



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
55 Great Republic Drive
Gloucester, MA 01930-2276

Ernest F. Stockwell III
Chairman
New England Fishery Management Council
50 Water Street, Suite 2
Newburyport, MA 01950

FEB 21 2014

Dear Terry:

This month the New England Fishery Management Council will take an important step towards completing the Omnibus Essential Fish Habitat Amendment by selecting a set of preferred alternatives for consideration. To assist in that discussion, I'd like to offer a few thoughts on different groups of alternatives to help ensure that they meet the requirement of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to "minimize to the extent practicable the adverse effects of fishing on essential fish habitat" (EFH), as well as meeting the Council's stated goals and objectives for this amendment.

I encourage the Council to carefully assess how the proposed measures meet its goals and objectives as you adopt preferred alternatives. I also want to note that the Council should be cautious in selecting alternatives using the "gear modification" options because the draft Environmental Impact Statement (EIS) concludes that it is "very difficult to say with any certainty that there would be a net habitat benefit" of the proposed gear restrictions (Section 4.1.1.1.2). To ensure consistency with the Magnuson-Stevens Act, the Amendment and EIS should demonstrate that adverse effects on EFH would be minimized with this management approach.

Habitat Management Areas

Gulf of Maine

Recently, some commercial groundfish industry groups have voiced a preference for Western Gulf of Maine Alternative 6, which would implement a habitat management area (i.e., "Stellwagen Large") that is roughly half the size of the current habitat management area in this region. We are concerned about opening vulnerable habitat on Jeffreys Ledge to mobile gear fishing because it would compromise years of recovery in this important and sensitive area. We are also concerned that this alternative may reduce protection on critical juvenile groundfish habitat, including habitat for Gulf of Maine cod, so much that it could not be compensated for elsewhere in the Gulf of Maine, regardless of what alternatives are selected in the Central and Eastern Gulf of Maine. This is, in large part, because of the low level of mobile gear fishing in these other sub-regions.

I understand that the analyses in the draft EIS suggest that the Bigelow Bight Habitat Management Areas would result in economic impacts that are likely not practicable. We need to meet the practicability standard. However, the Council, at a minimum, may need to consider a package of preferred alternatives that includes the *status quo* alternative in the Western Gulf of Maine in order to minimize, to the extent practicable, the adverse effects of fishing on EFH while



meeting the objectives of improved “refuge for critical life history stages” and “protection of critical groundfish habitats.”

For example, a set of preferred alternatives that includes the *status quo* alternative (Alternative 1) in the Western Gulf of Maine, Alternative 2 in the Eastern Gulf of Maine, and Alternative 3 in the Central Gulf of Maine appears to be a combination that would minimize adverse effects in a practicable way and allow for a modest improvement in juvenile groundfish habitat protection.

There may be several combinations that would achieve the desired goals; this is just one example using the alternatives currently under consideration. A wider range of alternatives, such as potentially revisiting some previously considered but rejected options could provide some additional opportunity to more effectively balance the goals of the amendment in the Gulf of Maine. However, that would require additional analyses to be completed prior to public hearings. Note, significant changes or additions after public hearings may require a supplemental EIS and/or additional opportunity for public comment.

Georges Bank

On Georges Bank, the issue of balancing the need for protecting vulnerable habitat and allowing access to a large concentration of valuable sea scallops has been an on-going issue. Of the alternatives currently under consideration, Alternative 6A would provide the greatest amount of protection for the most vulnerable substrate identified in this region. Alternative 6B appears to provide a better balance between habitat protection and access to some of the high concentration of scallops than any of the other alternatives by implementing an “alley” parallel with the Hague Line. However, the Council needs to justify the width of any such alley; e.g., why is an 8-mile alley necessary, and could the Council’s objectives be met with something narrower that allows for effective enforcement while providing additional fishing opportunities. We also have concerns regarding allowing mobile bottom tending gear fishing within the northern section of the existing Habitat Area of Particular Concern (HAPC). The Council should note that the HAPC is currently established and proposed in the “Phase I” portion of this amendment to remain an HAPC for juvenile cod, in large part because of its vulnerability to fishing impacts. The Council should be prepared to justify why any mobile bottom tending gear fishing would be allowed in the HAPC or explain why the HAPC designation is no longer warranted.

Prior to the December 2013 Council meeting, the Fisheries Survival Fund suggested in a letter to you that they would prefer Alternative 5 on Georges Bank. This would implement a large gear modification area with a smaller mobile gear closure in the southern portion of Georges Shoal. As noted above, however, it may be difficult to justify using the gear modifications described in the draft EIS to minimize adverse effects. Further, the mobile gear closure proposed in Alternative 5 would not protect the most vulnerable habitat in this sub-region.

More recently, the Fisheries Survival Fund, Associated Fisheries of Maine, and the Northeast Seafood Coalition submitted a proposal that included a modified version of Alternative 5 that would implement a smaller habitat management area on the northern edge of Georges Bank and a smaller habitat management area on Georges Shoal. The draft EIS does not have any analysis on this combination of areas, so it is difficult to comment specifically on it. However, we remain concerned about increased fishing in the HAPC area and that the smaller Georges Shoal area

would protect an area of less vulnerable habitat, potentially shifting mobile gear effort on to more vulnerable portions of Georges Bank.

Determining what, if any, habitat management areas are necessary in the Great South Channel/Southern New England region is complicated by the minimal benefit to be gained to EFH due to the very high energy of this area. Because of this, the Council should be cautious in relying on increased protection in the Great South Channel to "off-set" decreased protections elsewhere on Georges Bank.

Spawning Alternatives

Previously, the Habitat and Groundfish Committees recommended moving a more comprehensive review of the spawning closures to a more focused groundfish action. While we support that decision, the Council should ensure that the alternatives that are related to spawning protection in this amendment are an improvement over the *status quo*.

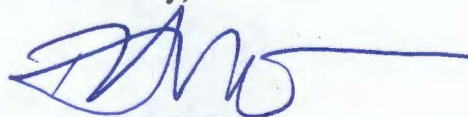
Gulf of Maine Spawning Alternative 2 would simplify the regulations by eliminating the "common pool" rolling closures, which only apply to a handful of vessels, as well as adding a winter spawning closure in Massachusetts Bay. Georges Bank Spawning Alternatives 2 and 3 would continue some protection for critical groundfish stocks during spawning periods; however, the Council should ensure that the seasons associated with these closures are the most appropriate by considering updated information on which species would be protected during the proposed seasons and which species would benefit from spawning protection at other times of the year. In addition, the Council should strongly consider the potential benefits from prohibiting recreational fishing in the spawning closures, given the increasing proportion of cod and haddock landings from that sector.

Dedicated Habitat Research Areas

Establishing dedicated habitat research areas (DHRA) would allow for a variety of research activities that could lead to improvements in how successfully we manage our fisheries. The Eastern Maine DHRA would provide near-shore research opportunities in Maine, the Stellwagen DHRA would help continue years of geologic and ecological studies in this critical portion of the Gulf of Maine, and the Georges Bank DHRA would help continue important scallop research in this area. A sunset provision would help ensure that the DHRAs are used appropriately and, if not, allow the Council the opportunity to remove the designation.

Finally, I'd like to thank your staff, particularly Michelle Bachman and Andy Applegate, the Habitat Plan Development Team, and the Closed Area Technical Team for the tremendous amount of work that went in to producing the draft EIS and all of the analyses contained within it. Thank you for considering these suggestions as we move towards the successful completion of this significant undertaking.

Sincerely,



John K. Bullard
Regional Administrator

for



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of National Marine Sanctuaries
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February 21, 2014

Mr. Terry Stockwell
Council Chairman
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Mr. Thomas Nies
Executive Director
New England Fishery Management Council
50 Water Street, Mill
Newburyport, MA 01950

Dear Mr. Stockwell and Mr. Nies:

During recent New England Fishery Management Council meetings, comments were made about the presence of lobster fishing within the proposed Stellwagen Dedicated Habitat Research Area (DHRA), described in Alternative 3 in the Omnibus Essential Fish Habit Amendment 2 Draft Environmental Impact Statement (DEIS). The concern was that lobster fishing would bias any results of research within the DHRA at the expense of excluding charter/party and private recreational fishing from reference areas that are components in two options of the DHRA design. Herein I provide analyses and interpretation of available data for the lobster trap fishery that leads us to conclude that this issue is not a significant concern at this time.

Attached is an analysis of lobster fishing effort as it relates to reference area options for the Stellwagen DHRA. Slide 1 illustrates the distribution of trips based on vessel trip report (VTR) data. Approximately 70 percent of lobster permit holders also hold a federal permit that requires VTR reporting. Assuming that unreported effort mirrors the pattern from reported effort, there are minimal lobster removals and related bycatch from the proposed reference area options, especially in recent years. The heat map of effort clearly illustrates that most effort is distributed to the west of the Stellwagen Bank National Marine Sanctuary (SBNMS). This pattern is consistent throughout the time series when effort is parsed by year (slide 2). That is, the majority of effort is outside the DHRA each year and recent patterns are not anomalous.

To address concerns that VTR patterns do not reflect reality on the water, we compared VTR data to a fishery independent, standardized vessel survey we conducted during the 2001/2002 period with a high level of agreement within the DHRA region (slide 3). Because buoys observed in the visual survey could represent other gear types we used VTR data to contrast lobster and gillnet/longline effort (slide 4). These results indicate that lobster effort remained highest to the west of the SBNMS boundary while other fixed gear effort was highest to the west of the western boundary of the western Gulf of Maine Closure Area (WGOMCA). They also indicate that effort within the WGOMCA and Stellwagen DHRA can be assumed to represent lobster fishing effort at that time.



There is no question that lobster traps can impact the seafloor (lobster trap trawls in the area of SBNMS typically consist of up to about 25 traps) and that lobster gear can retain groundfish. Data within the current draft DEIS (Volume 1, section 4.3.1.2.3) indicate that bycatch rates of cod are minimal at 0.3 percent of lobster catch as is bycatch of other large mesh groundfish species at 0.9 percent (based on 137 sets in the area of rolling closures). Such effort has been ongoing within the WGOMCA, and we suggest resides within the ecological noise due to the extremely patchy nature of trap impacts at such low levels of effort and with minimal removal of predators as bycatch. Given the questions the Council seeks to address using the DHRA approach, and those of parallel interest to Stellwagen Bank National Marine Sanctuary, the current level of lobster fishing effort will not preclude a wide range of scientifically rigorous studies.

Sincerely,

A handwritten signature in black ink, appearing to read 'Craig D. MacDonald', written in a cursive style.

Craig D. MacDonald, Ph.D.
Superintendent

Enclosure

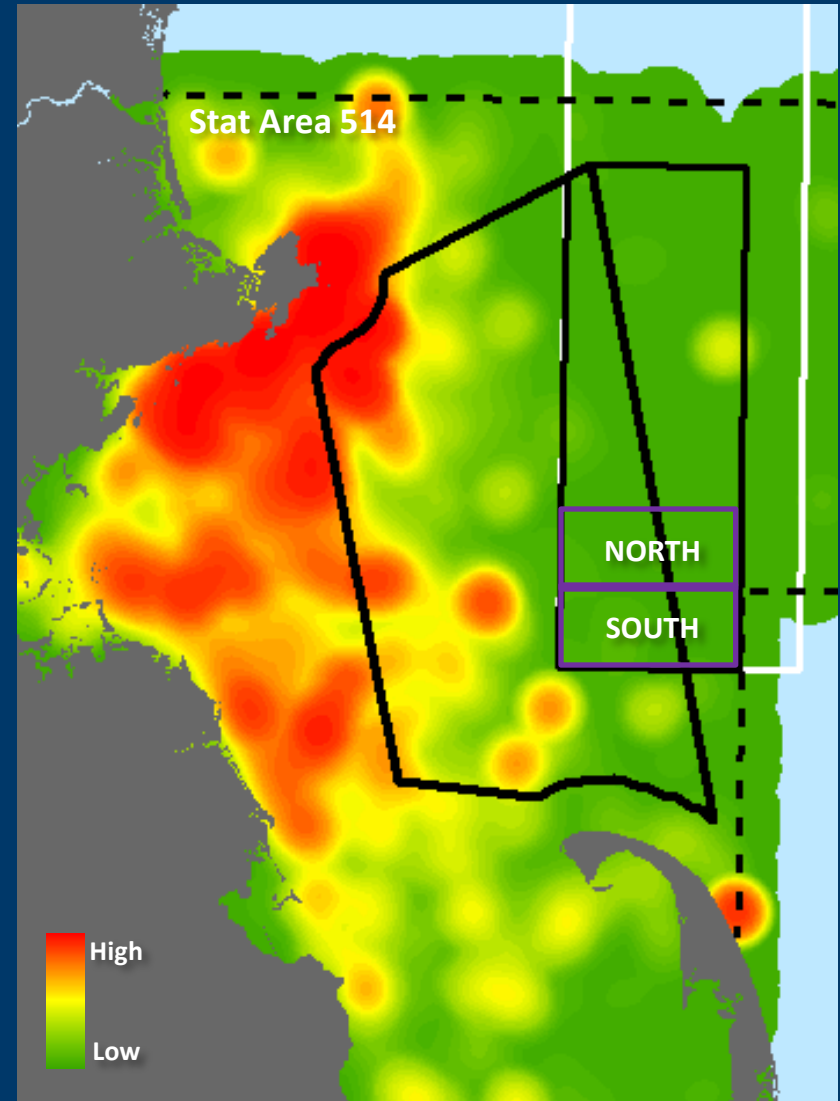
cc:

Mr. John Bullard, Northeast Regional Administrator, National Marine Fisheries Service
Dr. David Pierce, Deputy Director, Massachusetts Division of Marine Fisheries
Mr. Andrew Applegate, Ecosystems Based Management Coordinator, NEFMC
Ms. Michelle Bachman, Fishery Analyst, NEFMC

Lobster Boat VTR Trips 1996-2012

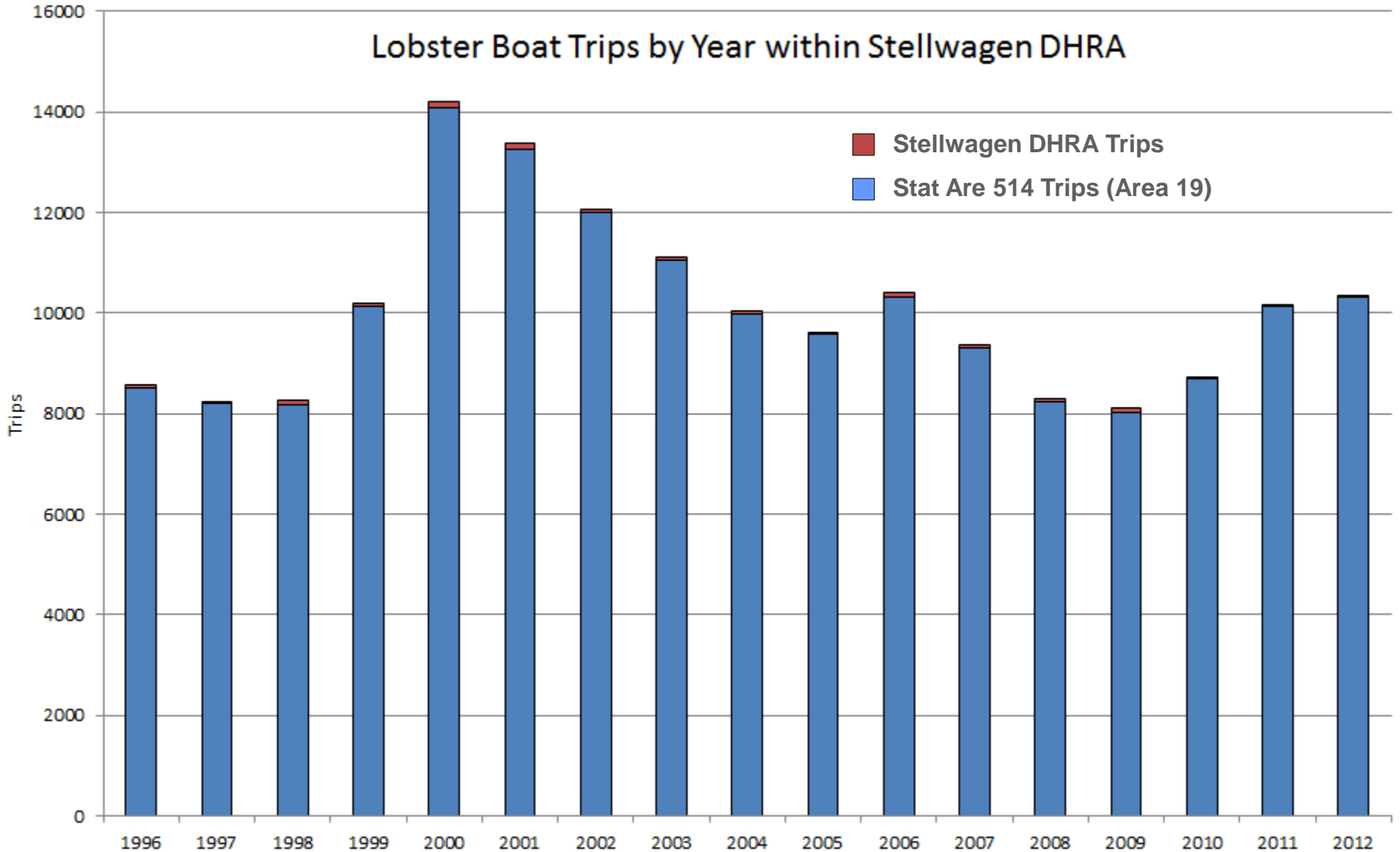
Lobster	Northern Reference Area	Southern Reference Area	Stellwagen DHRA	Stat Area 514 (Area 19)
2012 Boats	0	0	11	141
2012 Trips	0	0	15	10,348
2011 Boats	1	1	9	149
2011 Trips	1	1	11	10,137
1996-2012 Boats	44	51	160	642
1996-2012 Trips	110	174	1,080	171,083

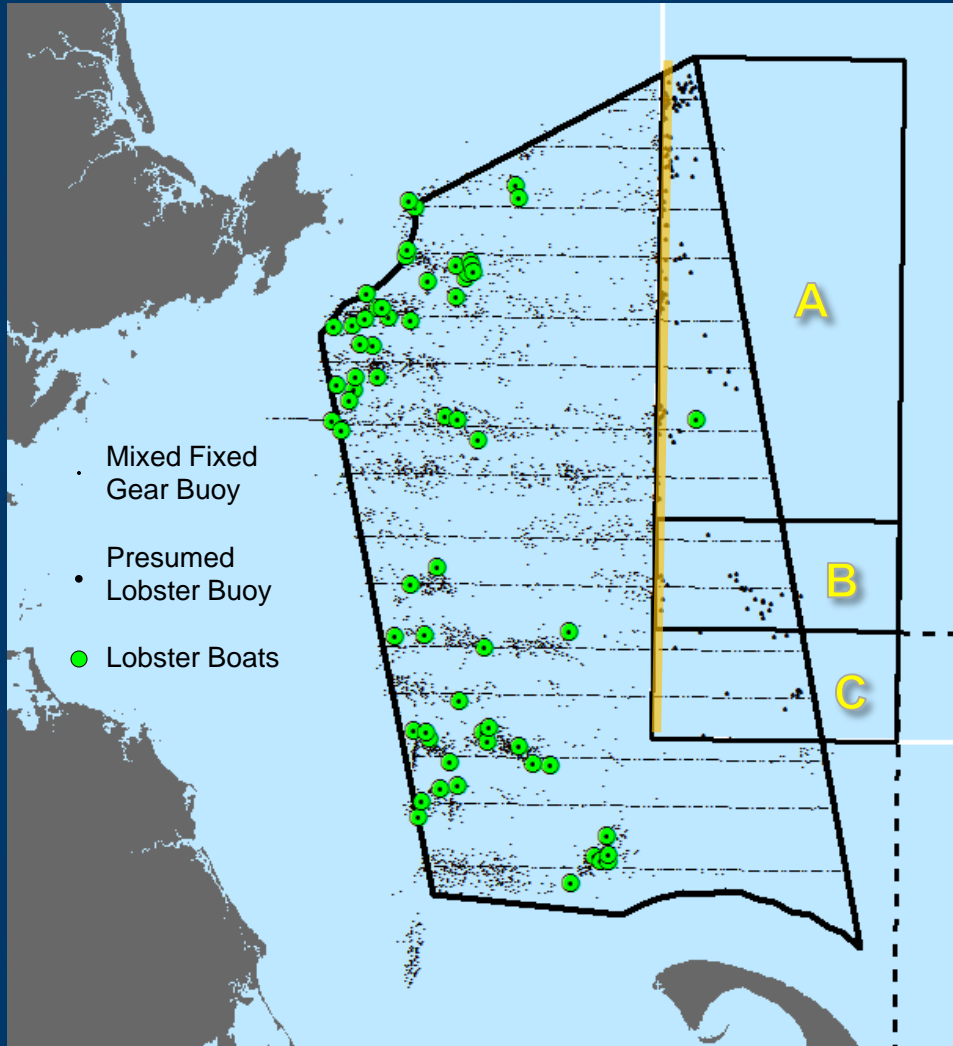
~70% of lobster permit holders also hold a federal permit that requires VTR reporting.





Lobster Boat Trips by Year within Stellwagen DHRA





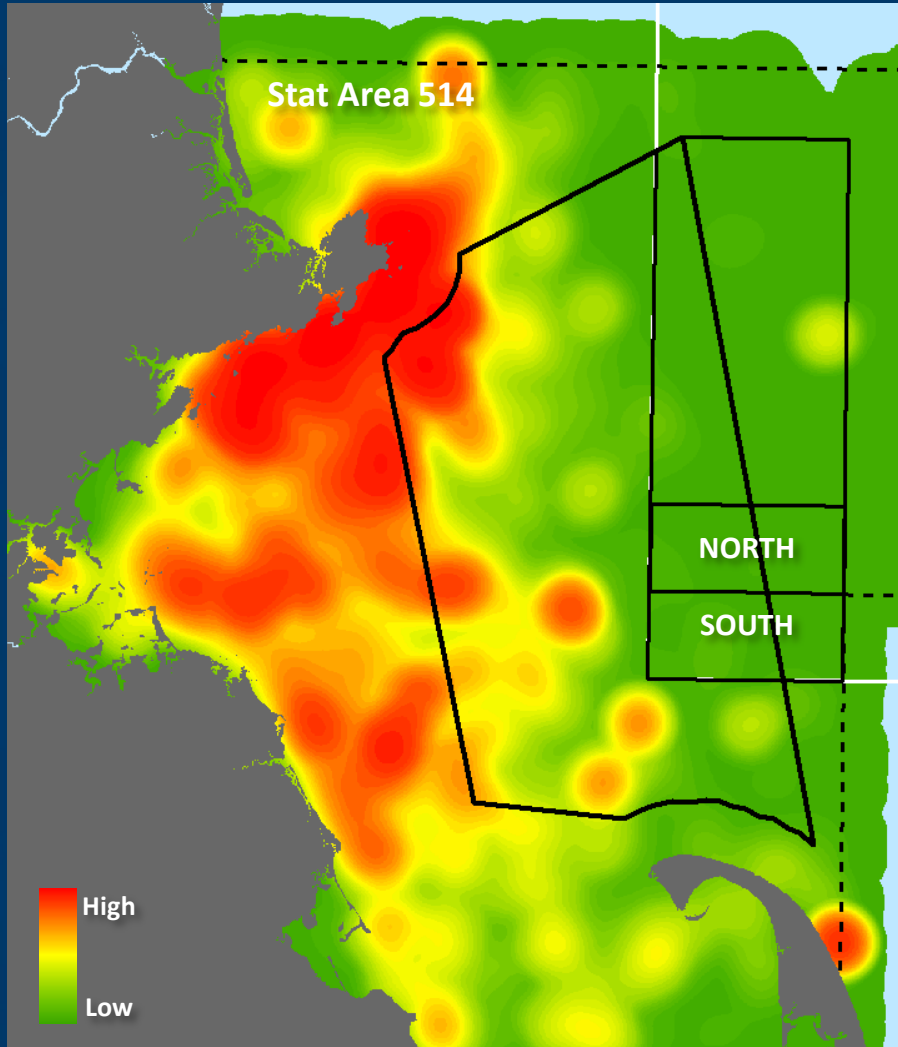
Stellwagen Standardized Survey & VTR 2001/2002

	Standardized	VTR
A	80 Lobster Buoys <i>*57 Buoys</i>	14 Boats (63 Trips)
B	15 Lobster Buoys <i>*21 Buoys</i>	6 Boats (6 Trips)
C	13 Lobster Buoys	7 Boats (19 Trips)

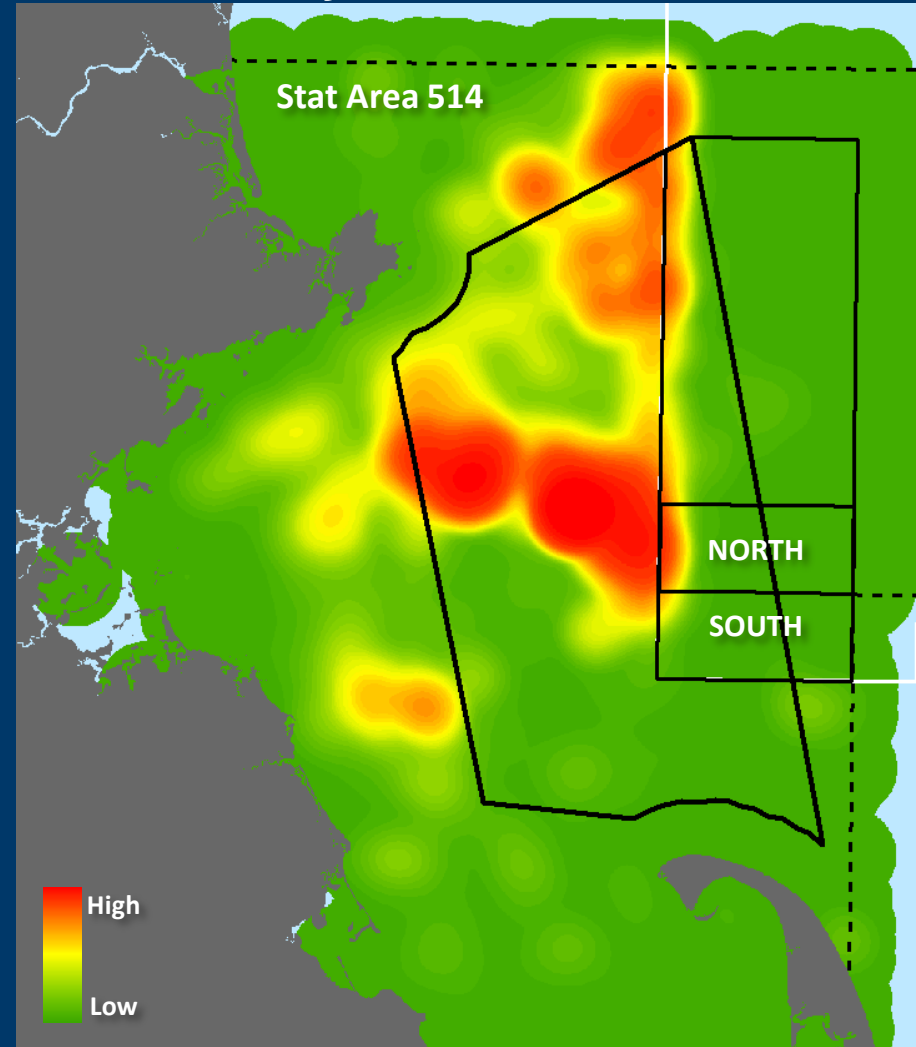
Source: The distribution and density of commercial fisheries and baleen whales within the Stellwagen Bank National Marine Sanctuary: July 2001-June 2002. MTS Journal 37(1), 35-53.

** mixed fixed gear associated with edge effect*

Lobster Boat VTR Trips 1996-2012



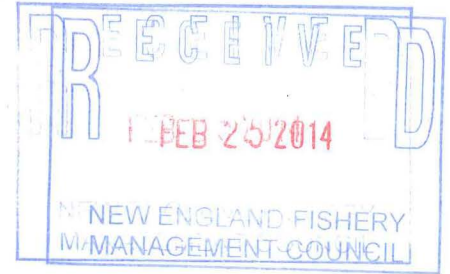
Gillnet and Longline VTR Trips May 1, 1998-2012





UNITED STATES DEPARTMENT OF COMMERCE
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February 24, 2014



Mr. Terry Stockwell
Council Chairman
New England Fishery Management Council
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Newburyport, MA 01950

Mr. Thomas Nies
Executive Director
New England Fishery Management Council
50 Water Street, Mill
Newburyport, MA 01950

Dear Mr. Stockwell and Mr. Nies:

This letter is written in full support of the Stellwagen Designated Habitat Research Area (DHRA) with Reference Area. We are in support of the Stellwagen DHRA (Alternative 3) with either Option A (Southern Reference Area) or Option B (Northern Reference Area). Alternative 3 (Stellwagen DHRA with Reference Area) is described on page 115 of Volume 3, Section 2.3.3 of the Omnibus Essential Fish Habitat Amendment 2 Draft Environmental Impact Statement (OHA2 Draft EIS) (see also map 28, page 117).

The Stellwagen DHRA with Reference Area can provide the opportunity to conduct empirical peer-reviewed research that contributes to improving the accuracy of the estimates of habitat impacts produced by the Swept Area Seabed Impact (SASI) model and to implement the research recommendations raised by the SASI Peer Review Panel (February 15-17, 2011). In particular the Panel recommended that the areas of biogenic characterization of the habitat and representative functional responses and uncertainty be examined.

The Stellwagen DHRA with Reference Area can address the priority research questions identified in Section 2.3 (OHA2 Draft EIS, page 109). The questions are based on four broad focus areas: gear impacts, habitat recovery, natural disturbance and productivity. Questions on impacts address the differential susceptibility and recovery of habitats by gear type and gear contact with the seabed. Questions on recovery focus on recovery models, patch size effects and effort response issues. Natural disturbance questions address the difference between natural and fishing disturbance. Productivity questions address productivity by habitat type.

My February 21, 2014 letter to the Council addressed the concern that lobster fishing would bias any results of research within the Stellwagen DHRA at the expense of excluding charter/party and private recreational fishing from the reference areas. The letter provided the results of our analysis comparing VTR and standardized survey data and concluded that the current level of lobster fishing effort will not preclude a wide range of scientifically rigorous studies.

cc: Council (2/27)
cc: Council (2/27)



Furthermore, data within the current draft DEIS indicate that bycatch rates of cod are minimal at 0.3 percent of lobster catch as is bycatch of other large mesh groundfish species at 0.9 percent.

Recent comments by recreational fishing interests assert that the use of VTR data in analyses is inappropriate. The attached map depicts the distribution and density of charter/party fishing trips based on VTR compared with recreational fishing boats based on a fishery independent standardized survey. Both data sets are mapped over multibeam bathymetry to provide context to underlying seabed characteristics. This comparison depicts close similarity in use pattern between these data sources within the Stellwagen DHRA. The similarity of pattern within the proposed DHRA Reference Areas is pronounced. The results of this comparison demonstrate that the use of VTR data is valid at this scale.

Thank you for the opportunity to provide these comments.

Sincerely,

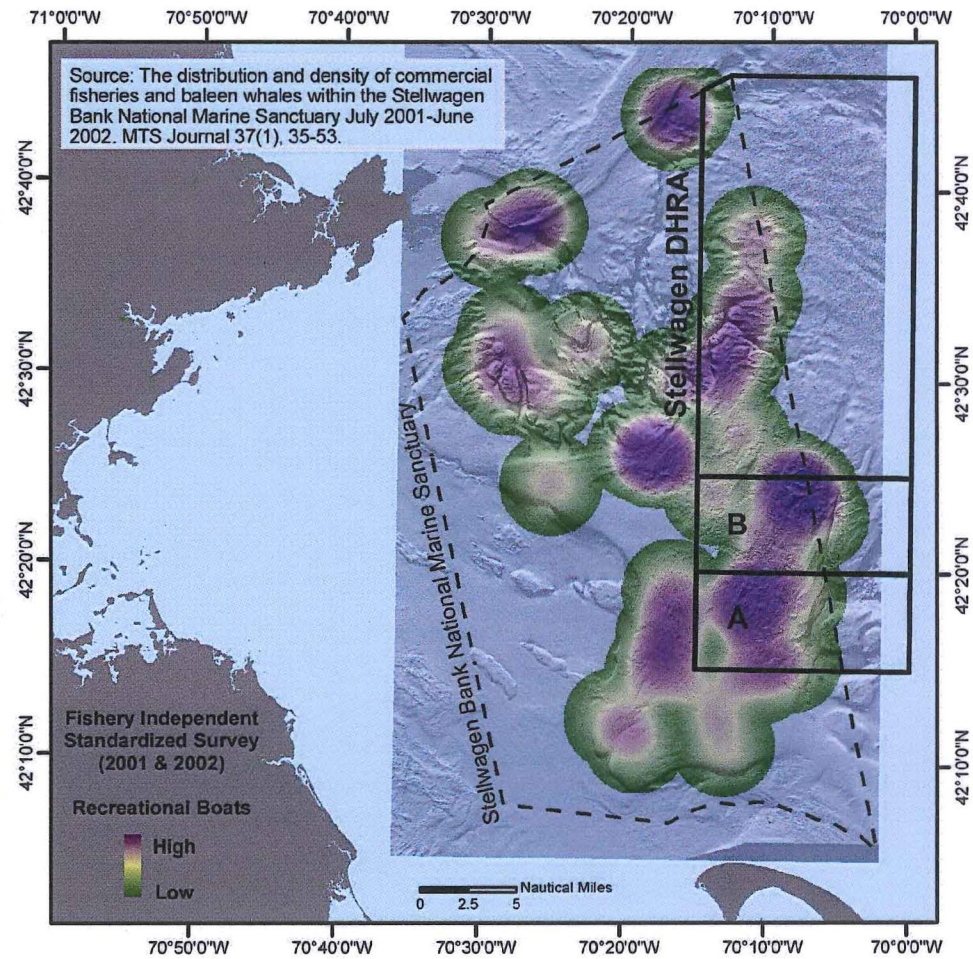
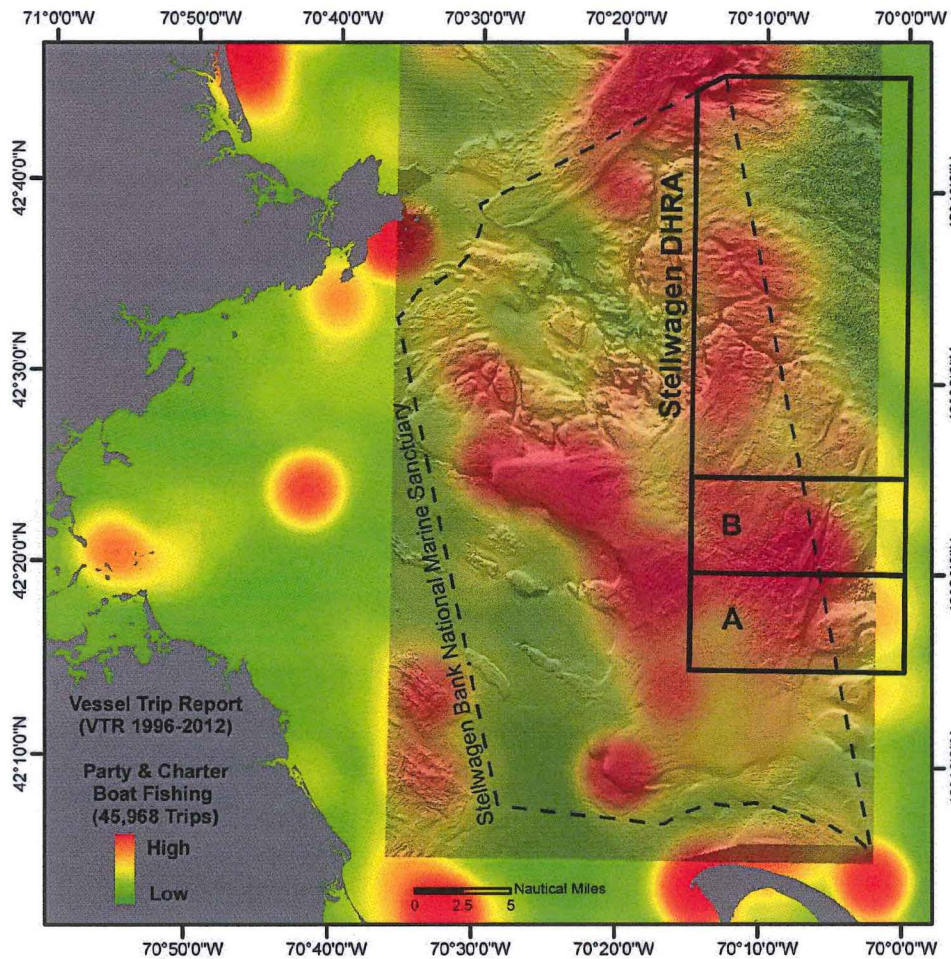
A handwritten signature in black ink, appearing to read 'C.D. MacDonald', written in a cursive style.

Craig D. MacDonald, Ph.D.
Superintendent

Enclosure

cc:

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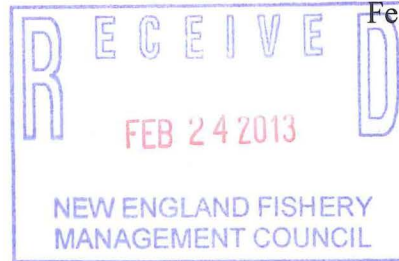
ATLANTIC OFFSHORE LOBSTERMEN'S ASSOCIATION

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February 24, 2014

Terry Stockwell, Chairman
New England Fishery Management Council
50 Water Street
Newburyport, MA 01950



Dear Terry,

This letter is in response to the Essential Fish Habitat Omnibus Amendment II Draft Environmental Impact Statement (DEIS) posted on the NEFMC website as of February 14, 2014. We commend you and your staff for all of the hard work that has been done on this amendment and would like to offer a few comments and suggestions.

From a historical perspective I think it is worth noting that the offshore lobster industry (represented by Atlantic Offshore Lobster Association/AOLA) and the groundfish industries (represented by the Sectors) acted proactively to develop a gear separation agreement for the area contained within Closed Area II (CA II). The basis for that understanding was the recognition by both parties, that each industry group required access to the area in order to optimize catches in their respective fisheries and that neither group could retain exclusive access. In addition, both industries embraced the need to avoid gear conflict in the area. Since being signed by the parties, the agreement has been codified by NEFMC and ASMFC into their respective management procedures. It is important to note that both industries had to sacrifice optimum access to their respective resources in order to finalize this understanding.

With this previous action in mind, AOLA initiated a similar dialog with the scallop industry, as represented by the Fishery Survival Fund (FSF), in an effort to avoid gear conflicts with that sector of the industry, should the area eventually open to scalloping. To date, the discussions have been productive, and both sides have expressed a willingness to collaborate in an effort to avoid gear conflict and reduce impacts on the lobster resource. Recently the lobster industry crafted and submitted a draft understanding to the FSF for review and FSF has requested a meeting to discuss the details of the draft. Unfortunately, the meeting will take place after the Council meeting of February 25-26. So to be clear, there is no sharing agreement or understanding between the parties at this time, but one may result from subsequent discussions. It is our hope that the two sides complete these discussions and reach a mutually beneficial sharing agreement; however, it is equally probable that we will not come to an understanding. If the latter were to take place, we expect the Council or NOAA Fisheries to mandate conditions to avoid a gear conflict in the area, as recently stated by Council Chairman Stockwell during the November Council meeting.

In regards to access to the area, it is important for the Council to understand that both industry groups have much at stake on this issue. Clearly the scallop industry has much to gain financially from accessing the area due to the very substantial quantities of large scallops in the area

*rec'd C Council mtg
cc: Council (2/27)*

Their representatives are in a better position than I to speak to the volume of scallops which can be sustainably harvested from the area.

The stakes are equally high for the lobster industry. Closed Area II hosts a seasonal lobster fishing fleet of approximately 20-25 large (generally 70+ feet in length) fixed gear vessels, fishing 20,000 to 30,000 traps annually, worth over \$4 million. Approximately one half of the fleet is home ported in NH, with the balance split between MA and RI. This fleet has been active on Georges Bank for over 30 years, and during the last 20 years or so, there has been very limited mobile gear fishing in large portions of the area. As a result, lobstermen have made substantial investments during this period in vessels, gear, and permits to access CA II.

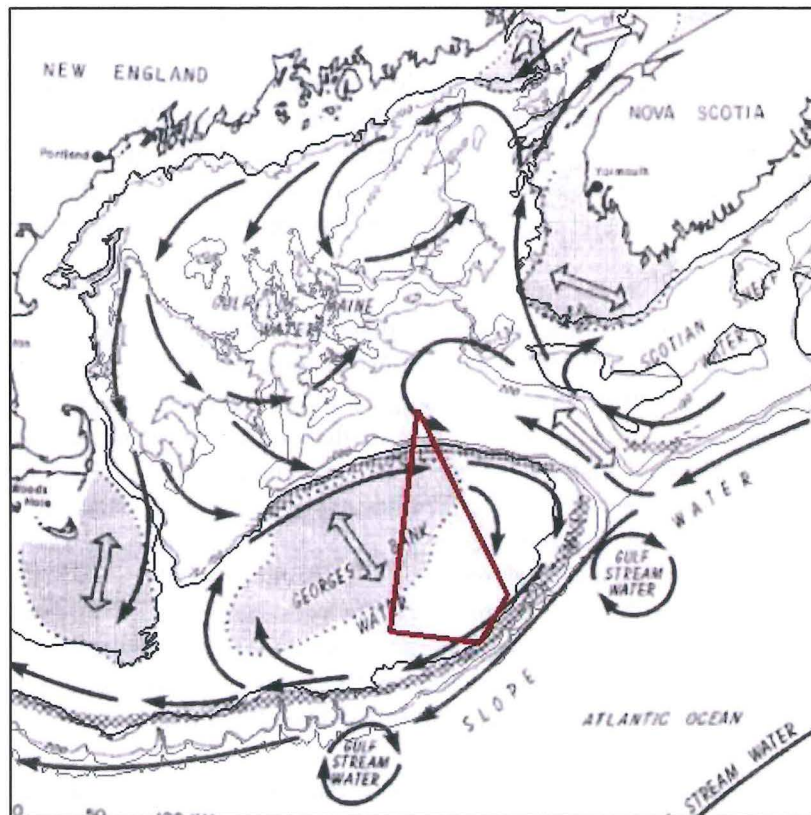
The lobster fleet has historically fished in the area from June through November, which coincides with the period when the lobsters migrate both from nearshore and multiple offshore directions to converge in shoal waters of CA II. This migration includes hundreds of thousands of egg bearing, or ovigerous, female lobsters. As noted in the Amendment, ovigerous females are present in this area in high numbers, as high as 80% of the haul, July-December of each year (DEIS, Volume 3, page 571). Most of these females are very large averaging 3-8 lbs, have very large egg masses attached to the underside of their tails and would be expected to release their eggs in late fall. I also note that these are some of the most fecund individuals in the lobster population, possessing large eggs, which should be expected to generally improve larval survival. Work by Smith and Howell (1987) confirm the low impact of pot fishing on the lobster population, with extremely low bycatch and incidental mortality rates.

With that as background, our Association does not believe that the DEIS has fully evaluated the consequences of a number of aspects of the proposed alternatives specifically relating to the connectivity of the inshore and offshore resource, potential for gear conflict, and potential consequences to coastal communities.

Connectivity: The lobster stock is managed based on three stock components: Georges Bank, Gulf of Maine, and Southern New England, although the stock recruitment relationship between these areas is not fully understood. One of our primary concerns with the DEIS is the general lack of discussion and analysis in regards to the connectivity of the inshore and offshore lobster stock components, and the impact that may result from unfettered CA II access by scallop gear during the period June to November. This is an extremely important issue given the magnitude of the egg bearing lobsters population that seasonally migrate through the area, and their potential recruitment contribution to the inshore fisheries.

Ovigerous females are present in high numbers, as high as 80% of the haul July-December of each year (DEIS, Volume 3, page 571). These data are supported by the VTR record, with high discard rates reported by lobster vessels in CA II July-September (see NH Fish and Game letter to NEFMC dated January 26, 2012 and figure at the end of this document). The majority of these discards are egg bearing or v-notched females. The density and persistence of ovigerous females in this area reoccurs annually, suggesting importance of this area to egg brooding and/or egg release. Given the location of this area and the circular currents that persist in the Gulf of Maine, lobsters in this area could be supplying larvae to Georges Bank, as well as inshore

fisheries in the Gulf of Maine and/or Southern New England. Note below Map 9 from DEIS Volume 1, on which we have superimposed CA II.



Although the scientific community has yet to reach a definitive conclusion on the interconnectivity of inshore and offshore lobster populations, the general consensus is that some lobsters are highly resident, many migrate to neighboring habitats, and still others regularly migrate long distances (Lawton and Lavalli, 1995). Campbell and Stasko (1985) found that ~20% of adult lobsters tagged in the Bay of Fundy moved more than 50 nautical miles, suggesting intermixing of lobsters throughout the Gulf of Maine and adjoining shelf edge sites. Similar studies have been done in Southern New England and north of Cape Cod, supporting the same conclusions. This issue becomes particularly relevant since larval settlement is down in almost all coastal sites sampled in the lobster settlement index (Canadian Maritimes to Rhode Island), including the Gulf of Maine (Wahle, 2013). This is a critical issue for hundreds of coastal communities, since the inshore lobster stock in the Gulf of Maine supports approximately six thousand commercial lobstermen with a fishery valued at approximately 400 million dollars.

As noted below, there is considerable literature that potentially links the inshore and offshore lobster populations. Some of that published literature could provide insight on this issue and should be integrated into the DEIS document. As an example, we note the following papers and conclusions. Cowan and Watson (2007) show that ovigerous lobsters, particularly large females, move offshore to optimize degree days and reduce temperature variability when brooding eggs. Tagging studies show that inshore ovigerous lobsters migrate to deeper water in the winter

(Campbell, 1986) and offshore lobsters migrate inshore in the summer (Cooper and Uzmann 1971). Watson (unpublished, 2007) in collaboration with AOLA did related tagging work showing that ovigerous lobsters reside in deep water in the winter and move to shallower water in the summer. He found that offshore eggers move more than inshore and that larger lobsters (>90mm CL) moved much further than smaller ones. Data collected by AOLA members since 2001, show that most of the female egg bearing lobster within CA II are greater than 90 mm CL; these data have been vetted by the Atlantic States Marine Fisheries Commission for inclusion in the forthcoming stock assessment. Watson (unpublished, 2009) also found evidence for brooding-site fidelity, although this work was not done on Georges Bank. He also did egger tagging in 2008 that tracked lobster movement from inshore New Hampshire to offshore Gulf of Maine.

In regards to larval transport, a number of studies potentially link the inshore and offshore lobster stocks. Work by Canadians in the 1980s and 1990s document larval lobster in the waters above Georges and Browns Bank in the summer and suggest that ovigerous females release larvae from shoal areas (Harding, et. al, 2003 review). From drifter work they inferred that larvae released offshore would be transported inshore (as described by Hare, 2005). Harding and colleagues (1983) find that oceanographic data (wind, tidal forces, seasonal surface circulations and occasional plumes escaping the northern edge of Georges Bank) and the ability of later stage larvae to conduct directional swimming support a high level of offshore to inshore connectivity and suggest that the Gulf of Maine, inclusive of Georges Bank, could be considered a single lobster recruitment system with larvae expected to move counterclockwise. Lawrence and Trites (1983) modeling surface oil from Georges/Brown Bank region in the summer found frequent impacts on coastlines of southwestern Nova Scotia and Bay of Fundy.

Incze, Xie and colleagues have published a series of papers related to modeling larval dispersal and population connectivity in the Gulf of Maine (Incze and Naime, 2000; Incze, et al., 2006, Xue et al., 2008; Incze, et. al, 2010). Their work suggests that recruitment can be a very local event, but there is potential for long distance dispersal, especially when females hatch eggs farther from shore. Modeling work by Fogarty (1998) of the NOAA Fisheries Northeast Fishery Science Center found that even relatively low levels of larval transport from offshore to inshore could explain resilience of the inshore population despite high levels of fishing mortality. Hare (2005) of the NOAA's National Ocean Service, advocates for the "*precautionary approach*", suggesting that offshore larval supply need be considered when managing inshore lobster fisheries. South of Cape Cod, Katz et al. (1994) sampled for larvae along an offshore-inshore transect (Hydrographers Canyon to Rhode Island waters) and found a gradient of stages with a greater proportion of earlier stage larvae offshore and later stage larvae inshore, suggesting hatching offshore and transport inshore. Further, Crivello et al. (2005) used genetic methods to link Long Island Sound larval lobsters to female lobsters from Hudson Canyon, suggesting that up to 45% of the larvae in Long Island Sound came from Hudson Canyon females. There is also morphometric evidence from throughout the region supporting mixing of inshore and offshore stocks (Harding et al., 1993; Cadrin, 1995).

All of the above lead our Association to the overriding conclusion that the DEIS needs to integrate all of published literature into the document and complete additional fishery and economic impact analyses of the alternatives. This work should be done under a varying range of

assumptions concerning connectivity, to ensure that any opening of CA II does not potentially interfere with larval transport to inshore areas in the Gulf of Maine or SNE stock area.

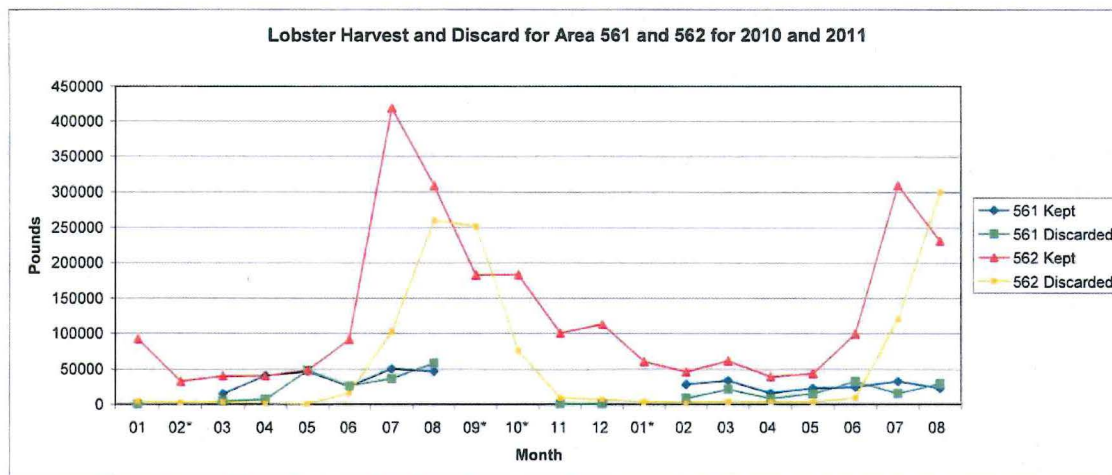
Gear Conflict: Unfettered access to HAPC in CA II by the scallop fleet will surely result in substantial trap losses due to the overlap between the abundance of scallops, and abundance of lobster gear. We take exception with the DEIS characterization of the loss as a “small negative impact” (Volume 3, page 338). We note the only way this could be true is if the impact analysis is calculated based on the entire lobster fishery in the Gulf of Maine (including the inshore fishery) or spanning the entire fishery from Maine to Virginia. We believe that the lobster gear impact analysis should be more fully developed specific gear conflict on Georges Bank, or at a minimum the unit under review should be the Lobster Management Area 3. We also take exception to the following sentence from Volume 3 of the DEIS (page 571) “*Lobster trapping, which comprises the vast majority of lobster fishing effort, would not be restricted under any of the management alternatives in this amendment, so there would not be any direct impacts through displacement of lobster trapping effort.*” Any alternative that provides for scallop access to CA II without a sharing understanding will surely displace lobster gear to other areas, which may cause gear conflict with other fisheries or enhanced interactions with protected species. These possibilities should be factored into the analysis. Further, it is factually incorrect to reference the groundfish and lobster industries’ agreement and subsequent action by ASMFC and NEFMC to codify this agreement, as ameliorating gear conflict concerns (Volume 3, page 571-572). The standing agreement does not apply to the scallop industry, and to date no sharing agreement exists that includes scallop/lobster fishery interactions.

Impacts on Coastal Communities and Ports: Given the connectivity potential between inshore and offshore lobster resources discussed above, we believe that the DEIS should fully develop, model, and forecast the potential economic impacts of each alternative for the most affected coastal communities. This analysis should include the possibility that the female egg bearing population will be negatively impacted by scallop dredging, resulting in direct and delayed mortality on the populations. Jamieson and Campbell (1980) examined dredge impacts on lobsters in the Gulf of Saint Lawrence, and found that dredge gear injured lobsters and, caused them to exhibit avoidance behavior. While the injury rates were up to 11% in this study, the 2012 assessment of trawl and dredge induced damage by the American Lobster Technical Committee of the ASMFC concluded that this study may not be applicable to the Georges Bank region. They advocate for 3-5 years of bottom tending mobile gear research assessing impacts before opening CA II. A result of this impact, recruitment may decline in some inshore areas, i.e. Gulf of Maine and also Southern New England. As noted in the Fogarty 1998 paper, minor amounts of larval transport to inshore areas could explain the resiliency of some of the inshore stocks in the face of high fishing mortality. We therefore conclude that minor reductions in larval transport to inshore areas could therefore result in real declines in the inshore landings, with dramatic impact on coastal communities.

Further, potential impact on specific states, ports, and groups of fishermen should be more fully developed under a range of different assumptions. The CA II lobster fleet represents close to one third of the active Area 3 lobster fleet, and a large portion is home ported in New Hampshire. We need to fully understand the negative impacts on that State and its fishermen.

Our conclusion is that fixed and mobile gears should gain access to Closed Area II in order to maintain historic catches of groundfish, scallop, and lobster provided that there is a gear separation agreements in place that protect against gear loss and impacts on the resources in the area, particularly the migratory ovigerous female lobster population. Such an agreement should be in effect from the middle of June through the end of October. We understand that the actions taken by the Council ultimately need to balance the needs of habitat protection with the needs of all regional fishing fleets. In our view it would be reckless to make changes to the status quo on Georges Bank without either an industry negotiated sharing agreement, or Council or NOAA Fisheries mandated gear separation regulations. We also believe that the analysis should be expanded to address some of the deficiencies that we have noted prior to scheduling hearings on the document. Although AOLA members prefer a path which leads to an industry negotiated agreement, we are committed to push for regulations if the industry parties cannot come to a timely understanding.

Figure from NH Fish and Game letter to NEFMC dated January 26, 2012



*Removed to protect confidentiality.

Figure 1. Kept and Discarded Lobster from Federal Vessel Trip Reports for Statistical Areas 561 and 562 from January 2010 through August 2011.

Sincerely,

David Borden
Executive Director

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Coalition for the Atlantic Herring Fishery's Orderly, Informed and Responsible Long Term Development

February 20th, 2014

Thomas Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill #2
Newburyport, MA 01959



Re: Omnibus Essential Fish Habitat Amendment 2

Dear Tom,

I am writing on behalf of CHOIR to comment on the Draft Environmental Impact Statement for Omnibus Essential Fish Habitat (EFH) Amendment 2 (Amendment). CHOIR is an industry coalition made up over 650 commercial and recreational fishing organizations, fishing and shore side businesses, researchers and eco-tourism companies.

One of the key aspects EFH management is supposed to address is protection of important spawning areas. As such, we are shocked to see that this amendment appears to do nothing to address the critical spawning areas for Atlantic herring. Herring are the most important forage stock off of the Northeast coast—without a healthy herring resource, management of groundfish and other critical predator stocks is a waste of time.

While there are some temporal fluctuations, the spawning areas for herring are relatively well known. And since the eggs fall and stick to bottom, they can easily be disrupted by certain fishing methods. Unfortunately, outside of a loose system of ASMFC-based closures in the inshore Gulf of Maine, there is nothing being done to protect these vulnerable areas. For example, there is no protection for spawning areas on George's Bank, or in the Nantucket Shoals area. Massive disruption of these spawning beds by pair trawl gear, for example, is not only problematic because of the negative impact on the future health of the herring resource, but it is problematic because the eggs themselves are well known to be an important food source in their own right.

We would strongly encourage the Council to consider taking steps in this Amendment to afford further protection to the key spawning areas during the spawning season. It is hard to understand how an amendment that is attempting to protect EFH can ignore the most essential of all habitats that of the key forage stock in the region. Moreover, given that the Council is discussing the elimination of certain closures that overlap with herring

cc: Council mtg; cc: Council (2/17)

spawning grounds—such as Closed Area I—this document could actually lead to an increase in the disruption of herring eggs!

Furthermore, while herring is our primary focus, we would also point out that there seems to be no measures to address EFH for other critical forage stocks in the region, such as sand lance (or sand eels) and river herring. We hope the Council will also take steps in this document to protect the EFH of these important species, as well.

Ask any successful fisherman what drives most of our fisheries, and they will tell you that it all comes down to having enough food. If we want to ever see the groundfish stocks regain their former health, we need to ensure that they have something to eat. While protecting the habitat of these important forage stocks is just one part of the puzzle, it is an important one, and so we hope the Council will treat it as such.

Thanks for your time,



Steve Weiner, Chair



CITY OF NEW BEDFORD

JONATHAN F. MITCHELL, MAYOR

February 24, 2014

Chairman Ernest F. Stockwell III
New England Fishery Management Council
50 Water Street
Newburyport, Massachusetts 01950

John K. Bullard
Regional Administrator
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276



Re: Habitat Amendment – Georges Bank and Nantucket Shoals

Dear Chairman Stockwell and Administrator Bullard:

This week the New England Fishery Management Council will meet in Danvers, Massachusetts to select preferred alternatives for the Draft Omnibus Essential Fish Habitat (“EFH”) Amendment. I write to express my concern that the draft amendment contains certain alternatives that threaten New England’s fisheries with significant economic losses. The range of alternatives in the current Draft Environmental Impact Statement for habitat closures are inadequate, and invite the public to question whether the Council has fully carefully weighed the purported environmental benefits of such closures with the economic impact of those actions. I am especially troubled by the continued closures of areas along the Northern Edge of Georges Bank and the proposed closure of Nantucket Shoals.

Georges Bank

The scientific record does not support large-scale closures on Georges Bank because there is insufficient evidence that such closures would facilitate stock recovery and increase fishery productivity. In fact, the likelihood of effort displacement and increased bottom contact associated with closures in areas with relatively high densities of fish means that net damage to habitat is likely to increase if broad areas are closed. Despite this lack of scientific justification for designating large closures, the Council is considering alternatives that will have enormous economic consequences. It is estimated that thirty million pounds of scallops, valued at over \$400 million, are contained in Closed Area II along the Northern Edge of Georges Bank. The Council’s decisions during this habitat amendment process will determine whether the revenue

cc'd C Council mtg (2/25)

from this resource will be realized or locked away in the absence of a compelling environmental benefit.

It is imperative that the highest-yield areas along the Northern Edge remain open in order to maximize benefits to the resource, the industry, and our shoreside economy. The Council should not consider implementing fisheries closures for which there is no scientific justification. The Fisheries Survival Fund, Northeast Seafood Coalition, and Associated Fisheries of Maine have developed an alternate set of closed areas that provide equivalent habitat protection, as indicated by the SASI model used by the Council's scientists and technical teams, while minimizing the economic harm incurred by such closures. If closures must be designated at all, the option proposed by these organizations would be the only viable alternative.

Nantucket Shoals

Although New Bedford is known as the center of America's scallop industry, the clam industry has quickly become a significant segment of our regional economy. Clam vessels and processors now employ over five hundred people in Greater New Bedford. According to NOAA, the value-added estimate of the industry is over \$250 million annually, and the clam fishery itself is the third highest in Massachusetts. Most of the clamming vessels are home ported in New Bedford and Cape Cod and clam primarily in and around Nantucket Shoals, which is now widely recognized as arguably the richest clamming grounds in the world.

The proposed closure of Nantucket Shoals to clamming threatens all of this activity. Closing Nantucket Shoals would cause these vessel operators to choose between going out of business and fishing further offshore at a greater safety risk. As you know, the clam fishery occurs on sandy bottoms – high energy environments with little habitat to support fin fish. This is yet another issue in which reliable science must precede new fishing restrictions. Any action in the direction of reducing clamming opportunities must be preceded by thorough surveys with industry participation which show significant demonstrable benefits for finfish and the groundfish industry. I urge you not to proceed in that direction until the environmental benefits are known with a substantial degree of certainty and weighed in the fullest consideration of the resulting loss of opportunity, income and jobs for the men and women in the clam harvesting and processing industries.

Thank you for your careful consideration of these issues of tremendous importance to the City of New Bedford and its citizens.

Sincerely,



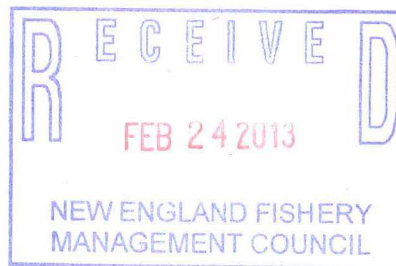
Jon Mitchell

Cc: Tom Nies, Executive Director New England Fisheries Management Council

From: Nathalie Grady [<mailto:nathalie.grady@boatma.com>]
Sent: Monday, February 24, 2014 2:47 PM
To: Pat Fiorelli
Cc: 'Nathalie Grady'
Subject: Letter of Concern from MA Marine Trades Association re: Potential Stellwagen Restrictions

February 24, 2014

Thomas A. Nies, Executive Director
Patricia Fiorelli, Public Affairs Officer
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950



Dear Mr. Nies and Ms. Fiorelli,

The Massachusetts Marine Trades Association (MMTA) is a non-profit organization that has represented recreational boating businesses statewide for a half century. Part of MMTA's mission is to protect public access to our coastal waters for boaters enjoying cruising, fishing and other family-friendly forms of recreation. This not only preserves the Public Trust but also supports the viability of the many small, family-owned marine businesses that largely comprise our membership.

We are concerned that the New England Fishery Management Council is considering placing restrictions on bottom fishing at Stellwagen Bank. These waters are beloved by recreational fishermen and women and access to the Stellwagen area in question is critical to driving activity at our members' marinas and boatyards. Fishing largely attracts boaters to the water. Further fishing restrictions will negatively impact countless small marine business owners who will see a decrease in boater activity in an already daunting economic and regulatory environment in a very short boating season.

We appreciate the challenge that NEFMC faces in balancing fishing access and stock preservation. However, a passion for the environment is inherent in boating and fishing as forms of recreation. Our members and their customers share your desire to preserve our natural resources but urge you to strongly consider the potential long-term, negative consequences of such vast restrictions.

If you have any questions please do not hesitate to contact the Massachusetts Marine Trades Association. Thank you for your consideration of our concerns.

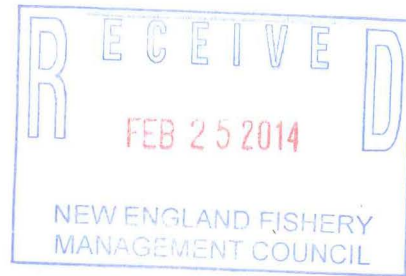
Cordially,

Tim Moll
President
Massachusetts Marine Trades Association
PO BOX 272
Milton, MA 02186
Nathalie.grady@boatma.com
978.808.1408

*rec'd @ Council mts
cc: Council (2/27)*

February 24, 2014

Terry Stockwell, Chairman
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950



Dear Terry,

It is with great urgency that I write to you today to request the Council address the existing Accountability Measures (AM) for Northern and Southern windowpane flounder through an expedited and focused Framework action.

We understand that a focused Framework adjustment can be accomplished in two Council meetings with one of them being a Committee meeting. Therefore we believe the Council could act to initiate a Framework during the February Council meeting, which would place the first Framework meeting at the next Groundfish Committee meeting and the second to occur at the full Council meeting scheduled in April. NSC greatly appreciates the limitations on Council resources which is why we offer that this Framework be focused on the groundfish sub-ACL and AMs for windowpane only.

NSC is committed to assisting the Council and NMFS toward immediate management adjustments that can prevent long term biological or economic losses. More specifically, to adjust the Multispecies FMP through focused, limited measure Frameworks where policy solutions may already exist and profound negative consequences can be avoided. NSC strongly believes this is the case with the Northern and Southern windowpane flounder AMs.

Over the past few months, NSC has come to learn that the existing AM for Northern windowpane flounder is entirely inadequate and therefore ineffective for preventing ACL overages while the triggering of the Southern windowpane flounder AM now appears to be largely unnecessary. The following includes additional information for consideration:

NORTHERN WINDOWPANE FLOUNDER:

- The existing AMs are reactive and only trigger once the ACL is exceeded which is rarely known in-season.
- We estimate the existing large AM area will cost 5 to 10 million dollars in lost revenues.
- The existing AM areas do not account for much of the area where windowpane bycatch has been occurring in recent years. There will be tremendous economic losses without commensurate biological benefits in the form of windowpane mortality.

- The AM only applies to groundfish. Groundfish caught 100.5% of the 2012 sub ACL yet the large AM area was triggered.
- The groundfish industry will be prepared to submit an alternative AM that will provide improved accountability to the sub-ACL.

SOUTHERN WINDOWPANE FLOUNDER:

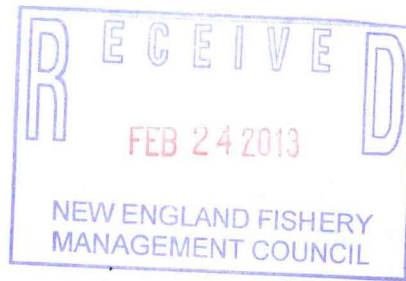
- The most recent status determination for this stock is that S. windowpane is rebuilt.
- The ACL overage reported in 2012 is covered by the increase in the ACL in 2013.
- The economic impacts to our SNE membership that will result from lost income generated from the SNE winter flounder and SNE yellowtail flounder fishery will be substantial. A framework will allow a focused look at the AM and future catch projections using updated information.

Thank you in advance for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Jackie Odell". The signature is written in a cursive, flowing style.

Jackie Odell
Executive Director



Sea Watch International
15 Antonio Costa Avenue
New Bedford, MA 02740

Atlantic Capes Fisheries
16 Broadcommon Road
Bristol, RI 02809

February 20, 2014

The Honorable Jonathan F. Mitchell
Mayor of the City of New Bedford
133 William Street
New Bedford, MA 02740

Dear Mayor Mitchell:

We are writing to express our extreme displeasure with the provisions of the Omnibus Fishery Habitat Amendment as it specifically relates to the surf clam and ocean quahog fishery on Nantucket Shoal. It is difficult to comprehend or overstate the economic harm facing Massachusetts and Rhode Island fishermen if certain closed areas are adopted under provisions of the amendment being considered by the New England Fishery Management Council.

In particular, it is a matter of great concern that Nantucket Shoals, under certain alternatives, could be closed to surf clam and ocean quahog clamming. The New England surf clam and ocean quahog industries, both fishing and processing, are primarily centered in New Bedford and nearby Bristol, Rhode Island. According to the National Marine Fisheries Service (NMFS) statistics, the industry lands approximately 200 million pounds of product valued at \$84 million, employs 450 individuals directly (300 plus in New Bedford and 150 in Rhode Island), and another 250 in support industries. This makes the industry the largest fishery in New England in terms of total weight of landings and the third largest in terms of

rec'd e Council mtg; cc: Council (2/27)

dollar value. Most of the processing facilities are located in Massachusetts, and the vast majority of the harvesting vessels home port is New Bedford and Fairhaven, Massachusetts. Given the magnitude and importance of the fishery, this is not a trivial issue and numerous hard working families in New Bedford and Rhode Island derive their primary income from this industry. Any changes that affect this industry should be done with great caution and based on sound science.

According to the Amendment, one of the primary purposes of the exercise is to protect complex habitat, and thereby protect juvenile habitat for groundfish species, ages 0 and 1. We note that Nantucket Shoals is primarily composed of sand, mud, and silt as evidenced by Map 40, Volume 3 of the EIS (attached) and that there is little complex habitat in either the Nantucket Groundfish or Habitat protection areas. The primary habitat type is sand, which is one of the least vulnerable types of habitat according to the DEIS.

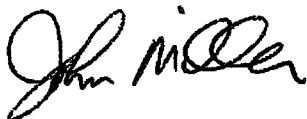
In addition, the Council completed a hot spot analysis which was peer reviewed, to document the occurrence of groundfish, characterized as "well above average survey catches of 0 and 1 groundfish". The analysis was based on a composite of the most relevant finfish surveys, which included the NMFS surveys, data from commercial boats, state surveys, and appropriate industry based surveys. The data was collected from 2002 to 2012 and was very comprehensive as noted in Map 105 from Volume 1 (attached). According to the criteria and the analysis, there are few concentrations of juvenile groundfish in this area with the exception of barn door skate, red hake, and monkfish, none of which are over fished, refer to Figure DEIS page 269-299 Volume 1.

Our overriding conclusion from this data and extensive analysis is that there is little or no scientific basis for establishing Nantucket Shoals as either a habitat protection area or as a groundfish protection area. This is particularly so, if you consider the potential loss of \$84 million dollars to the two State economies. In addition, there is no basis to close the area to hydraulic clam dredges as the area is a high energy environment, primarily composed of sand and mud, with little complex habitat, and few concentrations juvenile groundfish.

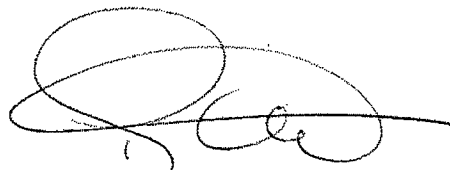
We therefore support Alternative 2 on page 188 of Volume 3, which would allow mobile gear to fish throughout the area. In addition, every effort should be made to not prohibit access to the clam resource; as such an action would impose unjustified and unequal penalties on the clam industry and residents of our two States, without demonstrable benefits for groundfish fishery or protecting critical habitat.

Finally, as noted in the analysis Page 188-Volume 3, this option would have a positive impact on the habitat and provide greater flexibility to the industry, which could also shift effort to less vulnerable habitat. This change would also make more products available to the industry and generate more economic activity and jobs for New England fishermen. I therefore urge you to support alternatives that leave the entire Nantucket Shoals area open to clamming for the overall benefit of the New England seafood industry in Massachusetts and Rhode Island.

Best regards and wishes for an outcome that supports our seafood industry.



John Miller, Vice President of Operations
Sea Watch International

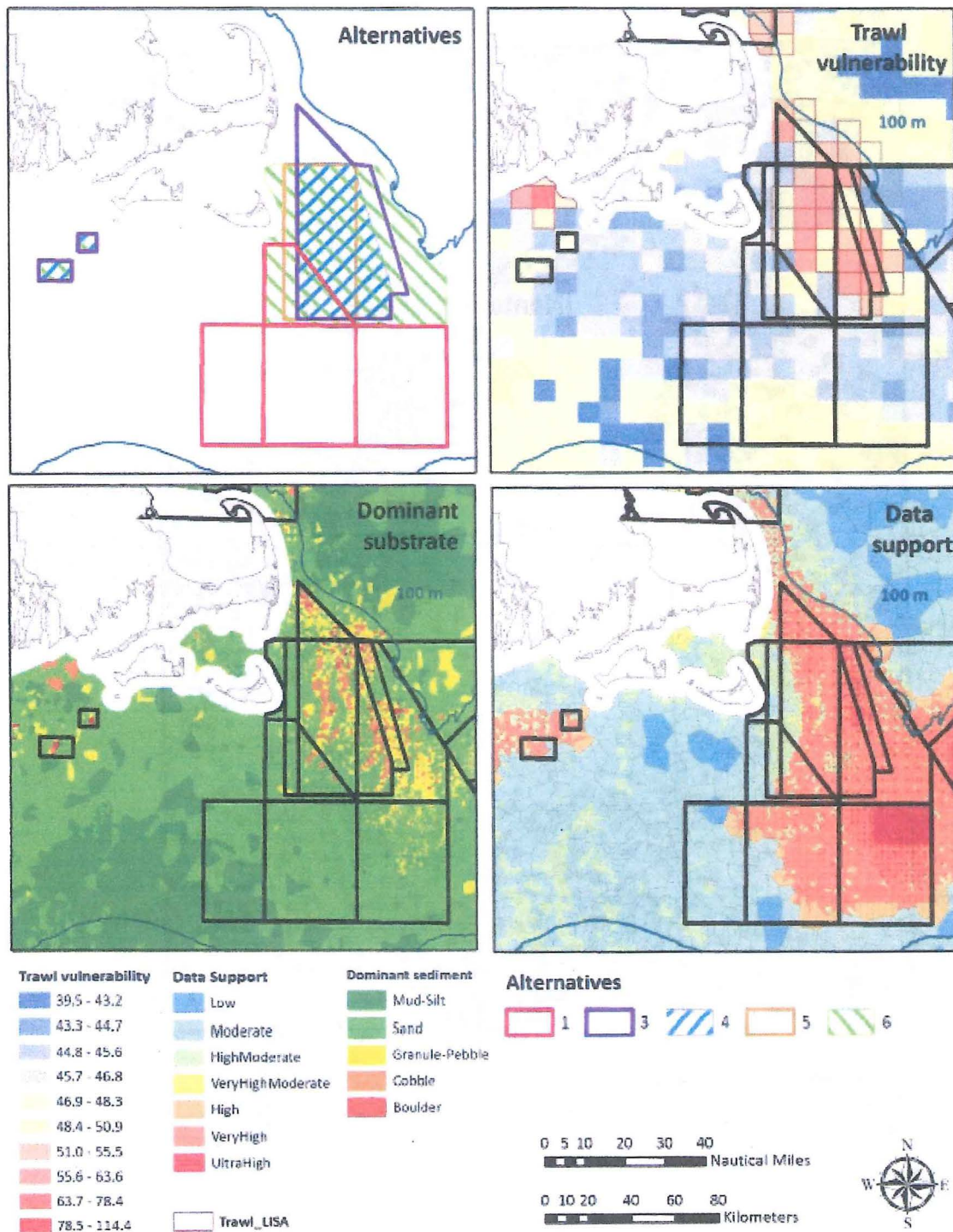


Thomas Slaughter, General Manager
Atlantic Capes Fisheries

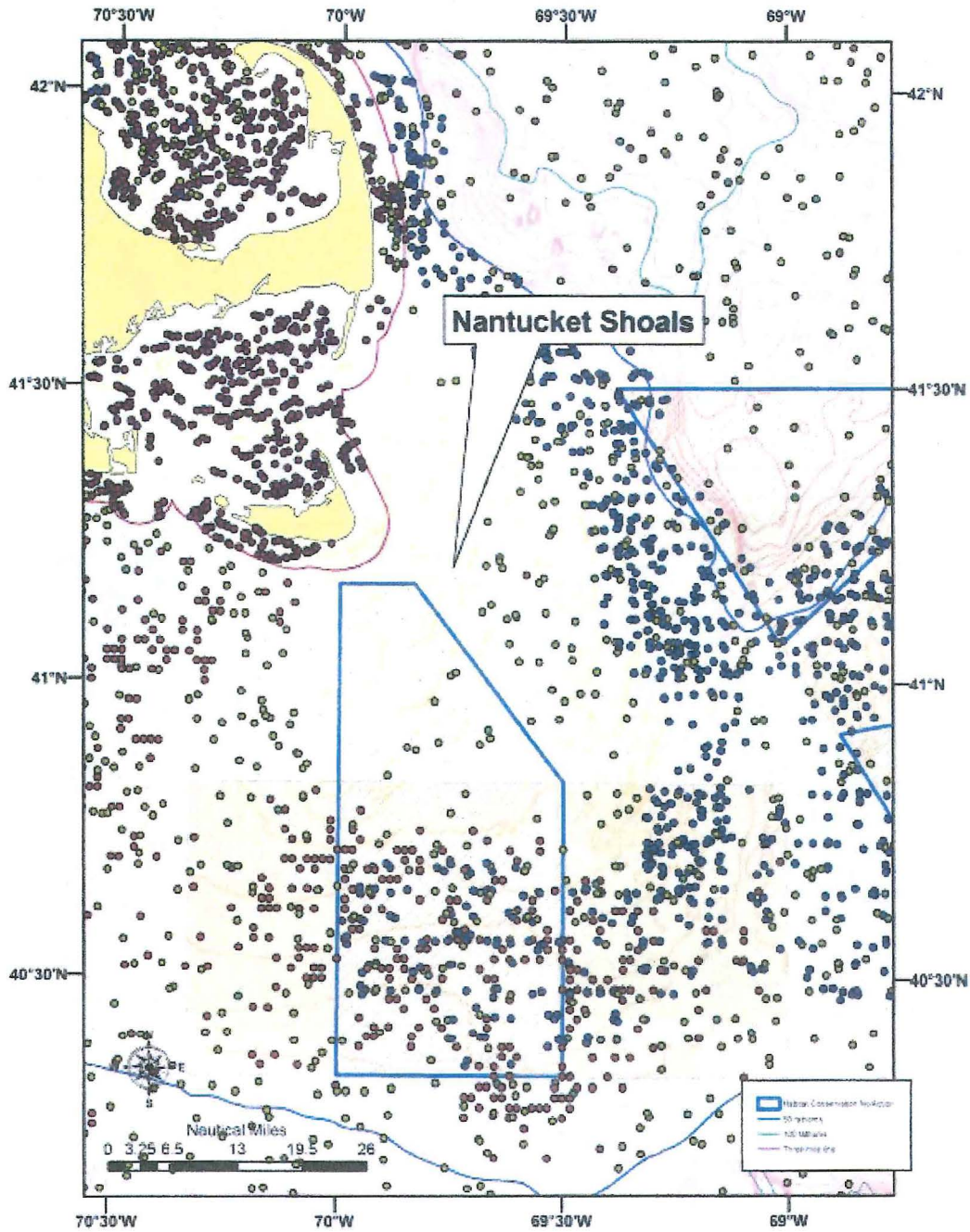
Cc: The Honorable Deval Patrick, Governor of Massachusetts
The Honorable Lincoln D. Chafee, Governor of Rhode Island
Richard Robins, Chairman Mid-Atlantic Fishery Management Council
E. F. Stockwell, III, Chairman New England Fishery Management Council



Map 40 – GSC-SNE: SASI dominant substrate, data support, and vulnerability outputs (trawl gear). Management areas not shown in the upper left panel are from other sub-regions.



Map 105 – Survey tows taken by NMFS trawl and MADMF trawl surveys in the vicinity of Nantucket Shoals during Fall 2002 to Spring 2012.



The various surveys occurred during various periods, the longest being the fall NMFS trawls survey which has been conducted annually since 1963. Data for all of the regular surveys, including the ME/NH trawl survey was available during 2002-2012. The Council analyzed age 0/1 groundfish distribution data during the fall 2002 to spring 2012 period because it was more likely than earlier data to represent current and potentially future conditions. Data before 2002 is probably reflective of differing conditions that affect geographical distributions, including changing temperature and stock abundance. Survey data from Industry Based Surveys (IBS) for monkfish, cod, and yellowtail flounder were included in the hotspot analysis, even though a proportion of survey tows were directed by fishermen specifically to target spawning cod². Summer (primarily the shrimp and scallop surveys) and winter (primarily the NMFS trawl survey that terminated in 2007) only partially covered the range of species included in this analysis. Obviously hotspots during these seasons were undetectable in unsurveyed areas not covered by these surveys.

Species included in the hotspot analysis were Acadian redfish, Alewife, American plaice, Atlantic halibut, Atlantic herring, cod, monkfish, haddock, ocean pout, pollock, red hake, silver hake, white hake, windowpane flounder, winter flounder, witch flounder, and yellowtail flounder.

Hotspot analyses were conducted for the entire range for each species in the survey data, but were given differing weights by stock area to account primarily for differences in stock abundance relative to each stock's B_{msy} target. Since the purpose of the analysis was to identify areas that were vulnerable bottom habitat, only stocks that either "occur in a variety of substrates including gravels" or had "strong affinity for coarse or hard substrates" were given non-zero weights.

The species that were therefore given non-zero weights in the composite scoring to identify habitat areas included cod, haddock, pollock, redfish, halibut, pout, and wolffish. Wolffish catches were relatively sparse and no hotspots were identified. Suitable data for skates were compiled but were not analyzed for hotspots.

Although the entire range of survey data for a species was analyzed, this amendment focuses on specific areas for habitat protection, for dedicated habitat research, and for spawning. Therefore a summary of hotspots in areas included for the various alternatives is given below.

4.3.1 Age 0/1 juvenile hotspot and GAMs analyses

As mentioned in the section above, management-weighted and unweighted hotspots were summarized for existing EFH closed areas (No Action) and for various areas under consideration for habitat management (via gear modification or closure) in this amendment. Gridded (1 km resolution) hotspot summaries by season and species for age 0 and 1 fish are presented below, along with these management area summaries. The number of hotspots in specific areas vary by season due to seasonal variations in geographic distribution as well as the amount and extent of

² A sensitivity analysis conducted by the Council's Closed Area Technical Team showed that clustering of data did not affect the results, unless areas of high concentration went unsampled or were not surrounded by other samples.

surveys conducted during each season (see sampling summary in the above section). Therefore no attempt was made to rank or grade areas by summing weighted or unweighted hotspots across seasons.

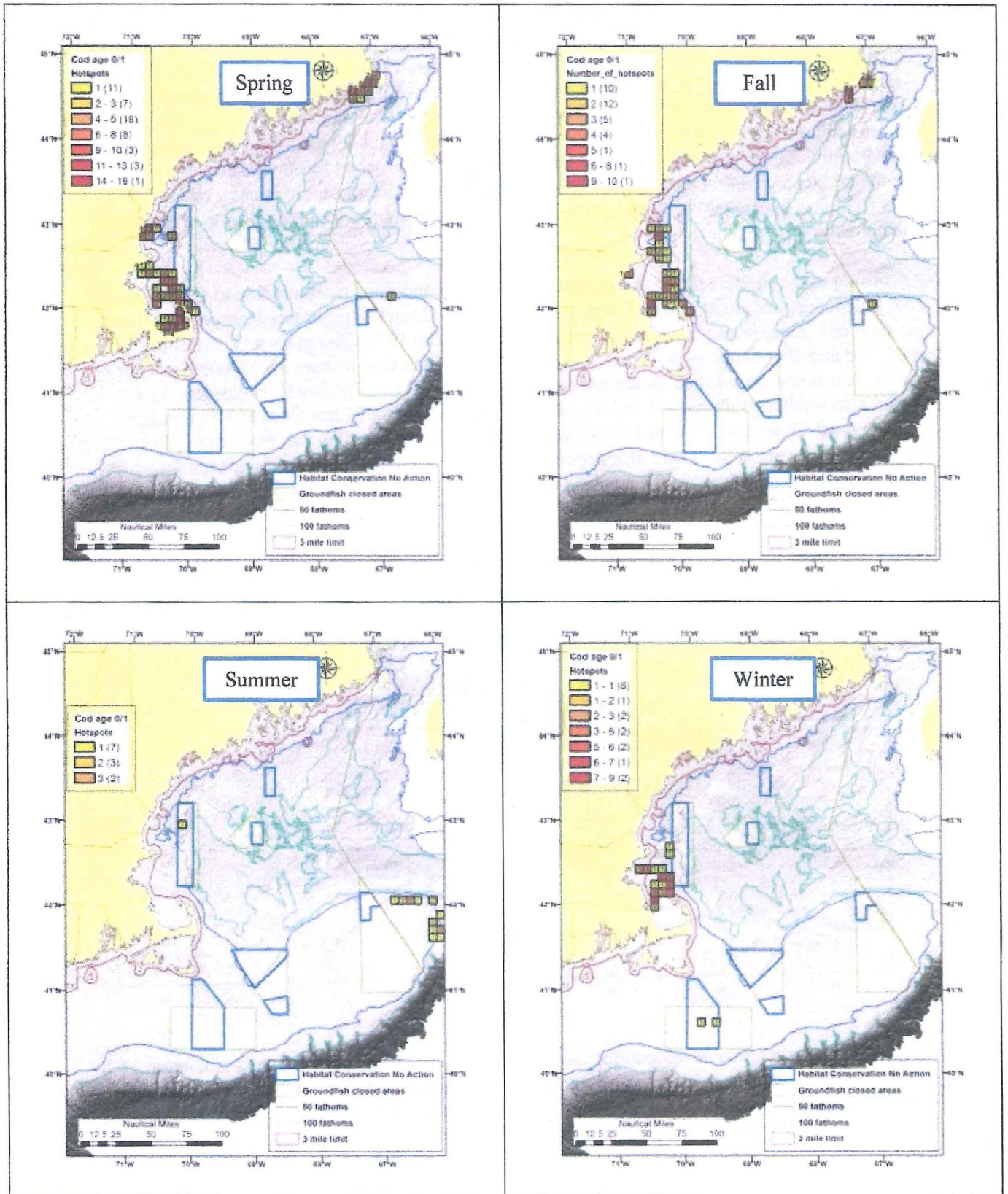
4.3.1.1 By species

Hotspots (i.e. concentrations of significantly above average survey catches from 2002-2012) for individual groundfish stocks are shown in Map 106 to Map 127. Hotspot distribution maps for age 0/1 or small juvenile fish are summarized below for the large mesh groundfish, small mesh groundfish, and other associated species that are common in the Gulf of Maine and on Georges Bank.

Cod

Cod are caught throughout the region, including the Gulf of Maine, Georges Bank, and Southern New England. Two stocks are recognized, Gulf of Maine and Georges Bank/Southern New England (Map 106). Using survey age-length keys, age 0 and 1 cod are less than 24 cm in the spring and 34 cm in the fall, rounded up to 25 and 35 cm respectively for the hotspot analysis. Hotspots of age 0/1 cod were identified mainly in the western Gulf of Maine in the spring and fall surveys (Map 106), mostly in Massachusetts Bay, inshore of Stellwagen Bank and in the southern portion of the Bigelow Bight, north of Cape Ann, MA. The summer surveys for shrimp and scallops did not cover areas where there were concentrations of abundant age 0/1 cod. The winter trawl and IBS cod surveys found concentrations of age 0/1 cod in Massachusetts Bay, partly overlapping the Stellwagen Bank area, but inshore of the Western Gulf of Maine year round groundfish closed area (Map 106). Close examination of the age 0/1 cod survey catch distributions and the identified hotspots indicate that small juvenile cod are more abundant in habitat areas west and south (i.e. inshore) of Stellwagen Bank in the spring, and offshore of it in the fall, but in either season mostly inshore of the Western Gulf of Maine year round groundfish closed area. During the summer scallop dredge survey, it is common to find clusters of high abundances of age 0/1 cod on the far eastern portion of Georges Bank, in Canadian waters.

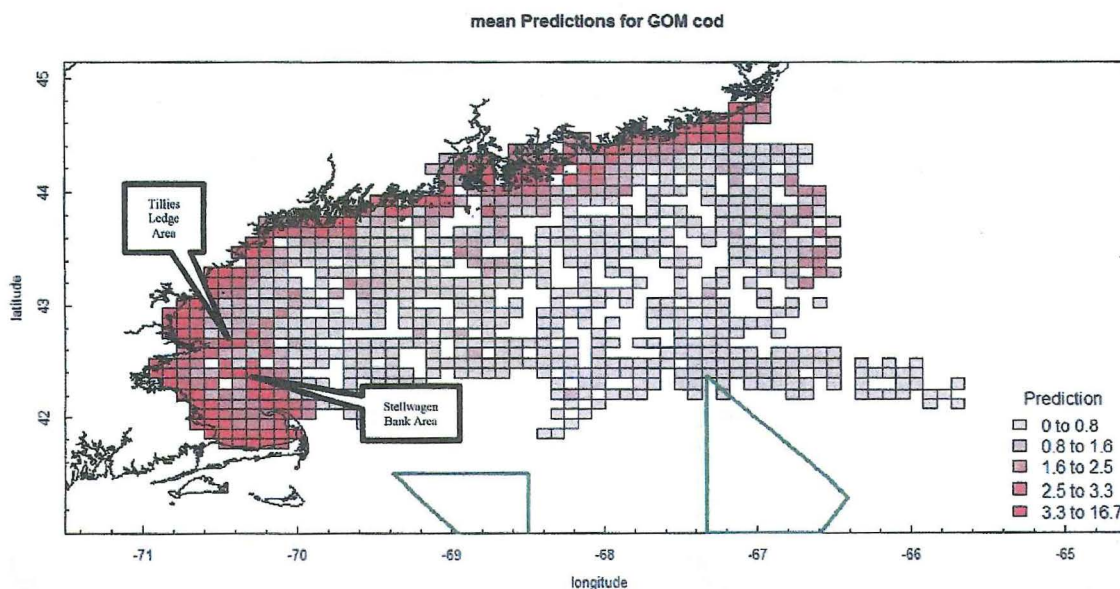
Map 106 – Seasonal distribution of age 0-1 cod hotspots from 2002-2012 survey abundance.



The above cod hotspots are consistent with a habitat suitability model developed for the Council by Mr. Truesdell, a PhD candidate at the University of Maine, Orono (“Modeling Juvenile Atlantic cod and yellowtail flounder abundance on Georges Bank and in the Gulf of Maine using 2-stage generalized additive models” by Samuel Truesdell, 2013, Appendix F). A two-stage General Additive Model (GAMs) was developed using analytical methods previously used in a lobster habitat suitability model (Chang et al. 2010). The cod model estimated the association of age 0/1 cod with various environmental factors that included seabed form, sediment type, depth, and temperature. Control variables included in the model included season, survey (accounting for differences in catchability between surveys), and zenith angle (accounting for diel variations in catchability).

According to the model results, the habitat and oceanic conditions most suitable to small juvenile cod, independent of stock size and fishing, were located along the shallower inshore portions of the Gulf of Maine, from Cape Cod to northern Maine (Map 107). The grids with the highest predicted cod abundance in the Western Gulf of Maine were well inshore of the Western Gulf of Maine year round groundfish closed area and the Western Gulf of Maine EFH closure. The model also predicts high age 0/1 cod abundance for areas north of Cape Cod, MAStellwagen Bank and off Cape Ann, MA on Tillies Ledge, both partly overlapping the Western Gulf of Maine EFH closure area. There also appear to be above average predicted abundance for some of the higher relief features in the central Gulf of Maine, such as Platts Bank, Cashes Ledge, and Jeffries Bank.

Map 107 – Mean predicted age 0/1 cod abundance in the Gulf of Maine.

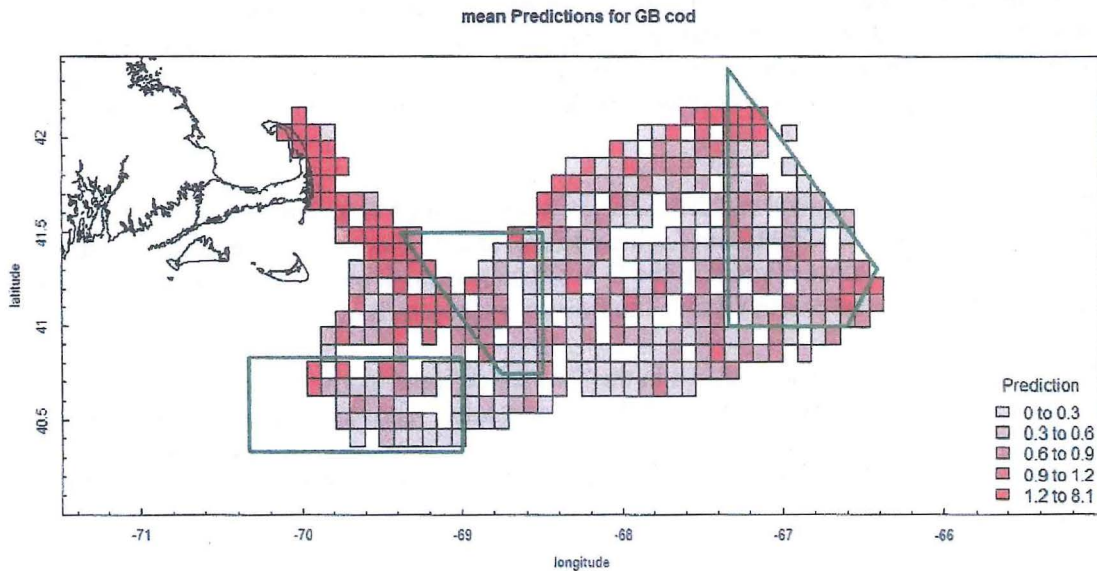


A GAMs model was also developed for Georges Bank cod, which estimated the association of age 0/1 cod with various habitat and oceanographic variables, including seabed form, dominant sediment, sediment coarseness, sheer stress (a measure of wave and current energy), temperature, and depth. Control variables included in the analysis were season, survey type, and zenith angle.

Based on habitat and oceanographic conditions, the GAMs analysis predicted high abundance along the Great South Channel from off Cape Cod, MA and past the western edge of Closed Area I, with notable predictions of high abundance in the center and northern portions of the Nantucket Lightship Area, which also overlaps the Nantucket Lightship Area EFH closure (Map 108). It is important to recognize that high juvenile cod abundance was predicted in these areas yet cod catches from the 2002-2012 surveys was not above average and no age 0/1 cod hotspots were detected in this area. Over a longer 1963-2008 period, this area was very important for cod and had high abundance of age 0/1 cod (Lough 2010). The implication is that conditions are good for juvenile cod, but recent abundance is low and there were few hotspots identified in this area due to other factors including fishing.

High cod abundance was also predicted along the northern margin of Georges Bank through the Northern Edge in Closed Area II. Unlike the Perry and Smith (1994) results for the Scotian Shelf, the Georges Bank GAMs analysis indicated suitable habitat on the shallower areas of Georges Bank, including near an area called Little Georges Bank, east of Closed Area I. Age 0/1 cod were predicted to have high abundance in the shallower areas of the Bank during the spring and along the deeper margins of Georges Bank in the fall.

Map 108 – Mean predicted age 0/1 cod abundance for Georges Bank and the Great South Channel.



Yellowtail flounder

Catches of age 0/1 yellowtail flounder appear to be more broadly dispersed and not as concentrated as are cod. Fewer hotspots were detected in any season (Map 109). Yellowtail flounder hotspots in the spring were located mainly in the shallower portions of Massachusetts Bay, much of them from the MADMF survey in state waters. These hotspot results are not surprising, since yellowtail flounder are less concentrated and more strongly associated with

sand and mud substrates. A few scattered hotspots of age 0/1 yellowtail flounder were found in the summer and fall survey catches, but no hotspots were detected in the winter survey (which was designed to sample flatfish).

Age 0/1 yellowtail flounder hotspots were less numerous than they were for cod. Since yellowtail flounder occupy more widely dispersed sandy habitats, this result is unsurprising. Another factor that might influence the outcome is stock size. Depending on how species respond to changes in stock abundance, density can remain constant across space or increase as a proportion of the total abundance. For total abundance, Periera et al. 2012 found that yellowtail flounder densities are consistent with the constant density and basin models. Their results were based on total catch per tow of all sizes. Based on the Periera et al. 2012 results, hotspots should be more prevalent at low stock size as they are now³. The hotspot analysis, however, focuses on age 0/1 flounder. Fish of this size range may respond differently to density dependent factors than large and adult fish, particularly if there is age truncation due to high fishing mortality.

In the spring, hotspots were identified in Ipswich, Massachusetts, and Cape Cod Bays in the Western Gulf of Maine. These hotspots are in the Cape Cod yellowtail flounder stock area. During the summer and fall, sporadic hotspots were identified in the Great South Channel and on Georges Bank. Despite the type of survey gear that is designed to catch flatfish in the winter trawl survey, no yellowtail flounder hotspots were identified from the 2002-2007 data.

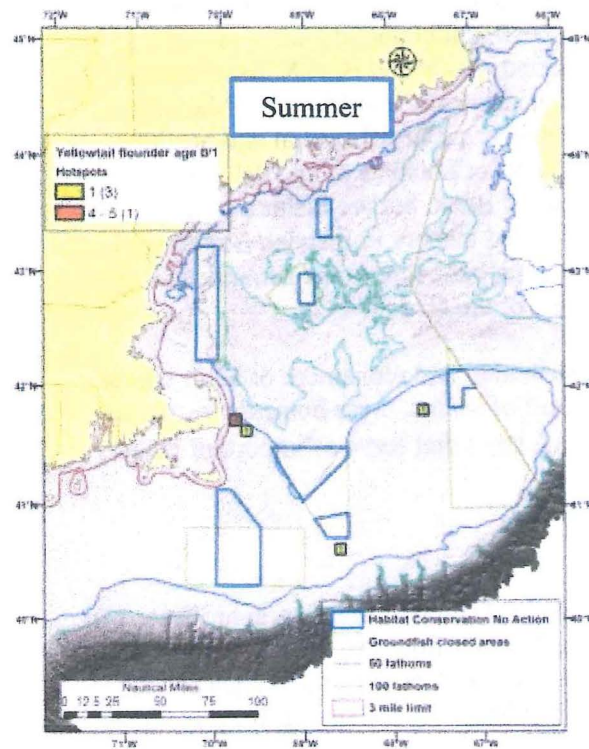
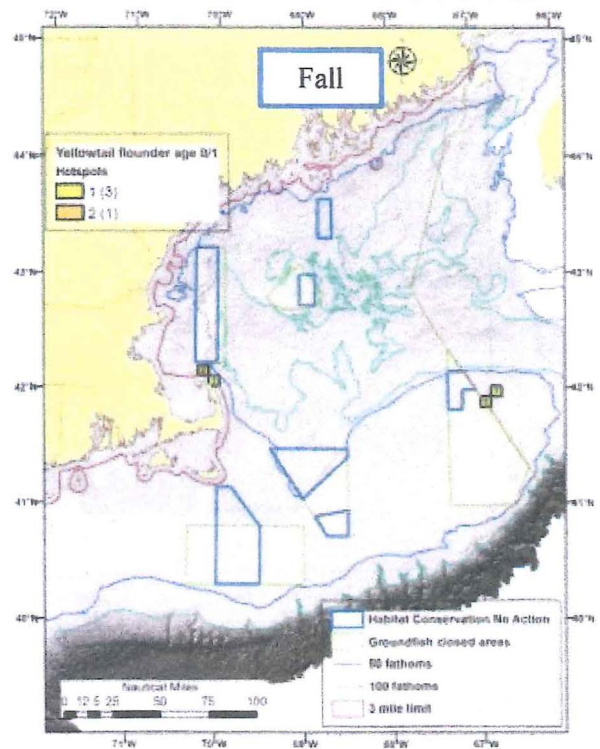
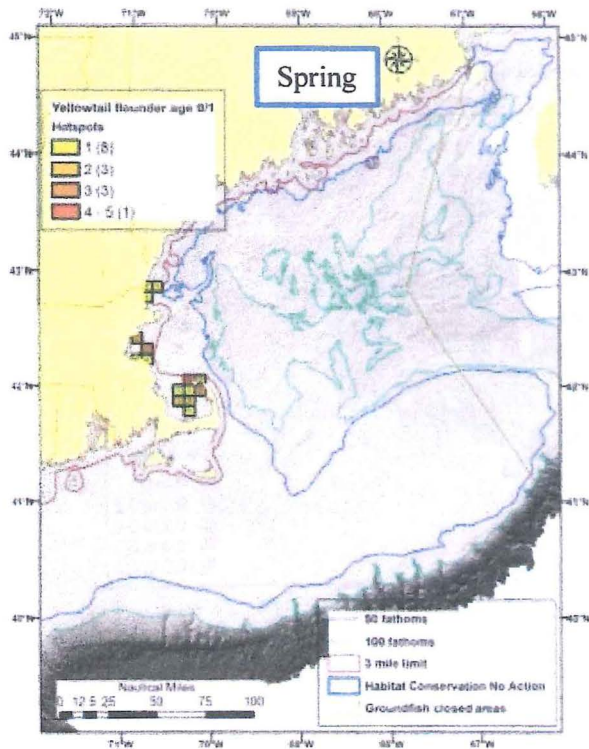
A GAMs model for Georges Bank yellowtail flounder estimated the association of age 0/1 yellowtail flounder with various habitat and oceanographic variables, including seabed form, dominant sediment, sediment coarseness, sheer stress (a measure of wave and current energy), temperature, and depth. Control variables included in the analysis were season, survey type, and zenith angle.

The predicted abundance is shown in Map 110. Clusters of high abundance based on the GAMs analysis are generally in the Nantucket Lightship Area and on Eastern Georges Bank, mostly visible in the spring but more random in the fall. Clusters of high abundance elsewhere are more scattered through the Great South Channel and western Georges Bank.

The higher predicted juvenile abundance in the Nantucket Lightship Area suggests that it may play an important role for a yellowtail flounder nursery area. The Nantucket Lightship Area may however play a less important role for adult yellowtail flounder since it was not found to contribute to yellowtail flounder biomass rebuilding (DeCelles et al. 2012; Kerr et al. 2012).

³ The ratio of B_{MSY} to current biomass is 9.39 for Georges Bank yellowtail flounder and 4.21 for Cape Cod yellowtail flounder.

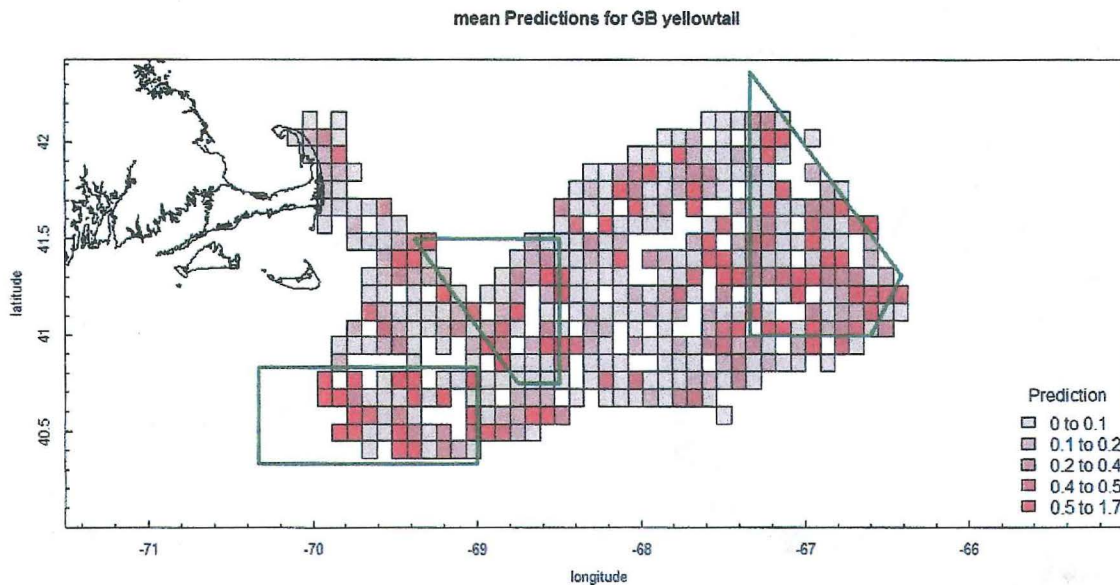
Map 109 – Seasonal distribution of age 0-1 yellowtail hotspots from 2002-2012 survey abundance.



Winter

No hotspots detected

Map 110 – Mean predicted age 0/1 yellowtail flounder abundance for Georges Bank and the Great South Channel.



Winter flounder

Age 0/1 hotspots for winter flounder were detected along the coastline from Southern New England to northern Maine in the spring. The hotspot analysis for age 0/1 winter flounder revealed several important areas with clusters of high winter flounder abundance in the spring, ranging from the shallow coastal areas in Rhode Island Sound, Cape Cod Bay, Massachusetts Bay, Ipswich Bay, Casco Bay, off Mt. Desert Island, ME, and in Northern ME, near Machias (Map 111). In the fall, hotspots were identified in a little deeper water off central and northern ME, but not in the Massachusetts Bay area. In winter, clusters of hotspots of age 0/1 winter flounder appear in Massachusetts Bay and overlap Stellwagen Bank, but are inshore of the Western Gulf of Maine closed area. A few hotspots are located inshore in Ipswich Bay as well. No hotspots were identified in the summer shrimp survey data, but occur in the summer scallop dredge survey on the Northern Edge of Georges Bank, west of the Cod HAPC.

Although DeCelles and Cadrin (2010) focused on the distribution and movement of adult winter flounder in coastal and estuarine waters of the southern Gulf of Maine, these hotspots results are adjacent to the identified spawning locations and may show areas that serve as important nursery areas.

White hake

Less is known about the distribution of juvenile white hake in relation to oceanographic features in the Gulf of Maine than information on cod, haddock, and winter flounder. The hotspot analysis of the distribution of age 0/1 white hake identified hotspots, or clusters of significantly above average catch, scattered mostly in the northern Gulf of Maine in the spring, from moderate

depths along the coast to deeper depths in the eastern Gulf of Maine (Map 112). In the summer shrimp trawl survey, age 0/1 white hake hotspots were distributed broadly in moderate depths off central and southern ME, and on both sides of the Jeffries Bank EFH closed area. Hotspots further east might be found in the summery, but it is outside the sampling range of this survey. Hotspots for age 0/1 white hake were also found in the IBS cod survey data, clustered in Ipswich Bay and off Casco Bay. This survey has a restricted sampling region, however, and age 0/1 winter flounder hotspots may occur elsewhere in the inshore portions of the Gulf of Maine.

4.1.1.5.1 Alternative 1 (No action)

The only portion of this alternative currently off limits to mobile bottom tending gear is the habitat closure itself; scalloping is allowed in an access area in the eastern part of the Nantucket Lightship groundfish closed area, and clam dredging is allowed in both the eastern and western portions, just not inside the habitat closure, so these areas offer limited habitat conservation benefits. Relative to the various action alternative areas, the Nantucket Lightship habitat closure is not as vulnerable to fishing gear impacts (vulnerability distribution shifted to the left in Figure 10), and consists mainly of high and low energy sand-dominated habitats (Table 37). Overall, the No Action alternative has neutral to slightly negative impacts on seabed habitats, if closure of the existing areas to various types of fishing effort results in a displacement of effort onto more vulnerable habitat types. If displacement is not occurring due to differences in species composition in the existing vs. alternative areas, then the current areas and measures are likely more neutral in terms of their impacts on habitat.

4.1.1.5.2 Alternative 2 (No Habitat Management Areas)

Under this alternative, there would be no specific protection provided for benthic habitats through limits on the use of mobile bottom-tending gears. Because the No Action areas in this sub-region are not very effective in terms of encompassing vulnerable habitats, Alternative 2 would have a neutral to slightly positive impact on seabed habitats in this sub-region relative to no action, to the extent that it removes existing areas and allows greater flexibility in choice of fishing location and could shift fishing effort from more vulnerable habitat types to less vulnerable habitats that are currently closed. Alternative 2 has negative impacts relative to Alternatives 3, 4, and 5 if Options 1 or 2 are selected and also relative to Alternative 6, because unlike those alternatives, Alternative 2 offers no specific protection for vulnerable habitat types north of the currently closed areas.

4.1.1.5.3 Alternative 3

Alternative 3 includes the Great South Channel East HMA and Cox Ledge HMA (2 sub-areas). The Great South Channel East is the largest of the alternative areas in the sub-region at 3,356 km², and roughly comparable in size to the existing Nantucket Lightship EFH closure (3,387 km²). This area also has the largest fraction by area of cobble- and boulder-dominated habitat, with 17% cobble and 2% boulder coverage (Table 37). Data support is high for 77% of the area, meaning that these larger grain sizes are detectable in the substrate data overlapping most of the management area (Table 38). Greater uncertainty in substrate classification due to lower data support occurs in the western portion of the area (Map 40). Habitat vulnerability in this area, and the other action alternative areas, is much higher than for the existing Nantucket Lightship EFH closure. Therefore, implementation of the GSC East HMA with Option 1 is expected to have a positive impact on seabed habitats relative to No Action.

In general, clam dredges are used frequently in this sub-region as compared to other sub-regions, so their exemption from the HMA restrictions (Options 2, 3, or 4) or not (Option 1) has an influence on the habitat conservation benefits of any particular area. This is different from other regions where the habitat impacts of Options 1 and 2 are probably equivalent to one another due to little overlap with the clam resource or clam fisheries. As shown in the economic impacts sections, clam dredging represents an increasing fraction of overall revenues across all gear types