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The Global, Regional, and Local Effects of the Commercial Fishing Industry

**Introduction**

The purpose of this research paper is to explore the two-way effects involved in the act of commercial fishing. For thousands of years, humans have relied on our oceans as one of the best places to find their next meal. Fishing has had the ability to support entire communities economically, as well as nutritionally. With over 15,300 different species of marine fish in the ocean, this is not particularly anything new to us (Census of Marine Life, 2003, 1). However, a lot has changed since the days when there were fishing communities that strictly relied on the success of their fishing tactics to feed themselves. Now, fish are caught in mass amounts and distributed around the world. Have we outdone ourselves? Is there a possibility that we may completely wipe out the fish that we have cherished for so long? This paper will explore the positive and negative effects that our fishing tendencies are having on three areas: the ocean as a whole, the Atlantic Ocean in the region of Florida, and the specific area of the Indian River Lagoon, Ponce Inlet, FL.

**Background**

To provide a bit of background we will define the term “commercial fishing”; “fishing in which the fish harvested, either in whole or in part, are intended to enter commerce or enter commerce through sale, barter or trade” (“102”, 2016, 1). This type of fishing has made it possible for people like us for example, living in Michigan, to eat those awesome saltwater fish that some many people enjoy. It has done wonders for business in every corner of the world. This industry accounted for about $230.4 billion in 2014, and is estimated to reach about $318 billion by 2022 (Reddy, Niha, 2015, 1). However, fishing unsustainably has led to consequences. A main downside of commercial fishing is described by the use of the term “bycatch”. This term is defined as, “the unintended capture of nontarget animals, including those landed and those that escaped from the fishing gear” (Raby, 2011, 271). The impact that bycatch has on marine and freshwater ecosystems has grabbed a great deal of my attention throughout this research because it plays a huge role in the two-way effect of commercial fishing.

**Global Effects**

Worldwide, our ocean as we know it is changing. There are coral reefs that have been completely wiped out, species that are extinct, and many other issues that are directly and indirectly caused by the fishing industry. However, the initial reasons this industry grew to be so large are not all negative. It provides a healthy lifestyle for people across the world; all of the new knowledge that humans have about the positive health benefits of eating fish raises its demand. Also, as stated earlier, commercial fishing has an economic value of roughly $230.4 billion (Reddy, Niha, 2015, 1). An industry with this amplitude has the inevitable ability to create jobs all over the world; an indication that the ocean and its wildlife has benefited us as humans in many ways. How are we affecting it?

Most of the statistics on the worldwide fishing industry, including the global bycatch percentages are not in the oceans favor. As of 2014, we have found that “29 percent of global fish stocks are over exploited” (Living Blue Planet, 2015, 25). In addition to the stocks that have been pushed over their limit and classified as overfished, the Living Blue Planet Report reveals that roughly 61 percent of fish stocks have been fully exploited (Living Blue Planet, 2015, 26). A major economic tenement, as the demand of a product increases, the supply of that product is required to increase in order to provide for that amount of demand is demonstrated here. What we are seeing in the global fishing industry is consumers are demanding higher and higher amounts of fish, assuming that the supply will always be there. So much so that some of these commercial fishing companies have resorted to scraping the bottom of the barrel and going into deeper waters, fishing at greater depths than ever before. “Around 40 percent of the world’s fishing grounds are now in waters deeper than 200 meters and many deep-water species are likely to be overexploited” (Living Blue Planet, 2015, 26). This same report also shows something possibly more sinister. “Most deep-sea fisheries considered unsustainable have started to target fish populations that are low in productivity, with long lifespans, slow growth and late maturity” (Living Blue Planet, 26). What we are also seeing is that overfishing is not just a problem at the industrial-scale level. Many of these industrial-scale fleets bully smaller-scale fleets that rely on the fishing industry to support their communities, to the point that they have to resort to destructive fishing practices to compete to survive.

Another negative aspect of the fishing industry is the presence of Illegal, Unreported, Unregulated (IUU) fishing in the world’s oceans. These fleets have accounted for roughly 11-26 million tons of fish per year, which is within the range of 12-29% of global capture (Living Blue Planet, 2015, 28). The monetary value of these “pirate fish products” is in the range of $10-23.5 billion annually (“Overfishing” 4). However, there are organizations and programs that are fighting against the issues of IUU fishing. These programs are specifically being put in place in the Southern Ocean. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is a very large proponent of this; “After these mechanisms were put in place, there was an approximately 90 percent greater decrease in IUU catches” (Österblom, Henrik, 2012, 640). This is a very promising statistic in regards to a positive push for the preservation of marine life.

Bycatch is very closely related to the issue of overfishing all over the world; as stated earlier, bycatch is “the unintended capture of nontarget animals, including those landed and those that escaped from the fishing gear” (Raby, 2011, 271). We are seeing a loss of animals such as sea turtles, dolphins, sharks, seabirds and many more. An estimation of the global bycatch levels was revealed in the Living Blue Planet Report, with the exclusion of IUU fishing; we find that it is 7.3 million tonnes (Living Blue Planet, 2015, 28) or 8.05 million tons.

In addition to these bycatch levels, we must investigate the types of fish associated and where they are sourced from. Due to the types of fish that we are demanding, commercial fishing fleets are going out and targeting predator fish such as tuna, cod, and groupers (Jha, Alok, 2011, 1). When we do this, we are effecting a lot more than just simply that fish species. In an article written by the World Wildlife Fund, the authors claim that targeting these predators “eventually disrupts marine communities, causing increased abundance of smaller marine animals… [and has] impacts on the rest of the marine ecosystem, such as increased growth of algae and threats to coral reef health” (“Overfishing” 5). This concept seems obvious to bystanders like us; imagine how many antelopes in Africa if we all of the sudden decided we enjoyed the taste of lions and began to hunt them to the point of extinction.

Though it may seem as though there is nothing but negative consequences as a result of the fishing industry, there is a light at the end of the tunnel; this light is in the form of the Marine Stewardship Council (MSC). This is a non-profit international organization that the World Wildlife Fund helped found. As stated on the Marine Stewardship Council’s website, “The MSC works with scientists, fisheries, seafood producers and brands to promote sustainable fishing and safeguard seafood supplies for the future” (“What We Do” 1). By visiting their website, you will have the ability to learn more about how they carry out their vision of a sustainable fishing industry. In 2015, the MSC had a record year. They certified 256 fisheries in 36 countries, and accounted for 9.7 million tons of seafood, which was about 10 percent of what the seafood industry did last year; there were roughly 17,000 products available with the MSC label, and consumers spent about $4.5 billion on MSC labeled goods (“2010-2015: New Horizons” 1).

**Regional Effects**

In order to look at the regional impact of the commercial fishing industry, scientists look at bycatch levels in different areas around the U.S. In 2005, a study was conducted by the National Marine Fisheries Services (NMFS) to find the ratio of bycatch to total catch within US Fisheries. They calculated this as bycatch divided by total catch (Brooke, Desfosse, and Karp 1). Out of the 152 total fisheries in the United States, 61 were included in this study. The fisheries were then broken up into five regions: Pacific Island, Alaskan, Northwest, Southwest, Northeast, and Southeast. Below are the results.

* + - Pacific Island Region—2 fisheries—ratio of .14
    - Alaska Region—27 fisheries—ratio of .07
    - Northwest Region—5 fisheries—ratio of .07
    - Southwest Region—0 fisheries
    - Northeast Region—25 fisheries—ratio of .14
    - Southeast Region—2 fisheries—ratio of .76 (Brooke et al., 3)

Florida fell under the Southeast Region. Though the results show that it has the worst bycatch ratio, we must take into account that only two fisheries were included in the calculation; of the 152 fishers nationwide, 61 were used in this national bycatch ratio estimate. The commercial fishing industry in Florida is much larger than that of just two fisheries. In the 2013/14 fiscal year, there were 12,681 Saltwater Products Licenses (SPL) sold, generating $937,450 for the state; in the 2014/15 fiscal year, there were 9,892 individual commercial SPL accounts; 8.555 individual SPL accounts as of 9/29/2015; 1,595 wholesale and 5,637 retail dealer licenses sold, generating $799,700 for the state (“The Economic Impact” 1). The NMFS should be able to gather a bit more information to come up with a more accurate bycatch ratio. However, if the ratio were to stay relatively as high as 0.76, there would be a major problem to deal with.

In addition to Florida’s commercial fishing industry, there is a large amount of people participating in recreational fishing. According to the Florida Fish and Wildlife Conservation Commission’s 2014 Socioeconomic Assessment, the recreational freshwater fishing industry accounts for $1.7 billion and 14,040, and the recreational saltwater fishing industry accounts for $7.6 billion and upwards of 109,341 jobs (“Economics”, chart 1). There were over 123,381, out of 19.89 million, people that relied on fishing as a career. One very successful industry in Florida is its charter fishing industry. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) defines charter fishing as “fishing from a vessel carrying a passenger for hire...who is engaged in recreational fishing” (“102”, 2016, 1). Many tourists, as well as those who are native to Florida, enjoy going on these types of trips due to the experience and the wide variety of possible catches. According to one website, Florida’s top 10 list of fish includes Tarpon, Sailfish, Spotted Sea Trout, Snook, Red drum, Largemouth bass, Panfish, Grouper, Snappers, and Mackerels (“Florida’s Top Ten.” 1).

**Local Effects**

To narrow down this topic to the local level, we will look at the positive and negative impacts of the fishing industry on Ponce Inlet and the Indian River Lagoon. The Indian River Lagoon occupies roughly 156 miles of Florida’s east coast. The northern tip of the lagoon is located at the Ponce de Leon Inlet, and travels south toward the Hobe Sound and Jupiter Inlet. This strip of the 3000 mile Intracoastal Waterway has become an integral asset to Florida. According to Captain Richard Bradley, “The Indian River Lagoon has helped groom central Florida into a true eco-tourism and outdoor destination for American and the world” (Bradley, “The Lagooner” 2016).

In addition to the Indian River Lagoon Florida to become a “true eco-tourism and outdoor destination”, it has a large, positive, economic impact on the local communities. Annually, the lagoon is able to generate upwards of $3.7 billion, and support about 15,000 full and part-time jobs; in turn, it generates recreational opportunities for over 11 million people per year (“The Indian River Lagoon” 2014, 1). As we saw earlier in the Florida Fish and Wildlife Conservation Commission’s 2014 Socioeconomic Assessment, there are roughly 123.381 fishing jobs in the state of Florida. Which means that of all of the fishing occupations in Florida, the 156-mile stretch of the Indian River Lagoon is responsible for about 12.16 percent.

In Ponce Inlet, Florida, there is an extremely wide variety of seafood restaurants including the North Turn, Hidden Treasure, and Crabby Joe’s. I was not able to find out exactly where each of these restaurant outsource their seafood. However, after talking with a manager at Hidden Treasure, I found out that they are connected to a charter fishing company, Rainbow Charters. This allows the restaurant to offer fresh, local catch to customers who are looking for some variety. In addition to the charter company solely providing what they catch themselves, they team up with Hidden Treasure to cook up whatever it is that their customers catch while out on their personal charter fishing adventure.

Though I was not able to find out where exactly each restaurant sourced its seafood, I was able to take note of each menu and correlate the similarities in the seafood listed. Below is a chart of the notes I took; highlighted in green are species found in one of the three; highlighted in yellow are species found in two of the three; highlighted in red are those found in all three.

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This data shows there are obvious overlaps in the types of marine life that is in high demand in the Ponce Inlet. We are able to see that five of the species are in red, indicating they are served in each; five that are served in two of the three; and three that are exclusive to one specific restaurant. In each of the three restaurants, I was not able to get any more information on whether or not their operations required the MSC label; if they are providing any efforts to help maintain the health of the lagoon; or how much of an impact they would experience if the lagoon were to lose its fish species.

**Conclusion**

The purpose of this research paper was to explore the two-way effects involved in the act of commercial fishing; to determine the positive impacts that our oceans have on the fishing industry, as well as the negative impacts the fishing industry has on our oceans. The expansion of this industry has made it possible for people in all corners of the world to experience the extraordinary variety of tastes and benefits marine life has to offer. In addition to the consumer benefits, in 2014 it had accounted for about $230.4 billion for the global economy and is estimated to reach $318 billion by 2022 (Reddy, Niha, 2015, 1). From 2013 to 2015, Florida made over $1.7 million off its fishing industry from taxes alone. Between the freshwater and saltwater recreational fishing in 2014, there was roughly 123,381 jobs and $9.3 billion generated.

On the other hand, there are many ways in which we, as humans, have begun to destroy our oceans. There are coral reefs have been completely wiped out, species that are extinct, and many other issues directly and indirectly caused by the fishing industry. The scary thing is that the reason behind most of this is simply our demand for a healthy lifestyle. A majority of humans have come to the conclusion that fish is the most beneficial food to eat. However, this has resulted in over 29 percent of global fish stocks to be exposed, along with 61 percent of stocks being over exploited (Living Blue Plantet, 2015, 26). We are beginning to fish at the bottom of the barrel, going deeper than 200 meters to commercially fish, resulting in overexploitation of these areas. In addition to the legal industrialized fishing fleets, there are also IUU fleets producing roughly 11-26 million tons of fish per year, as well as doing anywhere from $10-23.5 billion annually (“Overfishing” 4). The global bycatch levels are higher than ever, and untargeted species are constantly having to be put under the endangered category because of it.

Works Cited

Bradley, Richard. "Lagooner." *Indian River Lagoon, Florida's Intracoastal Waterway IRL*. 19 Jan. 2016. Web. 22 Mar. 2016. <http://indian-river.lagooner.com/>.

Brooke, Samantha G., Lisa L. Desfosse, William A. Karp. “Estimating Overall Fish Bycatch in U.S Commercial Fisheries.” *Marine Fisheries Review* 74.3 (2012): 1-5.

Census of Marine Life. "How Many Fish In The Sea? Census of Marine Life Launches First Report." ScienceDaily. ScienceDaily, 24 October 2003.

"Economics." *FWC-*. Web. 10 Mar. 2016. <http://www.myfwc.com/about/overview/economics/>.

"Florida's Top 10 List of Fish." *| VisitFlorida.com*. Web. 22 Mar. 2016. <http://www.visitflorida.com/en-us/fishing/articles/fishing-capital/kingmackereltomalin051614.html>.

"Indian River Lagoon - Spacecoast Business Magazine." *Spacecoast Business Magazine RSS*. 2014. Web. 10 Mar. 2016.

Jha, Alok. "Eat More Anchovies, Herring and Sardines to save the Ocean's Fish Stocks." *The Guardian*. Guardian News and Media, 18 Feb. 2011. Web. 22 Mar. 2016.

"Living Blue Planet Report 2015." *WorldWildlife.org*. World Wildlife Fund, 2015. Web. 10 Mar. 2016.

"Overfishing." *WorldWildlife.org*. World Wildlife Fund. Web. 09 Mar. 2016.

Österblom, Henrik, and Örjan Bodin. "Global Cooperation among Diverse Organizations to Reduce Illegal Fishing in the Southern Ocean." *Conservation Biology* 26.4 (2012): 638-48. Web.

Raby, Graham D., Alison H. Colotelo, Steven J. Cooke, and Gabriel Blouin-Demers. "Freshwater Commercial Bycatch: An Understated Conservation Problem." *BioScience* 61.4 (2011): 271-279. Web.

Reddy, Niha. "Global Commercial Fishing Industry Market Outlook (2015-2022)." 9 Dec. 2015. Web.

"The Economic Impact of Saltwater Fishing in Florida." *Value of Saltwater Fishing in Florida*. Web. 22 Mar. 2016. <http://myfwc.com/conservation/value/saltwater-fishing/>.

"The Indian River Lagoon: An Estuary of National Significance." *News Releases*. Web. 10 Mar. 2016.

"What We Do." *—*. Web. 22 Mar. 2016. <https://www.msc.org/about-us/what-we-do>.

"102." *102*. Web. 22 Mar. 2016. <http://www.nmfs.noaa.gov/sfa/sfaguide/102.htm>.

"2010-2015: New Horizons." *—*. Web. 22 Mar. 2016. <https://www.msc.org/about-us/our-history/2010-2015-new-horizons>.