

## **1. Project title and contract number**

Evaluation of closed areas: Cashes Ledge as juvenile cod habitat

Prime Award No. NA05NMF4721057

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## **2. PI contact information**

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## **4. Major accomplishments and milestones**

To date we have made significant progress on all three project goals:

Objective 1: we have been reviewing the historic data of cod on Cashes Ledge collected by Bob Steneck (U. Maine-Orono) in the 1980's and 1990's.

Objective 2: in June of 2006, Tom Weber (UNH) conducted multibeam sampling from the F/V Seacup captained by Matthew Weber of our field sites around the peaks and sides of Cashes Ledge in order to create detailed habitat maps including the spatial extent of kelp habitat on the ledge. Tom collected half a terabyte of multibeam data. The Gulf of Maine Mapping Initiative sponsored a graduate student of Dr. Craig Jackson from the University of Ulster, Chris McGonigle to come to the US and produce predictive habitat maps by analyzing these data. Chris is currently stationed at GMRI until September and is beginning the process of building predictive, ground-truthed habitat maps that are based on quantitative analysis of the multibeam data.

Objective 3: in order to determine the juvenile cod use of Cashes Ledge, we began sampling cod use of habitats on and around the top of Cashes in the summer of 2006. To date we have completed gill net sampling in the summer and fall of 2006 and the spring of 2007 as well as hook-and-line and video work in the summer of 2006 and spring of 2007. Sampling will be conducted again in the summer and fall of 2007. Both gillnet and hook-and-line sampling have proven effective at capturing cod when present on Cashes, and individuals and schools of cod, haddock, and pollock were observed on the fish video surveys.

## **5. Unexpected difficulties and project alterations**

The major issues that have arisen to date are as follows:

i) Because trapping was not successful, this spring we switched from crab pots to long-lining. Unfortunately we did not have great success catching cod in long lines. However, we have had good success to date with hook-and-line, gillnet, and video surveys of cod, so we will stick with these methods.

ii) Although we initially proposed to sample 3 depths at Cashes, we added an additional depth after recognizing that Ammen rock is much shallower (~5-10 m) than other pinnacles on Cashes Ledge. Thus we sampled the following depths & habitats:

- |   |                                       |
|---|---------------------------------------|
| ○ Shallow (~5-10 fathoms or 10-20 meters) | <i>Laminaria</i> spp. (kelp)          |
| ○ mid (~15-20 fathoms or 30-40 meters)    | <i>Agarum cribosum</i> (shotgun kelp) |
| ○ deep (~25-30 fathoms or 50-60 meters )  | rocky bottom                          |
| ○ extra deep (~35-50 fathoms or 70-100 m) | mud/sand bottom                       |

We also proposed to sample 4 replicate sites during each sampling events, but were able to add in two to four addition sites depending on the sampling method.

iii). In between submitting our proposal and receiving the funding, we learned that multibeam efforts were conducted at Cashes Ledge in 2005 to describe the bottom topography. We were able to use existing information on the bottom topography to select our field sites. In order to avoid creating redundant maps of the bottom, we focused our multibeam efforts towards collecting high resolution water column data to describe the extent of kelp habitat on Cashes Ledge. Groundtruthing these two multibeam datasets with our video data will permit us to construct much more accurate habitat maps of Cashes Ledge (Objective 2) in order to examine the historic and current distribution of cod within this closed area (Objective 3).

## **6. Next steps, tasks for next 6 months**

Over the next six months the primary tasks include 1) completion of habitat maps, 2) completing field work this summer and fall, and 3) processing laboratory samples (stomach contents & stable isotopes for diet composition, otolith age analysis, video surveys of cod visitation rates, etc.) and entering data, and 4) beginning initial analyses.

## **7. Impacts of the project to fishermen/fishing community, and scientist/science community**

This project is still in the data collection stage, so that it is difficult to predict its impacts on fishermen and the fishing community.

## **8. Signature and date**

- Attachments: while attachments are not required or expected, we welcome vivid images or graphic demonstrations of project activities.

December 1, 2006

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Jonathan Grabowski