



Could the Gulf of Maine's Ground Fishery Rebound?

Dams, overfishing & now climate change —

by Andy O'Brien

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Arthur MacCleave with a “steaker” at his shanty in town
(Photo courtesy Penobscot Marine Museum)

“The English had discovered living resources that would attract, shape, and sustain the communities of the coast of Maine for the next four centuries,” wrote journalist and historian Colin Woodard of the bounty that once existed in the Gulf of Maine in the 17th century in his book “The Lobster Coast.” “Early explorers were flabbergasted by the largesse of the Gulf of Maine, a semienclosed sea stretching from Cape Cod to Nova Scotia. They saw great pods of whales, acres of thrashing tuna, vast schools of salmon, herring and mackerel, clouds of puffins and terns, shoals of mussels and oysters, vast mudflats infested with fat clams, cod and haddock biting at the hook, and enormous lobsters foraging in the rockweed. The waters off England and France seemed barren by comparison.”

As Woodard noted, the geology and climate of the Gulf of the Maine with its 7,500-mile coastline made the area perfectly suited for a thriving fishery — a “fertile oasis in a world ocean that is, ecologically speaking, largely desert.” But today — with climate change, ocean acidification and overfishing — the Gulf is a different story. The groundfish fisheries have collapsed, shrimp are disappearing, scallop fishing is severely restricted, clamming has been in steep decline and more than half of the mussel beds have vanished. Lobster is booming due to a number of factors related to warming waters and lack of natural predators, but the question remains: How long will it last?

Dams, Overfishing & Climate Change

Overfishing was certainly the major factor that led to the crisis of the fisheries in the Gulf of Maine, but the proliferation of dams played a pivotal role in the loss of coastal groundfish, says lifelong fisherman and researcher Ted Ames of the Maine Center for Coastal Fisheries. As the early industrialists constructed dams to power the woods industry, they also blocked off the spawning grounds for sea-run fish like alewives, the cod’s major food source. Speaking at the Penobscot Marine Museum’s “Our Evolving Fisheries History Conference” in Belfast on April 8, Ames recounted a time when the entire Penobscot Bay was teeming with cod, as millions of diadromous fish made their way up the river to their spawning grounds.

“If you can imagine hundreds of rivers filled from bank to bank with these critters every spring,” said Ames. “And then imagine the 20 million alewives that were paddling up the Penobscot and then... 7 million shad and countless amounts of blueback and salmon and sturgeon. All of a sudden you just have this incredible bounty.”

Ames noted that spawning grounds for cod and haddock once reached as far as the bridge in Bucksport and there were over 200 species of fish in the Penobscot alone. Fish weirs of poles and netting were erected along the shore from Camden all the way up the river to Bangor to catch migrating fish. It was a time when a farmer could go out on the water on a weekend, easily fill up his dory with fish and take them back to shore for salting and drying. Using historical records from 1600 to 1900, fisheries researcher Carolyn Hall estimated in a 2011

study that there was originally a population of about 24 million alewives in the Penobscot. But then in 1848, the dam at the head-of-tide on the Penobscot River was sealed, and the number of alewives declined sharply. And by the end of the 19th century, the alewife population had collapsed.

By 1935, the entire upper Penobscot Bay's ground and anadromous fisheries had collapsed, said Ames. With the introduction of new fishing technologies, draggers overfished the lower Penobscot Bay to the point where inshore stocks of pollock, cod, haddock and flounder had also mostly collapsed by 1950. A 2007 study by research scientist Shelly M.L. Tallack of the Gulf of Maine Research Institute found that there are now no more cod left from the Kennebec to the St. Croix rivers. And the lack of alewives, says Ames, is likely why the cod aren't rebounding along the coasts.

"If you want to be a codfish or haddock and eat lots of oil-rich prey so that you can have good robust eggs, for up to the present anyway, you don't want to be in that strip of coast," said Ames.

With the easy pickings gone, the boats got even bigger in the 1960s as fishing fleets went farther off shore. Factory ships like the super Russian trawlers could clean, process and package massive quantities all on board.

"What those factory trawlers were able to do is cast a net that could swallow the Empire State Building," said Patrick Shepard, a fisheries policy associate with Maine Coastal Fisheries, at the conference. "They catch the fish, they put it on board, they process it on board and they can deliver food-grade-ready fish to the consumer and send it back to their country."

In the 1970s, the federal government began to take a more serious approach to preserving the fisheries with the 1976 Magnuson-Stevens Fishery Conservation and Management Act, which banned foreign vessels from fishing within 200 miles of the US shores. But then the government did something incredibly stupid, said Shepard.

"There were subsidies available to fishermen to build these large-scale draggers to go after groundfish," he said. "There were fishermen who tried to take advantage of it, and the government told them that their plans for building a vessel were actually too small and they wouldn't fund them. They basically told them that their business would be unsustainable and they told them they would need a bigger vessel. Folks that were fishing with 50-foot boats all of a sudden started building 70-, 80-, 100-foot boats."

And the rest, as we know, is history.

"Overdone? Understatement if I ever heard one," said Ames. "And then the fish were gone and

they're still gone today.”

By 1995, the region's last cod spawning group had collapsed. Then in 2012, the U.S. Commerce Department concluded that cod stocks were not rebuilding and declared a federal disaster as regulators made deep cuts to fishing quotas.

With the implementation of fishing quotas, the commercial groundfishing fleet has been consolidated and relocated. These days, most of the vessels are in Gloucester and New Bedford, Massachusetts, as most local Maine groundfishermen long ago switched to catching lobsters. The quota system was in the news recently after New Bedford fishing boss Carlos Rafael, the “Codfather,” was found guilty of forging catch records to increase profits after he managed to buy up a large number of permits when they were cheap. He then reportedly offered to sell his entire fleet of 40 vessels for \$175 million to undercover IRS agents posing as Russian mafia men. As Shepard noted, federal regulations have made it increasingly difficult for small boats to operate, as fishermen are required to purchase expensive fishing monitors at a cost of \$600 to \$700 per day.

Shepard noted that the National Marine Fisheries Service (NMFS) and the National Oceanic and Atmospheric Administration have proposed a rule change to cap the number of quotas that any entity could own in order to rein in people like the Codfather. However, the quota cap was set at 15 percent, allowing one fisherman to potentially own 15 percent of the fishery.

“That basically whittles it down to about 7 or 8 people that can own the groundfish fishery,” said Shepard.

Meanwhile, cod stocks are still only at about 3 to 4 percent of sustainable levels, according to the Gulf of Maine Research Institute (GMRI). And they keep going down. A recent survey by the Massachusetts Division of Marine Fisheries found that the number of cod in the Gulf of Maine has declined by 80 percent in the last 10 years alone.

A 2015 study published in the journal *Science* points to climate change as the culprit. The study, which was led by researcher Andrew Pershing, noted that the Gulf of Maine is warming faster than 99 percent of the world's oceans. The researchers found that the changing position of the Gulf Stream, a warm ocean current that originates in the Gulf of Mexico, along with two decade-long ocean climate cycles, resulted in even higher sea temperatures. As a result, coldwater-loving cod have been reproducing less and fewer young cod are surviving to adulthood. Pershing argued that national fisheries regulators fail to take into account climate change when they develop fishing quotas, which has further exacerbated the problem.

Hope for the Future?

Ted Ames says he's still hopeful that the recent removals of dams across the state, such as the Veazie Dam in 2015, will begin to allow river herring to rebound and potentially bring back the inshore cod. This year, he said about 1.5 million alewives went up the Penobscot, a far cry from the 20 million that once filled the river, but it's a start.

The question becomes, Will restoring river herring, alewives and so on help restore groundfish?" said Ames. "Probably the answer is it could if we adapted an ecosystem-based management strategy that integrated our human systems with natural systems. Make it a collaborative approach that engaged fishermen and scientists as well as managers. But we'll just have to wait and see."

And while he wouldn't specify exactly where, Ames added that researchers are finding codfish in places where they haven't been seen since 1935.



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