

THE BLUEFIN TUNA: Overfishing Takes a Toll

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Just after the New Year begins, a competitive group of men holding flashlights and knives gathers before sunrise, ready to bid for the honor and publicity associated with winning the year's first bluefin tuna auction at Tokyo's Tsukiji market, the largest fish market in the world. In 2016, the winner bagged a 440 pound specimen for \$117,000, a bargain compared to the \$1.76 million paid for the first fish of 2013. Considering the prestige associated with bluefin tuna today, it is hard to believe it was not well-liked in Japan before the 1960s. Now the fish's tremendous popularity may lead to its demise.

If you think tuna and picture the six-ounce can used for tuna salad sandwiches, you have just a small part of the picture. It would take 1,760 cans to reach the 660 pound weight of a 6.5-foot long bluefin tuna. Bluefin are one of some 15 species of tuna, including the smaller skipjack (the type most often found in the can, accounting for 80 percent of the U.S. canned tuna market), albacore (also often canned), and yellowfin and bigeye (generally called ahi at sushi restaurants or served as tuna steaks).

Bluefin, used for the prized *toro* and *maguro* sashimi, make up less than one percent of the tuna catch, but command the highest prices. At regular auctions a single bluefin can cost tens of thousands of dollars. The bluefin tuna market totaled \$2 billion in 2014, according to research done for the Pew Charitable Trust.¹ Over 80 percent of bluefin sales are in Japan.

Catching fish torpedoes

Bluefin tuna are impressive animals. The "king of all fish," as penned by Ernest Hemingway², they speed through the ocean at 40 miles per hour and dive 4,000 feet below the surface in pursuit of prey.³ They migrate thousands of miles over their potential 40-year lifespan.⁴ And unlike most fish, bluefin tuna are warm-blooded, meaning that they can keep their bodies warmer than the surrounding ocean.

Geography separates the three species of bluefin tuna. Atlantic bluefin tuna are found throughout the northern Atlantic Ocean and adjoining seas, with important spawning grounds in the western Mediterranean and the Gulf of Mexico. Pacific bluefin tuna live in the northern Pacific Ocean and spawn between Japan and the Philippines. Southern bluefin migrate across the temperate parts of oceans in the southern hemisphere, spawning in the Indian Ocean to the south of Java, Indonesia.



Photo Credit: ZekaG/iStockphoto.com

A group of Pacific bluefin tuna (*Thunnus orientalis*) swimming.

All three bluefin tuna species are subject to heavy fishing pressure. On any given night, massive drift nets spanning hundreds of miles could be set out in the open ocean to harvest tuna, until this indiscriminate fishing practice was banned in the early 1990s. Today fishers catch most of these fish torpedoes using **purse seining** or **longlining** methods. Locating the schools of tuna often is a high tech endeavor, deploying sonar, helicopters, and even satellite imagery.

With a purse seine, a small boat is deployed alongside a big fishing vessel to drag a large net, buoyed at the top and weighted at the bottom, to encircle a school of fish.

The fish (and other nearby sea creatures) are trapped when the bottom of the net is cinched like the drawstring on an old-fashioned coin purse. Thousands of tons of entrapped tuna can be loaded aboard the vessel or dragged alongside it to be taken to tuna “ranches” for fattening before sale.⁵ Longlining is more of a passive fishing practice in which a vessel sets up to 3,000 baited hooks on branch lines that stem off of the 60-mile “longline.” On-board processing and freezers make it possible for larger vessels to stay at sea for over a year.⁶

Tuna in trouble

Because tuna spend much of their lives in the ownerless high seas, their fishing is overseen by regional fisheries management organizations. The health of their populations are assessed by scientists for the International Union for the Conservation of Nature and Natural Resources (IUCN), a body of some 1,200 governmental and non-governmental organizations that maintains a “Red List” of species that are threatened with extinction. All bluefin tuna make the list.

Southern bluefin are in the deepest trouble, according to their 2011 ranking of “critically endangered”—one category shy of “extinct in the wild.”⁷ The latest assessment by the Commission for the Conservation of Southern Bluefin Tuna reports some improvement since the 2011 assessment but still places the species’ total mass at just 9 percent of its original level.⁸ The current catch is just one-seventh the 1961 peak.⁹

Atlantic bluefin were listed as “endangered” in 2011. The stock is thought to have shrunk by half or more since 1970. One population off the coast of Brazil has already disappeared.¹⁰ In 2010, national governments discussed banning trade of Atlantic tuna under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), but ultimately care of the stocks were left to the International Commission for the Conservation of Atlantic Tuna.¹¹ That body estimates that catch limitations have led to early signs of improvement in Atlantic bluefin stocks, though scientists have warned that the catch level needs to be reduced for long-term improvement.^{12 13}



Fish buyers inspect large tuna at the Tsukiji fish market in Tokyo, Japan.

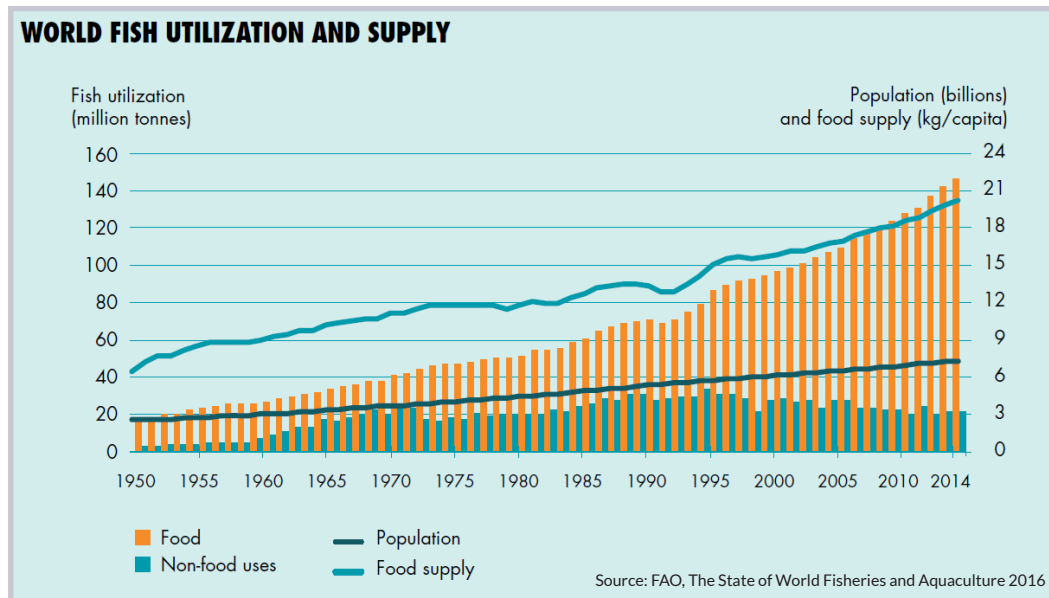
Pacific bluefin tuna plunge

Pacific bluefin tuna were thought to be in better shape than their cousins, but recent data indicate that the IUCN categorization of “vulnerable” may not be strong enough. Populations may have shrunk to below 3 percent of their unfished level, according to preliminary 2016 estimates from the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean. This means that there could be as few as 26,000 adult Pacific bluefin tuna on the planet.^{14 15}

Heavy fishing pressure has led to very young fish making up greater shares of the catch since the 1990s.¹⁶ Now over 90 percent Pacific bluefin tunas captured are less than three years old. Harvesting them before they are old enough to breed signals trouble for recovery. A study done for The Pew Charitable Trusts indicates that if fish were allowed to mature to 20 kilograms or more before capture, populations could increase four-fold within five years. If catches were banned for tuna less than 30 kilograms, yields could jump five-fold in five years and balance out ten times higher than at present.¹⁷

Part of a bigger problem

Bluefin are far from the only fish in trouble. A rapid expansion of the global marine fishing fleet after World War II to its current 3.2 million vessels, along with developments in fish tracking, capture, and processing technology have given fishers access to parts of the world's oceans that were once too remote or too deep to harvest.¹⁸ As the global fishing fleet grew, the fish catch climbed--until it peaked at 86 million metric tons in 1996. Since then, despite increasing the fishing effort, the oceanic catch has declined slightly.^{19 20}



Demand for fish has not declined, however. Fish are an important part of the global food supply; over 4 billion people now get at least 15 percent of their animal protein from fish. Average fish consumption worldwide increased from 10 kilograms per person per year in the 1960s to an estimated 19 kilograms per person in 2012. Meeting this near doubling of demand has required expanding **aquaculture** production. For the first time in history, half of the fish people eat come from farms.

Looking forward, fish farms will provide the majority of the world's seafood because of the troubled state of wild fish stocks. The Food and Agriculture Organization of the United Nations estimates that just 10 percent of the world's marine fisheries have the capacity to increase output sustainably. Another 61 percent of fisheries are fully exploited, meaning that they are maxed out and cannot increase production. In the worst shape are the 29 percent of the world's fisheries that are overfished, at risk of collapse at current extraction rates.²¹

Restoring fisheries

Without concerted efforts to restore overfished populations, the global fish catch will continue to drop. For the bluefin tuna and other overfished species, recovery depends on continually monitoring populations to develop science-based catch quotas that are implemented and enforced. Catch restrictions should include a minimum size for each fish captured to allow the fish to grow old enough to breed. Marine protected areas, where fishing is prohibited, can be set aside in key spawning and feeding zones.

Cracking down on the illegal, unreported, and unregulated fishing that plagues many of the world's fish stocks, particularly the high value ones like tuna, is important to ensure that catch quotas are meaningful. Furthermore, governments can lessen pressures on fisheries by removing harmful subsidies, for instance subsidies for diesel fuel used to take fishing vessels to locations and depths that would otherwise be unprofitable.

Traceable supply chains

Consumers can play a role in helping fish stocks recover by avoiding purchasing fish from fisheries that are not managed sustainably. In the United States, the Monterey Bay Aquarium's Seafood Watch program provides recommendations for fish that are relatively abundant and warns against consuming those that are overfished.²² Such guides, however, are only as useful as labels are accurate. A study by the ocean conservation group Oceana found widespread mislabeling of fish in stores and restaurants across the United States. In fact, 59 percent of fish sold as tuna was actually another species altogether.²³

Inaccurate labeling can be dangerous to human health, for instance prompting people to eat fish that they shouldn't, whether for allergies or because of metals like mercury, which accumulate up the food chain to high concentrations in larger fish, like the bluefin tuna. Mislabeling also can give the misimpression that certain fish stocks are abundant when they are really in trouble. These are some reasons why traceability and transparency across the entire fish supply chain is important. Labels should indicate clearly and accurately where fish were caught and what gear were used.

The decimation of wild fish populations like the majestic bluefin tuna is an indication of human pressures on the Earth's **ecosystems**. Lessening that pressure through reductions in fishing efforts and protecting key spawning and feeding areas can help ensure that the king of fish is around in the future.

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