

Collaborations

A report on collaborative research projects in the northwest Atlantic Ocean.



How to *Not* Catch the Big One

New Fabricated Bait Catches Haddock Without Catching a Top Stock of Concern: Georges Bank Cod

Like people, fish can be finicky eaters. For example, given a choice between herring and clams, a cod will go for the clams. Its next preference is squid (that's calamari to you and me). On the other hand, a haddock will eat just about anything you put in front of it, even sausage, but we'll get to that later.

The dietary preferences of groundfish may seem trivial or, perhaps, a topic best left for marine biologists. But one way to help make sure there are enough cod, haddock, and flounder for us humans to eat in the future is to study what they are eating today.

With this in mind, a group of hook fishermen from Cape Cod began experimenting with different baits back in 2003 to see if they can be used to harvest the abundant haddock on nearby

Project Specifications

Title: Production and Testing of an Alternative Bait Selecting for Haddock.

Funder: Initially supported by Chatham & Harwich fishermen, later new projects were developed with NEC, Kaplan Fund, and CRPI support.

Industry Participants: Bruce Kaminski, Ron Braun, Peter Taylor, Mike Russo, Eric Hesse, Terry Pickard, Roger Horne, Jamie Eldredge.

Science Partners: Dr. Susan Goldhor, Cornell Dept. of Food Science, (see report for full list of research scientists and technicians.)

Reports available: The data is stored on the New England Fishery Science Center's SeaSamp archive and the CCCHFA's database. Final reports available at www.cchfa.org.

Message From Editor:

Men have had great dreams: to discover the fountain of youth, a golden city, and everlasting happiness. One such dream has been to fabricate bait that will hook a trout, striper, haddock, (or trap a lobster) as well or better than the real thing.

At a time when traditional oceanic bait species, such as mackerel and herring, are harder to find and more expensive to buy, scientists are teaming up with fishermen to dream up new ways to catch (or in some cases not catch) their species of choice.

The fabricated bait phenomenon has already hit the recreational sector, such as the billion-dollar striped bass fishery, where fake baits are taking a bite out of traditional bait sales.

Take Fishbites, an alternative to the Northeast's bloodworm, long a favorite of anglers for reeling in the sporty fish.

The pink bait looks like a strand of bubble gum and is filled with additives that mimic a bloodworm's scent.

Some believe demand for the striper bait is driving an overexploitation of seaworms in Maine's tidal flats. As worms become harder to find (and on average smaller), costs have increased. Today, a single 2-inch bloodworm can cost as much as \$1 dollar.

While anglers spend the next few seasons making up their minds about how well the artificial bait works (sales of Fishbites last year closed in on \$2 million dollars), an interesting conservation twist on the story is also being felt in some commercial sectors (see "Not Catching the Big One.")

The two most popular fabricated baits in the groundfishery today are the Norwegian-based Norbait and the Alaska-based Trident.

Created of byproducts from herring processing, the baits not only make the most of waste, they are formulated to attract haddock without hooking cod, which is depleted in many regions.

Other fabricated baits are being tested by fishermen and scientists in New England's lobster fishery, where unpredictable herring prices can make or brake a season.

While no one expects fabricated baits to replace the species that have been used to harvest a variety of commercial stocks for generations, the research shows an important aspect of collaborative research and underscores the central risk to many of the region's fishermen and ports:

Because of the desperate economic situation they face, collaborative research not only serves to collect data, but also a way to help fishing operations get through this critical phase while stocks continue to recover.

If, as appears to be the case, fabricated bait research finds a way to let fishermen make a buck while the cod come back, the study will not only help save cod it may just save cod fishermen too.

Michael Crocker
Editor, Collaborations



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Georges Bank without harming its depleted cod stock.

In fact, preliminary results proved so promising, additional support was given by the Northeast Consortium, the Kaplan Fund, and CRPI (the cooperative research branch of the National Marine Fisheries Service) to expand the research.

The findings, which were recently presented to government managers, could have substantial implications for the region's commercial and recreational fishermen. Not to mention those of us who eat fish, but don't have the wherewithal to catch it ourselves.

The impetus for the study came from fishermen's longstanding assertion that cod turn their noses up at the same bait that will hook haddock.

"Since haddock and cod spend the majority of their time on the bottom of the ocean and tend to aggregate in similar locations, fishermen who want to fish sustainably for haddock and avoid cod must develop innovative ways to do so," said Tom Rudolph of the Cape Cod Commercial Hook Fishermen's Association (CCCHFA), who helped direct the project.

In the early 1990s, European researchers struggling with the same dilemma helped scientists formulate a bait proven to capture haddock, without also capturing large numbers of cod. Similar findings were later replicated by a Canadian team working on this side of the Atlantic.

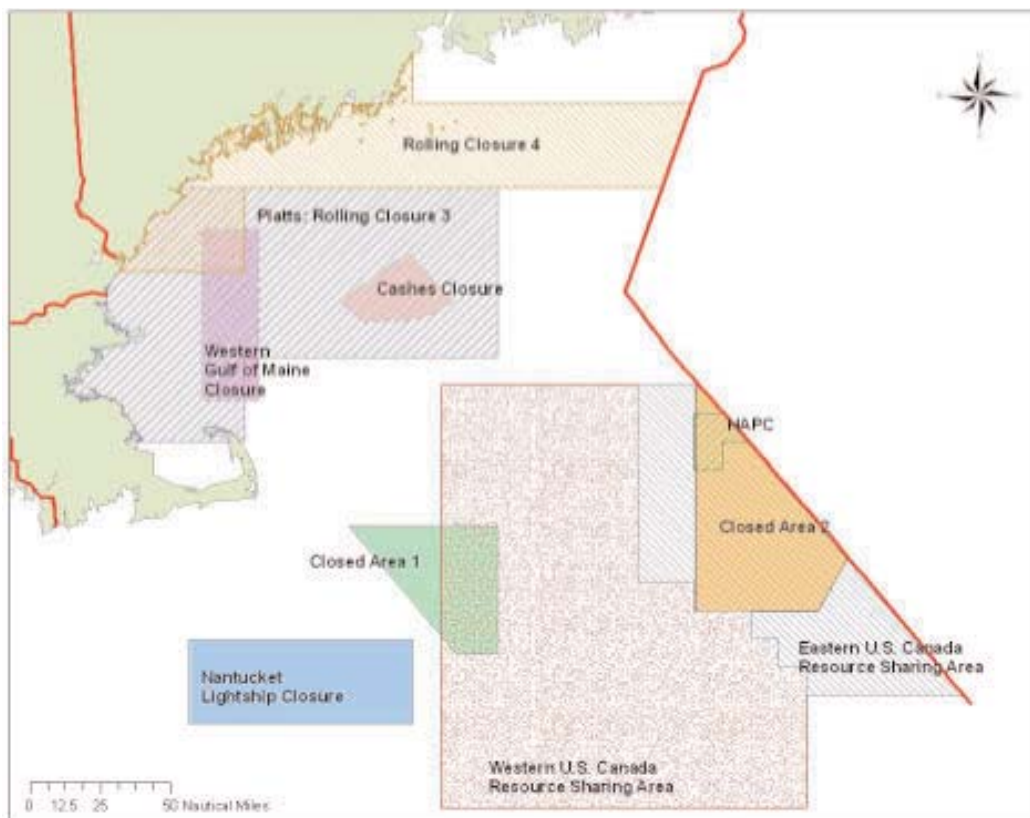
Today, commercial trawlers are permitted access to parts of eastern Georges Bank where cod landings are heavily restricted, provided they use special gear known as a "haddock separator trawl." However, no such opportunity exists for hook-and-line fishermen.

From the standpoint of the consumer, particularly those who prefer fresh fish be caught daily, maintaining the economic viability of small fishing communities, like Chatham and Harwich, is nearly as important as preserving the ecological productivity of the resource: after all, fishermen have to be around to catch what we eat.

Indeed, at sea, as on land, ecology and economics are very often tied firmly together, which brings us back to the focus of the project at hand--and it turns out to sausage.

You see, for the government to allow hook-and-line fishermen to go after haddock, they must prove cod won't be hurt in the process.

But the aforementioned artificial baits—marketed as Norbait and Trident—are manufactured in Norway and on the West Coast, so shipping the product can get expensive.



The Gulf of Maine and Georges Bank fisheries are regulated by a patchwork of closed areas. Haddock have recovered across the region, but cod continue to struggle. Thus, opportunities to catch haddock have been limited by the need to protect cod. A group of hook fishermen from Cape Cod recently proved they were able to prosecute haddock without impacting cod stocks by using special fabricated baits.

To demonstrate a similar concoction could be manufactured locally (and thus one day eliminate the cost of freight) the team partnered with Dr. Susan Goldhor and Cornell's Department of Food Sciences to develop recipe attractive to cod, but unpalatable to less fastidious haddock.

The baits are all a blend of byproducts from herring processing factories (which would otherwise be wasted) and food additives that are squeezed into sausage links.

All the fabrications are biodegradable and frozen before shipping.



The fabricated bait is made of byproducts from herring processing factories, which is combined with biodegradable fillers and binders and formed into continuous links for storage and baiting.

continued next page

“We were not only interested in the baits’ ability to catch haddock and exclude cod, but also in the ease of baiting and hook cleaning, number of hooks coming up empty, and fishermen’s general responses,” Rudolph said.

Put simply, the first NEC funded experiment proceeded as follows:

Eight commercial fishing vessels fished the three baits with longline gear in Georges Bank’s Closed Area 1. Sets of traditional herring and squid baited hooks were also tested.

The research was observed and administered by trained, independent scientists and met Exempted Fishing Permit (EFP) guidelines needed to fish in closed areas.

The weight, length, and number of fish captured were recorded; the comparative catch rates per unit of fishing effort calculated, and the results are significant.

All three fabricated baits substantially reduced the catch of cod relative to haddock and to a greater extent than the fresh baits tested.

As with the other studies, the faux bait didn’t catch as much haddock as fresh bait, but the increased fishing opportunities offered would more than offset the difference, according to Rudolph.

In May, the results were presented to the New England Fishery Management Council’s research steering committee, which passed it on to another committee for further analysis.

But Rudolph said while his group’s proposal to target the abundant haddock on eastern Georges is adrift in bureaucracy, fish are going uncaught and fishermen are struggling financially.

An unfortunate waste, he added, particularly because data from several peer-reviewed studies shows fabricated bait to be far more selective than the haddock separator trawl currently being used there.

“The potential applications of this project are great for the fishermen in the entire northwest Atlantic ecosystem; indeed, anywhere that cod and haddock coexist,” said Rudolph.

The data is stored on the New England Fishery Science Center’s SeaSamp archive and the CCCHFA’s database. A final report is available at www.cchfa.org.

Preliminary Catch and Bycatch Data as of 4/19/2006:

Area	# Trips	# Hooks	Total Haddock, pounds weight	Haddock, CPU E*	Total Cod, pounds weight	Cod, CPU E*
EUSCA	11	176,800	65,181	0.37	3,276	0.02
WGOM	14	74,207	27,617	0.37	2,667	0.04
Cashes	5	42,955	4,932	0.11	1,677	0.04
Platts	1	12,320	1,434	0.12	73	0.01
Totals	31	306,282	99,164	0.32	7,693	0.03

* CPU E= Catch per Unit Effort (pounds per hook)

Results from the most recent CRPI sponsored project shows considerable cod bycatch reduction when fabricated baits are used. The participants hope such results will lead to increased fishing opportunities for hook-and-line fishermen using the bait in Georges Bank’s Closed Area 1.



A load of freshly dressed haddock is unloaded in Chatham, Mass.

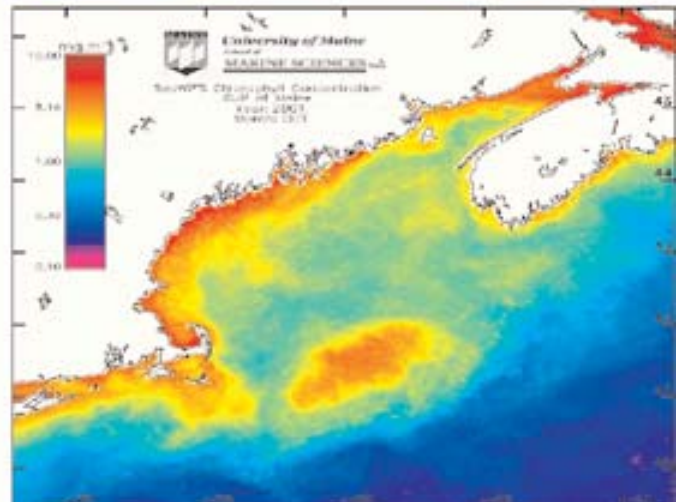
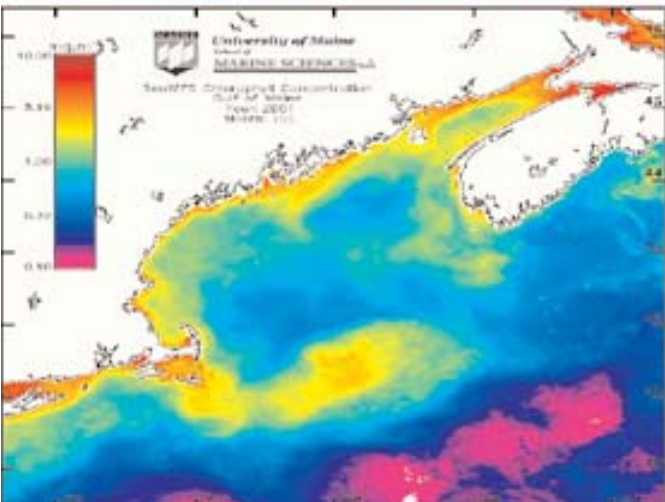
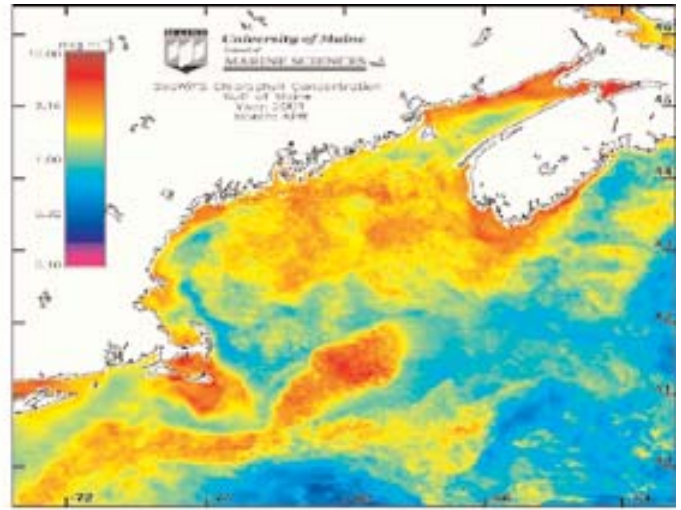
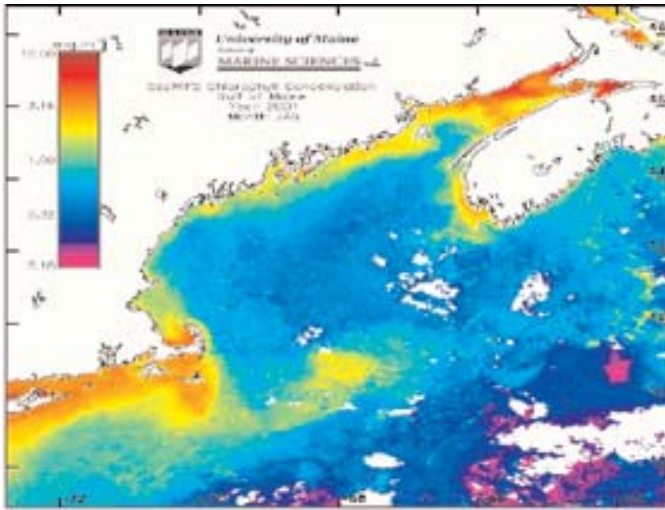
American Fisheries Society

137th Annual Meeting, September 2-6, 2007

San Francisco, California



Thinking downstream and downcurrent;
Addressing uncertainty and unintended consequences in fish and fisheries



Bathymetric charts show depth contours of the WGOMCA. Some fishermen believe the area's boundary should follow depth curves.

NEC Symposium Reflects on the Social and Ecological Impacts of Western Gulf of Maine Closure

For almost a decade, the Western Gulf of Maine Closure Area (WGOMCA) has served as a primary management tool for the region's groundfishery. The large swath of protected ocean, stretching from Stellwagen Bank in the south to Jefferies Ledge in the north, has undergone a variety of changes, testing not only the biological benefits of the strategy, but also its political justification.

With both factors in mind, the Northeast Consortium convened a symposium of diverse fishery stakeholders last spring to reflect on the social and biological impacts of the closure.

The group tackled the difficult task by exploring five interrelated questions:

- Is the Closure meeting its goals?
- What are the effects of the Closure?
- How far have we come in understanding the Closure?
- What future research is needed to evaluate the Closure?
- What does the future hold for the Closure?

Tom Nies, Senior Fishery Analyst at the New England Fishery Management Council, opened the meeting by reviewing the protected area's legislative history, which revealed that the objectives used to justify the closure initially have evolved sub-

stantially over time, and may help explain why it has had elicited ambiguous support from the fishery.

The Western Gulf of Maine Closure Area, as currently defined, was created in 1998 with Framework 25 to the Multispecies Fishery Management Plan (FMP), but the first sanctions on commercial fishing there came in 1994 with Amendment 5.

The amendment established a juvenile cod protection area on Jeffrey's Ledge and required new regulations on minimum mesh sizes, minimum size limits, new fishing permits, and reporting requirements.

However, additional changes have sought to protect new species and areas, leading some to question the basic mission of the closure.

In fact, its location, which includes much of the inshore Gulf of Maine, has led to considerable socioeconomic impacts on fishing operations, particularly for small boat fishermen in New Hampshire and southern Maine who lacked the size and horsepower to steam to easily steam outside the area.

"Some of the rules have good intentions, but they end up backfiring, and they end up backfiring on us," was how a groundfisherman described the change at the time. "We simply want to have its goal clearly defined."

The symposium, which was open to the public, drew more than 80 fishermen, scientists, managers, conservationists, and other interested parties.

This July, the NEC published a review of the meeting's outcomes on its website, www.northeastconsortium.org, and printed copies are available upon request.

Rachel Gallant, a fisheries specialist at the NEC, who helped design the symposium, said that the questions raised complicated topics involving both biology and social issues.

For instance, the closures do not affect the recreational fleet, which leads many commercial fishermen to question its fairness as well as its goal to protect juvenile cod.

"People wondered if the original purpose of the WGOMAC was to reduce cod mortality, why was recreational catch still allowed in the area? The commercial fishermen don't see it as fair and they and others wonder how the goal can really be attained when only commercial groundfishermen are excluded," said Gallant.

The group generally agreed that the cobweb of regulatory changes in the past decade—from emergency closures to days-at-sea cuts—make it difficult to measure results with certainty.

Additionally, few disagreed that the closure was doing well to protect habitat. However, with little or no information to assess the environment before the protection went into effect, research has focused on comparing habitat just outside the area.

Nevertheless such studies seem to reveal striking differences that support the conservation benefits of the strategy.

In fact, Dr. Ray Grizzle presented findings that show an increase of biomass and taxonomic richness by fourfold inside the closure at 30 to 50 fathoms deep along the edge of Jeffrey's Ledge. Additionally, the largest increases in epifaunal communities were found along the top of Jeffrey's Ledge on gravel sediment and were up to 2.5 times higher in the closure.

For the industry, Peter Kendall of Portsmouth presented a talk on the impacts of the closure on the fleet. He said at least 80 percent of his coop was initially displaced by the rule change and described how subsequent regulation have whittled days-at-sea down to the point that opening the area back up to some fishing wouldn't have a large impact on fish populations there.



The Seafloor Habitat Recovery Monitoring Project (SHRMP) was initiated in April 1998, one week prior to the closure of the WGoMCA, to investigate the recovery rates of seafloor habitat (physical and biogenic) and associated taxa (such as fishes) in the SBNMS following impacts from fishing. A total of eight stations were identified in four major habitat types—piled boulder, gravel, sand, unconsolidated mud—on either side of the WGoMCA boundary. Annual sampling is conducted using remotely operated vehicles, video drift camera systems, side scan sonar, seafloor-mounted current profilers, and bottom grabs.

"Groundfish management allows for only 46 days of fishing a year," he told the group. "With the passage of Framework 42, groundfish days count 2:1, leaving only 23 days to fish in a year. If the area was opened completely and there were no rolling closures, mortality would not be increased because of trip and DAS limitations."

Currently NMFS has not systematically analyzed studies that have assessed the effects of the closure. Until that is done, some fishermen have suggested that its boundaries be set by bathymetry (depth), rather than arbitrary political lines, to protect stocks in the critical 30-50 fathom mark, while still allowing some fishing in the less sensitive deep areas on the closure's edge.



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