

ON THE FARM

A Seafood Snob Ponders the Future of Fish

New York Times

By [MARK BITTMAN](#)

Published: November 15, 2008

I suppose you might call me a wild-fish snob. I don't want to go into a fish market on Cape Cod and find farm-raised [salmon](#) from Chile and mussels from Prince Edward Island instead of [cod](#), monkfish or haddock. I don't want to go to a restaurant in Miami and see farm-raised catfish from Vietnam on the menu but no grouper.



DeAgostini/Getty Images

VANISHING Atlantic bluefin tuna.

Those have been my recent experiences, and according to many scientists, it may be the way of the future: most of the fish we'll be eating will be farmed, and by midcentury, it might be easier to catch our favorite wild fish ourselves rather than buy it in the market.

It's all changed in just a few decades. I'm old enough to remember fishermen unloading boxes of flounder at the funky Fulton Fish Market in New York, charging wholesalers a nickel a pound. I remember when local mussels and oysters were practically free, when fresh tuna was an oxymoron, and when monkfish, squid and now-trendy skate were considered "trash."

But we overfished these species to the point that it now takes more work, more energy, more equipment, more money to catch the same amount of fish — roughly 85 million tons a year, a yield that has remained mostly

stagnant for the last decade after rapid growth and despite increasing demand.

Still, plenty of scientists say a turnaround is possible. Studies have found that even declining species can quickly recover if fisheries are managed well. It would help if the world's wealthiest fish-eaters (they include us, folks) would broaden their appetites. Mackerel, anyone?

It will be a considerable undertaking nonetheless. Global consumption of fish, both wild and farm raised, has doubled since 1973, and 90 percent of this increase has come in developing countries. (You'll sometimes hear that Americans are now eating more seafood, but that reflects population growth; per capita consumption has remained stable here for 20 years.)

The result of this demand for wild fish, according to the United Nations' Food and Agricultural Organization, is that "the maximum wild-capture fisheries potential from the world's oceans has probably been reached."

One study, in 2006, concluded that if current fishing practices continue, the world's major commercial stocks will collapse by 2048.

Already, for instance, the Mediterranean's bluefin tuna population has been severely depleted, and commercial fishing quotas for the bluefin in the Mediterranean may be sharply curtailed this month. The cod fishery, arguably one of the foundations of North Atlantic civilization, is in serious decline. Most species of shark, Chilean sea bass, and the cod-like orange roughy are threatened.

Scientists have recently become concerned that smaller species of fish, the so-called forage fish like herring, mackerel, anchovies and sardines that are a crucial part of the ocean's food chain, are also under siege.

These smaller fish are eaten not only by the endangered fish we love best, but also by many poor and not-so-poor people throughout the world. (And even by many American travelers who enjoy grilled sardines in England, fried anchovies in Spain, marinated mackerel in France and pickled or raw herring in Holland — though they mostly avoid them at home.)

But the biggest consumers of these smaller fish are the agriculture and aquaculture industries. Nearly one-third of the world's wild-caught fish are reduced to fish meal and fed to farmed fish and cattle and pigs. Aquaculture alone consumes an estimated 53 percent of the world's fish meal and 87 percent of its fish oil. (To make matters worse, as much as a quarter of the total wild catch is thrown back — dead — as “bycatch.”)

“We’ve totally depleted the upper predator ranks; we have fished down the food web,” said Christopher Mann, a senior officer with the Pew Environmental Group.

Using fish meal to feed farm-raised fish is also astonishingly inefficient. Approximately three kilograms of forage fish go to produce one kilogram of farmed salmon; the ratio for cod is five to one; and for tuna — the most beef-like of all — the so-called feed-to-flesh ratio is 20 to 1, said John Volpe, an assistant professor of marine systems conservation at the University of Victoria in British Columbia.

Industrial aquaculture — sometimes called the blue revolution — is following the same pattern as land-based agriculture. Edible food is being used to grow animals rather than nourish people.

This is not to say that all aquaculture is bad. China alone accounts for an estimated 70 percent of the world's aquaculture — where it is small in scale, focuses on herbivorous fish and is not only sustainable but environmentally sound. “Throughout Asia, there are hundreds of thousands of small farmers making a living by farming fish,” said Barry Costa-Pierce, professor of fisheries at University of Rhode Island.

But industrial fish farming is a different story. The industry spends an estimated \$1 billion a year on veterinary products; degrades the land (shrimp farming destroys mangroves, for example, a key protector from typhoons); pollutes local waters (according to a recent report by the Worldwatch Institute, a salmon farm with 200,000 fish releases nutrients and fecal matter roughly equivalent to as many as 60,000 people); and imperils wild populations that come in contact with farmed salmon.

Not to mention that its products generally don't taste so good, at least compared to the wild stuff. Farm-raised tilapia, with the best feed-to-flesh conversion ratio of any animal, is less desirable to many consumers, myself included, than that nearly perfectly blank canvas called tofu. It seems unlikely that farm-raised striped bass will ever taste remotely like its fierce, graceful progenitor, or that anyone who's had fresh Alaskan sockeye can take farmed salmon seriously.

If industrial aquaculture continues to grow, said Carl Safina, the president of Blue Ocean Institute, a conservation group, "this wondrously varied component of our diet will go the way of land animals — get simplified, all look the same and generally become quite boring."

Why bother with farm-raised salmon and its relatives? If the world's wealthier fish-eaters began to appreciate wild sardines, anchovies, herring and the like, we would be less inclined to feed them to salmon raised in fish farms. And we'd be helping restock the seas with larger species.

Which, surprisingly, is possible. As Mr. Safina noted, "The ocean has an incredible amount of productive capacity, and we could quite easily and simply stay within it by limiting fishing to what it can produce."

This sounds almost too good to be true, but with monitoring systems that reduce bycatch by as much as 60 percent and regulations providing fishermen with a stake in protecting the wild resource, it is happening. One regulatory scheme, known as "catch shares," allows fishermen to own shares in a fishery — that is, the right to catch a certain percentage of a scientifically determined sustainable harvest. Fishermen can buy or sell shares, but the number of fish caught in a given year is fixed.

This method has been a success in a number of places including Alaska, the source of more than half of the nation's seafood. A study published in the journal *Science* recently estimated that if catch shares had been in place globally in 1970, only about 9 percent of the world's fisheries would have collapsed by 2003, rather than 27 percent.

“The message is optimism,” said David Festa, who directs the oceans program at the Environmental Defense Fund. “The latest data shows that well-managed fisheries are doing incredibly well. When we get the rules right the fisheries can recover, and if they’re not recovering, it means we have the rules wrong.”

(The world’s fishing countries would need to participate; right now, the best management is in the United States, Australia and New Zealand; even in these countries, there’s a long way to go.)

An optimistic but not unrealistic assessment of the future is that we’ll have a limited (and expensive) but sustainable fishery of large wild fish; a growing but sustainable demand for what will no longer be called “lower-value” smaller wild fish; and a variety of traditional aquaculture where it is allowed. This may not sound ideal, but it’s certainly preferable to sucking all the fish out of the oceans while raising crops of tasteless fish available only to the wealthiest consumers.

Myself, I’d rather eat wild cod once a month and sardines once a week than farm-raised salmon, ever.

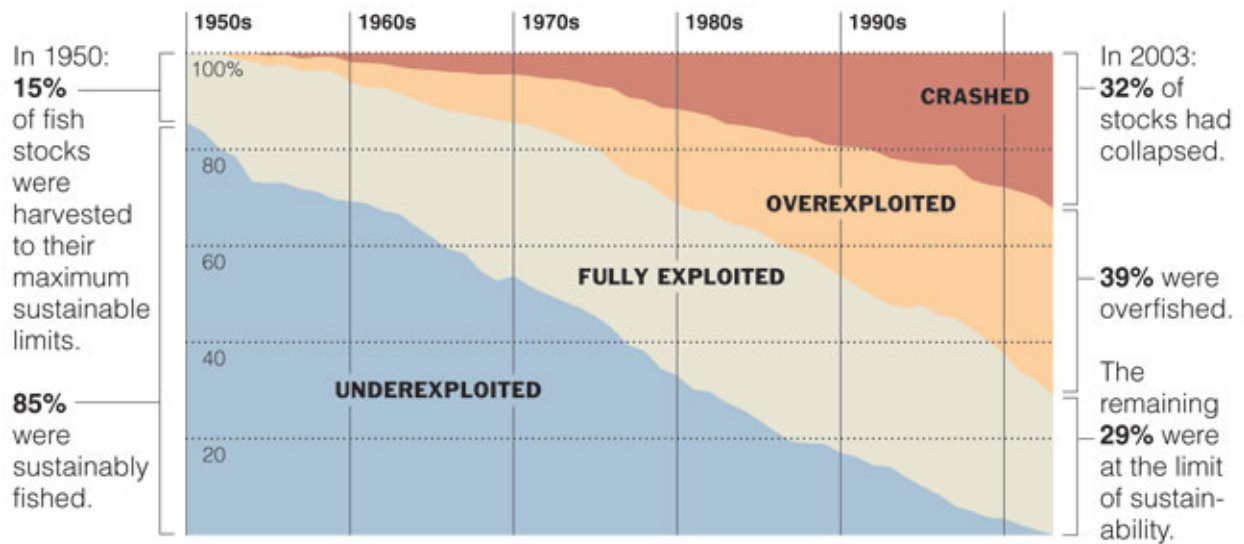
Mark Bittman writes the Minimalist column for the Dining section of The Times and is the author of “How to Cook Everything.”

Correction: An earlier version of this article incorrectly stated the findings of a study by the Worldwatch Institute. The study showed that a salmon farm with 200,000 fish releases nutrients and fecal matter roughly equivalent to as many as 60,000 people, not 600,000.

A version of this article appeared in print on November 16, 2008, on page WK1 of the New York edition.

At the Breaking Point

The condition of the world's fisheries has declined drastically because of overfishing.



Source: Sea Around Us Project (seararoundus.org)

BILL MARSH/THE NEW YORK TIMES

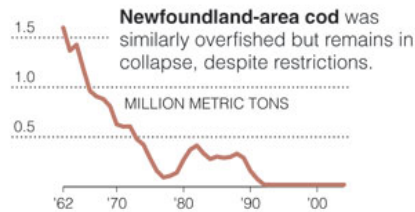
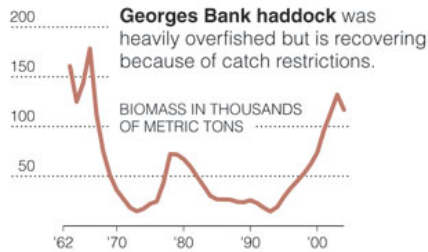
Threatened

Here are the total stocks of several species that have faced collapse from overfishing.

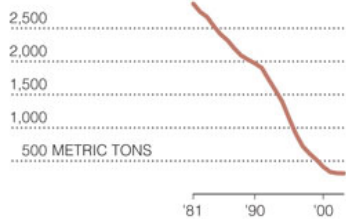


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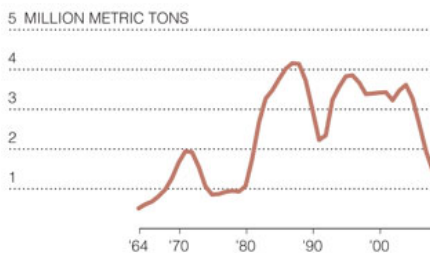
Sharks of all kinds are vulnerable to destruction as "bycatch" — unintentionally caught by industrial fishing methods and largely discarded as waste (above). One study found that nearly a quarter of the catch from U.S. marine fisheries was wasted.



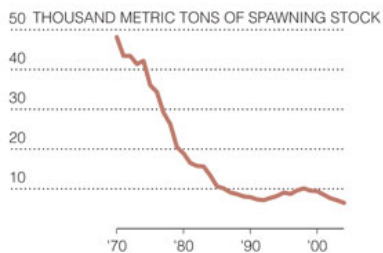
The dusky shark is in rapid decline. Some scientists believe it will need 100 to 400 years to recover.



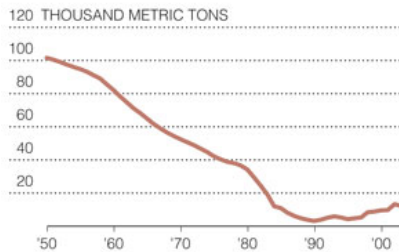
Eastern Bering Sea walleye pollock, one of the three largest fisheries in the world, was doing well until recently, in part because of catch restrictions.



Western Atlantic bluefin tuna is commercially very valuable. It has been overfished to a dangerous degree.



Eastern Gulf of Mexico red snapper was gradually overexploited by commercial and recreational fishing.



Northwestern Atlantic Coast herring was heavily overfished in the 1960s and early 1970s. It has recovered because of catch restrictions and perhaps because some of its predators, like Atlantic cod, have been overfished.

