

Longliners, scientists team to study cod survival

From confrontation to collaboration, good example of cooperative research

CHATHAM, MA - Out of concern for the future of cod stocks and the small boats that depend on them, 25 fishermen and 14 vessels from the Cape Cod Commercial Hook Fishermen's Association (CCCHFA) and two scientists recently completed a two-year collaborative study to determine the discard mortality of juvenile cod in the longline fishery.

Since so little is known about bycatch mortality from demersal fishing gear, scientists routinely set the juvenile cod discard survival rate at 0.0 percent when doing stock assessments. This high mortality assumption has had a significant impact on how much fish the hook boats have been allowed to catch.

To begin to fill this critical information gap, CCCHFA member crews worked hand in hand with scientists to move fish from capture to evaluation, into cages, and finally back to the seafloor as part of the study.

Their idea was to collect a strong set of discard survival data during different seasons and at different depths from regional longline fishing operations off Cape Cod. Approximately 4,000 fish were sampled over the course of the project, which began in 2004 and was completed in January 2006.

Hook mortality

In the longline fishery, discard mortality results from a variety of factors such as depth, water temperature, and/or hook damage to the fish gills, mouth, or gut.

One particularly severe injury may occur when the longline is hauled back and the fish is removed from the hook by force. During this process, often referred to as "snubbing," the hook is pulled through the fish's flesh as the longline travels through two parallel steel cylinders placed vertically on the gunwale.

The resulting damage ranges from jaw breaks to complete lower jaw loss, which may lead to infection and/or starvation. Whether "snubbing" is common isn't known, nor is science able to predict mortality resulting from this action.

However, many fishermen have developed techniques that deter "snubbing" and minimize damage to the fish, but these alternate methods still can cause superficial injuries, not unlike the damage caused during recreational catch and release events.

Collaborative approach

A few years ago, Marianne Farrington of the New England Aquarium, Arnie Carr of the Massachusetts Division of Marine Fisheries, and Henry Milliken of the National Marine Fisheries Service conducted a small-scale study on the discard mortality of juvenile cod in the longline fishery.

This project, which was funded by the Saltonstall-Kennedy program, was completed in 2002. Farrington remembered presenting the results to a room filled with Massachusetts longliners – and being immediately taken to task.

"The hook fishermen threw down the gauntlet," she said.

Recalled CCCHFA Research Director Tom Rudolph, "We all felt the mortality rates that were suggested were much too high, and the handling protocols did not represent commercial fishing."

Farrington summed up the meeting by saying, "We could have stood on a pedestal and ignored their concerns, which is what they expected, but instead we said, 'If that's what you think, let's prove it.'"

To do that, the CCCHFA, together with Farrington and Milliken, turned to the Northeast Consortium for funding. Not convinced by the high mortality estimates, the CCCHFA wanted to collect as large a data base as possible with available funds and take the time to ensure that the science truly represented normal longline operations.

"This is one of the best examples of cooperative research," Farrington said. "It began confrontational. Then we listened and they listened, and we came up with a new approach together."

High survival observed

With the preliminary results now in hand, Milliken described what the project revealed.

"After looking at our initial results, we can say that short-term (72 hours) survival is higher than expected," he said.

Project participants also observed higher mortality in the summer, when water surface temperatures were highest, and a higher mortality with depth (20-40 fathoms) meaning that fish pulled from a depth of 40 fathoms experienced a higher mortality than those fish caught at 20 fathoms.

As expected, "snubbed" fish experienced the highest mortality, with Milliken and Farrington both suggesting that long-term survival of "snubbed" fish would be lower.

For his part, Rudolph thought the results highlighted the importance of fish handling. He added that education is the best avenue to discourage "snubbing."



In order to study the survival rates of longline-caught cod discards, captured fish were placed in cages, held in the water, evaluated after varying intervals, and finally released back to the seafloor.

About 25 CCCHFA members and 14 vessels teamed up with two scientists for a collaborative study to determine the discard mortality of juvenile cod in the longline fishery. The project, which began in 2004, was completed in January 2006 and sampled about 4,000 fish.

Rudolph also stressed that the recently completed work is really just the beginning of a long process to understand discard mortality. He said he would like to see a more comprehensive study that looks at long-term mortality over, say, 30 days, across all gear types.

Co-op works

Now that the field work is complete, the next steps are writing up the final report and submitting it to the Northeast Consortium for technical peer review.

Once those results are in hand, the consortium will help to channel the information into the scientific and management system for consideration. The findings may prompt a rethinking of the current assumption of zero cod discard survival in the groundfish fisheries.

The CCCHFA has seen firsthand that cooperative research can lead to management changes. One example is the Closed Area I Hook Gear Haddock Special Access Program (SAP).

"The haddock SAP is the most successful program of its kind to date," Rudolf said. "The bait selectivity work the CCCHFA conducted through the Northeast Consortium directly led to the SAP being developed by the New England Fishery Management Council."

Milliken noted that the recently concluded survivability study had

multiple benefits.

"We not only collected a robust set of data," he said, "but we managed to collaborate with a large fleet of vessels and over 20 fishermen."

Ken La Valley

Ken La Valley is an extension specialist with University of New Hampshire (UNH) Cooperative Extension/New Hampshire Sea Grant who is working to connect commercial fishermen interested in cooperative research with scientists who want to work with fishermen. He encourages anyone with ideas to get in touch.

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