



It's ugly. And endangered, too?

Scientists say deep-sea fish in the Atlantic are now facing the same fate as the nearly extinct cod. But, as with cod, the government is ignoring their warnings

Jan. 8, 2006. 01:00 AM

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NATIONAL SCIENCE REPORTER

Are the onion-eye grenadier and its cousin the roundnose grenadier about to go the way of the Atlantic cod, overfished nearly to extinction?

Not to mention the spiny eel, spinytail skate and blue hake?

And not intentionally wiped out, but mostly by accident when deep-sea trawlers are really after something else?

Probably, say researchers at Memorial University in Newfoundland. Probably not, say federal fisheries officials.

This difference of opinion over the fate of five obscure fish might seem arcane. But it highlights how little scientists and fisheries officials know about the thousands of species of fish that live mostly beyond Canada's continental shelf.

In spite of this lack of knowledge, commercial fishing efforts shifted to these deeper waters after the collapse of the northwest Atlantic shelf fishery in the 1970s and '80s from intense overfishing.

The disagreement also draws attention to two striking ironies in the scientific study of what swims in the world's oceans:

A global nose-counting effort, called the Census of Marine Life, is discovering scores of previously unknown creatures, adding one new fish species a week on average to the worldwide tally. But some species are going extinct before the census can get around to identifying them.

Canadian researchers lead the world in tracking the impact of overfishing, but federal and provincial governments ignored the weight of scientific evidence that quotas for Atlantic cod were unsustainable.

The revealing fish feud arose this past week with the publication of a simple one-page report in *Nature*, the highly regarded British research journal.

The report from three Memorial University marine biologists concluded that the abundance of all five species had plunged by between 87 and 98 per cent from 1978 to 1994.

As well, the average size of all except the spiny eel had also shrunk in the same span by anywhere between a quarter and a half.

The researchers blamed commercial overfishing for the decline both in numbers and size, as recorded during hundreds of surveys carried out yearly by federal fisheries research ships.

Only the roundnose grenadier has ever been the target of a large-scale commercial fishery; the other species are accidentally scooped up in the monster trawling nets used to catch marketable deep-sea fish like Greenland halibut.

This "by-catch" is usually fatally injured.

"If nothing changes, we would expect the rate of decline over three generations to be in excess of 99 per cent," says author Jennifer Devine, whose Ph.D. research produced the *Nature* paper.

But the federal scientist in charge of the marine species-at-risk effort says the conclusions of the *Nature* paper are "misleading and alarmist."

David Kulka says the Memorial University researchers place far too much faith in the yearly research-trawl surveys, operated out of the federal fisheries centre in St. John's where he is based.

"Our annual surveys only cover the inner fringe of where these species occur," he says. "So a large portion of the population for those deep-sea species is never surveyed."

Kulka also says the government's sampling simply isn't reliable in this case because the research ships trawl only to 1,400 metres; the five species are known to live in much deeper waters.

"Those areas are like natural refuges because they're never fished," he says.

In reality, the clash between the two views says a lot more about what science does not know about deep-sea species than what it does.

For example, even though the research trawls produce yearly counts of onion-eyed grenadiers, Fisheries and Oceans Canada was unable to come up with a photograph of one from its own resources.

For many of the deep-sea species now turning up in trawling hauls, marine biologists can do little more than guess about lifespan, age of maturity, reproduction rates, growth rates and so on. This ignorance means it is mostly a matter of opinion about how vulnerable they are to overfishing.

Daniel Pauly, however, is categorical. "Deep-sea fisheries cannot be sustainable," he wrote in an email.

Head of the fisheries centre at the University of British Columbia, Pauly is recognized internationally for his insightful analysis of fishing statistics gathered by the UN's Food and Agricultural Organization (FAO).

Over the past decade he has demonstrated how commercial fleets around the world have turned to "garbage" fish they once ignored after depleting higher-value species.

He calls this "fishing down marine food webs."

Now, in a new study based on FAO statistics, Pauly and colleagues say commercial fleets have been casting their nets deeper and deeper into the sea — by as much as 30 metres a decade in the North Atlantic.

"We are already seeing the well-documented declines observed for shallow-water fish stocks repeated in deep-water stocks," says the study, which is about to be published in the journal *Fish and Fisheries*.

In general, deep-water species like the grenadiers live long lives but grow more slowly and mature sexually much later than fish on the continental shelf.

This makes them more vulnerable to overfishing, Pauly and others contend, because they are caught before hitting their reproductive prime.

It also means the collapse of deep-sea fisheries is liable to be sudden and have far less likelihood of recovery than for something like cod.

"Deep-sea fisheries cannot be seen as a replacement for declining shallow-water resources," the new study concludes.

But the shallow-water fish are already being used as replacements. Fisheries scientist Kulka says that anything described as turbot in Canada is probably really Greenland halibut.

Unlike many marine biologists, Kulka has actually seen roundnose grenadier hauled out of the ocean; it happened decades ago when he was an observer on Soviet and East German trawlers.

"They cut off the heads and tails, likely to be made into fish meal. I think the body was sold as a whole fish."

At Memorial University, Jennifer Devine hasn't actually seen a roundnose grenadier, but she thinks its white, flaky flesh means "it's a fish-and-chips kind of fish."

So, since the roundhead was briefly fished commercially by Canadians off the Labrador coast, you might actually have munched a deep-sea fish that's now endangered. Or perhaps not endangered.

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