Edited by Laurie Schreiber 288-3311

# COASTLINES

# For the halibut

by Laurie Schreiber

FRANKLIN — A crop of baby Atlantic halibut has been successfully reared for the first time ever in the U.S., thanks to a multi-year effort at the University of Maine Center for Cooperative Aquaculture Research.

The event occurs three years after a halibut in captivity spawned for the first time at the center. Because halibut taken from the wild take several years to acclimate to new surroundings, however, the viability of the first and subsequent batches of eggs was low and didn't result in the successful production of juveniles until recently.

CCAR's operations manager, Dr. Nick Brown, began developing the project in 2000 when, working under a special permit from the National Marine Fisheries Service — there is no commercial fishery for halibut in the Gulf of Maine — fishermen caught about 70 adult halibut to act as broodstock for eggs and sperm. The project suffered a major setback in 2002 with the loss of the entire population caught in 2000. However, fish caught in 2001/02 — kept in covered tanks under carefully controlled environmental conditions — thrived and started to spawn last year.

Since that time, the center itself has grown considerably and its many projects, in addition to halibut farming, are thriving.

Located at a former commercial-scale aquaculture site on 24 acres fronting Taunton Bay, the center's facilities range from small labs to cavernous buildings designed to incubate fish eggs, rear larvae, house breeding adults, and grow feed, all under environmentally controlled conditions designed to keep out pathogens and optimize the success rate of getting fish to grow from the egg stage to a marketable size.

One building houses a pilot-scale finfish nursery. Here, about 5,000 juvenile halibut, hatched from one batch of about 50,000 eggs — amounting to about a quart — are swimming around in 14 tanks. The 10 percent success rate is considered excellent, but is also expected to grow as the broodstock become increasingly accustomed to their new surroundings and more is known about the ideal environmental conditions and feed needed by the young fish. The adults will also benefit from new quarters, now under construction, that will be part of a full-sized commercial hatchery designed to produce around 500,000 juveniles.

The project represents the groundwork CCAR needed to do to facilitate the start of a halibut farming industry. The next step toward that goal was achieved with the formation of Maine Halibut Farms Inc., which is being assisted by the University of Maine. This first crop and subsequent crops will be sold to Maine Halibut for grow-out using land-based farming techniques.

This type of partnership is what the facility is all about, said Dr. Brown. The facility has the equipment and wherewithal needed for the years of experimentation that go into starting up a new farming protocol.

"No business would start from scratch," he said.

In a related project, CCAR is home to a study to develop diets for the broodstock. The goal is to produce formulated feeds that will replace the raw marine components currently used to feed the broodstock. Specifically, the food must be high-quality and pathogen-free. Feed trials are underway now, testing a new off-the-shelf commercial diet, and an experimental diet containing polychaete worms and crab meal, as compared with the control diet that contains wet fish, squid and vitamins. The study is in its second year, and must show the effectiveness of the new diets on egg production, egg quality and hatching rate.

"We haven't found the proper diet yet," Dr. Brown said. "One fish (producing viable eggs), so far, is not a lot of data to go on."

CCAR continues to grow with numerous additional projects designed to assist the aquaculture industry in developing new technologies, integrated aquaculture techniques, production of juveniles for commercial growing, transfer hatchery technology, and recirculation technology.

CCAR is in the third year of a NOAA Saltonstall-Kennedy-funded grant to determine the feasibility of on-growing juvenile Atlantic cod in net pens.

At the moment, broodfish quarantine facilities are in the final stage of construction for the production of pathogen-free cod eggs. The facility will provide a place to screen for additional wild cod broodstock and to test disinfection practices for cod eggs. The goal is to ensure a reliable egg supply for the emerging industry and enable a major salmon growing company to diversify.

Center for Cooperative Aquaculture Research biologist Steve Eddy checks on the mature halibut that are the basis of a breeding program expected to diversify Maine's aquaculture industry one day. PETER TRAVERS PHOTO

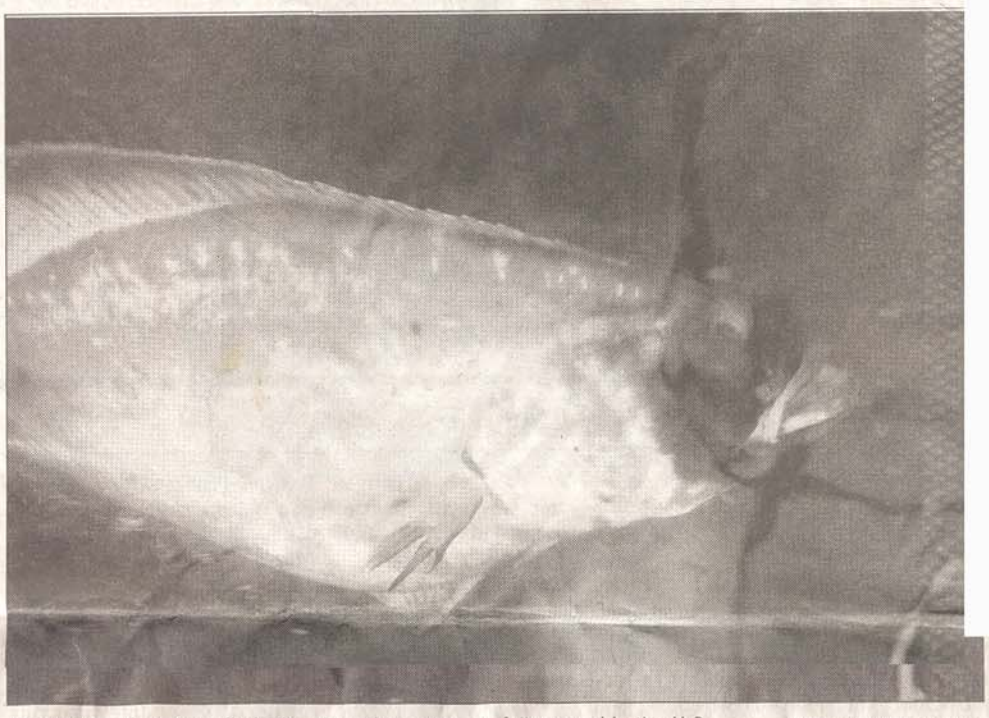
Preliminary work is underway in the farming of nori (Porphyra), the most valuable sea vegetable in the world.

Maine has at least seven native species of Porphyra, and the goal is to develop some of them as new mariculture crops. The project, a collaboration between researchers at the University of Maine and the University of Connecticut, focuses on environmental cues that trigger reproduction in native species, in order to be able to control these for net-seeding. At CCAR, experiments have been done to grow native Porphyra to seed test nets, and the plan is to work with local aquaculturalists to test these in the sea.

Over the past two years, marine worms have been the focus of Seabait Maine, which has worked to improve harvesting and feeding techniques, moving the operation from the status of research pilot project to manufacturing plant.

The project began as a satellite to the highly successful Seabait Ltd., producers of marine polychaete worms in England. Seaworms are sold mostly to striped bass anglers and inshore fishermen.

Seabait is about to break ground for a commercial-scale worm farm. Now producing 7 metric tons, or about 1 1/2 million worms per year, it is expected that rate will increase 20-fold, to about 130 metric tons, said general manager Greg Paquette.



For the first time, juvenile halibut have been successfully reared in the U.S. PETER TRAVERS PHOTO

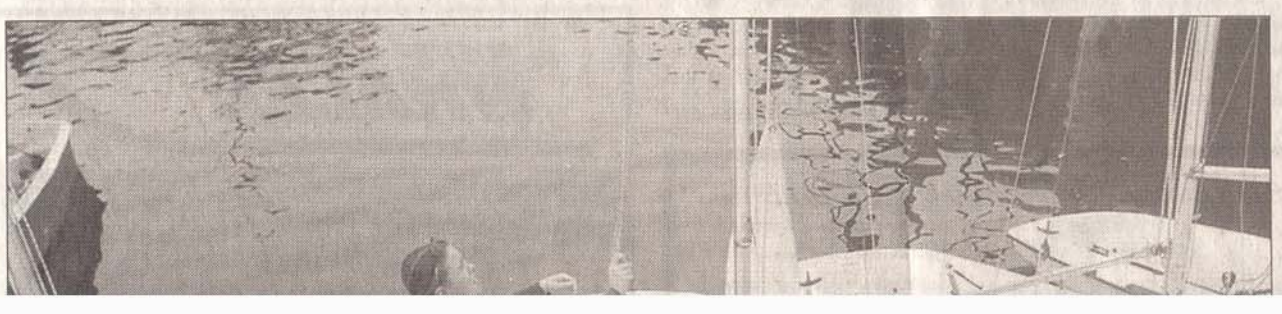
The operation uses its own broodstock under temperature- and light-controlled conditions that mimic summer conditions year-round, and is equipped with its own recirculation system. They've also created their own formulation of pelletted food for the worms. A second set of raceways was added last summer to hold grow-out bins. The operation is now getting into a regular production cycles.

A portion of the production is sold to labs around the country exploring their use in the bioremediation of marine sediment and in bio-assays to analyze the chemicals found in sediment. Marine worms are also used in broodstock maturation diets in fish and shrimp aquaculture facilities.

Elsewhere on the farm, the National Marine Fisheries Service, Maine Atlantic Salmon Commission, and U.S. Fish and Wildlife Service are occupying two quonset-style buildings to study fecundity of river-specific Atlantic salmon. Reproduction rates of stocked salmon reared in pens — representing 140 families of salmon from five rivers and streams around Maine — have been relatively low in recent years, and the project has taken a selection of salmon to study possible reasons. Although fertilization and egg-survival rates were very high, reproductive performance remained low.

The study comes in response to the addition of Gulf of Maine Atlantic salmon to the Endangered Species List and experimentation with introducing pen-raised adult salmon into their native rivers in hopes that these fish would spawn naturally and seed the rivers.

Next door to CCAR, the nation's only research center for cold water aquaculture is under construction, a project of the Agricultural Research Service costing about $25 million. ■



## Almanac

Oct. 13-20

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| low | 12:11 | 12:27 |
| sun | 6:47 | 5:46 |