December 2014

Plundering the Seas:

The Damage from Pirate Fishing on US Fishermen & Communities

Photo: US Coast Guard

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Executive Summary

For decades, national governments, international agencies, and nonprofit marine conservation organizations have sought ways to reduce the amount and impact of illegal, unreported, and unregulated (IUU) fishing on fish populations, national economies, and law abiding fishermen around the world, with limited success. This "pirate fishing" exacerbates poverty, food insecurity, and political turmoil in many coastal countries in Africa and elsewhere by draining fish resources for the consumption of richer countries. It takes potential sales away from American fishermen and lowers prices they can charge even though they follow some of the strictest fishery management laws and catch quotas in the world. The economic playing field is therefore tilted against US fishermen due to IUU fishing.

According to the best estimates from the most current research, the global value of IUU fishing averages between $10 and $23 billion per year – meaning approximately one out of every five dollars of fish sold in international commerce is thought to be derived from IUU sources[1]. This translates into $1.3 – $2.1 billion of illegal wild-caught fish entering US markets each year, about 20% of the total wild-caught seafood sold in American grocery stores, seafood shops, and restaurants every year. What other legitimate product commonly sold to Americans is so frequently the product of illegal activity?

IUU fishing vessel illegally transships catch to freighter for landing in friendly port. Photo: US Coast Guard

Although IUU fishing can be, and is, prosecuted under several current US laws, additional measures, both national and international, are needed to further reduce pirate fishing. Our cops on the beat (i.e., Department of Justice, National Oceanic and Atmospheric Administration, Food and Drug Administration) simply need more and stronger tools and additional resources to fight this environmental and economic crime.

Several bills introduced and marked up by their committees in Congress would strengthen US, and ultimately international, efforts against IUU fishing by making US enforcement more consistent across different statutes and by implementing an important international agreement designed to reduce IUU imports worldwide. These include several pieces of legislation introduced in prior Congresses beginning in 2008. In the 113th Congress, Senator Rockefeller (D – W.Va.), along with other original sponsors, introduced S. 267, the "Pirate Fishing Elimination Act of 2013" and S. 269, the "International Fisheries Stewardship and Enforcement Act". The Pirate Fishing Elimination Act would implement the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (PSMA) that was

ratified by the Senate in April 2014. The second bill – S. 269 – streamlines IUU fishing definitions and penalties across one dozen international agreements and statutes, creating consistency and clearer enforcement procedures and penalties. Similar legislation – H.R. 69 from Delegate Madeleine Bordallo (D – Guam) – has also been filed and marked up in the House. Thus both houses of Congress have now have marked up similar bills that are ready for floor action that is urgently needed.

The purpose of this report is to examine the potential impacts of IUU fishing on US fishermen (and related businesses such as fish processing and importing), in order to shed light on the importance of these legislative measures in protecting US fishermen and fishing communities. The most recent peer reviewed academic study on this topic concludes that the US imports approximately $1.3 to $2.1 billion worth of pirate seafood each year or between 15%- 26% of the total value of wild-caught seafood imported into the US[2] In another study, based on data from over 60 fishing countries, the authors estimate the global traffic in IUU seafood to be 13%-31% of total trade with a most probable value of 18% of trade (note: this is not an average value).

For the purposes of this report, we believe the most conservative estimate of IUU seafood imported into the US is 18%, a percentage at the lower end of the ranges of the published estimates. With 2012 imports of wild-caught seafood into the US totaling $10.26 billion, we estimate US imports of IUU seafood to be approximately $1.85 billion. If this seafood was replaced with domestically caught and processed seafood, an important assumption discussed in the report, US fishing and related industries might be able to reclaim as many as 55,900 direct fishing and related jobs in coastal areas, and an additional 40,000 indirect jobs from fishing supply businesses and increased income. The additional jobs and income would provide large benefits to coastal economies where fishing is often quite concentrated. This increase in direct fishing and related jobs would equate to a 34% increase in potential employment for harvesters and processors.

Even if IUU seafood imports cannot be completely eliminated, a likely case, and not all IUU seafood is replaced by domestic seafood, greatly reducing the amount of pirate fishing around the world will:

- Increase employment in the US seafood industry by a substantial amount
- Benefit towns and businesses in coastal areas of the US where seafood is harvested and processed for the market
- Open markets for US caught seafood at home and abroad
- Ensure better protection for vulnerable marine resources around the world
- Safeguard national and international fish populations for US fisherman and foreign fishermen – many of whom rely on fish to feed their families.

Eliminating or reducing international IUU fishing will, in effect, “level the playing field” for American fishermen who face strict catch and bycatch limits and robust enforcement while IUU fishermen everywhere else live under no rules.

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Overview of Illegal, Unreported and Unregulated (IUU) Fishing

Illegal, unreported, and unregulated (IUU) fishing occurs when fishermen: 1) catch fish in areas (national waters or high seas areas beyond national jurisdiction) closed to fishing, 2) fish at times they are not supposed to be fishing, 3) target a species they are not supposed to keep, or 4) use fishing gear that is prohibited (e.g., driftnets, nets with mesh that is too small). It can als include failing to report, or falsifying, seafood catches to the national or international organization managing a fishery. Most critically, "pirate" fishing diminishes healthy fish populations available to legal fishermen throughout the world – exacerbating hunger, poverty and political turmoil, particularly along the coasts of developing countries. Furthermore, the sale of IUU seafood undercuts the market and prices for legally caught US seafood because of an increased supply of illegal seafood in the US domestic market.

The Acting Assistant Administrator for the National Marine Fisheries Service (NMFS) stated as part of a congressional testimony that "the stability of our fisheries and the livelihoods of US fishermen are challenged every day by activities on the international front… [IUU fishing] is a global problem that threatens ocean ecosystems and impacts fisheries, food security, and coastal communities around the world."[3]

Key Findings:

- **18% of the global annual fish caught comes from IUU fishing (weighted average value).**
- **The US likely imported $1.85 billion of IUU fish in 2013.**
- **The range of likely IUU imports to the US is from $1.3-$2.1 billion.**
- **This represents a potential gain of 55,900 US jobs in fishing and related industries if IUU imports are ended. Another 40,000 indirect & induced jobs.**
- **There is abundant empirical evidence of IUU imports into the US exists.**
- **The impact on US fishermen and communities is significant.**

The primary, and best substantiated, report on worldwide IUU fishing is based on detailed assessments of fishing in over 60 countries.[1] It concludes that between 13% and 31% of the reported annual value of fish caught around the world comes from pirate fishing. The weighted average of the global IUU seafood catch is estimated to be 18% of the reported fish catch. Thus, nearly one in five dollars in international fisheries commerce comes from IUU fish.

Additionally, a 2009 study indicated that around 85% of all fisheries worldwide are currently either fully exploited or overexploited.[4] Given this high level of exploitation, the additional fishing pressure from IUU activities in both national and international waters can be devastating – not only in terms of managing fisheries and preserving critical marine ecosystems – but also for the economic well-being of the US fishing industry.

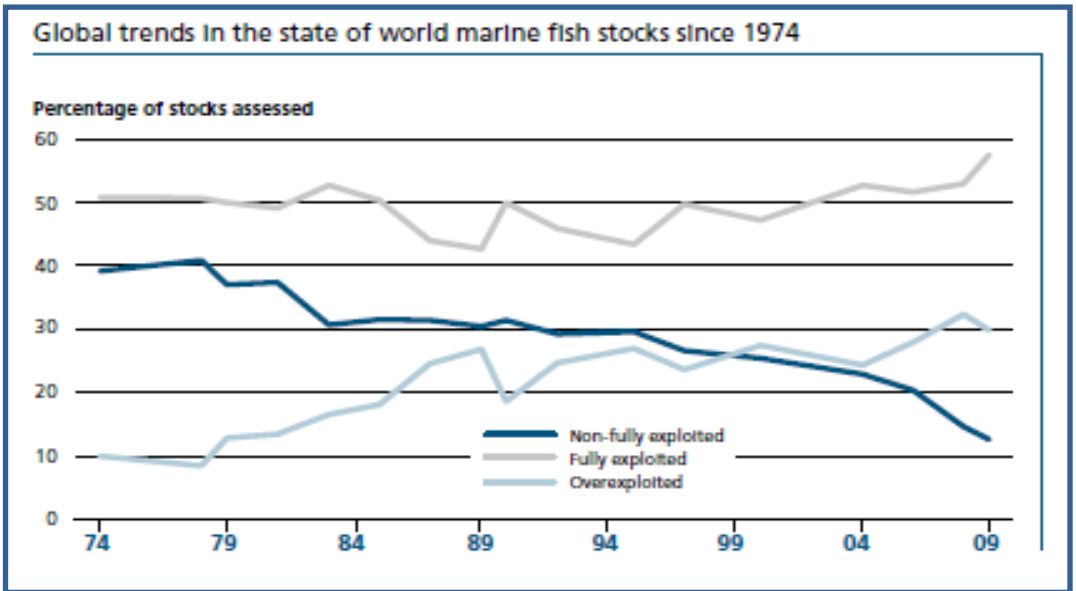


Photo: United Nations Food and Agriculture Organization

In 2013, the US imported $10.26 billion worth of wild caught seafood from around the world.[5] Assuming that 18% of imported seafood comes from IUU sources, the US is likely importing $1.85 *billion* worth of IUU products annually. This amount is very likely affecting domestic fishermen by driving down overall seafood prices and competing with domestically-caught fish of the same or similar types. Clearly, the economic damage to US fishing communities caused by pirate fishing is significant.

Mapping the Economic Impact of IUU Fishing on the US Fisheries Economy

Assessing the economic impact of IUU fishing on US fishermen and communities first requires estimating three distinct pieces of information: 1) how much IUU seafood is imported into the US every year, 2) the effects these imports have on the supply and price of fish, and 3) the impact on fishing and seafood related jobs by state. This section provides a brief description of our analytical methodology and research assumptions**. *For a more detailed account of methodological topics, please see the Methodology Appendix.***

To address the first question, Marine Conservation Institute utilized the most detailed and comprehensive assessment of global IUU fishing to date, based on thorough reports from over 60 countries who collectively represent the majority of the global fisheries effort. In this assessment, researchers estimated that between 13% and 31% of seafood in international trade comes from IUU sources. They further determined that the most likely percentage of IUU seafood in the global trade was 18% (this weighted average will be assumed as the best value for the rest of the report).

Secondly, to determine the impact of IUU fishing on supply, Marine Conservation Institute gathered data on seafood products imported into US ports in 2013.[5] The amount of wild-caught seafood was determined by removing the value of aquaculture, inedible, and freshwater products directly from US Custom Service import reports. While the environmental impacts of farmed seafood may be negative, farmed seafood is not the same as IUU seafood and was therefore excluded from this study. The calculated value of wild-caught seafood imports was multiplied by the previously established percentage of IUU seafood in order to obtain an estimate of the potential value of total pirate seafood imported to the US[6] Our analysis does not take into account price changes that could occur if IUU seafood was no longer imported or if the buying behavior of consumers changed in response to these prices changes. That would be a more dynamic analysis of impacts.

Third, predicting the impact of IUU seafood imports, state by state, on US fishermen, processors, wholesalers and importers requires a number of assumptions addressed here and detailed fully in the Methodology Appendix. For the purposes of estimating state by state impacts on fisheries employment, we assumed:

1. That the entire value of IUU seafood imported into the US would eventually be replaced by the efforts of domestic fishermen, processors, and wholesalers, etc.

2. Each state's gain in fishery revenue and employment from replacement of IUU fish with domestically caught fish would be proportional to its current share (percentage) of US landings. That is, if a state's landings were 5% of total US landings, it would capture 5% of the revenue increase ($1.85 billion) when IUU fish were eliminated from imports. A state's relative share of the total market for wild-caught seafood would not change.

3. Since each type of fishery job (i.e., harvester, processor, wholesaler, importer, etc.) generates a certain amount of revenue, an increase in fishery related revenues from replacing IUU imports is therefore assumed to increase the number of jobs, and conversely, a loss of revenues would reduce jobs.

Using the estimated revenue per fishery job calculated from National Oceanic and Atmospheric Administration (NOAA) data, we calculated how many new jobs could be added to different sectors of the fishing industry if the value of imported IUU seafood was replaced with US-caught and processed seafood. We also calculated how many jobs may be lost by importers as a result of reduced US imports of foreign fish.

Economists would call this a simple, static analysis of employment change, calculated from industry revenue changes. The analysis leaves out many indirect effects (e.g., more US fishing means more jobs for US fishing equipment suppliers and harbors) as well as ignoring possible changes in supply, prices and demand for seafood. However, we selected this method because it provides a reasonable estimate of employment change with limited data. It allowed us to develop a rough, but workable approximation of the job impacts from ending pirate seafood imports.

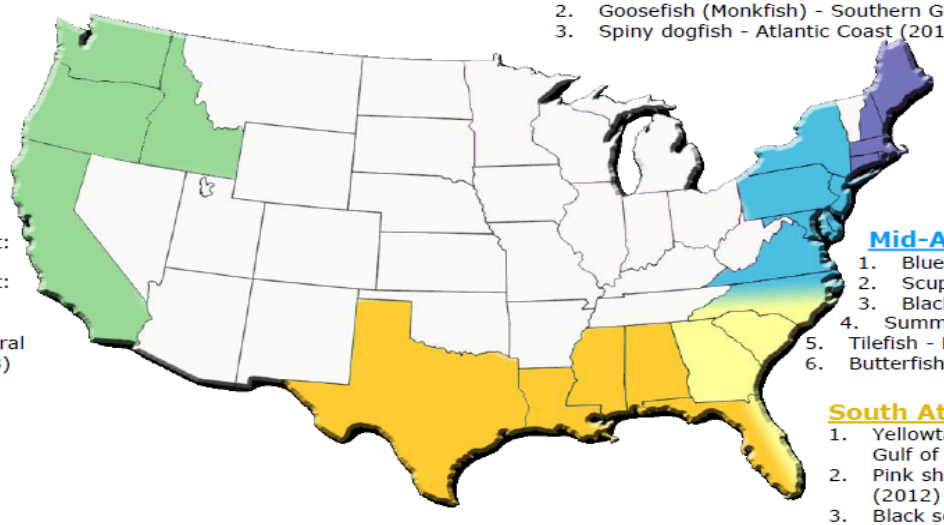
Rebuilt Stocks (36) – as of June 30, 2014

North Pacific:
1. Southern tanner crab - Bering Sea (2007 and 2012)
2. Blue king crab - Saint Matthews Island (2009)
3. Snow crab - Bering Sea (2011)

New England:
1. Sea scallop - Northwestern Atlantic Coast (2001)
2. Silver hake – Gulf of Maine/Northern Georges Bank (2002)
3. Silver hake - Southern Georges Bank / Middle Atlantic (2007)
4. Winter flounder – Georges Bank (2003)
5. Haddock - Georges Bank (2010)
6. Pollock - Gulf of Maine / Georges Bank (2010)
7. Haddock - Gulf of Maine (2011)
8. Acadian redfish - Gulf of Maine / Georges Bank (2012)
9. Windowpane - Southern New England / Mid-Atlantic (2012)
10. Yellowtail flounder - Southern New England / Mid-Atlantic (2012)

New England/ Mid-Atlantic
1. Goosefish (Monkfish) - Gulf of Maine / Northern Georges Bank (2008)
2. Goosefish (Monkfish) - Southern Georges Bank / Mid-Atlantic (2008)
3. Spiny dogfish - Atlantic Coast (2010)

Pacific:
1. Pacific whiting – Pacific Coast (2004)
2. Lingcod – Pacific Coast (2005)
3. Chinook salmon - Northern California Coast: Klamath (fall) (2011)
4. Widow rockfish - Pacific Coast (2011)
5. Coho salmon - Washington Coast: Queets (2011)
6. Coho salmon - Washington Coast: Western Strait of Juan de Fuca (2012)
7. Chinook salmon - California Central Valley: Sacramento (fall)[1] (2013)



Highly Migratory Species:
1. Blacktip shark – Atlantic / Gulf of Mexico (2003)[1]
2. Swordfish - North Atlantic (2009)

Mid-Atlantic:
1. Bluefish - Atlantic Coast (2008)
2. Scup - Atlantic Coast (2009)
3. Black sea bass - Mid-Atlantic Coast (2009)
4. Summer flounder - Mid-Atlantic Coast (2011)
5. Tilefish - Mid-Atlantic Coast (2014)
6. Butterfish - Gulf of Maine / Cape Hatteras (2014)

South Atlantic/Gulf of Mexico:
1. Yellowtail snapper – South Atlantic/ Gulf of Mexico (2003)
2. Pink shrimp - Southern Atlantic Coast (2012)
3. Black sea bass – Southern Atlantic Coast (2013)

Gulf of Mexico:
1. Red grouper - Gulf of Mexico (2007)
2. King mackerel - Gulf of Mexico (2008)

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Sustainable Fisheries

[1] Blacktip shark is now two separate stocks, but was previously assessed as one combined Atlantic / Gulf of Mexico stock.

Source: NOAA Status of Fisheries 2014

Fundamentally, this analysis rests on the key assumption that US fishermen can replace imported IUU seafood with domestic catches. Of course, in the short term, this is simply not possible. Yet the elimination of pirate fishing will also not be an instantaneous change, and over time, as domestic fish stocks are rebuilt and allowable catches increase, US fishermen may indeed be able to take up the seafood slack.

In the relatively short period of time since the 2006 amendments to the Magnuson-Stevens Fishery Management Conservation Act imposed more stringent, scientifically based catch limits on US fishermen, many species have begun to rebuild – resulting in higher and more sustainable populations, which allows for increased fishing. In 2013, catch weight was up by 5.6% (and value was up by 31%) compared to 2007 levels (first full year of MSA implementation).[7] The total seafood caught in the US is increasing, populations are rebuilding in many cases, and it is not unreasonable to project that this trend will continue.

The Results: Economic Impacts by State

Using the static revenue analysis described above, the net change in US jobs resulting from switching $1.85 billion of IUU seafood imports to domestic production is a net increase of 55,900 direct jobs. Table 1 displays the net number of jobs gained from an end to IUU import for each state. Table 4 in the Methodology Appendix displays how this net change divides into harvester and processor gains and import job losses. This rests on the assumption that harvester/fishermen and processor/dealer jobs will increase, importer jobs will decrease, and wholesaler and retail jobs will stay unchanged.

In this scenario, employment in the harvester, processor, and importer job sectors would increase nationally by approximately 34%. Using an average employment multiplier for direct jobs to indirect (e.g., support jobs at boatyards, etc.) and induced jobs (e.g., more fishermen buy groceries or cars) of 1.7 – a reasonable value based on NOAA's online employment model – the change in direct jobs would spawn another 40,000 indirect and induced jobs. Hence the total change could be 95,000 jobs. Realistically, a less dramatic change would likely occur, especially in the short term. However, these numbers represent the maximum possible adjustment in US employment in the seafood and related sectors.

Table 1: Revenue 'Lost' to IUU Fishing and Number of Jobs Gained from End of IUU Fishing in US Seafood Industry for 2012, By State.

State	Total Landings Revenue (Millions of Dollars)	Total Revenue Change from End of IUU Imports (Millions of Dollars)	Approximate Number of Jobs Gained from Ending IUU Imports	Existing Seafood Jobs in State (harvester, processor, importer)
Alaska	$1,704	$624	15,173	41,464
Massachusetts	$618	$226	5,942	17,244
Maine	$449	$164	5,155	14,128
Louisiana	$331	$121	4,344	11,954
Washington	$276	$101	5,596	16,231
California	$232	$85	1,830	9,101
Florida	$199	$73	1,899	7,942
Texas	$194	$71	1,752	5,053
New Jersey	$188	$69	2,510	8,115
Virginia	$176	$64	1,851	5,192
Oregon	$128	$47	1,681	4,683
Hawai'i	$92	$34	1,351	3,765
Rhode Island	$81	$30	754	2,235
Maryland	$78	$29	1,362	3,973
North Carolina	$73	$27	949	2,686
Mississippi	$49	$18	882	2,411
Alabama	$46	$17	1,085	2,977
New York	$39	$14	499	2,484
South Carolina	$24	$9	195	540
New Hampshire	$23	$9	319	960
Connecticut	$21	$8	219	700
Georgia	$16	$6	502	1,702
Delaware	$8	$3	52	145
Total	**$5,044**	**$1,846**	**55,903**	**165,685**

Source: Calculations were made using data from NOAA's Fisheries Economics of the United States 2012 Report and the NOAA's Seafood Industry Impacts Advanced Query Search Online Tool with the methodology described in the Appendix.

One obvious question to ask is whether the imported IUU seafood competes against the types of seafood US fisherman sell domestically or just with legal imported seafood. For example, does imported snapper compete against US caught snapper in the marketplace. To discern this we need to know how much snapper is imported into the US, what percentage of that is likely to be Illegal and are imports large enough relative to domestic product to have an impact on supply and price.

To answer these questions, we used the most detailed study done of seafood imports from the top 10 countries that export seafood to the US[8]. The study looked at the rates of IUU exports to the US for the top three seafood products from each of the top ten countries or a total of 30 'streams' of seafood. With overlaps in products, the list reduces to 14 types of seafood and some of those are not caught in the US or like herring or lobster have extremely low rates of IUU fishing.

Collectively, these ten countries account for approximately 80% of the total amount and value of wild seafood imported into the US. Our findings from this analysis are displayed in Table 2 which shows that competition with IUU seafood in product categories like snapper, crab, squid, mahi-mahi, tuna and octopus is tangible. In these categories the size of imports is large relative to domestic landings and the imported seafood has a high percentage of IUU.

Table 2: Top 3 Seafood Imports from Ten Largest Exporters to US in 2011 (metric tons).

Species Group	IUU Imports to US	Top 3 Imports	Total US Landings	Imports as % of US Landings	IUU as % of US Landings	IUU as % of Imports
Snappers	852	5,382	4,709	114%	18%	16%
Salmon	22,957	39,296	353,770	11%	7%	58%
Crab	7,701	60,368	167,579	36%	5%	13%
Squid	7,442	49,363	149,698	33%	5%	15%
Mahi-Mahi	538	5,382	1,055	510%	51%	10%
Tuna	65,997	228,991	22,607	1013%	292%	29%
Shrimp	5,595	17,801	146,922	12%	4%	31%
Octopus	1,963	7,231	448	1614%	438%	27%
Total *	**113,045**	**413,814**	**846,788**	**49%**	**13%**	**27%**

Source: Pramod, G., Nakamura, K., Pitcher, T. J., & Delagran, L. (2014). Estimates of illegal and unreported fish in seafood imports to the USA. Marine Policy, 48, 102-113; NMFS landing database.
**Note: Clams, Hake, Lobster, Herring, Toothfish, and Pollock are excluded due to very low IUU import levels.*

Table 3 identifies the states that have significant landings of the types of seafood that are most likely affected by IUU products by virtue of the fact that imports are a large percentage of supply and a high percentage of imports being IUU. One thing to note is that states in every fishery management region are affected by one or more of these IUU products; no region remains unscathed.

Table 3: State by State Landings of the Top Imported IUU Species (metric tons). Highlighted entries indicate states with high potential IUU impacts.

State by State Landings	Snappers	Salmon	Crab	Squid	Mahi-Mahi	Tuna	Shrimp	Octopus
Alaska		334,810	36,498	327			489	421
Hawaii	79		4	1	645	8,400	1	8
Washington		17,370	12,280	3		5,991	4,623	2
Oregon		1,076	7,820	1		4,392	21,897	1
California		514	10,073	121,514	3	800	3,727	2
Texas	646		1,322	10			39,804	
Louisiana	557		19,910		11	422	41,944	
Mississippi	40		168				4,558	
Alabama	137		734	4	3	6	8,720	
Florida	2,940		7,362	40	253	749	10,207	14
Georgia			1,554				1,975	
South Carolina	162		2,498	2	78	65	1,323	
North Carolina	148		13,664	16	43	479	2,332	
Virginia			17,281	708				
Maryland			22,736	1	2	88		
Delaware			1,721					
New Jersey			4,367	11,857	5	383		
New York			541	2,554	1	88		
Connecticut			35	226			4	
Rhode Island			1,525	11,792	3	21		
Massachusetts			4,320	641	8	593	160	
New Hampshire			31			41	536	
Maine			1,135	1		89	4,622	
Total U.S. Landings	4,709	353,770	167,579	149,698	1,055	22,607	146,922	448
IUU as % of US Landings	18%	6%	5%	5%	51%	292%	4%	438%

Source: NMFS Landings Database

Snapper imported into the US from the ten countries is almost 60% (57%) as large as domestic landings and the rate of IUU fish approaches 16% in those imports. Snappers are caught in the Gulf of Mexico states, primarily in the Gulf of Mexico states of Texas, Louisiana, Florida and to a lesser degree in the South Atlantic in North and South Carolina. Imported IUU snappers are

almost one fifth (18%) as large as domestic landings. This makes us conclude that imported IUU snapper is large enough to effect the domestic market for snapper.

Imported wild salmon that is caught in Russian waters, processed in China and sent to the US probably has a smaller but distinct effect on salmon fishermen. Imports are only 11% of US landings but the majority of wild salmon imported into the US, almost 60%, is thought to be IUU fish. IUU salmon imports are 6.5% as large as US landings, probably exerting some effect but not major on salmon fisheries in Washington and Alaska.

Imported IUU crab (the cold water species like King or Opilio and the warm water species like Blue) has had a major impact on pricing for Alaskan crab over the years, according to many sources. It may also have an impact on crab prices in the Mid Atlantic (Maryland and Virginia), South Atlantic (North Carolina) and the Pacific (Washington, Oregon and California).

Squid imports supply about one quarter of US consumption with about 15% of those imports being IUU seafood. This would impact squid fisheries in California, New Jersey and Rhode Island. Mahi-Mahi, or dolphin fish, is another type of seafood with large impact on US markets. Imported IUU mahi-mahi are around 50% the size of domestic landings, effecting fisheries in Hawaii and Florida.

Empirical Evidence That IUU Fishing Is Widespread and Products Enter the US

Due to insufficient surveillance, infrequent investigations, and inadequate resources, hard statistical data on IUU fishing is scarce. However, there is an abundance of empirical evidence that IUU seafood is caught world-wide and imported into US markets.

For example, IUU fishing in the Western and Central Pacific US Exclusive Economic Zone (EEZ) by foreign fishing boats, mainly fishing for tuna, is well documented by the US Coast Guard (USCG) and National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement (OLE). Yet the Coast Guard spends a relatively small portion of its time and resources in detecting and stopping IUU fishing in US or international waters. Roughly 10% of Coast Guard budget is spent on enforcing fishery laws in domestic waters as well as in international waters covered by treaties that apply to the US.

Chinese fishermen fight to stop South Korean Coast Guard agents from boarding during a crackdown on alleged illegal fishing in the Yellow Sea.

In the decade between 2002 and 2012, 270 cases of foreign fishing vessel incursions in the US Pacific EEZ were detected, an average of 27 *detected* incursions per year.[9] The majority of IUU vessels in the US Pacific EEZ hailed from three countries: Taiwan, Japan, and Ecuador. Unfortunately, the rate of interception and inspection of illegal boats is very low because the vast expanse of the Pacific makes locating and stopping these vessels quite difficult.

For example, in 2009, the USCG intercepted just four of the 26 detected incursions in the Pacific US EEZ and made only one successful interdiction (an onboard inspection and law enforcement action). However recorded intrusions are just the tip of the IUU iceberg – the Coast Guard predicts that actual incursions into US waters are likely to be four or five times higher than those detected.[10]

Examples of IUU Fishing

In 2004, three US businessmen were convicted of importing IUU South African lobster tails and Chilean seabass (aka Patagonian toothfish) into the US between 1987 and 2001. They were sentenced jail time ranging from one year to four years and paid over $7 million in US fines. In addition, a US district court recently affirmed restitution to the South African government of $55 million for the illegally caught lobster and fish.[11]

In 2011, NOAA's Office of Law Enforcement (OLE) conducted over one hundred investigations under the Lacey Act, which is often used to prosecute IUU fishing cases.[12] The Lacey Act is a very broad law making it illegal to import fish and wildlife into the US that is caught illegally according to another country's laws. If the accused party takes, possesses, transports, or sells such fish illegally, or knows that the fish has been taken illegally or should have known so, then a Lacey Act case may be made. Unfortunately, prosecution of these cases often takes years. NOAA's Office of General Counsel brought three civil cases under the Lacey Act for violations of IUU laws and regulations in the first half of 2012, four cases in 2011, and ten in 2010.[13] As of August 2012, three violations had been successfully prosecuted by the US Department of Justice.[14] In one case, several shipments containing a total of 112 tons of IUU Russian king crab were confiscated in Seattle.[15] In another case, an importer was jailed for six months for attempting to import IUU conch, lobsters, and turtle shells from the Bahamas.[16]

Fish Aggregation Device (FAD) - often illegal
Photo: ePhotograph.co.jp

Illegal driftnet fishing
Photo: Marine Photobank

A common occurrence in the Pacific is fishing with illegal driftnets, fishing for tuna in places or with devices that are banned, or fishing by foreign vessels without permits in another nation's waters. In August 2012, the US Coast Guard caught a "stateless" (unflagged) fishing vessel manned by Chinese citizens with 30 tons of albacore tuna; the vessel was using a driftnet, a type of gear banned since 1992. The vessel and crew were turned over to Chinese fishing authorities.[17] In cases like this, the fish normally would have been landed in China or some other country or transshipped at sea; eventually some or all of the catch might have and ended up in some US ports.

IUU Fishing in the News:

- "Big, Illegal Catches pf Russian Crab Threaten Stocks, Flood Global Markets" October 17, 2014 in *Alaska Dispatch News*
- "EW to Ban Fish from Sri Lanka, Saying Lax on Illegal Fishing" October 14, 2014 in *Reuters*
- "How a Drone Busted an Illegal Fishing Operation" August 25, 2014 at *TakePart*
- "As Illegal Fishing in Gulf Grows, US Fishermen Call for Stronger Policies and Enforcement" August 21, 2014 in *Guidry News*
- "How Illegal Fishing Costs Texas and Mexico Millions Each Year" August 20, 2014 in *State Impact: Texas*
- "Coast Guard Catches Poachers in US Waters, 153 Sharks" August 4, 2014 in *DVIDS*
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IUU Isn't Just Illegal, It is Also Unreported: Researchers compared amounts of fish reported to regional or international bodies like the FAO to those reported to local sources to see if they matched. For example, a study of Arctic fishing from 1950 to 2006 concluded that 75 times more seafood was caught than was reported.[18] Another study in the Baltic Sea shows that from 1950 to 2007 real catches were approximately 30% larger than reported catches.[19] US imports of seafood from Baltic countries total over $100 million each year.

And It Continues Because It Is Profitable: A compendium of sixteen IUU fishing cases from countries around the world shows that IUU fishing was profitable in most cases because the probability of catching the offender is small, penalties are too low, and the revenue from IUU fishing can be very high.[20]

Illegal Russian King Crab:

Perhaps the most recent and egregious example of IUU fishing concerns Russian crab exports to the US. Imported Russian crab competes directly against domestically produced Alaskan king and snow crab. Russian crab enters the US via shipments from China, Korea, Japan, and Russia itself. An indication of how much is actually IUU crab comes from comparing the allowable catch set by Russian authorities with its exports to Japan, Korea, and the US.

Grocery store sign for Wild Caught Alaskan King Crab Legs & Claws from Russia
Photo: Flicker member Badger 23

From 2000 to 2010, the total allowable Russian crab catch was about 500 million pounds, but Russia exported 1.3 billion pounds to those three countries.[21] The US imported over 60% of Russia's total allowable catch during those years. If we assume that just one half of the exported Russian crab was caught illegally, then it is possible that one half of US imports of Russian crab were IUU product. In 2011, the US imported over $200 million of crab from Russia; thus the potential damage to US fishermen was half of that, or $100 million in lost sales.[22]

Legislative Solutions to Reduce IUU Fishing

IUU fishing is difficult to detect, especially when it occurs in countries with poor or nonexistent law enforcement capability or on the high seas (outside the 200 mile limit of coastal states). But when it is identified, or when shipments of seafood are suspect, it is important to deny IUU seafood entry to US markets. Two bills pending in the Senate, S. 267 and S. 269 and another in the House, H.R. 69 (113th Congress), would help reduce the level of IUU seafood being imported into the US. Passing this legislation would reduce the economic incentive to engage in this illegal and environmentally destructive practice.

The Pirate Fishing Elimination Act, S.267, sponsored by Senator Rockefeller, would implement an international treaty (Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing or PSMA) that was ratified by unanimous consent in the Senate in April 2014, making it illegal to land IUU seafood in signatory countries.[23] It gives the US additional tools to prevent ships carrying IUU seafood from landing or re-supplying in US ports. Passing this bill and affirming the international agreement would send a powerful message to other countries to do the same. Under the bill, documented IUU fishing vessels cannot land in US ports; and the US Coast Guard (USCG) would be given enhanced authority to examine documents, board, inspect, and refuse entry to any ship suspected of carrying IUU seafood or fishing vessel suspected of carrying IUU fish.

S. 269 (International Fisheries Stewardship and Enforcement Act) and H.R. 69 (Illegal, Unreported, and Unregulated Fishing Enforcement Act of 2013) are technical measures to strengthen and streamline the enforcement provisions of the various laws that implement US fishing agreements. These bills update several existing laws to more effectively fight IUU fishing and the importation of IUU seafood. They would make prosecution of IUU fishing easier and financial penalties much larger, both leading to stronger deterrence. The bills would make the enforcement activities of the USCG, National Marine Fisheries Service, and Department of Justice significantly more productive by making enforcement powers, evidentiary requirements, and penalties more consistent across different fishery laws which today have a tangled mass of definitions and penalty provisions. Government investigators and lawyers will be able to spend less time figuring out what statute fits a case and more time prosecuting. H.R. 69 and S. 269 will enable better cooperation and resource sharing among US agencies, help provide information to international organizations fighting IUU fishing, and allow the US to list individual IUU vessels in order to take actions against them, such as refusing port entry or seizing vessels.

With your support, we can end a practice that threatens ocean habitats, food security, and international trade, while also protecting US fishermen and fishing communities.

Appendix: Methodology Discussion

The very nature of IUU fishing makes it difficult to study and requires that analysis be done using best estimates or projections of magnitude and impact. While Marine Conservation Institute has used the best available, published data in this report, our accounting does rest on a number of key assumptions that we wish to explain in this appendix.

Assumption 1: Determining the Percentage of Illegal, Unreported, and Unregulated Seafood Imported into the United States

Some believe that the US imports far less IUU seafood than the global average estimate of 18%. This argument is based on three assertions: 1) that the US buys seafood from countries with a lower than average percentage of IUU fishing, resulting in a percentage of IUU seafood imports lower than the global average, 2) that countries who export to the US generally export legal seafood while retaining IUU seafood for domestic consumption or for export to countries other than the US, and 3) that US law enforcement is better than other country's enforcement so as to more effectively deter IUU seafood compared to others.

To test the first assertion (that the US buys seafood from countries with a lower than average percentage of IUU fishing), we looked at the top ten countries from which the US imports fish: China, Canada, Thailand, Indonesia, Vietnam, Ecuador, Chile, Norway, Mexico, and the Philippines (Table 4). Using US Customs data, we find that these countries account for roughly half of US seafood imports. Data provided by Professors Tony Pitcher and Pramrod Ganapathiraju at the Fisheries Centre at University of British Columbia show that these top ten import countries have IUU percentages far greater than the estimated global average of 13% to 31% – ranging from a minimum of 30% of caught value to a maximum of 87%.[24] The midpoint estimate for the IUU percentage of these ten countries is 59%, more than three times higher than the global midpoint of 18%.

The second assumption (that countries who export to the US generally export legal seafood while retaining IUU seafood for domestic consumption) is more difficult to address directly. However, the fact that the US imports around 50% of its seafood from countries with approximately 60% of their seafood being IUU makes it highly unlikely that the only imports into the US come from the remaining 40% of legal catch. Given weak international and US regulations and systems for detection of IUU seafood and enforcement, coupled with the great difficulty in tracking and labeling seafood origin, it is unlikely that exporters feel compelled to divert a significant amount of their IUU seafood away from the US.

Table 4: Percentage of IUU Fishing in Top 10 Countries Exporting to the United States.

Exports to the US (2010)	Country	2010 Imports in Millions of Dollars (Not including aquaculture)	Percentage of IUU Fishing (Based on 2006 Data with Updates)		
			Minimum (%)	Midpoint (%)	Maximum (%)
1	China	1,214	35	95	155
2	Canada	1,659	16	29	41
3	Thailand	182	60	105	150
4	Indonesia	428	43	63	82
5	Vietnam	199	30	40	50
6	Ecuador	187	60	86	112
7	Chile	205	7	22	37
8	Norway	61	2	4	5
9	Mexico	143	51	73	92
10	Philippines	221	50	77	103
	Total	**4,499**			
	Mean Percentage Level of IUU Fishing (Weighted by Country)		30	59	87

Source: Personal communication from Dr. Tony Pitcher on the rate of IUU fishing in the top 10 countries exporting fish to the United States. 9/7/2012.

The third assumption (that US enforcement of IUU laws is significantly better than other country's) is also difficult to address directly. However, recent reports documenting the extent of mislabeled seafood with rates of fraudulent labeling reaching upwards of 33%[25], indicate that at least enforcement of labeling requirements, country of origin, and other aspects of imported seafood leave a great deal to be desired. The US does not spend a great deal on tracking or inspecting imported seafood, given the size of our imports and its overwhelming presence in our food chain.

For all these reasons, we believe that using 18% to represent the estimated level of IUU seafood imports into the US is justified, *and almost certainly an overly conservative estimate rather than an overestimate.*

Assumption 2: Illegal, Unreported, and Unregulated Imports Can Be Replaced by Domestically Fished Seafood

In order to assess the impact of eliminating IUU seafood on US markets, we need to make some assumptions about how much of that seafood would be replaced by domestically caught seafood, legal imports or other sources and whether prices and consumption would change as a result. We believe that much of the imported IUU seafood would eventually be replaced with domestically caught fish, rather than with legal imports. If and when IUU seafood imports are reduced, it is highly likely that the overall supply of fish will go down in the US and prices will

rise. While this will be temporarily detrimental for consumers, rising prices will stimulate an increase in participants in the US fishing industry while also initially raising profits.

Why will imported IUU seafood not be replaced with imported legally caught seafood? One reason is that it will not be easy for many foreign fishermen to switch to legal practices. If they could easily and cost effectively catch legal seafood today, many would. Unfortunately, many seafood populations are now overfished and catches are low which forces foreign boats to fish illegally.

Can domestic fishermen replace all or most imported IUU seafood with domestic production? Not in the short term. But over time, as domestic seafood populations are rebuilt and allowable catch increases, US fishermen may indeed be able to replace a high percentage of imports. As of 2013, NOAA's *Status of Stocks* report shows 34 fish stocks have been rebuilt since 2000, and as of June 30, 2014, 36 stocks have been rebuilt[26], most of them since passage of the tougher version of the Magnuson-Stevens Act in 2006.[27] Rebuilt species include commercially important fish such as: red grouper in the Gulf; summer flounder, bluefin, and black sea bass in the Mid-Atlantic; swordfish, monkfish, yellowtail flounder, and haddock in New England; Chinook and Coho salmon in parts of the Pacific; and Bering Sea snow crab in Alaska. Other US fisheries rebuilding plans will take up to a decade to accomplish. In rare cases where the population is very depressed, or the species is slow growing and/or reaches sexual maturity only when much older, rebuilding populations and catch will take much longer.

Several recent studies of the potential value of recovered fisheries place very large values on rebuilt US fish stocks. For example, a report released in 2006 by two eminent fishery economists at the University of British Columbia Fisheries Centre looked at the present value of rebuilding just 17 of the over 70 fish stocks that were overfished in the US in 2004.[28] Rebuilding these stocks to higher sustainable populations was predicted to yield an additional $375 million in net present value of *profit* (i.e., revenues minus costs) just during the time needed to rebuild populations. In truth, this number may be higher as it excludes additional possible revenues to processors and wholesalers.

Will increased prices and demand for domestic fish give the government and fishermen the correct signals to 'stay the course' and recover depressed fish populations? Only time will tell how successful this approach is. However, under the current US management regime, 36 fish populations have been rebuilt in the past decade to higher levels. These include many commercially important fisheries such as: various crab populations in Alaska; Chinook and Coho salmon and widow rockfish off California; summer flounder, scup, and black sea bass off the Mid-Atlantic. The size of U.S. fishery landings in 2013 (9.8 million pounds) exceeded the size in 2006 (9.5 million pounds) by 2.7%, a sign that US fisheries are beginning to recover from decades of overfishing.[29]

Assumption 3: More Domestically Caught Seafood Increases Employment

An important way to measure the impact of a change in IUU seafood imports is through potential job losses or gains in fishing and fishing related sectors. Job gains/losses were estimated using a simple, static analysis of fishery revenue change in the US and the impact of increased revenues on fishery jobs. We assume that the revenue from imported IUU seafood is replaced dollar for dollar by domestically caught seafood. These revenues require increased employment in several US seafood sectors and a loss of imports causes decreases in one other. NOAA divides US fishery related jobs into several sectors: harvesters (fishermen), processors & dealers, wholesalers & distributors, importers, and retailers. Specifically, reducing IUU seafood imports will increase harvester (fishermen) and processor jobs, reduce importer jobs, and leave wholesaler and retailer jobs unchanged. For each coastal state that will see a change in employment due to the end of IUU imports, NOAA has data on the sales per job in each of the different sectors.[30,32] In addition, each direct job gained or lost from ending IUU imports drives a certain number of indirect or support jobs (e.g., more fishing boats require more fishing equipment suppliers) and a certain number of induced jobs (e.g., more fishermen can buy more cars or food in grocery stores).

The Calculation Methodology

According to NOAA data for **all** states, in 2012each fishermen produced $77,123 of sales; each seafood processor produced $137,674 of sales; and each importer job produced $275,078 of sales[31]. Put another way, a $1 million increase in sales provides the following direct jobs: 13 fishing jobs, 7.3 processing jobs, and 3.6 importer jobs. However, because we wanted to make more accurate estimates based on the different fishery characteristics of each state, we used more disaggregated data: data on the number of fishery jobs in each state by type of job and the value of fish landed in each state.

The number of direct jobs of each type (i.e., fishermen, processor, and importer) by state is available from NOAA's Seafood Industry Impacts – Advanced Query Search online tool.[32] We divided the number of direct jobs in 2012 of each type from a state into the value of landings in 2012 from that state to calculate the value of landings per job. For example, each state's total annual landings revenue (Table 2) was divided by the number of fishermen for that state (Table 5), giving landings revenue/fishermen. Landings revenue per fishermen job was then divided into the revenue change estimated for that state from the reduction in imported IUU seafood to calculate how many more fishermen jobs would be supported/required by the new revenue.

We calculated each state's gain in fishery landings revenue from replacement of IUU seafood as proportional to its current share (percentage) of US landings. That is, if a state's landings were 5% of total US landings today, we assumed it would capture 5% of the revenue increase ($1.85 billion) when IUU fish were eliminated from imports. A state's relative share of the total market for wild-caught seafood therefore would not change, which we think is a fair assumption.

These calculations were then carried out for the processor and importer sectors across all coastal states. To calculate the total job change, the harvester and processor sectors were added together and the importer jobs were subtracted as a decrease in imported IUU seafood

would equate to a loss of importer jobs (Table 6). The net change in US jobs from switching $1.85 billion of IUU seafood to domestic production is an addition of 55,903 jobs – an increase of 34% in direct seafood jobs in the US.

The analysis does not account for changes in price, consumption, multiplier effects, or any factor other than a change in sector revenues from the shift to domestic production. It is true that not all changes in revenue are likely to result in direct job losses or gains, as some changes will result solely in profit increases or decreases. However, estimation of those numbers is impossible without more complete data and complex models (i.e., a supply-demand model equipped with price elasticity). We view this static estimate of job loss/gain as providing a reasonable idea of how changes in IUU fishing imports could most affect the US fishing community.

An estimate of the fishing ports most likely to feel the effects is listed in Table 7.

Table 5: Fisheries-Related Jobs (Direct) by US Coastal States for 2012.

State	Harvesters	Processors	Importers	Total Jobs
Alaska	31,613	9,847	4	41,464
Massachusetts	11,849	4,891	504	17,244
Maine	12,247	1,859	22	14,128
Louisiana	10,430	1,482	42	11,954
Washington	4,804	10,956	471	16,231
California	3,474	3,576	2,051	9,101
Florida	4,773	1,792	1,377	7,942
Texas	3,711	1,209	133	5,053
New Jersey	2,273	5,213	629	8,115
Virginia	4,016	1,109	67	5,192
Oregon	3,621	1,017	45	4,683
Hawai'i	3,286	442	37	3,765
Rhode Island	1,824	324	87	2,235
Maryland	2,487	1,360	126	3,973
North Carolina	1,852	787	47	2,686
Mississippi	1,404	1,006	1	2,411
Alabama	1,402	1,569	6	2,977
New York	1,290	634	560	2,484
South Carolina	445	91	4	540
New Hampshire	587	329	44	960
Connecticut	533	116	51	700
Georgia	652	885	165	1,702
Delaware	130	14	1	145
Total	**108,703**	**50,508**	**6,474**	**165,685**

Source: NOAA's Seafood Industry Impacts Advanced Query Search Online Tool

Table 6: Jobs Potentially Gained/Lost per Sector by State From IUU Imports for 2012.

State	Harvesters	Processors	Importers	Total by State
Alaska	11,571	3,604	(1)	15,174
Massachusetts	4,337	1,790	(184)	5,943
Maine	4,482	680	(8)	5,154
Louisiana	3,817	542	(15)	4,344
Washington	1,758	4,010	(172)	5,596
California	1,272	1,309	(751)	1,830
Florida	1,747	656	(504)	1,899
Texas	1,358	443	(49)	1,752
New Jersey	832	1,908	(230)	2,510
Virginia	1,470	406	(25)	1,851
Oregon	1,325	372	(16)	1,681
Hawai'i	1,203	162	(14)	1,351
Rhode Island	668	119	(32)	755
Maryland	910	498	(46)	1,362
North Carolina	678	288	(17)	949
Mississippi	514	368	0	882
Alabama	513	574	(2)	1,085
New York	472	232	(205)	499
South Carolina	163	33	(1)	195
New Hampshire	215	120	(16)	319
Connecticut	195	42	(19)	218
Georgia	239	324	(60)	503
Delaware	48	5	0	53
Total	**39,786**	**18,486**	**(2,370)**	**55,902**

Source: Calculations were made using NOAA's Seafood Industry Impacts Advanced Query Search Online Tool. Numbers in parenthesis are considered negative values

Table 7: Top 100 Ports Affected by Job Losses due to IUU Fishing, by Region, Based on 2012 Commercial Landings.

Region	Ports	Port Ranking by Dollars
New England		
Massachusetts	New Bedford	1
	Gloucester	17
	Provincetown – Chatham	40
	Fairhaven	46
	Boston	59
Maine	Stonington	22
	Portland	32
	Vinalhaven	37
	Rockland	63
	Frienship	68
	Jonesport	69
	Beals Island	77
	Port Clyde	84
	Spruce Head	85
Rhode Island	Point Judith	26
	North Kingstown	70
	Newport	81
Connecticut	New London	86
New Hampshire	Newington	73
Mid-Atlantic		
New Jersey	Cape May-Wildwood	11
	Long Beach – Barnegat	34
	Point Pleasant	39
	Atlantic City	51
Virginia	Hampton-Roads Area	13
	Reedville	31
	Accomac	72
	Chincoteague	88
North Carolina	Wanchese-Stumpy Point	55
	Beaufort-Morehead City	76
	Engelhard-Swanquarter	91
	Belhaven-Washington	100
New York	Montauk	54
	Hampton Bay-Shinnicock	92
Maryland	Ocean City	98
Southeast		
Florida	Mayport	62
	Cape Canaveral	93
Georgia	Darien-Bellville	94

Gulf		
Louisiana	Empire-Venice	7
	Dulac-Chauvin	14
	Intracoastal City	23
	Lafitte-Barataria	42
	Golden Meadow-Leeville	45
	Cameron	56
	Delacroix-Yscloskey	60
	Slidell-Covington	90
	Morgan City-Berwick	97
Texas	Galveston	10
	Brownsville-Port Isabel	19
	Port Arthur	21
	Palacios	53
Florida	Key West	25
	Tampa-St. Petersburg	52
	Fort Meyers	71
	Apalachicola	78
	Panama City	83
Alabama	Bayou La Batre	29
	Bon Secour-Gulf Shores	99
Mississippi	Gulfport-Bolixi	47
	Pascagoula-Moss Point	49
Pacific		
Alaska	Dutch Harbor	2
	Kodiak	3
	Aleutian Islands	4
	Alaska Peninsula	6
	Bristol Bay	8
	Naknek	9
	Sitka	12
	Seward	15
	Ketchikan	18
	Petersburg	20
	Cordova	27
	Homer	33
	Kenai	35
	Juneau	44
	Yakutat	65
	Yukon Delta	67
	Upper Southeast	79
	Anchorage	82
	Craig	96
Hawaii	Honolulu	5

Washington	Westport	16
	Shelton	36
	Ilwaco-Chinook	50
	Bellingham	57
	Seattle	58
	Willapa Bay	61
	Neah Bay	89
Oregon	Astoria	28
	Newport	30
	Coos Bay – Charleston	41
	Brookings	74
California	Los Angeles	24
	Crescent City	38
	Port Hueneme-Oxnard-Ventura	43
	Eureka	48
	San Fransisco Area	64
	Fort Bragg	66
	Bodega Bay	75
	Santa Barbara	80
	Moss Landing	87
	Morro Bay	95

Source: NOAA Commercial Fishery Statistics: Total Commercial Fishery Landings at Major US Ports

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To modify the database to contain only wild caught ocean fish and shellfish, we removed all freshwater fish, all salmon, all warm-water and previously prepared shrimp, and nonedible fishery products from the totals because these are either farmed, not from oceans, or difficult to determine. This left imports of fresh, frozen, canned, and cured fish and shellfish (other than shrimp) from the ocean. All are wild. The possible exceptions are farmed clams, oysters, and mussels, but these are hard to separate out and account for small amounts relative to the total. These deductions lower the value of US imports by almost half. This makes our estimate of imported IUU fish a more conservative estimate than it would otherwise be.

[6]Data on fish product imported to the US at each port from each country downloaded from: http://www.st.nmfs.noaa.gov/st1/trade/cumulative_data/TradeDataDistrict.html.
This database allows users to select the year and customs district (port of entry) for the value and weight of all imported fishery products or specific products. It includes data on the country from which the fish was imported, though not necessarily the country the fishing boat was flagged in. The data were modified to remove farmed or freshwater fish as described in endnote above.

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