New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
C.M. 'Rip' Cunningham, Jr., *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: November 26, 2012
TO: Habitat Committee
FROM: Habitat Plan Development Team
SUBJECT: Gulf of Maine Coral Zones as possible areas to minimize the adverse effects of fishing on EFH

Deep-sea coral-related management alternatives were split from Omnibus EFH Amendment 2 (OA2) by the Council in September 2012 and their development will be completed in a separate action. This action was taken to allow sufficient time to examine coral zone options and resulting economic impacts on the submarine canyons on the shelf edge. However, there are some highly vulnerable coral aggregations in the Gulf of Maine that are more susceptible to the effects of fishing because of their relatively exposed locations (they are not on canyon walls). These areas have documented value specifically as essential fish habitat. Therefore, the PDT requests that the Habitat Committee consider these additional areas as habitat management areas designed to minimize the adverse effects of fishing on EFH in OA2. The remainder of this memorandum summarizes technical and policy considerations relevant to this issue.

There are very few locations where deep-sea corals have been observed that are not on the outer continental shelf and slope. Almost all the documented observations of deep-sea corals that are vulnerable to fishing are in the submarine canyons, on the continental slope, and on the seamounts located at the edge of and beyond the shelf break. Two sites harboring corals that have been observed with remote imagery in the Gulf of Maine are (1) the area off the coast of Maine near Mt. Desert Rock, and (2) the hard bottom 'bump' habitats in Western Jordan Basin.

Many species of corals form structures that can be used by managed species of fish and their prey for shelter. This function as fish shelter provides a clear link to Essential Fish Habitat. Some of these structure-forming species occur in Mount Desert Rock and in Western Jordan Basin. In 2002 (unpublished), Watling and Auster documented colonies of red tree coral *Primnoa resedaeformis* on steep surfaces in the Mount Desert Rock area, with dense and diverse habitat-forming sponges found throughout dive transects. The authors inferred that corals are likely to be distributed in nearby areas of similar geology and experiencing similar oceanographic conditions. In Western Jordan Basin, patches of hard substratum support *Paragorgia arborea*, both pink and white forms, *Primnoa resedaeformis*, and a species of *Paramuricea*. Observed hard substratum communities were dominated by corals, and provided

habitat for Acadian redfish and cusk (Auster 2005)[1] as well as pandalid shrimp, an important prey taxa for species of economic importance. Thoma et al. (2009)[2] found that *Paramuricea* in the Gulf of Maine and along the continental margin were genetically similar but different from specimens elsewhere in the North Atlantic basin, and may represent a unique species.

While corals may serve as structural habitats for many managed species, there is a particular link between Gulf of Maine coral habitats and Acadian redfish. In the OA2 draft EFH designations, the mapped EFH area for adult redfish overlaps with the Western Jordan Basin coral zones, and the mapped EFH area for juvenile redfish, which extends further inshore, overlaps with the Mt. Desert Rock coral zone. Corals are cited specifically in the draft EFH text description for adult Acadian redfish:

> *Offshore benthic habitats in the Gulf of Maine, primarily in depths between 140 and 300 meters, and on the continental slope to a maximum depth of 600 meters north of 37°38'N latitude. EFH for adult redfish includes a wide variety of bottom types, but primarily occurs on mud and hard bottom, which supports the growth of deep–water corals and other structure–forming sedentary epifauna such as sponges.*

These corals are vulnerable to accumulating adverse effects from fishing because they are highly susceptible and have long recovery times following impact. In terms of their susceptibility, these species are structurally complex and have relatively high relief off the seabed such that they may be broken or removed by bottom-tending gears. In terms of their recovery, these species have extremely slow growth rates such that the time required to restore their functional value is essentially infinite in comparison with a fishery management timescales. These recovery times in particular argue for a precautionary management approach when considering protection of deep-sea corals. Whether the Gulf of Maine coral areas are protected as coral zones under the discretionary authority or as habitat management areas under the EFH authority, measures would likely include restrictions on the use of particular types of gear. As discretionary-provision coral zones, fishing restriction options already approved by the council for analysis include prohibitions on mobile bottom-tending gears, or bottom-tending gears, with the exception of lobster gear.

Note that directed redfish effort may increase in the foreseeable future given proposed mesh size exemption regulations (the current standard is 6.5 inches). During fishing year 2012, sector-based exemptions to use 6-inch mesh have been allowed, provided that there is an observer or at-sea monitor on board and daily catch reports are submitted. A currently proposed rule (FR Vol. 77 No. 217, pages 66947-66950) would allow 4.5-inch mesh to be used, with an observer or at-sea monitor on board. Implementation of this rule is expected to occur before the end of the 2012 fishing year. Catch composition thresholds for the 4.5-inch exemption were developed based on experimental trips conducted by the REDNET project. By sector, monthly catches on these trips would need to be comprised of at least 80% redfish, with discards of other

[1] Auster, P. J. (2005). Are deep-water corals important habitats for fishes? Pages 747-760 in Cold-water Corals and Ecosystems. A. Freiwald and J. M. Roberts, editors. Berlin, Springer-Verlag Berlin Heidelberg**.**

[2] Thoma, J. N., E. Pante, et al. (2009). "Deep-sea octocorals and antipatharians show no evidence of seamount-scale endemism in the NW Atlantic." Marine Ecology Progress Series **397**: 25-35.

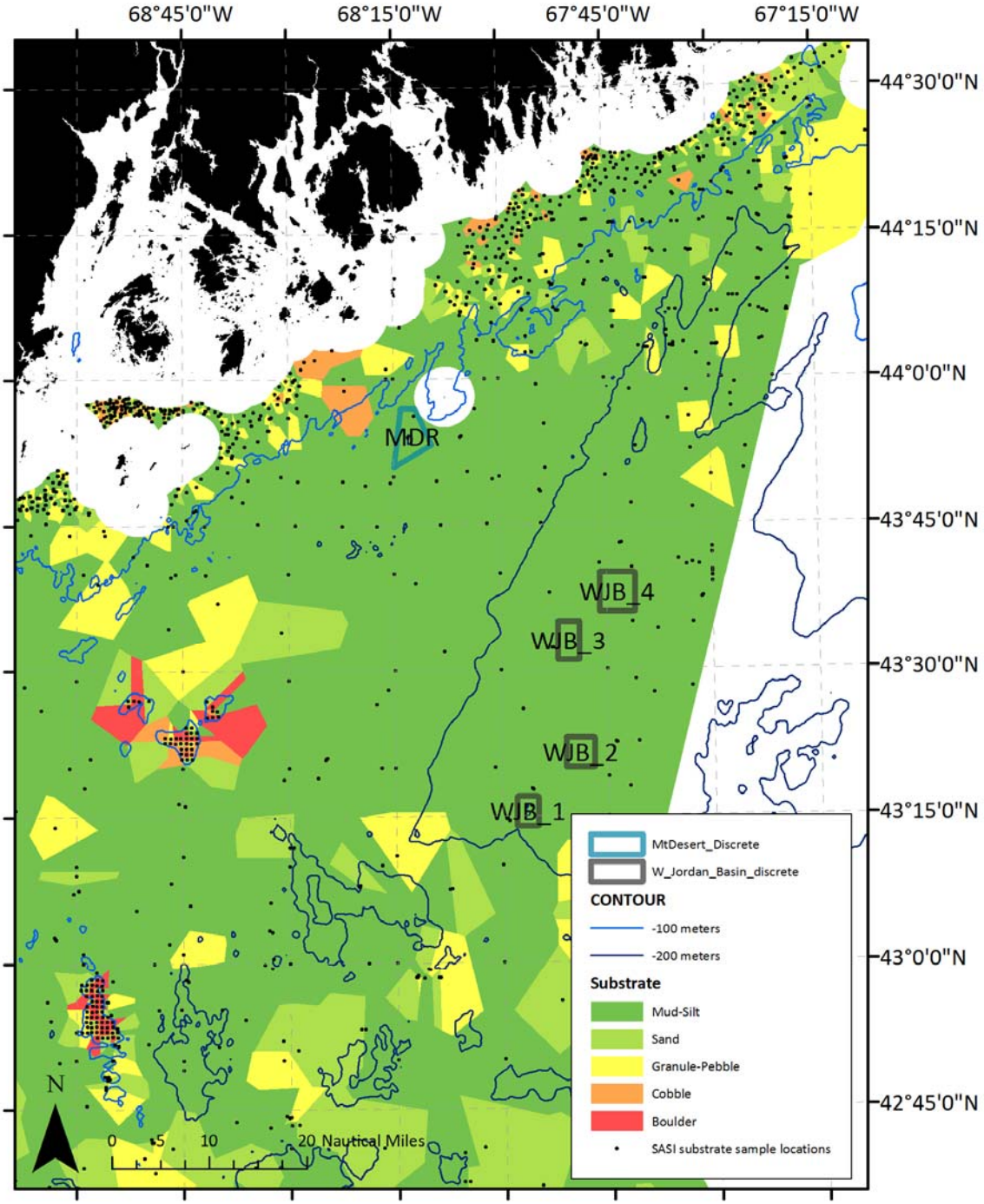
groundfish species not to exceed 5%. Although REDNET did not make any research tows in Western Jordan Basin during Component 2 of their study, redfish have been caught by the NMFS trawl survey in this area, and were observed by Auster (2005), **so it is possible that an expanded directed fishery for redfish would operate in and around the proposed Western Jordan Basin coral zones.**

It is likely that these two areas might have been identified as candidate habitat management areas to minimize the adverse effects of fishing on EFH in OA2, had a separate set of coral alternatives not been under development at the same time. While these areas have a clear link to EFH, particularly for redfish, they are not a good fit with the SASI analyses, and identification as habitat management areas would have occurred during the PDT's review of extra-SASI information. Although the SASI model spatial domain encompasses these two GOM coral areas as well as other known coral habitats, the substrates required by the corals described above for attachment were not well resolved in the model's substrate base grid. Based on photographic evidence and multibeam bathymetry data, we know that these substrate types exist in these locations, but point samples were not available in a format easily incorporated in the model. Therefore, most coral species, except for sea pens, were excluded from the SASI vulnerability assessment and spatial model. This choice reflected the desire to not skew the overall results of the model with the addition of biological features with very long recovery times if the substrates they would be inferred to occupy were not present in the substrate base grid.

Note that features just west of the Mt. Desert Rock coral zone did cluster in the SASI Local Indicator of Spatial Association outputs (cluster #1), but that this area and the other coastal cluster near Cape Neddick were not recommended for further management area development in an adverse effects minimization context. In general, coastal hard-bottom habitat types were incompletely mapped and not well-represented in the model output because the edge of the domain at the state waters boundary cuts through many of these features. Thus, the cluster locations were more an artifact of the way the state waters boundary cuts across these habitat types than a census of coastal areas likely to be vulnerable to fishing.

In summary, the hard substratum communities near Mt Desert Rock and scattered throughout Western Jordan Basin would make sense as either deep-sea coral protection zones or as habitat management areas to minimize the adverse effects of fishing on EFH. At the Committee's discretion, folding one or both of these zones into OA2 may be warranted as there is a nexus to redfish EFH in particular, and to fishing activity in the Gulf of Maine in general, which makes these zones distinct from the other proposed coral areas in the canyons, slope, and seamounts.

Figure 1 – Eastern Gulf of Maine coral zones near Mt. Desert Rock (blue outline) and in Western Jordan Basin (gray outlines). SASI model dominant substrate classification is shown in red-green shading; the model domain includes all colored areas. Black points indicate substrate sample locations.



New England Fishery Management Council Habitat Plan Development Team
Map date: 19 November 2012
NAD 1983 UTM Zone 19N

Figure 2 - Deep-sea corals observed in Mount Desert Rock area.

Figure 3 - Deep-sea corals observed in Western Jordan Basin.