Northeast Consortium Annual Report - June 2008

Project Title: Effects of the Western Gulf of Maine Closure Area on Groundfish Populations in Rocky Habitats

Period of Performance: 01/01/2008 - 06/30/2008

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Objectives: The overall goal of this project is to provide information useful to managers on the role of rocky habitats in the WGOM closure area with respect to groundfish stock re-building. The major objectives are: (1) determine the effects of the WGOM closure area on fish use of rocky habitats; (2) characterize fish use by species and size classes in major rocky habitat types; and (3) initiate an assessment of gillnets as sampling tools for rocky habitat by identifying variables that may affect their effectiveness.

Methods and work plan: The overall study design is based on a "control-impact" approach with sites chosen inside and outside the closed area, and compared using an "in vs. out" assessment. Sampling sites will be chosen along approximately the full length of Jeffreys Ledge inside the closure, and at comparable sites west of the closure (Fig. 1). This will allow an assessment of rocky habitats encompassing the entire northern half of the WGOM closure area, compared to similar sites outside. Sites will be chosen based on major habitat features that contribute to essential fish habitat (EFH) designations so that comparisons can be made between those sites that differ only or mainly with respect to their location inside or outside the closed area.

The sampling design is stratified random in blocks of three (one for each habitat type: low, medium, and high vertical relief). This design will randomize the sampling within each of the three habitat types but insure that all three habitats are chosen every three days of sampling. All fish sampling will be done with 300-ft long gillnets, each consisting of three 100-ft panels (one with 2-inch stretched mesh, another with 4-inch mesh, and the third with 8-inch). On each sampling day, a net will be set at each of two locations inside the closure and two outside. The following day, each net will be hauled, all fish removed, measured (total length), counted, and weighed by species. Each net will then be re-set at another location for ~24 hour soak. This hauling/re-setting process will be repeated for approximately 5 days each month. Latitude/longitude, water depth, and bottom type (one of three; see above) will be recorded at each site.

An underwater videography system will be deployed to obtain imagery of each study site. The primary purpose of the video will be to verify that the nets have been set in the appropriate general habitat type, but other information on habitat characteristics potentially useful in explaining differences in fish catch will be obtained. A 5-minute tow/drift will be made near the set gillnets with all imagery recorded and latitude/longitude recorded at the start and end points for each video

survey. The following habitat features will be determined for each survey: relative amounts of major sediment types (soft sediment, gravel, small bolders, large bolders), and relative abundances of dominant epifauna (identified to lowest practical taxonomic level).

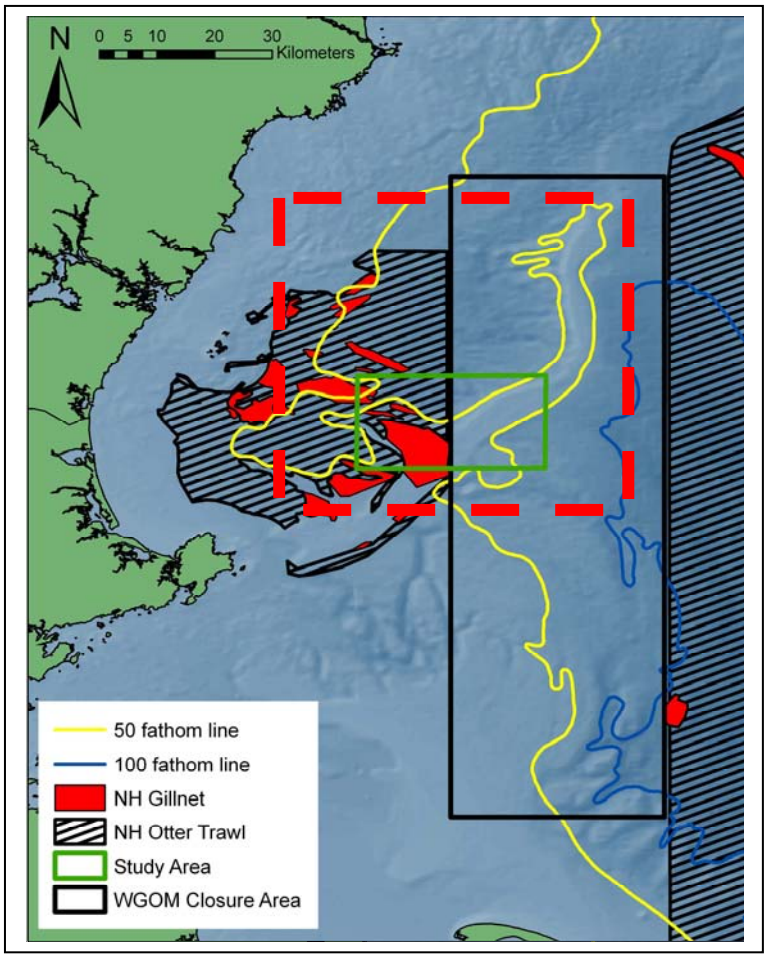

Fig. 1. Study area for present project (red dashed line box) on base map showing WGOM closure area (black box), 2002-05 NEC funded study area (green box), and areas where gill nets and otter trawls are predominantly used (gear use data from http://web.mit.edu/SEAGRANT/aqua/cfer/GearMapping/GearMapping.html.)

Work completed to date: A total of 28 cruises had been completed through 29 May 2008. The underwater video system was constructed, tested, modified, and became fully operational during the reporting period.

Results to date: At the time of this report, no statistical analyses of the data have been conducted. Several interesting trends, however, have been observed. First, the mean number and biomass (pounds) of all groundfish (cod, haddock, pollock, hake) combined caught per 300-ft net per day

have been much higher inside the closed area (Fig. 2). Secondly, there has been a strong negative relation between spiny dogfish catch and groundfish (Fig. 3). Finally, total fish catches (abundance and biomass) have averaged about twice the level inside compared to outside of the closure. It should be noted that these data are considered preliminary, and may not represent the final results when all data have been collected and analyzed.

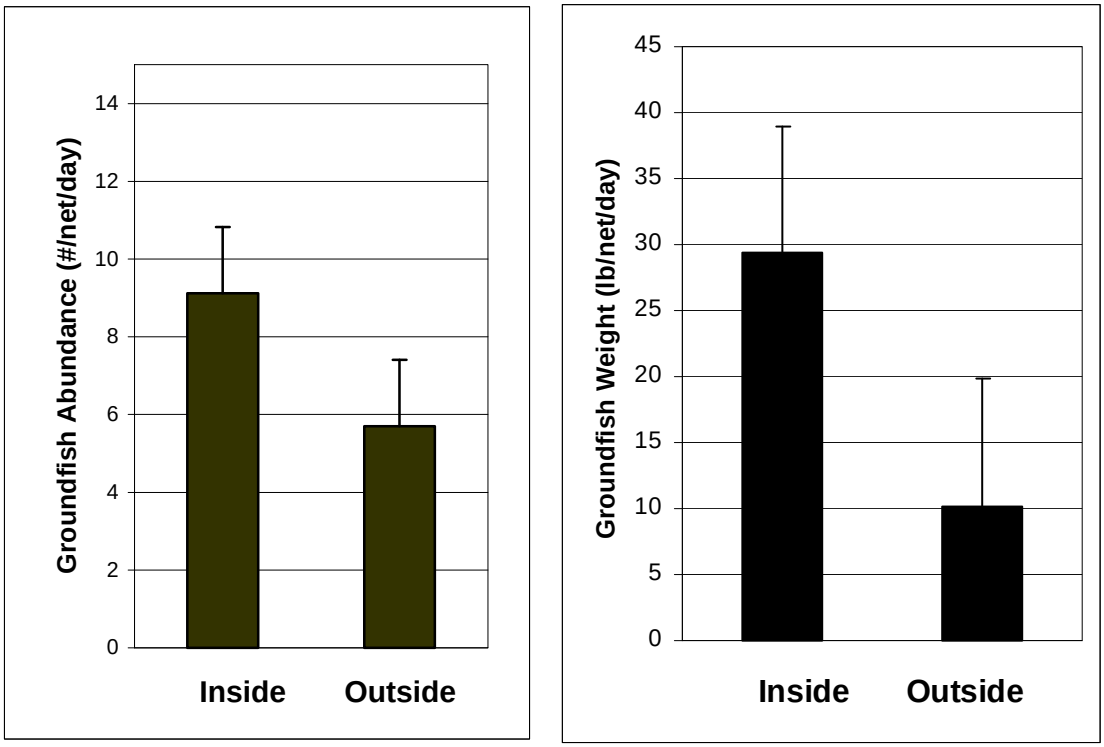

Fig. 2. Total groundfish (cod, haddock, pollock, hake) caught inside compared to outside of the Western Gulf of Maine closure area for the sampling period 23 August 2007 – 29 May 2008.

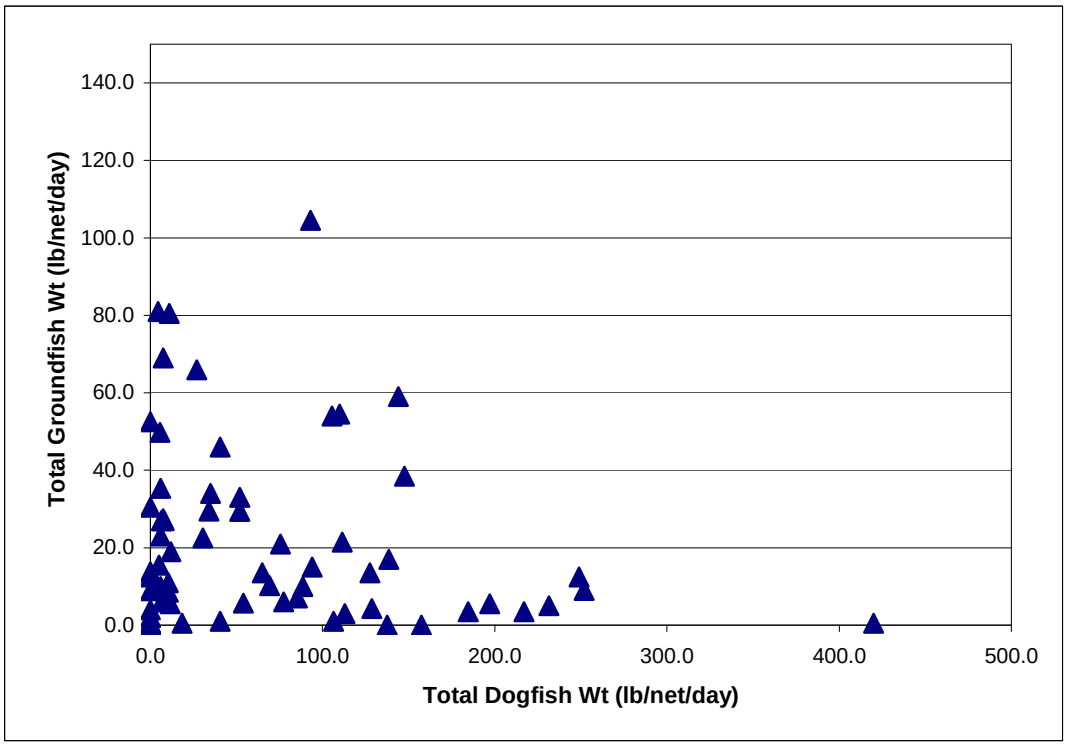

Fig. 3. Relationship between spiny dogfish and total groundfish (cod, haddock,

Data: No data from this project have been submitted to NEC.

Impacts and applications: The project is designed to provide new information useful for management of the WGOM closure area as well as sampling methods for rocky habitats. No standard protocol exists for sampling fish populations in rocky habitats with large vertical relief. The data collected thus far strongly suggest that the WGOM closure does harbor greater abundances and biomass of several managed species. The data also indicate possible relationships among managed species (e.g., groundfish and dogfish) that warrant further testing. Thus far the project has yielded a substantial amount of data that should provide new information with potentially important implications for management of the closure.

Related projects: This project was a direct result of findings and funding from two earlier NEC projects: "Intensive study of the Western Gulf of Maine closure area" (which was co-funded by UNH Cooperative Institute for New England Mariculture and Fisheries; CINEMAR), and “Developing a protocol for sampling juvenile groundfish in rocky habitat” (an NEC development award).

Partnerships: This project is the result of extensive collaboration between scientists and fishermen. It would not have been possible without the knowledge of fishing methods and the study area by Mike Leary.

Presentations: None

Student participation: None

Published reports and papers: None

Images: None