

## **FISHING AND MARINE ISSUES**

Fish are often misjudged as having no feelings and no intelligence, most likely because they are not furry, cuddly creatures whose communication is audible to us. The fact is that fish are fast learners, carry mental maps in their heads, can retain memories for months, and live in communities, sharing social relationships with the members of their community.

Although we do not endorse keeping animals in laboratory settings, we have chosen to include the findings of some laboratory studies, in the hope that the knowledge about fish intelligence obtained from them will encourage respect and compassion for these amazing beings, and thereby discourage their capture and imprisonment or killing.

Laboratory tests on fish have revealed that they can store memories for many months, disproving the belief that they forget everything after a few seconds.

Dr. Culum Brown at the University of Edinburgh found that Australian crimson spotted rainbowfish who learned to escape from a net in their tank remembered how they did it 11 months later.

Dr. Theresa Burt de Perera's experiments with blind Mexican cave fish, who rely on subtle changes in pressure to detect the presence of objects around them, found that the fish did more than merely avoid bumping into objects in their tank. They built a detailed map of their surroundings in their mind, memorizing all obstacles within a few hours. Once stored in their brains, the fish used their "mental map" to spot any changes in their surroundings—a feat most humans cannot manage. In one test involving obstacles arranged in a specific order, the fish memorized the order and then were able to quickly detect each time Dr. Burt de Perera made a change to that order.

According to biologists, fish have cognitive abilities that often surpass those of nonhuman primates. They can recognize individuals, use tools, and maintain complex social relationships. Fish communicate with one another through a range of low-frequency sounds that include buzzes, clicks, yelps, and sobs. The sounds, which are inaudible to humans without special equipment, communicate information and emotional states such as alarm or delight, and they help with courtship.

### **THE FISHING INDUSTRY AND FISH FARMS**

In recent years, because of increasing concern over the health risks and cruelty involved in eating cows, sheep, pigs, chickens, and turkeys, fish has been promoted as a healthy food alternative.

Fishes' bodies absorb the toxic chemicals in the water around them. The chemicals become more concentrated as they move up the food chain, when little fish are eaten by bigger fish. Larger fish, such as tuna and salmon, have absorbed the most chemicals from all the smaller fish lower on the food chain.

Most fish caught in the wild come from sites that have been contaminated by industrial waste and sewage sludge. Human pathogens in the sludge are consumed by the fish and passed back to the consumer. The flesh of fish contains contaminants such as DDT, PCBs, zinc, copper, chromium, nickel, and mercury.

Fish can accumulate up to 9 million times the concentration of toxins found in the waters in which they live. Even legally acceptable PCB concentrations in the fatty tissues of fish have been found to cause learning and behavioral difficulties in children. About 40 percent of the fish caught for human consumption worldwide have cancerous or bacterial skin diseases.

Many consumers choose farmed fish to avoid the dangers of wild-caught fish. Fish farming shares many of the problems of other intensive animal-farming operations, not only causing suffering to fish but also environmental pollution, wildlife destruction, and chemical residues absorbed in the flesh of the fish. Antibiotics and other drug residues are present in most farmed fish.

Chemicals found in farmed fish include disinfectants from equipment on fish farms, pesticides, and antifoulants used on cages. Bacteria, macroalgae, mussels, barnacles and other invertebrates build up on boat hulls and underwater surfaces. This is called fouling. To prevent or reduce fouling, paints called antifoulants, which contain biocides (additives designed to inhibit the growth of microorganisms), are applied to boat hulls and underwater structures.

The most controversial of the pesticides found in fish is the organophosphoric pesticide Dichlorvos, which is related to military nerve gases and is the most toxic substance on the U.S. government's "Red List" of dangerous substances. Dichlorvos, used to treat sea lice in salmon farming, is highly toxic at even 0.1 ppm.

In addition to the dangers of the chemicals described above, the food pellets fed to factory farmed fish and the fishes' feces create organic waste that kills large numbers of wild fish and other wildlife. One U.S. study showed that an 8 hectare (20 acre) salmon farm produces as much untreated sewage as a town of 10,000 people.

The fear of losing fish stock to predators causes fish farmers to kill wildlife. Each year, worldwide, billions of seals, herons, cormorants, dolphins, porpoises, and sharks are killed by shooting, trapping, or deliberate entanglement.

## **Methods of Commercial Fishing**

### **Trawl nets**

Fish caught in trawl nets are often crushed to death under the weight of the catch. Those still alive when they hit the deck of the ship are either allowed to suffocate to death or are gutted while still alive.

### **Lines**

Fishing lines are up to 400 meters (437 yards) long. Branching off the main line are many smaller lines, each of which is studded with a large numbers of hooks. The hooks are ripped from the fishes' mouths, known to be well-endowed with pain receptors.

### **Drift nets**

Nylon nets hang suspended in the water for up to 48 kilometers (30 miles). Fish become trapped, as do other animals who often drown when they are unable to reach the surface to breathe. Drift nets often break free, becoming "ghost nets," an invisible hazard that kills millions of animals for months or years. Drift nets have been given the nickname "walls of death."

### **Bottom trawls**

Net bags are dragged over the seabed to catch bottom-living fish. They also catch non-target species living on the seabed and rip up plants, destroying the habitat and leaving clouds of silt in the water.

### **Purse seine nets**

Bag-shaped nets are pulled behind a boat. Two sides of the net are brought together to enclose the catch. Tuna shoals gather below dolphin pods. In the last 30 years, these nets have drowned several million dolphins. More than a fifth of all marine catch is thrown back into the water because it is too small or the wrong species. Unwanted fish and other animals are usually thrown back into the sea dead, injured, or so weakened that they are easily killed by predators. In the last 50 years, 90 percent of large fish populations have been exterminated. While some fishing

companies have switched to “dolphin safe” catching methods, many tuna caught using purse seine nets are sold under the false label “dolphin safe.”

## **"ORNAMENTAL" FISH IN CAPTIVITY**

Tropical fish and other fish kept in glass aquariums are robbed of their natural habits and habitat. The capture and breeding of these fish for sale to pet shops and individuals is unregulated.

Approximately 95 percent of saltwater fish sold in pet shops come from the wild, mostly from the waters around Indonesia, the Philippines, Fiji, and other Pacific islands. Methods of capturing fish in the wild include the use of cyanide. Collectors douse coral reefs with cyanide, which is ingested by the fish who live there. The fish are either stunned or go into spasms, making them easier to grab or net. About half of the fish die on the reef. Only about 60 percent of those who survive this capture procedure live beyond the stage of being transported to pet shops. The cyanide also kills the coral reefs themselves. Marine biologists rank it as one of the biggest dangers in Southeast Asian waters to coral reefs, fish, and people.

Fish farms that raise goldfish raise as many as 250 million fish a year, in giant tubs, and sell them to zoos, pet stores, and bait shops. In the wild, fish communicate with each other, but on fish farms, the noise of filters and pumps disrupts their communication and interaction.

Some fish breeding facilities are creating breeds that would never occur in nature. To make the fish more attractive to buyers, some breeders dye the fish by injecting fluorescent dyes into the animals' bodies or by altering them genetically.

Fish kept in captivity cannot be returned to their natural habitat because they may spread disease to other fish and because they are most likely not living in the region from which they originated. Researchers believe that many species of non-native fish, including predatory species living off the coast of Florida, are there because of careless aquarium owners. These fish pose a threat to native species.

Fish should never be flushed down a sink or toilet to "free" them. It is unlikely they would survive the trip through plumbing to a water treatment plant.

Anyone concerned with the wellbeing of fish and who already has captive fish in their home or office should provide them with as much space and duplication of natural surroundings as possible and should not replace them when they die. One city in Italy banned keeping goldfish in bowls because these containers do not meet the needs of the fish.

Fish are very aware of who and what is outside their tank. There should be no television, stereo, or sudden bright lights switched on near the tank because these cause stress. Fish recognize individual people and will respond differently to familiar people versus strangers approaching their tank.

Fish are social animals and should not be kept alone in an aquarium. Even male fighting fish enjoy the company of other species of fish. If you no longer want to support the captive-fish industry but want a companion for your fish, find others who have fish and who would be willing to combine theirs with yours. Doing this will also give you an opportunity to educate other people who have purchased fish.

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