Appendix 2
NR 153
Policy Paper

The Salmon Stock's Decline in the Northwestern United States

Problem Definition

Throughout history, salmon fishing has been an integral part of the culture and economy of Alaska and the Northwestern U.S. The decline in salmon in these areas has drastic effects on not only the economy and lifestyle of the locals, but of the national and international communities as well.[1]

Salmon is a large part of America's diet, as well as nations across the world. Salmon consumption in the U.S. increased nine-fold between 1987 and 1999, while the European salmon consumption increased more than four times, and in Japan salmon consumption doubled **(**An Overview of Atlantic Salmon, 2010).[2] In fact, the National Marine Fisheries Service estimates "that salmon makes up 14% of the total U.S. fish consumption" while in 1989, "salmon made up about 5%" of fish eaten (An Overview of Atlantic Salmon, 2010).

Salmon species are the Chinook, chum, coho, pink, Atlantic, and sockeye, and "commercial fisheries are some of the most valuable fisheries in the United States, second only to crab" (Salmon Group Page, 2012). Fishing for Atlantic Salmon is prohibited by law, restricting fishermen to farm-raised Atlantic salmon only, due the low population levels and its protection under the Endangered Species Act (Salmon Group

[1] Establishes direction for the paper; a thesis statement, more or less, which identifies the argument being made in the paper
[2] Why it is important; background overview. In a lengthier research paper, a common approach is typically to give a subject overview in the beginning of the essay, to explain why the subject and thesis is of importance to begin with.

Page, 2012). The international trade in coastal and marine fisheries contributes $70 billion annually to our nation's economy, $554,796,956 of which is from fishing salmon (Commercial Fishing- A Cultural Tradition, 2011).

Salmon fishing has continually been an integral part of Alaska's economy and culture.[3] According to the Alaska History & Cultural Studies Website, salmon commercial fishing contributes about 5% of Alaska's economic base, and that is after recent competition from Chile, Norway, and British Columbia has decreased the market for Alaskan wild salmon ("Modern Alaska: Alaska Economy,"[4] 2012). According to the Alaska Department of Fish & Game, the total value of Alaska's commercial fisheries is $1.5 billion to the fishermen, with a wholesale value of $3.6 billion (Commercial Fisheries 2012). "Preliminary estimates for 2010 indicate commercial fishermen harvested 168 million salmon, which had an estimated total value of $533.9 million, the largest exvessel value in 18 years" (Alaska's Fishing Industry, 2011). Alaska accounted for 95% of total U.S. pacific salmon landings in 2009 (The Seafood Industry in Alaska's Economy, 2011). The total economic impact of the seafood industry in Alaska was estimated at 4.6 billion in 2009, and thousands of Alaskans depend on sustenance and personal use fisheries for food (Commercial Fisheries 2012).

For many tribes in the Northwest, salmon fishing is way of life; in fact the Native Americans of the Pacific Northwest refer to themselves as "Salmon People". According to PBS, the Nisqually tribe in Washington State held "fish-ins" in protest of the

[3] Note how this relates to the thesis of economic and cultural effects. Your thesis statement should outline the subsequent paragraphs, and be clearly marked by the topic sentence.

[4] No author for the source you need to cite? Put the title instead, followed by the year of publication.

limitations the government forced upon Native American fishing, whereas commercial fishermen caught salmon by the millions (Campbell, 2012). Finally, in 1974, Judge George Boldt's ruling "reaffirmed the rights of tribal members to fish, hunt and harvest shellfish on their native land and allocated half of the state's annual catch to tribes" (Campbell, K. et al., 2012). The Chairman of the Northwest Indian Fisheries Commission explains, "our economy was built around salmon, we're trying to bring them back to make that economy come to life within our tribes" (Campbell, K. et al., 2012).[5]

At the start of the 1990's, there began to be a noticeable decline in salmon stock in the Northwest United States. A report done by the American Fisheries Society, "214 of about 400 stocks of salmon, steelhead, and sea-run cutthroat trout in the Northwest and California are at risk of extinction. The report also indicated that 106 are already extinct" (Pacific Salmon 1991).

The EPA reported that Puget Sounds salmon stocks, which were historically 44-93 million large in the late 1800s, reached 24.8 million in the late 1900s; only 36.2% of the historic run size (Lackey 2003). The Washington Coast salmon stock has gone from 2-6 million historically to 0.07 million in the late 1900s; 1.8% of the historic run size (Lackey 2003). The trend is same throughout the Northwest, with the Columbia Basin and the Oregon Coast's salmon stock size at only 1.7% and 7.0% of the historic run size, respectively. California saw a stock size of only 5.1% of its historic run size (Lackey 2003). It is clear that since the late 1800s, the salmon stock in the Northwest has declined significantly. In 2006, according to the Northwest Power Conservation Council, "a total

[5] Quotes were used to help support the argument of effects on the culture. When including a quote, think about the relevance of the person you are quoting. They should be credible, part of the group you're writing about, etc.

of 263 jacks were counted at Lower Granite, the highest since 460 were counted in 1976" ("Columbia River History: Extinction" 2010). The U.S. Fish & Wildlife Service reports; "some stocks are so severely reduced that they have been listed as endangered or threatened species under the Endangered Species Act" (Pacific Salmon 1991).

While the Alaskan salmon stock, in particular, has seen dramatic improvement, other countries and states have failed to adapt more sustainable fishing practices.[6] Unfortunately, since the ocean and its resources are shared by all the nations of the world, each countries' fishing policy has a major effect on the livelihoods and economies of all other countries engaged in fishing practices. According to the Alaska Fisheries Research Bulletin, "as of spring 2006 only 3 salmon stocks in Alaska are classified as stocks of management concern" (Clark et al., 2006 [5]). While no stocks in Alaska have been identified as threatened or endangered under the Endangered Species Act, salmon runs in other areas of the west coast of North America are looking dismal (Clark et al., 2006 [5]).

Alaska, however, is not the only state that depends on the salmon industry for economic growth and stability. Washington, Idaho, and Oregon are among other states in the U.S. that are attempting to sustainably manage the salmon populations. Canada, more specifically British Columbia, is also struggling to deal with the decline of the salmon stocks. Over the last several decades declining salmon stocks surfaced as a major concern. In 2009, the Fraser River saw extremely low sockeye return—the lowest in 50 years (The Fraser Sockeye Inquiry, 2009). The Prime Minister announced a 14 million

[6] This is starting to introduce the second part of the thesis: "national and international communities as well"; there is a clear order to the organization of paragraphs. If you are having trouble with organizing and putting your points in order, try making an outline before you begin writing.

dollar federal inquiry to examine the issue, which has led to a discovery of a steady decline in sockeye productivity as well (The Fraser Sockeye Inquiry, 2009).

According to the Washington State Recreation and Conservation Office, "by 1999, wild salmon had disappeared from about 40 percent of their historic breeding ranges in Oregon, Washington, Idaho, and California" and that in Washington "the numbers had dwindled so much that salmon and bull trout were listed as threatened or endangered in nearly three-fourths of the state" (Salmon Recovery in Washington: Washington's Efforts 2010). According to the Washington State website, they are working toward recovery by creating healthier habitats, and through managing the fisheries through harvesting less fish and making improvements to hatcheries. The harvest rate has reportedly "dropped an average of 41 percent in response to Endangered Species Act listings" (Salmon Recovery in Washington: Washington's Efforts 2010). According to the website, "of the 12 Endangered Species Act listed salmon with available date, 8 are stable or increasing, 2 are declining, and 2 have insufficient date to determine status" (Salmon Recovery in Washington: Is Recovery Working? 2010). The efforts in Washington and the effects of recovery funding and action are much different from that of the Alaskan fisheries.

Save Our Wild Salmon is "a nationwide coalition of conservation organization, commercial and sports fishing associations, businesses, river groups, and taxpayer advocates" (Save Our Wild Salmon 2012). The majority of salmon returning to the Columbia and Snake Rivers are hatchery fish—around 80%-which clearly outlines the dangers faced by wild populations ("Wild Salmon & Steelhead," 2012). Oregon, Washington, Idaho, and California all have extensive websites filled with plans for

recovery of salmon species, however many of these plans have not yet been implemented or are still being rewritten and adjusted, and none have yielded results anywhere near of that of Alaska.

Policy Evolution[7]

Salmon had been fished sustainably for centuries by the tribes of the Northwest, however this changed with the Russians and Americans moved in to the area. When Alaska was obtained by the United States from Russia in 1867, it was solely a territory controlled and operated by the federal government. The Alaska Salmon Fisheries Act of 1889 was "passed to protect the salmon fisheries of Alaska" and "specifically prohibited the erection of dams or other obstructions on salmon streams" (Fish management, 1988). In 1900, the Act of 1896 was further amended to require that each sockeye salmon cannery in Alaska establish and operate a salmon hatchery (Fish management, 1988). According to a study conducted by the Alaska Fisheries Research Bulletin, the annual average Alaskan commercial harvest yielded 30 million salmon from 1900 to 1910, but increased in 1910-1920 to 65 million salmon annually (Clark et al., 2006 [1]). Congress remained in control of Alaska's fisheries because Alaska had yet to become a state.[8] "The Alaska Salmon Fisheries Act of 1906 established the first license tax on salmon landings but, perhaps more important, the Act also provided for a tax rebate to those companies

[7] This class assignment in particular had the intent of writing a "Problem Definition" and "Policy Evolution"; this is not a typical structure (dividing sections) for a research paper, but be sure to check the assignment sheet

[8] This section does not have the typical research paper format as the first section. The title "Policy Evolution" says that it will include a historical overview of salmon in the region and the policies implemented overtime regarding the species. Chronological order is the best way to organize time-relevant information.

operating salmon hatcheries and, if anything, only aggravated the damage that was already being inflicted upon the salmon runs where hatcheries had been established by the local canneries" (Fish management, 1988).

From 1906 to 1924, 42 bills were introduced in Congress proposing various restrictive regulations on the commercial salmon fishery, sparked by concerns that overfishing was depleting salmon runs in Alaska (Clark et al., 2006 [2]).[9] Multiple Acts about the management of fisheries were enacted until January of 1960, when the state government was given control of the management of fisheries in Alaska. The second Organic Act, passed in 1912, "provided for a territorial legislature with limited self-government," however "Alaska remained the sole exception to the convention that new territories were given some degree of autonomy in the management of fisheries" (Clark et al., 2006 [2]). The White Act in 1924 "gave broad authority to the Secretary of Commerce to regulate fisheries in all territorial waters including the authority to limit catch, size and type of fishing gear, and seasons" and was the "first attempts to regulate Alaska's salmon fishery for sustained yield" (Clark et al., 2006 [2]).

From 1920-1929, the average Alaskan commercial harvest increased to about 70 million salmon, prompting the Southwest Alaska Fisheries Reservation in 1933, a presidential order that "limited the case pack (harvest), the amount of gear that a fisherman could use, and the number of cannery operations" which enacted a new licensing system. The Alaskan commercial harvest increased between 1930 and 1939, with an average of about 90 million salmon, moving lobbyists to push for the abandoning

[9] Not the typical "topic sentence" that you would see in a research paper, but a new paragraph was still necessary because there was a shift topic, more or less ("42 bills were introduced…")

or liberalization of regulations restricting harvests (Clark et al., 2006 [2]). When harvests began to decline in 1939, the U.S. Fish & Wildlife Service took over management of Alaska's salmon fisheries until Alaska's state government took over in 1960. Alaska's state government inherited a decreasing salmon harvest; between 1950 and 1959, average annual commercial harvest decreased to an average of 40 million salmon, and the total harvest in 1959 had been reduced to about 25 million salmon (Clark et al., 2006 [3]). The Alaskans viewed "the transfer of fishery management in 1960 as more than just a step toward the sovereignty guarantee by Statehood" (Taking Control, 2012). However the salmon canners were reluctant to lose their influence once the state government took over (Taking Control, 2012). Salmon runs generally improved in the 1960s, with catches of 40 to 60 million salmon annually, unfortunately the harvest fell into a cycle of boom and bust and required assistance form the federal government (Taking Control, 2012).

The State of Alaska enacted "the first comprehensive limited entry program in the United States" in which "Alaska stabilized the number of fishermen and therefore the amount of gear used in each of the State's salmon fisheries" while succeeding "in maintain a high proportion of Alaska resident participation in the state's salmon fisheries" (Clark et al., 2006 [3]).

A study conducted in 2006 by the Alaska Fisheries Research Bulletin states that when the state government took over control of the salmon fisheries from the federal government, the state's salmon runs were experiencing a period of depression. However, since 1990, it seems as though the state has successfully revived the salmon population. According to a study conducted in 2006 by John H. Clark and colleagues, in the 1950s, the annual harvest was 41 million fish. This marked the end of federal management of the

state's commercial salmon fisheries. In 1960 Alaska assumed management authority of its salmon fisheries, and the state's salmon runs became depressed. Since 1990, salmon fisheries have harvested an average of 172 million salmon annually, marking a clear difference in management styles between the state and the federal governments (Clark et al., 2006).

This revival in Alaska seems in part due to the policy put in place by the Fish Board in 2000. The Sustainable Salmon Fisheries Policy gained approval by the Marine Stewardship Council shortly after its adoption. The Policy for the Management of Sustainable Salmon Fisheries, as it was also called, offered two things: "a template in which to make decisions about how to regulate salmon stocks in the state of Alaska, and a common language that was carefully vetted so that no matter where you were in the state, the different terms in the discussion of salmon stocks were defined and understood before the regulatory body and the users themselves" (King, B 2009). The goal of the policy "is to 'ensure conservation of salmon and salmon's required marine and aquatic habitats, protection of customary and traditional uses and other uses, and the sustained economic health of Alaska's fishing communities" (Clark et al., 2006). This was a landmark policy-- a key player in the updating and strengthening of Alaska salmon management.

The original Magnuson-Stevens Act was enacted in 1976 and was "the foundational legislation for conservation and management of fisheries within the U.S. Exclusive Economic Zone. Besides establishing the framework for regulating U.S. fisheries, the Act contains specific and extensive prohibitions and enforcement authorities to ensure a high rate of compliance with laws and regulations governing both domestic

and foreign fishing within the EEZ" ("Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006", 2007).

The renegotiation of the Magnuson-Stevens Act in 2006 yielded changes in fisheries policy. According to the Biennial Report to Congress in January 2011, the implementation of Title IV of the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006 "called attention to the need for international cooperation to address fishing activities that have a deleterious effect on sustainable fisheries worldwide" and "required the Secretary of Commerce to identify countries whose fishing vessels were engaged in these activities, and to consult with those countries on improving their fisheries management and enforcement practices" ("Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006", 2007).

As shown in the renegotiation of the Magnuson-Stevens Act and reiterated by the Alaska Department of Fish and Game, "Alaska's fishery management practices were held as a model for other regional councils around the country to follow" (King, B. 2009 [47]). The United States, however, does not have an effective salmon recovery plan in all states. Congress established the Pacific Coastal Salmon Recovery Fund in 2000, to "protect restore, and conserve Pacific salmon and steelhead populations and their habitats," as well as provide "funding to states and tribes of the Pacific Coast region—Washington, Oregon, California, Nevada, Idaho and Alaska" ("Pacific Coastal Salmon Recovery Fund," 2012).

In addition, Alaska's implemented policies have led to international reform. In the 2009 Report to Congress the Commerce Department identified countries engaged in

illegal, unreported, and unregulated fishing during the preceding two years and opened up relations and has worked to help these nations act against these offensive activities ("Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006", 2007).

However, the NOAA fisheries 2011 totals report the highest overall commercial landings totals since 1994, suggesting all previous polices have done little to curb commercial fishermen's catches of salmon (NOAA Fisheries… 2012).

Policy Options:

Cost of Inaction

If the Northwestern United States does not act on the declining population of salmon, the population may continue to decline much like the Northern Cod.[10] "Globally, the rate of fisheries collapses, defined here as catches dropping below 10% of the recorded maximum, has been accelerating over time, with 29% of currently fished species considered collapsed in 2003 (Worm, B. 2006). If the current practices are not changed, "all fish stocks would collapse by 2048" (de Vrieze, J., 2012).

The Northern Cod population was once overabundant. Historically, Northern Cod "comprised almost three-quarters of all fish landed in Newfoundland and employed sixty to seventy per cent of all fishermen and plant workers" (Mahoney 1994). The cod fishery was sustained for centuries because people were "skimming off the excess that nature could produce" and the limited technology of the day controlled the catch and did not

[10] A clear first sentence, getting directly to the point

produce much waste (Keating 1994). Between 1850 and 1950, "the Northern Cod catch only grew from 200,000 to about 300,000 tonnes a year" (Keating 1994). However, with the rise in new technologies, "annual catch shot up in a few years to a peak of 800,000 tonnes [per year] by the late 1960's" (Keating 1994). The cod population crashed in the late 1980s. Since then, governmental bodies have searched for cost-effective ways to maintain the cod population. Since 1989, the federal fisheries department pushed for dramatic reductions in fishing quotas, however, in July 1992, when a two year moratorium was imposed on fishing the remaining Northern Cod, 25,000 people were out of work, and the economy became stagnant in around 400-700 fishing communities in Newfoundland (Keating 1994). In the North American cod fishery, the catch has declined by 90 percent since the early 1980s, and that the cod population could disappear in 15 years (Bonello, 2004).[11]

If there is no action to maintain a sustainable population of salmon, just as there was no action for the cod fishery, the population of salmon will continue to decrease and eventually disappear, taking with it jobs, money, and livelihoods.

Declare all salmon protected under the Endangered Species Act

One policy option is to extend the Endangered Species Act so that it includes all species of salmon.[12] The Oregon population of coho salmon has already been placed under the Endangered Species Act and has seen a increase in the population.

[11] Like the previous sections, gives a historical overview (in chronological order) in order to address the importance of the issue. This time it is the body of the response, because it is used as a comparison tool (to the salmon decline)
[12] Introduce the concept, then expand.

In the past, the Endangered Species Act has been used in Oregon to halt the coho harvest, however this was only implemented after the salmon were at less than 3% of historic abundance (Rahr, Guido R., 2012). It was found that "the longer a species is listed and subject to the regulation of take, the more likely it is to be improving and the less likely to be declining… this suggests that imperiled species should be listed under the ESA as soon as possible" (Taylor, et al., 2005). Surprisingly, wild coastal coho returns hit 262,000 in 2009, the highest in at least two decades of counting, however they still remain at about 10% of their historical levels (Learn, 2011).

Only 14% of species have recovered from the point of collapse, however most of these were protected birds and mammals (Worm, B. 2006). Placing a species on the Endangered Species List is considered by some a beneficial way to improve the species' abundance. In fact "few threatened and endangered species have fully recovered, [and] the short time most have been protected (15.5 years on average) renders this a weak test of the Endangered Species Act" (Taylor, et al., 2005). However, in 2006, the federal government "announced its decision to formally remove the fish from Endangered Species Act protection" due to the "modest up-tick in numbers since being ESA-listed in 1998" (Lovell & Curtis, 2006). While the federal government deems this a success story, scientists "believe the rebound may be largely the result of better ocean conditions" and that the coho "appear to need protection now more than ever (Lovell & Curtis, 2006).

While placing a threatened species under the Endangered Species Act may not cause the immediate bounce back of the species, the chances of the species recovering are higher than inaction.

Implement a farm-raised only law

One option for policy makers is to implement a farm-raised only law that would apply to all species of salmon. While there are six species of salmon fished in the United States, only the fishing of the Atlantic salmon is prohibited.

This law restricts the sale of Atlantic salmon to only farm-raised salmon (Fay, C, 2006). Due to overexploitation, degradation of water quality, and damming of rivers, Atlantic salmon runs in New England were severely depleted by the early 19th century (Salmon Group Page 2012). As a result of this, "fewer than 2,000 salmon return annually to their spawning grounds in New England- barely 1 percent of the historic population" (Atlantic Salmon Restoration, 2001). In order to prevent the further declination of the Atlantic salmon, the fishing of wild Atlantic salmon was prohibited.

Despite these actions, the Atlantic salmon continues to be endangered. Instead of focusing on the causes of the decrease in population, they introduced farm-raised salmon. By introducing hatchery-bred salmon, "we have weakened these native stocks by planting non-native salmon and steelhead stocks over 40 years" (Rahr, Guido R., 2012). While farmed salmon has more omego-3 fatty acids, it tends to have higher levels of chemical contaminants (Schwartz, 2005). Whether we are eating farmed or wild salmon, it comes down to "the need for policy and regulatory efforts to limit pollution of our waters and clean up pollution that has occurred" (Schwartz, 2005).

Environmentalists and many others have concerns about farm fishing. Many worry about the crowding of fish in their artificial environment, as well as pesticides and veterinary drugs that are used to prevent pests and diseases. These chemicals can affect the entire aquatic ecosystem. In addition, coastal areas are altered in order to

accommodate fish farms; harming other species and contributing to immense devastation from storms (The Pros and Cons, 2008).

Surprisingly, in January 2010, the Monterey Bay Aquarium's Seafood Watch program approved a method of farming Pacific coho salmon that is currently employed exclusively by the Washington based AquaSeed Corp (Leschin-Hoar, 2010). Traditionally- farm-raised salmon are grown in open-net ocean pens, however this has led to problems with salmon escaping into the wild or becoming diseased due to no barrier between the captive salmon and the wild salmon (Leschin-Hoar 2010). But AquaSeed's salmon are grown in land-based, freshwater tanks, which prevent escapes and problems with infestation and disease (Leschin-Hoar 2010). [13]

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[13] This is not considered a formal conclusion that would be written for a paper, but in this specific section, a conclusion (and introduction) are not necessary. The sections should be considered more like "extended short answers" for the purpose of this assignment

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