

Finfish, Shellfish, Crustaceans & Cephalopods

Version 2.0: 2025

Reason for Standard

Threats to our aquatic ecosystems are numerous. Overfishing, illegal fishing, excessive bycatch, habitat destruction, pollution, and climate change all contribute to biodiversity loss, degradation of water quality, and declines in wild fish populations.

Overfishing – catching fish faster than they can reproduce – is one of the key drivers of species population decline and biodiversity loss in aquatic ecosystems. According to the Food and Agriculture Organization of the United Nations (FAO UN), one-third of all fisheries assessed are considered overfished.ⁱ

Illegal fishing and bycatch are two components of overfishing. Legal catch limits are generally based on scientific estimates of what the fishery can sustain to prevent population decline. Illegal fishing operations undermine these protective efforts and pose a challenge to developing accurate management plans.ⁱⁱ High rates of bycatch and wasted catch threaten target and non-target species, caused primarily by unselective gear, improper handling of equipment, and lack of post-catch storage like icemakers or refrigeration.ⁱⁱⁱ

Habitat destruction, toxic pollution, and climate change, along with its resulting ecosystem challenges, are also major threats to aquatic ecosystems. Along rivers, dams alter riverbed conditions, create reservoirs of standing water where a fast-flowing river once existed, and block access to fish spawning areas; deforestation in riparian zones leads to streambank erosion.^{iv,v} Eutrophication and acidification create dead zones in oceans throughout the world, causing massive die-offs of coral, fish, and other species.^{vi}

All bodies of water suffer from pollution, including industrial and agricultural runoff, plastic waste, toxic chemicals from consumer products, and underwater oil drilling. Such insults to ecosystems contribute to eutrophication, acidification, and species die-offs. Plastic waste has become one of the leading threats to aquatic life, as animals eat plastic mistaking it for food, become entangled in items such as bags or nettings.^{vii} Plastic breaks down into microscopic pellets, known as nurdles, that are magnets for toxic chemicals like polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), organochlorine pesticides, and perfluorinated surfactants (PFCs). Nurdles, and microbeads used in personal care products, have been found in the bodies of almost every marine species examined, from shrimp to whales.^{viii}

Aside from environmental concerns, there are human costs associated with unsustainable fishing and biodiversity loss in our world's rivers, lakes, and oceans. Seafood is a critical source of nutrition for millions of people, and it is an economic and cultural pillar in many communities as well.^{ix}

Additionally, illegal fishing operations often exploit humans by engaging in practices like forced labor, human trafficking, debt bondage, and modern slavery.^x Human rights abuses are difficult to address in the seafood industry because the supply chains can be complex, and fishing happens far offshore, often out of sight. Even in legitimate operations, there can still be a risk of human rights violations occurring. Furthermore, until recently the environmental concerns in seafood dominated the stage, so the efforts to combat human rights violations is relatively new.^{xi}

Human activity is responsible for releasing toxic contaminants like mercury, PCBs, and pesticides into waters that accumulate in fish, posing a health risk to humans who consume them.^{xii} Many toxic chemicals accumulate up the

food chain, so species at the top (apex predators) generally have the highest concentrations of those substances. Bottom-feeding species that live in critically contaminated regions can also accumulate high concentrations of toxic chemicals because they settle into ground sediments where those animals spend the majority of their lives.^{xiii} Some species, such as tuna or American eels, have been identified as having greater toxic chemical loads of contaminants like mercury or PCBs.^{xiv} Remediation projects to address existing persistent pollutants and reducing toxic chemical use in the future are critical to reduce the toxic load in seafood to ensure we have sustainable and healthful options for generations.^{xv}

In an effort to combat overfishing and preserve wild stocks, the aquaculture or farmed fishing industry has grown rapidly. While some operations are better than others, the sustainability of farmed fish depends greatly on the species raised and the management practices employed. Carnivorous fish, like salmon, are particularly unsustainable because of their dietary needs and when raised in open ocean, coastal net pens, they are highly likely to escape into the surrounding environment.^{xvi,xvii} Aquaculture operations can also be disease vectors, and release pesticides or effluent runoff into the surround ecosystem.^{xviii}

To address these many concerns, PCC developed strong seafood standards that address environmental, social, and human health concerns of seafood. PCC was the first retail partner of Monterey Bay Aquarium's (MBA) [Seafood Watch Program](#) in 2004 and has continued that partnership, relying on the recommendations of Seafood Watch to set our baseline environmental standards. We set stricter standards in some of the areas that are currently outside of the scope of Seafood Watch criteria for assessing fisheries, including labor rights and human health.

Scope

This is a co-op wide, cross-departmental standard. All fresh and frozen raw seafood at PCC, except Chinook salmon¹, must meet the standards set forth below. To clarify, the following product categories fall under the scope of PCC's MBA contract and must meet all additional requirements in PCC's seafood standard:

- Fresh or previously frozen raw finfish and shellfish, wild caught and farmed.
- Frozen raw finfish and shellfish, wild caught and farmed.
- PCC chef-inspired raw seafood offerings.
- Fresh seafood sourced for deli or commissary prepared dishes.
- Refrigerated smoked/preserved seafood.

Not included in the scope of this commitment are shelf-stable/canned, cooked frozen or multi-ingredient grocery or frozen items (e.g., prepackaged frozen meals), however, preference should be given to products meeting PCC seafood standards for excluded categories whenever commercially feasible.

Standard

To meet purchasing requirements for PCC, *product must meet applicable standards below. Fisheries or aquaculture operations must be rated a Green Best Choice, Yellow Good Alternative or certified to a third party eco-certification recognized by Seafood Watch.*

1. Ratings and Certifications

- 1.1. All fresh and frozen raw seafood (wild-caught and farmed) rated by MBA Seafood Watch must be Green Best Choice or Yellow Good Alternative.
- 1.2. PCC will not sell any fresh and frozen raw seafood that is rated an "Avoid" by Seafood Watch.
- 1.3. Fisheries or aquaculture operations not rated by MBA Seafood Watch must have equivalent certification set forth in [Appendix A](#) and meet additional requirements specified.

¹ Chinook salmon must be sourced in accordance with the separate Chinook Sourcing standard and are exempted from Monterey Bay Aquarium Seafood Watch ratings and partnership commitments.

- 1.4. Support of additional certifications concerning social accountability standards (e.g., fair labor, prohibitions against slave labor, workers' rights, etc.)

2. Processing, Handling, and Packaging

- 2.1. The use of Sodium tripolyphosphate (STPP) in post-processing for any purpose, including prevention of thaw drip, is prohibited.

3. Social Accountability

- 3.1. PCC has zero tolerance for child labor, forced labor, human trafficking, abuse, harassment, or any other violations of human rights. All suppliers must comply with PCC's [Fair Labor Standard](#).
- 3.2. All suppliers must meet local, federal, and international labor laws.
- 3.3. PCC encourages suppliers to seek Fair Trade USA or other certifications to ensure social and equitable treatment within the seafood supply chain.

4. Consumer Health

- 4.1. PCC will not sell any species of seafood that is considered toxic to humans (e.g., Escolar).
- 4.2. PCC will not sell any species of seafood that are well known to contain extremely high levels of mercury. This includes, but is not limited to, the following species:
 - 4.2.1. King Mackerel
 - 4.2.2. Marlin
 - 4.2.3. Orange Roughy
 - 4.2.4. Shark
 - 4.2.5. Swordfish
 - 4.2.6. Tile fish (Gulf of Mexico)
 - 4.2.7. Tuna, Bigeye
- 4.3. PCC will avoid the sale of fresh seafood known to contain high levels of PCBs.

5. Aquaculture Operations: Additional Requirements

5.1. Restricted Methods and Species

- 5.1.1. PCC does not sell salmon or carnivorous fish species raised in aquaculture operations, including open ocean net pens.

5.2. Feed and Health Requirements

- 5.2.1. Feed must not contain high-risk genetically engineered ingredients.
- 5.2.2. Feed must not contain artificial astaxanthin coloring or any other artificial dyes.
- 5.2.3. Feed must not contain ethoxyquin or other artificial preservatives.
- 5.2.4. Use of sub-therapeutic or non-therapeutic antibiotics is prohibited.
- 5.2.5. Use of hormones is prohibited, including methyltestosterone.
- 5.2.6. Use of synthetic or artificial chemicals, including those added to feed, to promote growth, increase feed efficiency, improve taste, or other enhancements is prohibited.
- 5.2.7. PCC strongly discourages the practice of eyestalk ablation in crustaceans, such as shrimp.

5.3. Facility Management and Environmental Impact

- 5.3.1. Use of neonicotinoids or other pesticides is prohibited.
- 5.3.2. Water quality and stocking densities must be managed to avoid negative impacts on fish, and water systems must be clean and designed to mimic water conditions of the natural habitat.

- 5.3.3. Production systems utilizing low or zero ecological impact and sustainable practices, such as non-plastic infrastructure in shellfish cultivation, should be given preference and encouraged.

Standard-Specific Glossary

Aquaculture is the breeding, rearing, and harvesting of fish, shellfish, algae, and other marine species in a controlled environment. Depending upon the practices used and species raised, aquaculture can have minimal to serious ecological impacts. Shellfish raised without pesticides in contained land-locked ponds can be an effective and sustainable way to breed and harvest a species. Coastal net pens of Atlantic salmon along the West coast can have detrimental impacts on native salmon species when inevitable escapes occur. Carnivorous species of fish, like salmon, tend to be less sustainable for farming operations than fish like trout, which consume plant material only. MBA's definition of aquaculture is, "the process of converting resources from one form to another more desirable form via aquatic animals and plants."

Bycatch refers to any non-target fish species that are caught along with target species. Even when released back to the water, many fish cannot survive after being initially caught and this can have serious impacts on populations levels, especially for endangered or near-extinct species. Fishing methods can greatly minimize the bycatch amount of a fishing operation.

Cephalopods are a class of marine mollusks that includes squid, cuttlefish, and octopi. They move by expelling water from a tubular siphon under the head, have a group of muscular (and typically sucker-bearing) arms around the front of the head, highly developed eyes, and usually a sac containing ink that is ejected for defense or concealment.

Crustaceans are a class of aquatic animals often referred to as shellfish. It includes lobsters, shrimp, crabs, woodlice, water fleas, and barnacles.

Endangered, Threatened, or Protected (ETP) species are aquatic species protected under the United States Endangered Species Act (ESA) or other conservation laws due to critically low population numbers.

Escapement is the proportion of a fish population not caught by fisheries and returning to spawning grounds.

Eutrophication is the process by which a body of water becomes overly enriched with nutrients, primarily nitrogen and phosphorous, leading to excessive algae and plant growth and oxygen deficiency. When the algae and plants eventually start decomposing, they release large quantities of carbon dioxide, which lowers the pH of the water, making it more acidic (a process known as acidification).

Eyestalk ablation is the practice of removing one or both eyestalks on female crustaceans to induce reproductive development. Removal techniques include pinching or cauterizing the eyestalk, slicing the eyeball and crushing the stalk, or ligature (tying with string to cut off blood flow). The practice is controversial as it can cause pain and discomfort in the animals and can increase the risk of infection. There is still debate over the question of whether fish, crustaceans, and other less advanced lifeforms feel pain like mammals do. Therefore, use of anesthetics to perform the procedure is not common.

[Fair Trade USA](#) is an organization, with accompanying certification system, dedicated to ensuring safe working conditions, protecting the environment, building sustainable livelihoods, and providing additional money to empower and uplift communities.

Finfish are bony or cartilaginous aquatic species like salmon, trout, tuna, tilapia, or halibut. The term is used to differentiate such species from shellfish.

Fisheries are geographic areas associated with a population of aquatic life harvested for commercial or recreational value.

Heavy metals are naturally occurring elements found in the earth's crust and are characterized chemically by a high atomic weight and a density at least five times greater than that of water. Heavy metals are widely used in various industrial, agricultural, and domestic applications, such as the production of clothing dyes, pesticides,

electronics, batteries, and more. This extraction, processing, use, and disposal has released large quantities of heavy metals in more reactive forms into the environment. Once released from the ground, they are persistent pollutants that can accumulate food, water, air, and dust. Arsenic, lead, chromium, cadmium, and mercury are of particular concern because they are highly toxic to humans.

Human-made, or man-made, chemicals are substances that do not occur in the environment through natural reactions but must be manufactured by humans. Some human made substances can biodegrade, might be produced through relatively benign techniques, or derived from what would be considered natural sources.

Illegal, Unreported and Unregulated (IUU) Fishing is a broad term that encompasses a range of injurious and unapproved fishing activity that occurs globally, taking advantage of corrupt administrations, regulatory loopholes, and weak management systems. IUU fishing activity can take many forms, from operating without a license to underreporting catch amounts to the proper authorities.

Mercury is a heavy metal that can have detrimental effects on the brain and nervous system and is known to accumulate in fish, most well-known being Tuna. Mercury poisoning is especially dangerous to pregnant women and children. The widespread use of mercury in various industrial applications has led to higher levels in the environment, which combines with bacteria to create methylmercury that accumulates in fish higher up the food chain. Mercury is considered a bioaccumulative toxin, because it accumulates up the food chain instead of breaking down and being eliminated from an animal's body. Humans need to be particularly careful about bioaccumulative toxins as we are at the top of the food chain.

Modified Atmosphere Packaging (MAP) refers to the process of replacing the air in a packaged fresh food with a specific gas mixture. The intent is to preserve the food and extend shelf life by reducing the oxygen in the package.

[Monterey Bay Aquarium Seafood Watch](#) Program educates consumers, creates partnerships with groups along supply chains, and advocates for policies to improve seafood traceability, end illegal fishing, and protect at-risk marine species. It began in 1999 and is officially owned and operated by the Monterey Bay Aquarium Foundation, which was created to generate sufficient capital to build the aquarium that is located in Monterey, California. The Seafood Watch program evaluates aquaculture operations and fisheries and rates them as Green Best Choice, Yellow Good Alternative, and Red Avoid.

Net pens are used in open water aquaculture operations and confine fish with a mesh enclosure with a rigid frame around the top at the surface of the water. Sometimes referred to as "cages," these systems are considered a very risky form of aquaculture, as they allow for the free exchange of waste, chemicals, parasites, and disease with the surrounding environment. Escapes are also highly common with open net pens, leading to the introduction of potentially invasive species into the surrounding waters.

Ocean acidification is a reduction in the pH level of the ocean over an extended period of time, caused primarily by an overabundance of carbon dioxide. When oceans become more acidic, carbonate ions are less abundant, which impacts organisms like oysters, clams, and corals that rely on carbonate to survive – carbonate is present in shells and coral skeletons.

Organochlorine pesticides are a group of neurotoxic pesticides used extensively in the 1940s through the 1960s, the most well-known being DDT. While most have been phased out, they are extremely persistent chemicals and, in some areas, continue to be a source of contamination.

Overfishing is the removal of a fish species from the wild at a rate that the species cannot replenish, causing diminishing numbers of that species over time. Managing fisheries such that species are not overfished to critical levels is one of the cornerstones of sustainable fishing.

PBDEs, or polybrominated diphenyl ethers, are a class of chemicals used as flame retardants in various consumer products such as furniture, rugs, upholstery, and plastic housing units of electronic devices. Production of these chemicals peaked in the late 1990s and has started to decline due to the efforts of environmental and public health advocacy groups.

PCBs, or polychlorinated biphenyls, are industrial chemicals that were banned world-wide in 1979. PCBs, a member of the chlorinated hydrocarbons family, can remain in the environment for long periods of time, cycling between air, water, and soil. They have demonstrated a broad range of adverse health impacts on animals and humans, affecting the immune system, reproductive system, nervous system, and endocrine system. There is strong evidence that PCBs cause cancer in humans.

Pesticides are chemical substances used to kill, repel, or control pests, including insects, rodents, fungi, and unwanted plants, which interfere with cultivation of a crop or food product. The term includes herbicides that target plants, insecticides that target insects, rodenticides that target rodents, and fungicides for controlling mold or mildew growth. In the context of seafood, aquaculture operations commonly use pesticides to control predation from other marine life, unwanted seagrasses, or parasites such as sea lice.

PFCs, or perfluorinated surfactants, are a subcategory of per and polyfluoroalkyl substances (PFAS), which are used for their water and oil repellency. The most well-known PFAS is Teflon, which is used to coat non-stick cookware. There is strong evidence that exposure to PFAS reduces immune system function, causes birth defects, damages internal organs, and increases the risk of certain cancers, such as prostate and bladder cancer. PFCs and PFAS are persistent in the environment and can accumulate in fish that people consume.

Shellfish are aquatic invertebrates, most of which have an exoskeleton or shell. The colloquial term is commonly used to identify species within the crustacea class or mollusk family that are eaten by humans. While crabs, shrimp, lobster, and oysters are well-known types of shellfish, octopus, squid, and sea urchins are also considered shellfish.

Wild-Caught refers to fish that are caught in their natural habitats of rivers, lakes, or oceans.

Appendix

Section A: MBA Seafood Watch Approved Eco-Certifications

Seafood Watch and PCC support robust, independent eco-certification programs for seafood. PCC will accept eco-certified seafood that is recommended by Seafood Watch, so long as all additional criteria of the standard above are met. Seafood Watch will only recognize a certification if the certification's standard has passed an internal benchmarking test and is considered equivalent to at least a Good Alternative rating.

[Aquaculture Stewardship Council](#)

- Farmed bivalves
- Farmed catfish
- Farmed salmon
- Farmed shrimp

[Canada Organic](#)

- Farmed shellfish

[Naturland](#)

- Farmed carp
- Farmed freshwater fish
- Farmed mussels
- Farmed shrimp

[Global Aquaculture Alliance's Best Aquaculture Practices](#)

- Farmed catfish (2 stars or above)
- Farmed mussels
- Farmed shrimp (2 stars or above)
- Farmed tilapia (2 stars or above)

[Marine Stewardship Council](#)

- Wild-caught seafood

[Friend of the Sea](#)

- Farmed mussels

For more information from Seafood Watch, visit:

<https://www.seafoodwatch.org/recommendations/certified-seafood>.

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- ⁱⁱⁱ Damian Carrington, “One in Three Fish Caught Never Makes It to the Plate – UN Report,” *The Guardian*, July 9, 2018, sec. Environment, <https://www.theguardian.com/environment/2018/jul/09/one-in-three-fish-caught-never-makes-it-to-the-plate-un-report>.
- ^{iv} Darlene Lee, “Protect the Environment/Right of Nature,” *Earth Law Center* (blog), October 17, 2017, <https://www.earthlawcenter.org/blog-entries/2017/10/do-dams-violate-a-rivers-right-to-flow>.
- ^v Robert Emberson, “Accelerating Riverbank Erosion,” *Nature Geoscience* 10, no. 5 (May 2017): 328–328, <https://doi.org/10.1038/ngeo2948>.
- ^{vi} “Dead Zone,” in *National Geographic Resource Library*, January 21, 2011, <http://www.nationalgeographic.org/encyclopedia/dead-zone/>.
- ^{vii} Barry Yeoman, “A Plague of Plastics,” National Wildlife Federation, June 1, 2019, <https://www.nwf.org/Home/Magazines/National-Wildlife/2019/June-July/Conservation/Ocean-Plastic>.
- ^{viii} Peter Wardrop et al., “Chemical Pollutants Sorbed to Ingested Microbeads from Personal Care Products Accumulate in Fish,” *Environmental Science & Technology* 50, no. 7 (April 5, 2016): 4037–44, <https://doi.org/10.1021/acs.est.5b06280>.
- ^{ix} Damian Carrington, “One in Three Fish Caught Never Makes It to the Plate – UN Report,” *The Guardian*, July 9, 2018, sec. Environment, <https://www.theguardian.com/environment/2018/jul/09/one-in-three-fish-caught-never-makes-it-to-the-plate-un-report>.
- ^x “Addressing Illegal Fishing and Labor Abuses,” Stanford University Center for Ocean Solutions, August 8, 2019, <https://oceansolutions.stanford.edu/key-initiatives/addressing-illegal-fishing-and-labor-abuses>.
- ^{xi} “Was Your Seafood Caught with Slave Labor? New Database Helps Retailers Combat Abuse,” *All Things Considered* (NPR.org, February 1, 2018), <https://www.npr.org/sections/thesalt/2018/02/01/582214032/was-your-seafood-caught-with-slave-labor-new-database-helps-retailers-combat-abu>.
- ^{xii} “Contaminants in Fish,” Washington State Department of Health, accessed January 14, 2021, <https://www.doh.wa.gov/CommunityandEnvironment/Food/Fish/ContaminantsinFish>.
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- ^{xiv} Ibid.
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