The Negative Impacts Of Wild Caught Fish

A Survey Demonstrating the Benefits of Aquaculture as Weighed Against Destructive Wild Fishing Practices

Tag Words: Aquaculture; Fish Farming; Fish

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Summary

Fish farming, also known as aquaculture, is the process of growing genetically modified fish in enclosed areas, such as in tanks or netted enclosures. Although large improvements have been made in fish farming, people today still have reservations consuming fish grown from aquaculture. The human population, of course, has continued to grow, raising the demand for all foodstuffs, including fish. As a result, fishing techniques that catch enormous amounts of fish in the least amount of time are favored. However, these techniques (such as trawl net fishing and bottom trawling) cause severe damage to the ocean habitat. Fish farming is a critical solution that may enable us to both service the growing demand for fish and preserve the remaining ocean habitat. Therefore, it was imperative that consumers were educated on the benefits of fish farming by filling out a survey on what they knew about aquaculture. After completing the survey, the consumers started to understand how their small economic choices, aggregated across the population, might preserve and sustain fragile ocean ecosystems. (AK)

Video Link - http://www.youtube.com/watch?v=saOLKcXAxrE

**Listed under The Negative Impacts Of Wild Caught Fish on YouTube**

Introduction and History of Fish Farming

(AK) For several years now, the idea of eating healthy and living a sustainable lifestyle has permeated the public consciousness. In order to achieve this lifestyle, consumers may seek products produced organically. Farmed fish are therefore quite controversial. Fish farming, also known as aquaculture, refers to the practice of growing fish in enclosed, controlled environments, either inland or within bodies of water surrounded by nets. Since its inception, fish farming has been in competition with wild fishing. Fish farming has been hampered by a perception that wild fishing products are superior, provide higher quality protein, and taste
However, consumers are gradually starting to transition to increased consumption of farmed fish.

The practice of fish farming has been around for several centuries, but the idea of aquaculture has been around for thousands of years. There is no definitive date as to when the idea of aquaculture came into being, but ancient Chinese manuscripts indicate that the Chinese were already practicing fish aquaculture as early as the 5th century B.C. In addition, Egyptian hieroglyphs dating back to the 2nd century B.C. reveal that the Egyptians of the Middle Kingdom struggled to create an intensive fish culturing practice. The concept of fish farming has therefore been with us for a considerable period of our history. There is, however, one known form of ancient aquaculture that is still practiced today. The Romans followed in the Egyptians’ footsteps in trying to create sustainable aquaculture practices, and succeeded in developing a method of producing and harvesting aquaculture oysters, variants of which are still in use today.

Nevertheless, there are major differences between the aquaculture that we practice today compared to the forms of aquaculture that were in use in antiquity. In ancient times, instead of culturing fish in an enclosed area, people collected undeveloped fish or shellfish and transferred them to an artificially created environment that favored their growth. One of the earliest known methods originated in China. Carp, which was the first fish that was successfully cultured, were collected as fries and then permanently moved to special artificial ponds. The Egyptians and Romans further developed aquaculture by extending the practice to many other species, which also included oysters (as described above) and other species that were able to survive the transfer to the artificially created ponds.

In contrast, the first modern form of aquaculture was first introduced in 1733, in Germany. There, a farmer captured both male and female trout that were ready to reproduce. Eggs and sperm were extracted from the trout, and then manually combined under favorable conditions. After the fertilized eggs are hatched, the fry were taken to a suitable environment, such as cultivated ponds or an enclosed tank. Initially, this technique was only limited to freshwater fish. Eventually, new techniques and technologies were developed allowing the aquaculture breeding of saltwater species as well.

Fish culture eventually became a common practice. One lingering issue for fish farming was transportation. It was extremely difficult to transport fish around the world since it is difficult to keep fish alive in transport for any extended period of time. A man by the name of James Ramsay Gibson Maitland solved this issue in 1873. Mr. Maitland created the first commercial fish farm at Howietoun, Stirling in the United Kingdom. At his farm, Mr. Maitland developed the first transport container (among other many other new products and systems). Just one container was able to carry 10,000 fry and up to 100 fish. Using the transport container, fish farmers were able to consistently transport fish without overt risk of death. The containers were versatile as well, and could be moved by donkeys over short distances, or by trains, horses, or carts for longer voyages.
In 1887, Mr. Maitland published all his aquaculture research and therefore laid the foundation for the modern fish farming industry. The fish farming industry has grown from these humble roots, and now supplies 50% of the fish that are eaten today.

http://en.wikipedia.org/wiki/Fish_farming
http://www7.taosnet.com/platinum/data/whatis/history.html
http://www.bbc.co.uk/ahistoryoftheworld/objects/9b8TsIQtSTO8k_CSvdlu3g

**Consumer Perception of Fish**

Consumers possess many misconceptions about fish aquaculture. For example, many assume that fish farms require huge tracts of land and large expenditures on capital and equipment. In reality, fish farming can be implemented rather efficiently. Any body of water can be used as a fish farm, including small ponds and lakes. Similarly, fish farming equipment (such as those that regulate variables within the fish farm environment) is not expensive, complex or difficult to maintain. Grassroots efforts, such as building a sustainable fish farm in one’s backyard can significantly reduce strain on wild fish populations. Consumers would gain greater control over the fish they consume and may avoid, for example, wild fish contaminated by pollution in the ocean (e.g., mercury).

Consumers generally associate farmed fish with chemicals, dyes, and low nutritional levels. Media outlets are much at fault for the public’s negative perception of fish farming, reporting, for example, how genetically modified fish escape from loose nets and outcompete wild marine life. These negative aspects are greatly exaggerated, and the positive features outweigh them significantly. Fish farming is generally beneficial for natural ocean ecosystems.

First, it reduces the amount of stress on the environment. The decline of over-fished (or accidentally fished) populations affects other organisms by upsetting the predator/prey balance. Fish farming relieves these pressures and can therefore aid in correcting (or at least maintaining) current balances between different organisms, and thereby prevent the extinct of many marine organisms. When choosing between a wild fish or a farmed fish, the public ought to consider the impact their economic choices have on the environment, instead of focusing only on incorrect presumptions they may possess about farmed fish.

Because of the evolving perception of fish farming, farmed fish are in ever greater demand, and more diverse types of fish are being cultured today. These species include, for example, the Atlantic salmon, Rainbow trout, Coho salmon, Big-eyed tuna, Carp, Tilapia, Catfish, and Cod. The United Nations Food and Agriculture Organization has predicted a global fish shortage by 2030. Fish farms are starting to become crucial to feeding the world’s ever increasing demand for fish. Fish farms are therefore crucial to feeding an ever expanding human population, and offsetting the damage done by overfishing, and the use of environmentally destructive fishing techniques such as bottom trawling, which destroys ecosystems on the ocean floor, and net trawling, which results in large amounts of wasteful by-catch. Consumers would well consider that the choice may not necessarily be between farmed fish and wild fish, but rather, between farmed fish and no fish at all.

http://en.wikipedia.org/wiki/Fish_farming
Environmental Issues

(AJM) The ocean environment maintains a balance between the web of organisms and various ocean ecosystems. They function together in a delicate equilibrium that is easily disrupted. The main focus of the following section will be on the effects of commercially farmed fish and catching wild fish in relation to the ocean and/or other related or interdependent organisms.

The environmental impacts concerning farmed fish are minimal depending on the methods used. Nutritional value and waste by-product are the most common negative connotations associated with fish farms. It is true that the nutritional value is significantly less in farmed fish, however, this case is further examined and resolved in Tilapia. Farmed Tilapia are fed an unnatural diet therefore their nutritional value is less than those found in the wild. Also wastewater would not be an issue if the water mass is completely enclosed from the environment. There is no exchange between the farm and the surroundings. Furthermore, the wastewater may be used as a natural fertilizer instead of harm chemical fertilizers. There are farms that are located in lakes, ponds, and oceans that transfer water between the farm and the environment. Waste can be harmful as phytoplankton blooms may occur, but with better regulations, farmed fish can be just as nutritious and have minimal impact on the surroundings.

Methods used in capturing wild fish are very damaging. Even with regulations and polices in place to reduce negative consequences on the environment, the general population of marine resources are in decline. It is estimated that 80% of the worlds natural fish stocks are fully to over exploited, depleted, or in a state of collapse. Approximately 90% of the large predatory fish are already gone. Fisheries deploy a variety of effective methods of capturing fish, but have detrimental effects on the environment. The by-catch is generally high, ranging from 5 to 20 times of the targeted catch and bottom trawling destroys habitats that may never fully recover. These events occur even with regulations in place.

Overfishing

It was once believed that ocean wildlife was an unlimited resource, but history has since shown this to be untrue. Overfishing is harvesting the fish populations at a rate that is unsustainable by the reproductive capacity of the population. Fish harvesters, such as corporations or individual fisherman, seek to capture as many fish resources as they can for their own benefit with no regard or oversight for the overall ecosystem and because of that, limited fish populations are often depleted, exemplifying, unfortunately, the so-called “tragedy of the commons.” Fish harvesters are, of course, not solely to blame. They seek only to meet the constant demand for fish, which cause them to overfish to meet those demands.

Overfishing can cause, of course, population collapse or even extinction of the targeted
species. Additional damage may accrue. The downfall of one species affects not only itself, but also other interdependent ocean systems and organisms. For the example, the depleted species may be a food source for another organism. Without a sustainable food source, the dependent population would also fall into decline. The affected species may alternatively be a predator of some other organism. Without a natural predator, the prey species may overpopulate. Afterwards, the lower tier organisms may subsequently move higher on the food chain, which may impede the recovery of the overfished species since it has a new competing species to contend with. The ability of the downfall of one species to cause a major ecological shift should not be underestimated.

http://overfishing.org/pages/what_is_overfishing.php

**North Atlantic Cod**

One of the most well known examples of overfishing occurred within the North Atlantic Cod industry. The Northern Atlantic Cod was a flourishing natural resource that was thought to be unlimited. The majority of the coastal citizens of Canada, mainly Newfoundland, built and based their livelihood on the Cod industry; hence, Cod played a very important role in their lives. They were linked both directly and indirectly with the fishing industry as fishers, fish plant workers, fish sellers, fish transporters, or as employees in fish-related businesses.

Many factors contributed to the collapse of the Northern Atlantic Cod industry. After the end of World War II, the introduction of new technology greatly improved the efficiency of fishing. For example, sonar from war submarines were implemented to easily locate and track large pods of fish. This gave the submarines an advantage, enabling them to catch more fish at a faster rate. In addition, radar, electronic navigation systems, and large powered trawlers were also introduced, allowing fishers to fish much deeper, farther, and longer. The end result of the introduction of this technology was the depletion of the Northern Atlantic Cod. In addition, the introduction of the larger powered trawler also lead to a huge amount of by-catch, including the critical Capelin. Capelin is natural prey for the Northern Atlantic Cod. Consequently, the large by-catch of the Capelin made it almost impossible for the Northern Atlantic Cod to recover since it removed one of their primary food sources.

The Northern Atlantic Cod was a top-tier predator. Since the decline of the natural population, the natural prey of the Cod has become the top-tier predator in that region. The Cod had to re-compete with the new top-tier predators in order to fully recover. Besides the competition, the complex life cycle of the codfish is also an impediment to their recovery. The codfish requires years to reach reproductive maturity. This long maturation impedes any potential recovery, as sexually mature adults are required to increase the population. The West Atlantic Cod matures in approximately 2 to 4 years but it can take as much as 8 years in the North Arctic. With the natural population already low, the population of larvae is at an extreme low, only a small percentile of larvae will survive to become sexually mature adults.

By the summer of 1992, the Northern Atlantic Cod population had fallen to 1% compared
to the population a year prior. Because of this overwhelming reduction in the natural Cod population, Canada issued a moratorium, prohibiting the fishing of the North Atlantic Cod. However, by present, it is apparent that the damage done to the Northern Atlantic Cod may be far too great. The population has yet to recover, and may never be able to.


**Orange Roughy**

The Orange Roughy is a more recent example of overfishing. They are located in every ocean, but situated mainly in the Western Pacific. The fishing of this deep ocean fish began approximately 30 years ago. The discovery of the Orange Roughy was purely accidental. As coastal fisheries were becoming depleted, fishing vessels ventured further into the deep ocean in search of other fish to catch. As soon as the Orange Roughy hot spots were discovered, they were quickly overfished. Amazingly, in less than 25 years, the Orange Roughy has made it onto the conversation dependent list and, indeed, even the Australian endangered species list.

When the fish supply started to decline, total allowable catches (“TACs”) standards were implemented to manage the total amount of Orange Roughy removed from the fishing grounds. However, gauging the actual size of the fish stock was hard since research in the deep sea was hard to conduct. Recent research shows that stocks of Orange Roughy were less than initially predicted when the TACs were being set. TACs in the following years were lowered to sustainable levels based on the new data, but the populations were still struggling to recover.

The effects of overfishing on deep ocean fish, like the Orange Roughy, are greatly magnified because organisms from the deep ocean typically have extremely long life spans and low reproductive rates. The Orange Roughy can live as long as 130 years or more and may take between 30 to 40 years to be sexually mature. When the fish matures, they migrate over 200 km to reproduce while females carry about 22,000 to 70,000 eggs per kilogram of mass. In comparison, 22,000 eggs is less than 10% of the average for other species of fish while 70,000 eggs is about 32% of the average for the other species of fish. The long sexual maturity and low egg count make Orange Roughy extremely susceptible to being overfished. The early symptoms of overfishing are starting to become apparent, as some of the common fishing grounds are now completely depleted.

Besides the extensive life cycle required to produce more offspring, the Orange Roughy are also losing their surrounding habitat, because the methods of harvesting fish from the benthic environment are destructive. In sum, although there are regulations to prevent further decline of the fish stock, the Orange Roughy is still struggling to recover.

[http://www.montereybayaquarium.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_OrangeRoughyReport.pdf](http://www.montereybayaquarium.org/cr/cr_seafoodwatch/content/media/MBA_SeafoodWatch_OrangeRoughyReport.pdf)
Destruction of Habitat

For each type of habitat in the ocean, there exists a harvesting method. The most common method is trawling, or dragging large nets through the water to capture a targeted population of fish. Trawling is applied to both the benthic zone and middle water column. Another method, deployed at coral reefs, is “muroami” (described further below). Both of these methods tend to be very destructive for the environment.

http://www.bornfreeusa.org/facts.php?p=456&more=1

Muroami

Coral reefs cover a mere 0.1% of the ocean but they provide a home to 25% of all marine organisms. They are often referred to as “the rainforest of the sea.” Besides serving as a home for sea life, coral reefs act as natural storm barrier for islands and coasts. Due to their high biodiversity, resources in the area are often exploited.

Corals reefs may be farmed using a process called “muroami.” The process of muroami involves securing a net to the corals by hammering poles into the corals in a circular fashion. The hammering tends scares fish out of the holes and crevasses of the reef. Afterwards, pounding devices smash the corals into tiny pieces. With no place the hide, the organisms are caught into the net. Because of muroami, entire reefs are destroyed in a short period of time. Because of the extremely slow growth rate of coral reefs, and the recovery of the habitat may never occur.

http://en.wikipedia.org/wiki/Muroami

Bottom trawling

The ocean floor is covered with ridges and trenches. These often serve as shelters and habitats for benthic organisms. Bottom trawling is the most common method of harvesting from the ocean. Bottom trawling may be “demersal” and “bentic.” Demersal trawling harvests fish just above the benthic zone, while benthic harvests fish from the lowest portion of the water column.

The basic process of bottom trawling involves dragging large nets across the ocean. The top of the net is often fixed with a floatation device while the bottom of the net is fixed with large wheels or metal plates. As the nets are dragged across the ocean floor, the large wheels or metal plates crush everything on the bottom and “clear cuts” the ocean floor.

The effects of bottom trawling are extremely detrimental to the environment. Besides crushing everything in the net’s path, large amounts of sediment and detritus is released into the
water column. Sediment rich waters reduce the depth at which sunlight can penetrate, decreasing the amount of aquatic plant growth, such as kelp. Sediments are also a sink for nutrients and pollutants. Not only can the sediments in the water column release trapped pollutants back into the water, but the release of nutrients can also spawn harmful phytoplankton blooms, which can be extremely devastating to the ecology.

Large phytoplankton bloom can cause hypoxia, which is the lack of oxygen in the water column. As the phytoplankton population increase, large portions of them die off. As dead phytoplankton sink down to the water column, bacteria decompose and re-mineralize the organisms. These two processes are both aerobic and intake all the dissolved oxygen, killing the majority of the life forms in the surrounding area of the bloom.

By-catch

By-catch is the unintentional catching of sea life in the course of harvesting a targeted fish. Untargeted sea organisms include, but are not limited to, immature fish, turtles, sharks, dolphins, whales, and even birds. Most of the time, they are already dead or dying when nets and lines are brought on deck. The ones that survive being caught are released back into the ocean, but their survival rates are extremely low. Being caught and released is an extremely stressful experience that reduces the overall fitness of the animal. Various parts of the animal, such as a protective slime coat, fins, mouths, and skin are often damaged if the aquatic animal is kept out of the water for a prolonged period. Weakened by-caught animals often fall prey to predators following the fishing vessel to prey on weakened by-catch.

The largest amounts of by-catch are associated with bottom trawling and long lining harvesting techniques. Bottom trawling uses specific sized nets that have holes just large enough to catch the targeted species. While smaller organisms are able to swim out through the holes, larger untargeted animals often get trapped within the net. Unsurprisingly then, shrimp harvesting has the highest rate of by-catch out of all fishing industries, because of the extremely small holes required to catch the targeted shrimp. The by-catch to catch ratio for shrimp globally is approximately 5.7 by-catch to 1 shrimp. The by-catch ratio varies greatly depending on location, and some fishing grounds have ratios as high as 20 by-catch to 1 shrimp.

Even when trawling for larger species, many untargeted finfish and cetaceans get caught in the net. This is very dangerous for cetaceans, as they are mammals and must come to the surface to breathe. Cetaceans are therefore often drowned in trawling nets. Sea turtles are also often caught in trawling nets as well. Trawling is the leading cause of mortality for all sea turtles that are currently being listed as threatened or endangered. Sea turtles are very important since they are the natural predators for jellyfish, and therefore regulate the population of jellyfish.
The longlining harvesting method involves dragging a main line that can be as long as 80 miles long with shorter lines attached by a “snood.” Each of these shorter lines are attached with baited hooks that often unintentionally catch sea turtles and albatross by-catch. Albatross often feed on affal and carrion, which is usually the bait used by fishermen on these hooks. Therefore, longlining is the main cause of the decrease in the albatross population. Of the 21 species albatross, 19 of them are currently threatened with extinction, and the other two are close to being endangered. It is estimated that 100,000 albatross are killed yearly by longlining.

By-catch can occur indirectly as well. When nets get tangled up and the lines are no longer of use, fishermen usually cut and discard them into the ocean. Nets and lines may also get lost from them breaking off during strong storm or turbulent seas. These so-called ghost nets may trap ocean life long after they have stopped being useful to fishermen. Sea creatures trapped in these ghost nets will invariably die by starvation, suffocation, laceration, and infection. It is likely that there are miles of ghost nets floating around the ocean, continuing to claim victims.

http://seagrant.gso.uri.edu/factsheets/Bycatch.html
http://www.montereybayaquarium.org/cr/cr_seafoodwatch/issues/wildseafood_bycatch.aspx
http://www.nmfs.noaa.gov/by_catch/bycatch_nationalreport.htm
http://www.bornfreeusa.org/facts.php?p=456&more=1
http://en.wikipedia.org/wiki/Bycatch
http://en.wikipedia.org/wiki/Sea_turtle
http://en.wikipedia.org/wiki/Longline_fishing
http://en.wikipedia.org/wiki/Albatross
http://en.wikipedia.org/wiki/Ghost_net
http://www.wakeproject.net/?q=node/21

Benefits of Fish Farming

(AK) There are several reasons why fish farming is beneficial to consumers. First, the sustainability of fish farming reduces the stress on the environment. This creates a more sustainable future for current and future generations. Second, the consistency of commercially grown fish can be better controlled, ensuring higher standards of health and the exclusion of pollutants prevalent in the ocean environment. Third, because of controlled production methods, fish farms can and will be able to continue to meet the demand for fish without the danger of fish shortages. This will not only greatly reduce the derby style fishing where fisheries race to harvest as many fish as possible, but it will give many wild fish populations a chance to recuperate in the ecosystem. Fourth, fish farms provide jobs and job security to a large segment of the population. Fish farm exports worldwide currently earn more revenue than any other traded food product in the world, including rice, cocoa and even coffee.


Tilapia

Tilapia is one example of a successfully aquacultured fish. It is a popular fish for
aquaculture because it is an easily grown. It does not require a high meat diet like other commercially grown fish and it easily tolerates even overcrowded conditions.

Standards for sustainable commercial fish farming have been rising. For example, because fish farming may be implemented in lakes where Tilapia is not a native species, Tilapia may be required to be grown within caged enclosures, thereby reducing the chances of Tilapia becoming established in the local ecosystem as an invasive species. Furthermore, restrictions on the amount of fish allowed in each cages are in place to ensure good water quality and a healthy level of oxygen. Tilapia are also grown in special pens with roofs so birds may not carry fish somewhere else, and the waste is often collected and used as fertilizer. In addition, fish farms may not use prophylactic antibiotics.

Many consumers argue that the nutritional value of farmed Tilapia is much lower than wild caught Tilapia. In fact, when nutritionist and doctors say to include two servings of fish in a weekly diet, they are referring to the intake of omega-3 and omega-6 oils that are found naturally in fish. Wild Tilapia has about 135mg of omega-3 oils but commercially farmed Tilapia may have much less. This is due to the fact that we feed the farmed fish mostly soy and corn, which is not their natural diet. In the wild, Tilapia obtains omega-3 oils from eating wild plants and fish. The standards on raising Tilapia need to be adjusted further with respect to what they are fed, thereby raising the nutritional value of farmed Tilapia.

Wild Fish and Fraudulent Labeling

When consumers go out to buy fish, they tend to examine the label. What if the information on the label was, in fact, wrong? Recent studies show that fish being sold and served may not be what the customer thought they were buying and eating. In order to see if it was true, an independent lab ran a DNA test to detect the disparities on 183 fish that were randomly chosen from restaurants, supermarkets and fishmongers. Out of 183 fish, 87 were mislabeled. While some of the mistakes were due to honest errors, many were caused by outright fraud. More poignantly, most of the fish that was mislabeled were wild fish. Fraud with respect to farmed fish is rarer, because the sale of some farmed fish require the use of special dyes, and it is known and publicized when the farmed fish are genetically modified from the start. In other words, if the consumers want to avoid fraudulent misrepresentation of fish products, it is advantageous to purchase farmed fish instead of wild fish.

Conclusion

Even though there is information on the web that states that wild fish is fresher, tastier, and provides better nutrition, it all comes at the cost of harming the environment. Farmed fish
may possess more calories and fat than wild fish, but farmed fish are grown and harvested in a controlled environment. In addition, farmed fish do not contain a high nutritional value as wild caught only because we don't feed them their natural diet. Instead of feeding them naturally grown plankton or algae, they are fed soy and corn meal usually because its cheaper. There are possible methods to increase the nutrition in fish, but it will only result in an increase in price, which is not ideal since most consumers want everything cheap. In contrast, wild fish require the use of fishing techniques such as nets that overfish and trawls that destroy entire habitats. Furthermore, overfishing can result in massive amounts of by-catch, which is later thrown out since they serve no purpose for the fishermen. Therefore, when you choose a fish at market, think about the impact your economic choice in buying that one fish, and make the informed and moral choice.
Service Project

Our service project was based on survey questions to the staff of the fish department and to the customers inside the supermarkets and other fish markets. Our projects primary focus was to spread awareness about the difference between farmed fish and wild caught fish. We wanted to inform people that the choices they made either benefitted the economy or may have destroyed the ecosystem even further. Another purpose was to gauge the knowledge of the general population on commercially farmed fish versus wild caught fish. Hence, we went to each fish market and their department, with the permission of the manager, and asked a few customers about what they knew about fish farming and if they would purchase the same type of fish after they took our survey. Afterwards, we gave them an information packet concerning what type of fish were the best choice, good alternatives, and the bad choices they should stay away from so it can help inform them to make better choices and assist other people if they had the chance. Next, we gave a survey to the staff of the fish department. This survey was to inform both the consumers and ourselves, so that everyone can perceive the choices a customer would make depending on their situation or their culture.

From the survey we gave out to both the staff and the customers, we learned that price is the most important factor whenever a customer buys fish. Even though, most consumers didn't know that they might be buying an inferior product, different type of fish, the customers still wouldn't reconsider not purchasing wild caught fish and specifically purchase farmed fish only because most customers didn't care. Regardless of wild or farmed fish, mostly everyone bought fish depending on price. If the given time allotted by management was more sufficient, a greater number of consumers could be reached and educated on the different choices available at the fish market.

Customer-Based Questions:

1. Please rank in the order of importance. (1 being the most important) What influences your purchase of fish today?

   a) Price
   b) Quality/taste
   c) Farmed vs. Wild caught

Customer 1 – A, B, C  
Customer 2 – C, A, B  
Customer 3 – B, A, C  
Customer 4 – C, B, A  
Customer 5 – A, C, B  
Customer 6 – A, B, C  
Customer 7 – A, B, C

4/7 customers preferred price. 
2/7 customers preferred Farmed vs. Wild Caught. 
1/7 customer preferred quality/taste.
2. Are you aware that, if you choose wild caught fish, you may be buying an inferior or different type of fish than what it is advertised to be? Would you then reconsider not purchasing wild caught fish and specifically purchase farmed fish?

Customer 1 – Yes, No
Customer 2 – Yes, Yes
Customer 3 – No, No
Customer 4 – No, No
Customer 5 – No, Yes
Customer 6 – No, No
Customer 7 – No, No

5/7 customers did not know that they were buying an inferior product.
2/7 customers did know that they were buying a different type of fish.

3. With the world’s population growing, many of whom eat fish, we are at great risk of overfishing and depleting the world’s fish supply. Would you then reconsider not purchasing wild caught fish and specifically purchase farmed fish?

Customer 1 – No
Customer 2 – No
Customer 3 – Yes
Customer 4 – No
Customer 5 – Yes
Customer 6 – Yes
Customer 7 – No

4/7 customers would not reconsider not purchasing wild caught fish.
3/7 customers would consider purchasing farmed fish.

Staff Survey Questions: East Brunswick Shoprite

1. Can you taste the difference between each fish?
   - Yes. There is a distinct difference between taste. Wild fish tends to be more fresh and nutritious than farmed fish.

2. What is your highest sold product in terms of fish?
   - Fresh salmon and tilapia

3. Do you have any fish that is farmed?
   - Salmon and tilapia

4. Do people buy more farmed fish or wild fish?
   - They only ask for wild fish.

5. Do a lot of people ask what the difference is and which do they prefer better? Is it labeled?
   - Yes. It’s surprising not to see someone who knows the difference between farmed and wild.
   - Prefer wild fish.
   - Yes.

6. Does farmed fish cost more than wild fish?
   - No. Wild fish cost more than farmed fish but not by much. Only a dollar to two dollars
7. Is every fish out there farmed in some way or are only a few species farmed while the rest are wild caught?
   Only a few species that are farmed. People don’t like farmed fish.

8. If there is so much % of fishes that are farmed and sold why is there still an overfishing situation in the ocean?
   - People will always demand for wild fish even if there is nothing left.

9. Do you offer a choice between wild/farmed fishes or do you only carry one type of quality fish?
   - Tilapia is the only fish that comes farmed (no wild caught option) and salmon is the only fish that gives you the option of farmed vs. wild. Of course, wild goes out a lot faster than farmed.

10. Do you guys buy fish depending on quality or price?
    - Quality

Person we talked to: Jason / Shoprite representative
Why Do Your Seafood Choices Matter?

Worldwide, the demand for seafood is increasing. Yet, many populations of the large finfish species we enjoy eating are overfished and in the U.S. we import over 93% of our seafood to meet the demand. Overfishing and fish farming practices only add to the problem.

By purchasing fish caught or farmed using environmentally friendly practices, you're supporting healthy, abundant oceans.

You Can Make a Difference

Support ocean-friendly seafood in these easy steps:

1. Purchase seafood from the green list. If unavailable, the yellow list, or look for the Monterey Bay Aquarium Seafood Watch logo on seafood products.
2. When you order seafood, ask your seafood provider where it was farmed or wild-caught.
3. Tell your friends about Seafood Watch. Ask for ocean-friendly seafood, let them know.

Learn More

Our recommendations are researched by Monterey Bay Aquarium scientists. For more information about your favorite seafood, including its nutritional value, visit seafoodwatch.org.

Picklist guides are updated twice yearly. Get current information on your mobile devices, on our website or by adding our free app to your Android or iPhone.

To use your pocket guide:
1. Cut away outer black line.
2. Fold on gray lines.

Avoid

- Atlantic (U.S.) Bluefin tuna
- Atlantic (U.S.) Chinook salmon
- Atlantic (U.S.) Coho salmon
- Atlantic (U.S.) Steelhead (rainbow) trout
- Atlantic (U.S.) Whitefish
- Atlantic (U.S.) White perch
- Atlantic (U.S.) Winter flounder
- Black (Gulf of Mexico) cod
- Blue swimmer crab
- European (Atlantic) bass
- European (Atlantic) cod
- European (Atlantic) haddock
- European (Atlantic) plaice
- Euphausia superba
- Farmed (southeast Asian) tiger prawn
- Farmed (southeast Asian) whiteleg shrimp
- Farmed (U.S.) turbot
- Farmed (U.S.) striped bass
- Farmed (U.S.) white perch
- Farmed (U.S.) yellow perch
- Farmed (U.S.) white catfish
- Farmed (U.S.) tilapia

Good Alternatives

- Alaska (U.S.) king salmon
- Alaska (U.S.) chum salmon
- Alaska (U.S.) sockeye salmon
- Atlantic (U.S.) mackerel
- Atlantic (U.S.) striped bass
- Atlantic (U.S.) porgy
- Atlantic (U.S.) flounder
- Atlantic (U.S.) haddock
- Atlantic (U.S.) cod
- SeafoodWatch certified

Best Choices

- Atlantic (U.S.) cod
- Atlantic (U.S.) mackerel
- Atlantic (U.S.) striped bass
- Atlantic (U.S.) porgy
- Atlantic (U.S.) flounder
- Alaska (U.S.) king salmon
- Alaska (U.S.) chum salmon
- Alaska (U.S.) sockeye salmon
- SeafoodWatch certified

Monterey Bay Aquarium Seafood Watch

The Monterey Bay Aquarium's Seafood Watch program creates seafood consumption guidelines that help you make a sustainable, delicious choice!
In recent years, there has been increased focus on living a healthy and sustainable lifestyle. People are buying organic products because they are generally less harmful to the environment and more ecologically sustainable. But even in the midst of this newfound green conscientiousness, the ocean is being ignored. The primary source of high-quality protein is the ocean. The ocean also produces approximately 16-17% of all extant animal protein. About 14% of the world’s population depends on seafood as their main source of protein. Therefore, it is alarming (and perhaps predictable) that the oceans are being overfished at dangerous rates. Since the 1940’s there have been huge improvements in sea farming technology, allowing us to capture more seafood at faster rates and in larger quantities. However, the fishing rates often exceed the replenishment abilities of the natural populations. This is especially damaging to those populations with naturally lower reproductive rates, such as the North Atlantic Cod.

Many such fishing practices are also very damaging to the environment as well. For example, “bottom trawling” involves dragging a large net weighted with large wheels or metal plates along the ocean floor. The net crushes everything on the bottom floor, devastating the impacted habitat. The specific habitat will often require several hundreds of years to fully recover. Bottom trawling is also problematic in that it results in a large amount of “bycatch.” Bycatch is a term used to refer to sea-life unintentionally caught by the trawling net that was not the targeted species of interest for the fishery. It is estimated for every 1 gigaton of targeted fish caught, there are about 10 to 20 gigatons of bycatch.

To reduce the anthropogenic destruction of the ocean, people have turned to commercially farmed fish. The populations of some wild species have been depleted so severely that they may only be purchased from commercial farms. Currently, farmed fish supply about 50% of the total fish bought at local fish markets and supermarkets. However, the majority of the customers do not fully understand what differentiates wild-caught seafood from commercially farmed seafood. New methods should be developed to better educate the consumers in this respect, thereby improving the sustainability of ocean produce. The organic-food movement should involve commercially farmed food as well.

In recent years, whenever customers order fish from the supermarket or a fish market, the one thing they always ask is if the fish is either farmed or wild caught. The difference between each other is that farmed fish is grown commercially in a tank on land or in the ocean surrounded by nets while wild caught fish basically speaks for itself. In recent studies, it shows that 50% of the fish currently comes from fish farms but even if that's true, most of the people today will always prefer wild caught fish than farmed fish. Most of the reasons why wild fish is preferred usually come from the Internet. There are a lot of articles stating how farmed fish is bad for your
health and that wild caught is the way to go but what you don't know is how and what fishermen do, in order to acquire the wild caught fish.

In the world, there is always a high demand for fish and fish protein and because of that it leads to the first problem, overfishing. Overfishing can lead to many things that includes population collapse, destruction of species that rely on those fish to survive, and then overpopulation of the other species that the fish preys on to survive. Another problem involves the destruction of habitats. In order to catch enormous amounts of fish in a short amount of time without a lot of work, huge nets were created, some as long as 80 miles. These nets would clear cut the ocean floor that not only destroys the habitats of millions of species but it also leads to a lot of by-catch which include dolphins, sea turtles, and other unwanted fish. The term by-catch means the unwanted marine creatures that are caught in the nets while fishing. You would think they would use the by-catch as a source of income selling it to other companies but they don't. After they catch it they are later discarded as waste.

Some of the fishes today, for example tilapia, are actually only sold as farmed fish since there isn’t enough supply of that particular fish in the ocean. Eventually as time goes by, since we catch more fish than they can reproduce, there is going to be less amounts of wild fish in the ocean and farmed fish is all we’re going to have left. You have to ask yourself, would you rather have farmed fish or no fish at all?