

What happened to Newfoundland's cod? ; Ten years after a moratorium on fishing northern cod was declared, scientists are still baffled by the disappearance of the Atlantic stock

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ABSTRACT (ABSTRACT)

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Nobody knows if cod that swim far off shore mingle and mate with the cod traditionally caught close to shore by land-based fishermen in small boats. Even DNA testing hasn't resolved the disagreement between researchers, some of whom say inshore and offshore populations are distinct while others argue they are one and the same.

JONATHAN HAYWARD / CP FILE PHOTO VANISHING ACT: Kevin Picco guides a load of cod off a fishing boat in Southern Harbour, Nfld. in 1997. Under the moratorium, catches are restricted to small vessels only. LISA POOLE / AP FILE PHOTO IN THE BALANCE: Some say that fishing cod every time the stocks rebound must stop. "It's not rocket science," says a researcher.

FULL TEXT

John Spears

JEFFREY HUTCHINGS still remembers the day a couple of years ago when one of his graduate students asked where she could find a map showing all the spawning areas of Atlantic cod.

Hutchings had to tell her that one doesn't exist.

It still doesn't.

It's a glaring gap in understanding the fish, but not the only one. Scientists can catalogue a long list of things they don't know about the behaviour of the cod, its environment and other creatures that share the North Atlantic Ocean.

"The biggest thing we've learned is we don't know nearly as much about fish populations as we thought we did," says Hutchings, who holds the Canada research chair in marine conservation and biology at Dalhousie University in Halifax, N.S.

"We're truly lacking in the factors that influence the growth rates of fish populations. I would argue that comes from a lack of understanding of ecology, behaviour and habitat."

How could we be so ignorant about a creature that Canadians and their forebears have fished for half a millennium, but that declined so dramatically that a moratorium on fishing northern cod was declared July 2, 1992?

At least 30,000 people lost their jobs in Newfoundland over the moratorium. And 10 years later, federal scientists say there's little evidence to suggest the northern cod population has recovered.

When George Rose looks at the ocean, he sees many puzzles. Why, for example, are fish populations in some areas recovering well and in others not at all?

Out on the Grand Banks, the cod "are still in pretty miserable shape," says Rose, senior chair of fisheries conservation with the Fisheries and Marine Institute at Memorial University of Newfoundland.

Their whole reproductive cycle seems to have changed, he says. Instead of maturing at six or seven years and then having many productive years of spawning, today's fish are reaching sexual maturity early.

They spawn, once, at about four years of age. Then they die. They never achieve the size or reproductive capacity of their ancestors.

Scientists don't know why, Rose admits. They may have been weakened by malnourishment or cold. That might make them vulnerable to disease or predators.

The population of the cod's own dietary mainstay, a small fish called the capelin, has also dropped alarmingly. Why? Scientists have no answer for that, either.

Nor is much research underway to find out. Rose is studying capelin populations in the ocean, but inshore surveys of capelin are almost non-existent. The fish spawn on beaches, at the very edge of the water, where they are fairly easy to count and observe, but the only beach surveys of the fish are now conducted on one solitary beach in Newfoundland.

Rose says the collapse of the cod population in 1989 put scientists under a cloud.

"Fisheries science got a black eye," he says. "It was pretty easy for the politicians to pick it off.... There was blood on the floor in any research lab in the early 1990s."

It was understandable. After all, a task force headed by Senator Michael Kirby on the northern cod in the early 1980s had confidently predicted the catch would grow to 400,000 tonnes annually. It had once hit 800,000 tonnes in the 1960s.

Instead, the population collapsed when the catch hit 267,000 tonnes. It was easy to blame scientists for getting it all wrong.

Easy, but dangerous.

Cutting back research meant data that might have helped scientists and fishermen reassess the state of the fish population and give them trend lines to study populations went uncollected.

And like it or not, much basic information is still lacking. Consider, for example, what we know about cod fertilization:

The male fish rolls on its back and grasps the female with its fins. If the male is accepted, the female releases a stream of eggs and the male emits a cloud of sperm. But other males nearby are watching; they swim to the mating couple and release their own sperm.

"Some limited work we've done to date indicates that these satellite males are clearly able to fertilize eggs," Hutchings says.

"Which leads to the question- if the density of cod drops, maybe fertilization success goes down. We don't know the answer."

Dalhousie researchers are studying cod mating behaviour in big tanks, but this still fails to answer questions about behaviour in the wild.

Do the mating fish set up territories? If dozens of interloping cod rush to a mating couple, do they all have a chance to fertilize eggs, or only a few of them?

Hutchings throws out an additional piece of information.

"The other cool thing with cod is the males produce sounds, a clucking sound with their swim bladder. We don't know why. Females don't, males do."

Why? No one knows.

Daniel Pauly says science matters. He is, after all, a scientist.

But the University of British Columbia researcher says behaviour matters, too. And even with the gaps in Canadian fisheries research, it's not hard to hit on one common-sense conclusion: Sending ships out to fish for depleted stocks is only going to make things worse.

Pauly is not optimistic. Globally, he foresees a fishing industry killing off one species and then going after the next, until oceans are inhabited by nothing but jellyfish. The only prescription for allowing stocks to rebuild is to stop fishing.

"We have this stupidity of every time the stock makes a little sign of showing up, we go after it," he says.

"So there is a sport fishery, a sentinel fishery, all kinds of little fisheries. The stock is never going to rebuild, ever.

"It's like your job is to build a garden and every time you see something growing, you go out with your lawnmower. Everything that sticks up will be taken up."

His frustration is clear.

"Why can't this organization be honest with the community and tell them: If this stock is going to rebuild to some

level where we can have some security, and we can let people fish and we can make mistakes and allow for environmental variability, we have to stop bothering it for 10 to 20 years?"

But instead, every time fish appear, it's "let's go (after) 5,000 tonnes. And obviously it will not rebuild.

"Nothing that we know contradicts the notion that if you fish too much, the stock goes down. And if you want it to rebuild, you don't fish it. That is elementary- it's not rocket science. And if you can't do that, you might as well pack and go home."

Cod catches off Newfoundland have plunged since 1989, when 262,000 tonnes were taken.

In 1999, the quota was set at 9,000 tonnes. In 2000, it was cut to 5,600 tonnes, but fishermen hauled in 7,000 tonnes. Scientists agree it's still too much.

"The current removals are not sustainable," says Peter Shelton, after the latest assessment of cod populations released in May. "There's no evidence of recovery," adds Shelton, head of the cod research group with the federal fisheries department in St. John's

His colleague George Lilly says surveys show today's cod population is only 2 to 3 per cent what it was in the late 1980s. A decision on what level of fishing to allow, if any, may come as early as next week.

Hutchings, at Dalhousie, says our problem is that we just don't understand how the ocean and its creatures work.

"We have these big gaps in science. By the same token, there's been no infusion of money- no recognition on the part of government that this is an important area," he says.

"Most of the species that exist out there, we don't know the first thing about. We don't know the growth rates, when they reproduce, how many eggs they have, what they eat. And on the eating side, that becomes pretty important when it comes to inter- relationships between species. Who is eating whom? Who is competing with whom?"

Lilly, a fisheries ecologist, agrees there are big gaps in understanding the ocean's creatures.

Looking just at cod, for example, he notes that they swam in prodigious numbers off Newfoundland in the 1950s and '60s before a population crash in the 1970s. Overfishing was clearly an issue, but scientists have little data available to describe exactly what happened- or to explain properly the recovery that then took place through the mid-1980s.

Nobody knows if cod that swim far off shore mingle and mate with the cod traditionally caught close to shore by land-based fishermen in small boats. Even DNA testing hasn't resolved the disagreement between researchers, some of whom say inshore and offshore populations are distinct while others argue they are one and the same.

Other marine life is just as little known.

The spiny lump sucker, for example, is only 5 centimetres long and practically round, with a sucker that allows it to attach to the bottom of the ocean.

It was commonly thought lump suckers spent their lives as quiet bottom-dwellers- until Hutchings got a small

research grant to look at them, among other commercially useless species.

He found some surprises. On opening the stomachs of the fish, he discovered larvae of cod and yellowtail flounder- two highly valuable commercial fish.

What's especially surprising is that these larvae do not inhabit the ocean floor: They swim at all depths, and they swim very fast. So if the lumpsucker is gobbling young cod and flounder, it is clearly a more formidable predator than ever imagined. Yet we know little about it.

The lesson is clear, Hutchings says. If you don't study what appear to be irrelevant species, you'll never find out much about them, and ignorance can lead to bad conclusions.

Pauly, the University of British Columbia researcher, sees bad conclusions in talk of aquaculture.

It's been hailed by some as a possible saviour for the fishing industry, and for a few species, such as salmon, farmed fish are far more likely to reach consumers' plates than their wild cousins.

Critics have pointed to many problems with intensive aquaculture, such as pollution from the massive fish pens and the widespread use of antibiotics to control disease, but Pauly says even if those problems are solved, much of aquaculture is based on a flawed premise: Raising farmed fish does not, in fact, leave wild fish alone to swim and multiply in the oceans.

Carnivorous farmed fish such as salmon eat other fish. To make the fishmeal that farmed fish eat requires the catch of vast quantities of other species, such as herring and mackerel. Those are excellent food fish, Pauly says, and when you do the math, it's a losing game. The amount of salmon produced on farms is less than the amount of fish caught to produce them.

Most fish farming only increases the pressure on wild fish in the ocean.

If there's a bright spot, 10 years after the great destruction of the cod, it is that fisheries have developed for other species.

In fact, the Atlantic fishery today produces more wealth (though fewer jobs) than it did a decade ago. In 2000, Canada's Atlantic fishery was worth \$1.7 billion, up from \$954 million a decade earlier.

Lobster, crab and shrimp are now the backbone of the fishery.

But scientists warn there are signs that the level of fishing of these species may not be sustainable. Rose says the idea of sustaining a fishery on that basis is like expecting to get somewhere riding a merry-go-round.

"We keep jumping horses, jumping from one to the next until it all runs out."

John Spears was The Star's Atlantic Canada bureau chief from 1988 to 1994.

Illustration

Caption: JONATHAN HAYWARD / CP FILE PHOTO VANISHING ACT: Kevin Picco guides a load of cod off a fishing boat in Southern Harbour, Nfld. in 1997. Under the moratorium, catches are restricted to small vessels only. LISA

POOLE / AP FILE PHOTO IN THE BALANCE: Some say that fishing cod every time the stocks rebound must stop. {ldquo}It's not rocket science,{rdquo} says a researcher.

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