Fishing off the Deep End — and Back

By Carl Safina

HUMANS ARE BY FAR the most aquatic primate, and close association with water probably played a major role in our evolution. People have been fishing for 100,000 years, and the birth of civilization was famously cradled in the crescent of two rivers. No one knows how humans got to Australia 40,000 years ago, but no land bridge existed, and it is astonishingly possible that the aboriginals' distant ancestors were adept boat builders even then. Using stone-age technologies — no metals, no compass — Polynesians fared throughout the vast Pacific. Humans have often explored, migrated and settled along watercourses and coastlines. Our products and pilgrims alike move by the flow of water. And today nearly half the global human population lives within 100 miles of the seacoast. So coastal living, fishing and seafood have been with us since, roughly, Day One. The question on the plate today is: How much longer will the fish be around for dinner?

As humans have changed the face and fate of Earth, we've caught fish faster than the sea produces them. One precocious premonition came centuries ago to King Charles I, who in 1631 proclaimed, "And the former abundance of fish is turned into such scarcitie and deareness, that ... especially our citie of London, and even our owne Court, are many times unprovided for their necessary dyet ... therefore ... the nets heretofore called traules ... which is notoriously known to destroy the said frie & spawne ... is ... forbidden by the law."

But as a global phenomenon, the scarcity and dearness of fish is rather new, its recognition newer still. By the 1960s, as frontiers on land were largely a thing of the past, the ocean presented a final earthly frontier and last great global commons, and the mentality of exploitation combined a sense of lawless freedom and a fish-rush race for riches. The participants were not just individuals, but the governments of the greatest nations, whose subsidized fleets rushed to the hunt carrying the most sophisticated detection devices fishing grounds had ever seen.

The fish rush was spurred by mechanical and electronic developments. In the early 1900s, internal combustion engines greatly increased boats' net-towing power. After World War II, detection technologies developed for fighting enemies at sea quickly found adaptation for what amounted to a veritable war on fish. Sonar allowed boats to see fish schooling hundreds of feet below the surface, Loran navigation systems allowed boats to instantly pinpoint and return to any rock pile or drop-off where fish congregated in the seemingly trackless distances of the ocean, radar allowed boats to fish safely and unrelentingly through fogs that might previously have suspended operations.

Before then, the fish had two great *de facto* reserves in the sea, known to fishers as "too far" and "too deep." But after fishing experienced its electronic coming-of-age, fish could only run; they could no longer hide. And while fishers could see the fish anywhere, the petrochemical industry spun nylon monofilament into nets and lines virtually invisible to fish.

Fisheries management was geared entirely toward finding new sources and catching more, until this headlong notion hit its first significant bump in the mid-1970s. A few coun-

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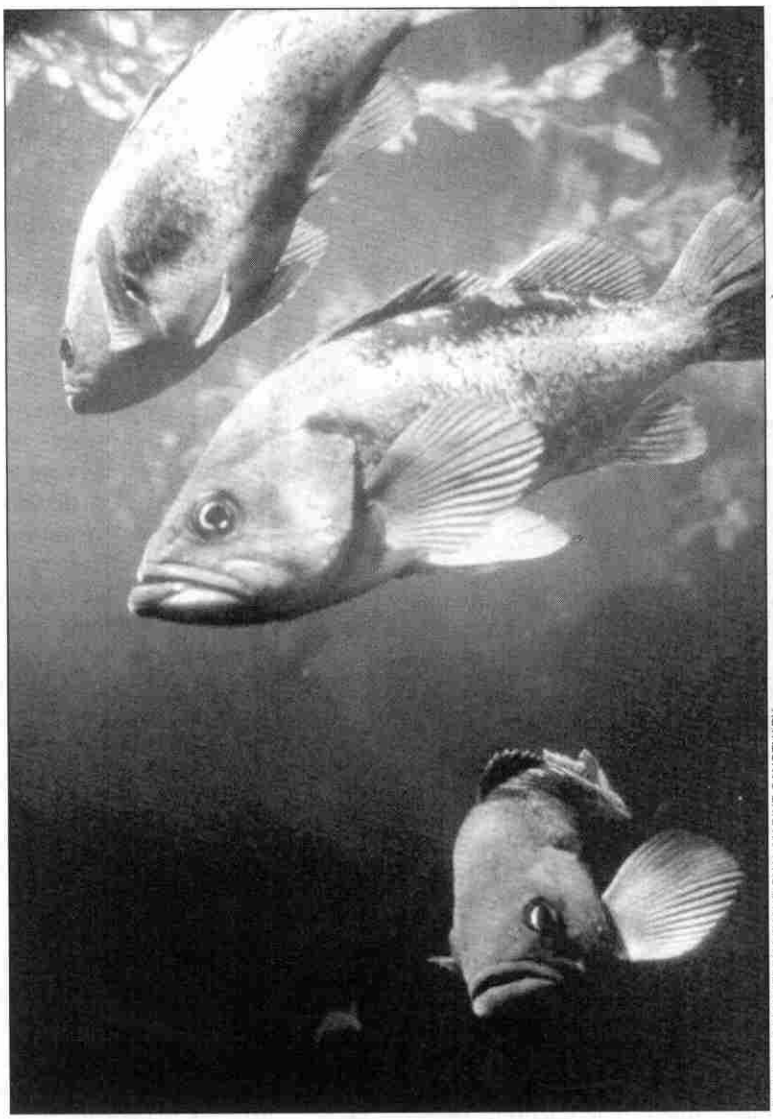
tries began extending their territorial seas by declaring waters out to 200 nautical miles from the coast to be "exclusive economic zones."

Communist-bloc nations' intensive fishing just off the beaches of New England brought the first widespread cries of overfishing. And by the time the United States declared its own 200-mile fishing zone in 1976 — specifically to protect its own fishers and the fish from the fishing power of foreigners — the notion that an ocean could be depleted by boats towing nets had gained international attention.



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WHAT'S NEW?

As declarations of 200-mile exclusive economic zones went from extremist to standard policy, continental shelves closed to foreign fishing throughout the industrialized world. This did not infuse wisdom enough to prevent countries such as the United States and Canada from finishing the job of depleting their own waters during the 1980s.

The U.S. government, for example, created a range of subsidies designed to expand and modernize the fleet. With the Fisheries Obligation Guarantee, the United States pledged its credit against any loan for a vessel or fish processing plant. Farm credit banks were among the major lenders to take advantage of this offer in the Gulf of Mexico, while in Alaska, the Christiana Bank of Norway put $315 million into fleet expansion, including construction of new U.S. factory trawlers. In 1986, the Reagan administration unveiled an investment tax credit that allowed people to take $10,000 off their taxes for every $100,000 they put into a new capital venture.

"The Reagan idea was let's give the big guys big investment credit," complains Maine fisher Paul Cohan. "They gave incentives to all these doctors and lawyers to get into the industry."

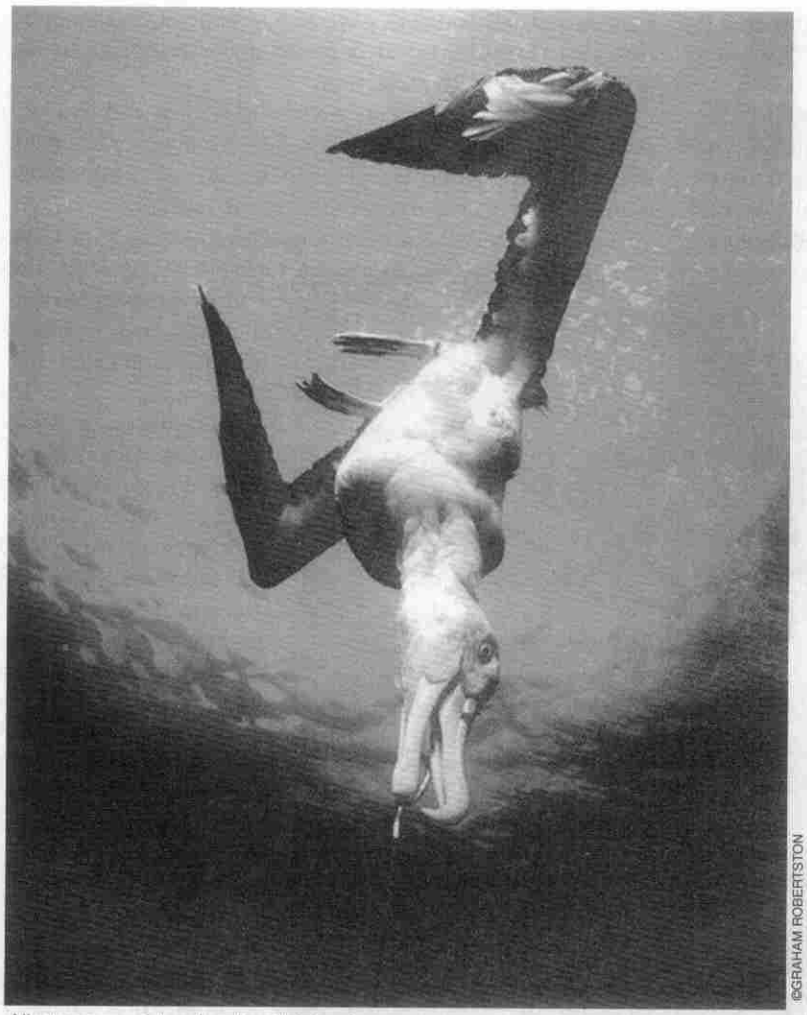
Closures during the early 1990s of the North Atlantic's Grand Banks and Georges Bank, which for half a millennium had produced the richest fishery on Earth, signaled yet another radical change in government policies, and recognition that overfishing had depleted major resources to the point of commercial extinction.

Massive unemployment, social dislocation and government bailouts turned these fisheries from glory to grief, shaming once-proud people and fracturing communities that had been stable and prosperous for centuries.

The North Atlantic's fishing grounds went from the world's richest to the world's most depleted in 20 years, and Europe's North Sea similarly suffered.

European and Russian distant-water fishing fleets shrank and their remnants turned south, under-paying their way into the fishing zones of countries too desperate for foreign cash to say no, lest the same bad offer be accepted by a neighboring country and the boats go there instead.

Things were changing on the high seas, too. In the early 1990s, the United Nations banned the large-scale driftnets (up to 40 miles in length) that a fleet of about 1,000 mostly Asian boats had been using mainly in the Pacific. Many driftnetters subsequently re-geared for targeting tunas with longlines (using as many as 3,000 hooks per line). Japan, which had pioneered longlining in the 1950s, actually decreased its distant fishing during the late 1990s and emphasized building fishing capacity of developing countries, using coercive grants of financial aid in exchange for pro-whaling support and tuna exports to Japan. Also during the late 1990s and early 2000s, as continental shelves closed to foreign boats, and international agreements began governing fishing in the Southern Ocean, unlicensed, illegal ships greatly increased their efforts in sub-Antarctic waters, largely targeting toothfish (marketed as "Chilean seabass"). Underpinning all this shifting effort, of course, has been shifting fish abundance. And the shifts are almost entirely downward; fleets moved south as the industrialized north serially depleted its fish and profitability dissipated.



Albatross caught on longline fish hook.

NEW SCIENCE

In the 1990s and in this decade, successive scientific reports have removed most remaining denial that fishing has depleted the prey it depends on. Not one peer-reviewed, journal-published scientific paper examining the issue has found evidence to the contrary, or reason to question the conclusion that many once-abundant populations have been driven to all-time lows. Teams led by the University of British Columbia, Scripps Institution of Oceanography, Duke University, Dalhousie University and several independent scientists have contributed major new scientific assessments. In a series of papers, they have shown that:

- Humans remove from continental shelves fully one-third of the annual productivity of those waters.
- Because of depletion of large edible fish, fisheries are forced to target animals lower on the food web. One example is new fisheries targeting jellyfish for human consumption.
- One quarter of all sea life caught is unwanted and discarded dead. This "bycatch" is driving serious declines, endangering sea turtles, albatrosses and other seabirds, and certain fish. In shrimp fishing, 10 kilograms of unwanted juvenile fish and other sea creatures are commonly discarded for each kilogram of shrimp caught.
- Abundance of large marine animals, including fish, whales and turtles, in the pre-industrial past was almost inconceivably greater compared to what is left in today's oceans.
- Data on fish catches shows that compared to 50 years ago, the abundance of large fish such as tuna, shark, cod and grouper has declined roughly 90 percent.

IMPROVEMENTS

Increasing recognition of these problems has led to changes in some fishing practices, legislation and international cooperation. But no country can claim their fishing problems are generally solved.

Some fisheries have succeeded in markedly reducing bycatch. For example, catches of endangered turtles have been significantly reduced in the United States and several other places by putting trap doors called turtle excluders in trawl nets. Albatrosses and most other seabirds can be kept away from lines or nets with simple scaring devices and by fishing at certain times of day or setting nets deeper. The Eastern Pacific tuna fishery's improved dolphin-release procedures have also greatly reduced the numbers of dolphins drowned in their nets. These improvements point the way toward success, but need to be refined and more widely adopted.

International bodies are increasingly recognizing overfishing as a problem. The United Nations recently enacted a new high-seas fisheries treaty, published a Code of Conduct for responsible fishing, and drafted Plans of Action for reversing sharp declines in populations of sharks and seabirds. Though change will come slowly, these represent major steps toward recognizing the problems. And the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recently took action to track trade in seahorses, sharks and caviar-producing sturgeon. This is the same body that made it illegal to import elephant ivory.

The United States has committed some of the worst mistakes in fisheries management, but also has taken some of the most forward-thinking steps. In an overhaul of its federal fishing legislation, the United States passed the Sustainable Fisheries Act in 1996. This act defined overfishing, prohibited fishery managers from allowing catches beyond sustainable levels, mandated that overfished species be listed and mandated recovery plans. In the five years since the law has been phased in, some populations of previously depleted species have made substantial recoveries.

TOWARD THE FUTURE

Whether ocean fishing remains viable depends on whether governments and industry can rebuild fish populations and then limit catches. In a world facing still-

THE SPECIAL CASE OF JAPAN

JAPAN IS A MAJOR CATCHER, importer and consumer of seafood, and the main market for whale meat. Since the 1986 global ban on whaling, Japan has consistently killed whales, and used financial aid to recruit pro-whaling stances from non-whaling nations. It has consistently opposed catch reductions for various tunas, and was convicted in the World Court of systematically and intentionally overfishing its quota for Southern Bluefin Tuna. Japan has consistently lobbied to keep Northern Bluefin Tuna catch quotas high in the Atlantic. It has long opposed and for a time ignored a global ban on international trade in endangered sea turtles. And after several years of negotiating a new treaty to govern fishing on the high seas of the North Pacific, Japan withdrew at the last moment. Japan's latest ploy is promulgating the fiction that whales compete with people for food (they eat very different things.)

— C. S.

increasing human populations, this will be challenging. Fishing power must be reduced by about half. One potential way of doing it is a system of transferable fishing quotas. In some fisheries in Alaska, for example, fishing power has been reduced by allowing boats to buy and sell shares of the allowed quota. This has allowed some marginal operators to sell out. For quotas to work economically, however, fish landings have to be well capped and enforced. For them to work socially, safeguards limiting share ownership must be in place to prevent corporate monopolies. Alaska's system provides good examples of both.

Many ask whether it would be best to stop hunting wild fish and focus on fish farming. While fish farming is the fastest-growing sector in agriculture, it is not necessarily an answer to the oceans' woes. In no case has fish farming reduced fishing pressure on wild fish. And fish farms are often made by.destroying natural habitats supporting diverse wild populations and human fishing communities. Many farmed fish and shrimp must also be fed fish caught from the ocean — a net loss of protein.

Yet some fish and shellfish are raised in environmentally benign ways; the way forward lies in developing progressively less harmful farming methods and supporting best practices.

Marine reserves, closed to fishing, have become a focus of debate in recent years. New Zealand, Australia, the Philippines and several other countries have established such reserves. What is clear is that the size, abundance and fecundity of fish increases in reserves. It is less clear that this leads to improved fishing outside the reserves. Whether it does probably depends on the size of the reserve. Reef ecologists are working to answer this question, and systems of reserves have been proposed in the United States and elsewhere.

Consumers of seafood can also play a large role in improving ocean fishing and farming practices. Several organizations, such as Blue Ocean Institute, Environmental Defense and the Monterey Bay Aquarium, analyze various seafoods' environmental considerations, and publish consumer advice recommending menu choices that seafood enthusiasts can enjoy with a clear conscience. Increasing awareness, celebrity-chef involvement and news media coverage has made the seafood experience more meaningful for choosy seafood lovers.

Not everyone agrees on the need for consumers to be selective, however. "If the seafood is on the market, the American public should be happy to eat it," argues William Hogarth, head of the National Marine Fisheries Service (NMFS). "Management works. We can rebuild (overfished) stocks."

The NMFS, say its critics, remains among those who would like to bury their heads in the beach sand to avoid confronting the problem of overfishing and declining fish stocks.

"The problem is that NMFS is charged with both conservation and promotion of seafood consumption," says Representative Jim Sexton, R-New Jersey, a fisheries conservation expert, "but NMFS is also located within the Department of Commerce, where its commercial function dominates."

For those who take seriously the overwhelming scientific evidence showing a precipitous decline in fish populations, the answers to ocean recovery lie in fishing slower than fish can breed, farming seafood in ecologically less destructive ways, and giving consumers the information they need to vote with their conscience and their wallet. There is time. And, yes, there is hope. ■