

Overfishing and Bycatch: An Empty Ocean

Essay Submission by Yolanda Chen

They came in sturdy kayaks made in the fashion of the Native Americans, then in sleek schooners with billowing sails. They traveled for months, over treacherous open ocean. They arrived on coasts with callused hands and weathered faces; they picked up their spears and arrows, and later, their pulleys and nets. First they caught fish to feed themselves, then sea otters for fur to trade with others. (*Sea Otters: A History*) Now, they catch until there's no life left in the ocean. Since the age of exploration, overfishing and overhunting of marine life has had devastating ecological effects. (*Fishers, Fishing, and Overfishing*) Certain commercially sold fish species have been hunted to near extinction using unethical and primitive methods that result in bycatch: the capture of animals that are not intended to be hunted, such as endangered mammals, turtles, and birds. Thus, overfishing, and its associated problem, bycatch, cause unacceptable animal suffering and constantly undermine environmental and endangered animal conservation efforts. (Oceana)

During summers, I work on a marine science research vessel, the 100 ton USCG certified Enhydra, as a camp instructor for Mountain and Sea Adventures summer camp. As I trained for this job, I extensively researched marine ecosystems, and found gaping holes in many food webs. Due to overfishing, many species have been depleted to a point where they may not be able to naturally reproduce to replenish their population. Certain types of tuna, including bluefin, albacore, and yellowfin, occupy vital positions in their food chains. (World Wildlife Fund) It is easy to imagine the ecological disruption of driving tuna populations to unsustainable levels, but the true damage of overfishing is even more devastating.

Overfishing and Bycatch: An Empty Ocean

Yolanda Chen

In the early days of commercial fishing, fishermen searched for large, fleshy fish that fed more people and made more profit— fish that were economically valuable. Most fish that fit this description are mature, carnivorous, pelagic fish that occupy high trophic levels in the food chain. This practice was sustainable, as most large fish were older and had already reproduced; fishing practices did not threaten the overall population. However, as the fishing industry commercialized and mechanized in the 1950s, the total mass of the catches became larger. But alarmingly, the sizes of individual fish in each catch became smaller and smaller. Fishing at such unsustainable amounts had prevented fish from living their full lifespan and maturing to full adult size. Many juvenile fish were captured prior to reproducing, and remaining populations were inadequate to repopulate. (*Our Dying Planet*)

The mass scale of overfishing alone destabilized ecosystems, but also took many lives with it. Animals that weren't commercially caught for consumption— dolphins, sharks, sea turtles, seabirds— whoever happened to be in the range of fishing nets were captured, and either killed, or processed for meat along with the rest of the catch. This “bycatch” could amount to up to 40% of all catches worldwide. (Oceana)

The practices of the fishing industry are an international threat to animal welfare. Overfishing alone encourages overpopulation of lower trophic species. Smaller fish that overfished species usually feed upon will overpopulate as they lose their natural predators, and over consume plankton and invertebrates that are the basis of many food chains in the ocean. Thus, food chains collapse; and we see these results today in bleached corals reefs and thinned out kelp forests. Marine mammals and apex predators are directly affected by the disruption of

Overfishing and Bycatch: An Empty Ocean

Yolanda Chen

the food chain in the lower trophic levels. Dolphins, sharks, whales, sea lions, and otters have trouble foraging for food and may resort to eating less appealing, smaller prey, or simply swallow plastic.

Of course, this is a dramatic oversimplification of a global issue into a linear cause-and-effect process. As modern overfishing practices have started relatively recently, the long term effects are still unknown, and the issue itself is not yet general public knowledge. Plastic waste reduction campaigns and marine mammal rescue are all causes that are well known and have earned widespread mainstream support, yet relatively few have heard of “overfishing” and “by catch”. These issues are also extraordinarily difficult to fix because of its economic impact. Ocean-based protein was touted as a cheaper, healthier alternative to land based protein, and a lack of research in the early days of commercial fishing led people to assume the fish supply in the ocean was by far, adequate to sustain heavy fishing. As fish supplies diminished by the 1990s, governments heavily subsidized the industry. As fish catches shrunk, governments poured money into developing technology and building fishing boats, which has further reduced populations. Today, the market demand for wild caught seafood is larger than ever, even in spite of the lack of fish in the ocean.

I did not know about the severity of these issues until the CEO of the summer camp company that I worked for mentioned bycatch. She spoke on the depletion of tuna fisheries, and the astounding amount of dolphin meat in commercially available tuna. To me, it was shocking that I had researched marine conservation and memorized marine science curriculum for so many years, yet never understood the scope of this blatant threat to animal welfare. Often,

Overfishing and Bycatch: An Empty Ocean

Yolanda Chen

seafood is portrayed as a healthier and more sustainable alternative to land-based meat like beef and pork; opinion pieces on the lower sentience of fish compared to other animals further build the case that seafood is a more ethical option. (Vice) These arguments fail to consider that animals generally considered to be intelligent and socially complex, such as dolphins and sea otters, are inquisitive by nature, often swim straight into nets and meet the same fate as tuna and cod. (Natural History Museum UK) Sea turtles, the inspiration for so many conservation and plastic reduction movements, often suffocate in trawls, and sea lions become easily tangled in gillnets. The world's appetite for fish and the fishing industry's disregard for the environment has culminated in a depleted ocean, where one in three fisheries are overfished beyond natural recovery. (Oceana)

With this in mind, my coworkers and I incorporated these facts into our summer camp curriculum. Our audience were students aged 9-17. They came to camp because they liked the ocean— they liked swimming, snorkeling, and playing ultimate frisbee with their fun camp counselors. Many of them, like me, had never heard of bycatch prior to coming to camp. We had to find a way to present these issues as engaging and interesting, yet emphasize their severity and urgency. We chose the approach of “show rather than tell.”

So we came in summer camp kayaks in all colors of the rainbow. We packed snorkel gear and paddled out into the rocky reef. We saw dolphins and sea lions playing in the distance; we stopped so I could explain the threats to their survival. We saw cormorants and pelicans perched on a rock, I described how these birds dived for their prey, where they risked being caught in and killed by fishing nets. We tied our kayaks to a mooring and donned our masks and snorkels, we

Overfishing and Bycatch: An Empty Ocean

Yolanda Chen

dove into the kelp forest, swimming with kelp bass and leopard sharks. In the well preserved coves of Catalina Island, the fish and no fear of humans, and swam alongside us curiously.

We spent the days of high summer on the ocean, showing our campers the beautiful animals and habitats beneath the surface of the water. Then as we emerge from our snorkeling adventures, exhausted but excited to talk about the incredible life that we'd seen. The campers would describe the vibrant garibaldi, the kelp bass chasing at the tiny stopsmelt, the invertebrates scuttling along the seafloor. I used these discussions to segway into the more serious discussion of food chain disruption. I let the campers come to their own conclusion about what would happen. Then I would explain how this hypothetical scenario was real; how it happened daily, and how it was a major part of our economy and our eating habits. I know that my coworkers and I have made an impression on every one of the thousands of students at camp. I hope these students are inspired by the beauty they witnessed at camp, and go on to spread awareness and raise questions about the ethics of the seafood industry. Bycatch and overfishing result in animal suffering, and the first step to ending this is by educating the public and stopping the unethical practices that kill millions of marine animals.

Overfishing and Bycatch: An Empty Ocean

Yolanda Chen

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