Overharvested and not rebounding, the yellowtail flounder population in New England has become a source of concern. Fishermen are worried for the future of the fish as a resource and troubled by inconsistencies that have surrounded assessment of flounder stocks. Now fishermen from more than a dozen commercial vessels, from Rhode Island to New Hampshire, are taking action to address their concerns.

The fishermen have partnered with a team of researchers led by Steve Cadrin, director of the UMass Cooperative Marine Education and Research Program, to carry out a comprehensive tagging program. The investigators hope the Yellowtail Flounder Cooperative Tagging Project will improve understanding of the yellowtail’s age structure and its movement within its range.

To date, the project participants have tagged more than 35,000 yellowtail flounder throughout Cape Cod, Georges Bank and southern New England. Data from the tags are offering important insights into the health, age structure and migration patterns of yellowtail flounder – information that may be used by fisheries scientists and managers to improve stock assessments.

Yellowtail flounder are managed as three distinct stocks: Cape Cod/Gulf of Maine, Southern New England/Mid-Atlantic, and Georges Bank. Assessments of these stocks are generally carried out analytically through Virtual Population Analysis (VPA) or Biomass Dynamics Models. To produce functional information, these models rely on assumptions about the number of fish of a particular age, their sexual maturity and the rates of natural and fishing mortality.

Responding to the results of these analyses, managers have taken steps to rebuild the resource by reducing the number of days fishermen can spend at sea, restricting gear and closing some areas to fishing. Nevertheless, the yellowtail flounder population hasn’t rebounded as well as expected, leading some to question the management approach. Now science and industry are looking for answers.

Puzzling Populations

One of the questions surrounding yellowtail flounder is how the three stocks interact. “While the Georges Bank and Cape Cod stock components are fairly well documented, the degree of mixing between stocks is not well known,” Cadrin explains. “There is little information on how, or how much, yellowtail move between waters off southern New England and the Mid-Atlantic states.” Those movements may have a significant impact on how trawl survey results should be interpreted. According to Cadrin, the survey results have been puzzling. Older fish aren’t showing up in the surveys, he says, and so far he’s not sure why. “Are they moving,” he wonders, “or dying due to fishing mortality?”

Cooperative researcher and NH commercial fisherman David Goethel agrees that yellowtail flounder present a puzzle. “The case of Cape Cod yellowtail remains a mystery,” he says. Winter flounder and Gulf of Maine cod have experienced recent reductions in fishing mortality, Goethel explains, but “yellowtail mortality has remained high.”

Electronic data tags provide information about the daily movements and migration patterns of the yellowtail flounder. Fishermen from across New England are participating in the cooperative tagging project.
Cooperative Efforts

The project participants hope to help solve those mysteries by determining how discreet the yellowtail populations are and why fishing mortality has remained high. The study began in 2003 as a pilot project funded through the National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center’s Stock Assessment Improvement Program. Since 2004, the Northeast Consortium has funded all of the tags and tagging trips, covering more than half the cost of the program. NMFS has continued to assist the program through in-house funds at the Science Center and through the Center’s Cooperative Research Partners Program.

Thanks to the fishing industry’s commitment to the project, more than 35,000 fish have been tagged so far and more than 2,000 tags have been returned. In particular, Rodney Avila (New Bedford, MA), David Goethel (Seabrook, NH), Fred Mattera (Narragansett, RI) and Luis Ribas (Provincetown, MA) have been key partners from the early stages of the tagging project.

Unexpected Behavior

Analyzing data from the electronic data storage tags that have been recovered so far, the investigators were able to document the yellowtail flounder’s daily movements and migration patterns over time. The results were surprising; the findings had not been documented in over a decade of research.

“Until recently, the yellowtail flounder was thought to be a sedentary fish, feeding on epibenthic fauna (amphipods) and limited to relatively shallow, sandy habitats,” Cadrin explained. These behaviors and habitat preferences were believed to limit yellowtail movement to offshore banks and shelves, which led to the current geographically based stock classifications.

In fact, the tagging project has revealed that the fish move off the bottom in the evenings, for an average of four hours at a time. The frequency of these off-bottom movements varied geographically, approximately once every 10 days off Cape Cod and once every three days on Georges Bank.

Cadrin attributes this behavior to “passive drift in midwater currents, similar to patterns observed for other flatfish species.” The finding is important. Understanding where the yellowtail flounder spend their time is key to effectively classifying and managing the stocks.

What’s Next?

By supplying managers with more accurate information about behavior, independent estimates of mortality, and confirmation of age determinations for each stock, the investigators believe the program will help improve management of the yellowtail flounder. The team plans to determine the fishing mortality rates for all three yellowtail flounder stocks by 2008. Already, they are making progress toward solving the mysteries of the yellowtail flounder.

For more information, please contact NH Sea Grant’s commercial fishing technology specialist:

Ken LaValley
219 Nesmith Hall, UNH
Durham, NH 03824
603.862.4343; ken.lavalley@unh.edu

NH Sea Grant:
www.seagrant.unh.edu

Yellowtail Flounder Cooperative Tagging Project:
www.cooperative-tagging.org

Northeast Consortium:
www.northeastconsortium.org