Oceana Reveals Shortfalls in Proposed Traceability Rule to Address Seafood Fraud

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Executive Summary

Undercover Federal agents posing as Russian mobsters catch a New England fishing magnate cooking his books to hide $154 million-worth of misrepresented seafood…

DNA tests reveal that a Virginia seafood supplier was regularly undermining Chesapeake Bay watermen and misleading consumers, by importing cheaper swimming crab and falsely labeling it as the iconic Chesapeake blue crab...

More than 10 million pounds of imported Asian catfish were mislabeled to defraud consumers and avoid tariffs in a conspiracy involving a dozen businesses and individuals, including a still at-large fugitive…

Seafood fraud cases like these have led to growing consumer concern and calls for a more transparent and accountable seafood supply chain. The government is responding to these calls, but its current plan to address seafood fraud is insufficient. Unless additional action is taken, crimes like these will continue.

Seafood fraud and illegal, unreported, and unregulated (IUU) fishing have serious economic, social and environmental consequences. Seafood fraud commonly involves the substitution of a less-expensive or less-desirable seafood item for a more expensive or desirable choice, but also includes activities such as hiding the true origin of seafood products, not declaring additives, and adding extra glazing or breading to seafood products to increase their apparent weight. The average level of global seafood mislabeling is between 20 and 30 percent, according to recent comprehensive analyses.[1,2]

Given that U.S. consumers spent $91 billion on seafood in 2014,[3] those levels of fraud could result in large illicit profits. Researchers estimate that up to 32 percent of the wild-caught imports into the U.S. are caught illegally, which can include using banned fishing gear or fishing in areas set up to protect overfished and rebuilding fish populations—both destructive practices that threaten the sustainability of global fisheries.[4] Troubling reports of forced labor on seafood vessels and in supply chains have added a human face to crimes within the industry.[5] The complex and opaque global seafood market provides

[1] Pardo, M. Á., Jiménez, E., & Pérez-Villarreal, B. (2016). Misdescription incidents in seafood sector. *Food Control, 62*, 277-283. doi: http://dx.doi.org/10.1016/j.foodcont.2015.10.048
[2] Golden, R., & Warner, K. (2014). The global reach of seafood fraud: a current review of the literature. Washington, DC: Oceana.
[3] NOAA Fisheries. (2015). Fisheries of the United States, 2014: Department of Commerce.
[4] Pramod, G., Nakamura, K., Pitcher, T. J., & Delagranc, L. (2014). Estimates of illegal and unreported fish in seafood imports to the USA. *Marine Policy, 48*, 102-113. doi: 10.1016/j.marpol.2014.03.01
[5] E.g. EJF. (2014). *Slavery at sea: the continued plight of trafficked migrants in Thailand's fishing industry*. London: Environmental Justice Foundation.

many opportunities to mix in and hide illegally sourced seafood with legitimate catches that end up at our borders and on our dinner plates.[6] Fishermen and businesses that play by the rules struggle to compete with cheaper mislabeled products.[7] Consumers are cheated when they pay higher prices for lower-value fish that is misrepresented as something more expensive. Farmed fish being labeled as wild is a common form of fraud, so in these cases many seafood lovers seeking wild fish don't realize they're eating seafood from industrial farming operations that use antibiotics and pesticides that can harm consumers' health and damage the environment.[8] Seafood fraud robs consumers of the ability to choose more sustainable seafood.

One tool that can help prevent seafood fraud and IUU fishing is full-chain traceability. That means information about a fish such as how, when and where it was caught or farmed, and what kind of fish it is, follows the product along the entire supply chain from the boat or farm to the plate. Full-chain traceability would increase transparency and accountability and improve enforcement of laws regulating seafood sold in the U.S.

The Presidential Task Force on Combating IUU Fishing and Seafood Fraud took a valuable first step by creating an action plan in 2015 that included a recommendation for a seafood traceability program.[9] The resulting proposed rule requires key information to follow 13 "at-risk" seafood types from the boat to the first point of entry into U.S. commerce (Table 1).[10] But this report will demonstrate that the proposed rule, which is meant to help prevent seafood fraud and IUU fishing, does not adequately address those problems.

While the proposed initial phase of the seafood traceability program is a valuable first step, it falls short in fighting seafood fraud inside the U.S. border and leaves the rest of the seafood sold in the U.S. without any increased transparency.

To illustrate the scope of seafood fraud that would remain unaddressed by the proposed rule, Oceana reviewed scientific studies, government documents and news reports to identify examples of seafood mislabeling since 2001 involving species that have been excluded from this rule and that have occurred within the U.S. seafood supply chain. These cases are neither rare nor trivial, and most are not simply honest labeling mix-ups. Many of the cases described in this report are serious crimes involving hundreds of millions of dollars' worth of seafood and millions of pounds of seafood products.

Mason, M., Mendoza, M., & McDowell, R. (2015, March 25, 2015). AP Investigation: Are slaves catching the fish you buy? March 15, 2015., *Star Tribune*. Retrieved from http://www.startribune.com/ap-investigation-is-the-fish-you-buy-caught-by-slaves/297484221/

[6] Pramod, G., Nakamura, K., Pitcher, T. J., & Delagranc, L. (2014). Estimates of illegal and unreported fish in seafood imports to the USA. *Marine Policy, 48*, 102-113. doi: 10.1016/j.marpol.2014.03.01

[7] NOAA FishWatch, Accessed 5/1/16 at http://www.fishwatch.gov/eating-seafood/fraud

[8] Cole, D. W., Cole, R., Gaydos, S. J., Gray, J., Hyland, G., Jacques, M. L., . . . Au, W. W. (2009). Aquaculture: Environmental, toxicological, and health issues. *International Journal of Hygiene and Environmental Health, 212*(4), 369-377. doi: http://dx.doi.org/10.1016/j.ijheh.2008.08.003

[9] Presidential Task Force on Combating IUU Fishing and Seafood Fraud. (2015). *Action Plan for Implementing the Task Force Recommendations* Retrieved from http://www.nmfs.noaa.gov/ia/iuu/noaa_taskforce_report_final.pdf

[10] Magnuson-Stevens Fishery Conservation and Management Act; Seafood Import Monitoring Program, 150507434-5999-01 C.F.R. (2016).

Proposed Rule Fails to Address Most Species Subject to Seafood Fraud

Seventy-four percent (37/50) of the 50 types of mislabeled seafood Oceana identified will not be covered by the proposed rule (example: wild Alaska salmon). Just 14 of the more commonly mislabeled types of seafood not covered represent more than $2 billion to domestic fisheries alone (example: selling escolar as “white tuna” or Asian catfish as “grouper”). This demonstrates the magnitude of the problem that will not be addressed by the proposed rule.

The proposed rule also does nothing to trace the fish that are substituted in mislabeling—the imposter fish that are called something else to fetch a higher price or hide their less-desirable origins. Sixty-two percent of the 180 seafood species identified as imposters in Oceana’s analysis carry species-specific health risks, and 21 percent face the threat of extinction, as determined by the International Union for the Conservation of Nature (IUCN).

Proposed Rule Fails to Address Illegal Activities that Occur in U.S.

Oceana identified 27 legal cases where seafood was found or suspected to be mislabeled since 2001. Twenty-one of these cases involved seafood fraud that occurred within the U.S. seafood supply chain. Some of the highlights from reviewed government documents and media sources include:

- Wholesalers allegedly mislabeling imported swimming crab as if it were the more valuable, wild-caught U.S. blue crab
- A distributor found guilty of labeling Mexican-caught shrimp as if it were domestic U.S. shrimp
- A seafood company accused of flouting government quotas by allegedly labeling severely overfished cod as relatively abundant haddock to circumvent catch limits
- A California sushi restaurant pleads guilty to importing endangered sei whale by mislabeling it as “fatty tuna,” in order to be able to illegally serve customers whale sushi
- A seafood processor pleads guilty to selling lower-priced coho salmon as more expensive Chinook salmon
- A dozen businesses and individuals convicted for a conspiracy that led to mislabeling imported Asian catfish as more expensive domestic catches to defraud consumers and avoid tariffs

These are cases in which the alleged perpetrators were caught. While the true prevalence of undetected fraud is unknown, it is clear that the proposed rule will not do enough to stop it, as the rule does not require accountability or traceability for seafood traded within the U.S.

As long as the U.S. border is the point at which transparency ends, bad actors will continue to exploit the lack of accountability in the seafood trade.

Recommendations

In the final rule, the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service (also known as NOAA Fisheries) and the National Ocean Council Committee on IUU Fishing and Seafood Fraud (NOC Committee) should include a timeline to expand traceability requirements to cover all seafood sold in the U.S., ensure that catch documentation follows all seafood through the entire supply chain, and require that information be made available to consumers about a fish’s species name, and how and where the fish was caught or farmed. Without strengthening the rule in these ways, fraudsters will continue to mislead consumers, cheat responsible and hardworking U.S. fishers and businesses, and damage efforts to ensure the long-term productivity of our oceans for future generations.

Introduction

Seafood fraud is a serious issue, but a recently proposed government attempt to help prevent fraud falls short of effectively solving this problem. Seafood fraud includes instances when lower-value seafood products are misrepresented as higher-value products, farmed products are mislabeled as wild-caught, or when fish are caught illegally with banned gear or in protected areas are presented as products more responsibly or legally sourced.

Practices like these have grave ecological, economic and social consequences, and can even threaten consumer health. Mislabeling may hide IUU fishing, which depletes struggling fisheries, threatens marine species facing extinction, and further stresses already exploited marine ecosystems. Seafood fraud and IUU fishing hurt consumers' wallets and cheat fishermen and seafood businesses that play by the rules, leading to billions of dollars in economic losses. Finally, some seafood carries health risks that consumers may wish to avoid, like antibiotics and chemicals used in industrial aquaculture, naturally occurring toxins, and toxic contaminants present in larger fish, such as mercury. Mislabeling can hide these risks if consumers think they are getting one fish when it is actually another.

In 2014 the Obama administration established a Presidential Task Force on Combating IUU Fishing and Seafood Fraud to address these problems.[11] The Task Force issued its final recommendations in 2015 and continues its work through the National Ocean Council Committee on Illegal, Unreported and Unregulated Fishing and Seafood Fraud (NOC Committee). As part of implementing the Task Force recommendations, NOAA Fisheries issued a proposed traceability rule, the Seafood Import Monitoring Program rule, in February 2016 that will focus on 13 seafood types deemed particularly "at-risk" of seafood fraud and IUU fishing[12] (Table 1). The traceability requirements under this rule would apply to these species starting at the fishing boat where they are caught, or the fish farm where they are raised, to the first point of entry into U.S. commerce. For most seafood this is the U.S. border—the point where traceability and transparency ends.

The proposed rule is a valuable first step, but by only focusing on 13 seafood types, and by ignoring the substantial portion of the seafood supply chain that exists within the U.S., the proposed rule will fail to capture fraudulent activities that occur within the U.S. or involve the other hundreds of seafood species consumed in this country.

[11] Presidential Task Force on Combating IUU Fishing and Seafood Fraud. (2015). *Action Plan for Implementing the Task Force Recommendations* Retrieved from http://www.nmfs.noaa.gov/ia/iuu/noaa_taskforce_report_final.pdf
[12] Magnuson-Stevens Fishery Conservation and Management Act; Seafood Import Monitoring Program, 150507434-5999-01 C.F.R. (2016).

Table 1: The "At-Risk" 13
Seafood Covered Under Proposed Seafood Import Monitoring Program Rule

#.	Name	Single species?	Species name
1	abalone	no	Species group
2	cod, Atlantic	yes	*Gadus morhua*
3	cod, Pacific	yes	*Gadus macrocephalus*
4	crab, blue	yes	*Callinectes sapidus*
5	crab, red king	yes	*Paralithodes camtschaticus*
6	dolphinfish	yes	*Coryphaena hippurus*
7	grouper	no	Species group
8	snapper, red	yes	*Lutjanus campechanus*
9	sea cucumber	no	Species group
10	shrimp	no	Species group
11	sharks	no	Species group
12	swordfish	yes	*Xiphias gladius*
13	tuna, (albacore, bigeye, yellowfin, skipjack)	several	*Thunnus alalunga,T. obeseus,T.albacares, K. pelamis*

Table 1 lists the types of seafood that will be covered by the proposed rule. Some of these categories refer to a specific single species (identified by a "yes"), while other names can refer to a group of multiple species and/or genera belonging to a broad type (or species group) of seafood (identified by a "no"). Tuna is referred to as "several" species because the rule identifies four particular species of tuna, but does not cover all tuna species broadly.

Seafood Fraud Serious Problem for U.S. Consumers

The proposed traceability rule is a good first step in improving transparency and accountability in the seafood supply chain. But seafood consumers remain at risk from economic, health and conservation concerns. The proposed traceability program simply does not go far enough to mitigate these risks.

Economic Concerns

The top three most commonly substituted seafood types across multiple studies are the farmed freshwater species of Asian catfish, tilapia and farmed Atlantic salmon (Table 2). These mostly imported farmed species are worth far less than the wild domestic species they frequently replace.

Farmed Asian catfish species**,** sold under the names of basa, swai and tra, have been found substituted for 11 types of other seafood, including grouper. Asian catfish may be sold to restaurants for as little as $2.50 a pound, while grouper may be sold to restaurants for up to $10 or $11 a pound.[13] With such a large price difference, those wanting to make a quick buck are ripping off consumers and restaurants by charging grouper prices for what is actually Asian catfish.

[13] Vasquez, M. (2009, August 23, 2009). Snapper on your plate may be an imposter, *The Miami Herald*. Retrieved from http://www.miamiherald.com/news/southflorida/v-print/story/1199524.html

The global salmon market is comprised mostly of farmed Atlantic salmon that may be treated with aquaculture chemicals and antibiotics to control diseases, and which relies mostly on wild-captured fish for feed.[14] For these and other reasons, many prefer wild Pacific salmon. But these fish are often mislabeled, particularly when sold out of season in restaurants.[15] One study of salmon mislabeling between 2009 and 2011 estimated $7 million in economic losses to consumers due to mislabeling at the retail level.[16]

Table 2: These Most Commonly Substituted Seafood Types in U.S. Market Won't be Traced Under Proposed Rule

Substituted seafood type (# species included)	Number of studies	Number substituted	Reference number
Catfish/Asian catfish[a] (6)	18	68	1, 2, 7, 13, 17, 21, 22, 32, 33, 34, 36, 37, 42, 45, 76, 80, 81, 82
Tilapia[a] (4)	16	110	1, 2, 12, 14, 17, 18, 21, 22, 23, 34, 40, 42, 44, 80, 81, 82
Salmon (mostly farmed)[b]	10	77	1, 4, 6, 7, 16, 21, 22, 35, 42, 80
Escolar[c] (1)	9	129	1, 2, 17, 18, 24, 26, 40, 42, 80
Flounder (7)	9	31	1, 7, 12, 21, 22, 26, 40, 42, 80
Seabream[a] (5)	9	43	1, 12, 14, 15, 22, 26, 37, 80, 82
Snapper (not red) (19)	7	58	1, 2, 7, 37, 44, 80, 82
Bass (3)	7	38	1, 2, 12, 26, 44, 80, 82
Perch (2)	7	8	2, 13, 21, 37, 44, 80, 82
Caviar/roe (15)	6	252	8, 11, 21, 37, 44, 82
Rockfish (13)	6	129	7, 12, 15, 23, 42, 80
Mackerel[d] (3)	6	13	21, 22, 25, 44, 80, 82
Pollock (4)	6	7	7, 12, 34, 42, 80, 82
Halibut (5)	5	17	1, 7, 22, 80, 82
Hake (4)	5	6	1, 34, 44, 80, 82
Sole (3)	3	7	17, 80, 82

[14] FAO, Food and Agriculture Organization of the United Nations. (2015). Salmo salar. *Cultured Aquatic Species Information Programme*, from http://www.fao.org/fishery/culturedspecies/Salmo_salar/en; Knapp, G., Roheim, C. A., & Anderson, J. L. (2007). The Great Salmon Run: Competition Between Wild and Farmed Salmon (pp. Appendix): TRAFFIC North America.
[15] Warner et al (2015b)
[16] Cline, E. (2012)

Crab (not blue or red king) (7)	2	33	12, 78
Amberjack (1)	2	26	42, 80
Haddock (1)	2	9	1, 2
Sablefish (1)	2	7	2, 80
Tilefish[d] (2)	2	3	7, 80
Whitefish (1)	1	125	17
Sardine (1)	1	9	37
Pufferfish[c] (1)	1	2	5

[a] mostly farmed species

[b] mostly farmed Atlantic salmon

[c] health risk

[d] FDA mercury advisory on tilefish and king mackerel (3 included in mackerel group)

Table 2 highlights common imposter seafood types (those that are labeled as other fish) (column 1), the number of studies that discovered mislabeling of that seafood (column 2), the number of mislabeled samples (column 3,) and the studies that found mislabeling in that type of seafood, which corresponds to the reference number in the report bibliography (column 4). Issues associated with a particular type of seafood are identified by a footnote below the table. See p.9 in next section for description of data sources

Health Concerns

Because the proposed traceability program excludes many of the farmed aquaculture species found commonly substituted for higher-priced alternatives, antimicrobials and other contaminants that may be present in mislabeled farmed species could be missed.[17,18,19,20] Some types of seafood carry one or multiple species-specific health risks as determined by the Food and Drug Administration. More than 50 percent of the 180 imposter species and 62 percent of the 1472 samples found substituted in this analysis carried at least one of these species-specific health risks.[21] These species-specific risks include scombrotoxin poisoning,[22] parasites, natural toxins, environmental chemicals and aquaculture drugs. Hazards like these could be missed if the associated species is labeled as one that does not carry the

[17] e.g., Cole, D. W., Cole, R., Gaydos, S. J., Gray, J., Hyland, G., Jacques, M. L., . . . Au, W. W. (2009). Aquaculture: Environmental, toxicological, and health issues. *International Journal of Hygiene and Environmental Health, 212*(4), 369-377. doi: http://dx.doi.org/10.1016/j.ijheh.2008.08.003;
Love, D. C., Rodman, S., Neff, R. A., & Nachman, K. E. (2011). Veterinary Drug Residues in Seafood Inspected by the European Union, United States, Canada, and Japan from 2000 to 2009. *Environmental Science & Technology, 45*(17), 7232-7240. doi: 10.1021/es201608q.

[18] Cabello, F. C., Godfrey, H. P., Tomova, A., Ivanova, L., Dolz, H., Millanao, A., & Buschmann, A. H. (2013). Antimicrobial use in aquaculture re-examined: its relevance to antimicrobial resistance and to animal and human health.

[19] Heuer, O. E., Kruse, H., Grave, K., Collignon, P., Karunasagar, I., & Angulo, F. J. (2009). Human Health Consequences of Use of Antimicrobial Agents in Aquaculture. *Clinical Infectious Diseases, 49*(8), 1248-1253. doi: 10.1086/605667

[20] Heuer, O. E., Kruse, H., Grave, K., Collignon, P., Karunasagar, I., & Angulo, F. J. (2009). Human Health Consequences of Use of Antimicrobial Agents in Aquaculture. *Clinical Infectious Diseases, 49*(8), 1248-1253. doi: 10.1086/605667

[21] Food and Drug Administration (FDA). (2011). *Fish and Fishery Products Hazards and Controls Guidance, 4th Ed.* Gainesville, FL: Retrieved from http://www.fda.gov/downloads/Food/GuidanceRegulation/UCM252383.pdf

[22] Scrombrotoxin is produced in the decomposition of certain fish species and can cause symptoms ranging from tingling or burning of the mouth or throat, rash or hives, low blood pressure, itching, headache, dizziness, nausea, vomiting, diarrhea, fluttery heartbeat, and trouble breathing

species-specific health risk. For example, a fish labeled as grouper might be screened for ciguatera fish poisoning[23] or parasites, but if it is actually Asian catfish, it would escape screening for aquaculture chemicals and pesticides that are common in farmed catfish.

Multiple studies, including Oceana's 2013 national seafood fraud investigation, found instances of high-mercury species, such as tilefish and king mackerel, neither of which are covered under the proposed rule, being sold as lower-mercury alternatives.[24,25,26,27] The FDA advises pregnant women and other sensitive groups to avoid these fish.[28] By not tracking seafood from boat to plate, swaps like this can harm sensitive populations that are trying to follow the FDA's advice.

Escolar, another commonly substituted species not covered under the proposed rule, carries risks of gempylotoxin poisoning, due to an indigestible wax, with symptoms ranging from nausea and stomach cramps, to oily bowel discharge and vomiting. Outbreaks have sent hundreds to the hospital in Hong Kong, Canada and Australia.[29] Sale of escolar is outlawed in Japan and Italy, and the FDA advises against selling it in the U.S.[30] Even so, 84 percent of the "white tuna" samples Oceana collected from sushi restaurants were actually escolar.[31] Additionally, in at least eight investigations, escolar has been substituted for other species that are not known to cause health impacts (Table 2).

Conservation Concerns

Oceana's review of mislabeled seafood in the U.S. identified species substitution involving 180 species. Twenty-five of these species are considered threatened, endangered or critically endangered by the IUCN.[32]

Seafood fraud can disguise illegal and unsustainable fishing, frustrating consumers who want to choose responsibly caught seafood. Sustainability guides such as the one by the Monterey Bay Aquarium's Seafood Watch program provide consumers with tools to make very deliberate decisions about the type

[23] Ciguatera is a naturally occurring toxin in certain fish species that can cause long term, severe neurological, gastrointestinal and cardiovascular disorders.
[24] Warner, et al (2013)
[25] Wong, & Hanner, R. H. (2008)
[26] Stoeckle, K., & Strauss, L. (2008, August 22, 2008). Students use DNA barcodes to unmask "mislabeled" fish at grocery stores, restaurants, *Rockefeller University Press Release*.
[27] Consumer Reports. (2011, December 2011). Mystery fish: the label said red snapper, the lab said baloney. *Consumer Reports.*
[28] FDA, & EPA. (2004). *What You Need to Know About Mercury in Fish and Shellfish*. Washington, DC: U.S. Food and Drug Administration & U.S. Environmental Protection Agency Retrieved from http://www.fda.gov/Food/FoodSafety/Product-SpecificInformation/Seafood/FoodbornePathogensContaminants/Methylmercury/ucm115662.htm
[29] CBC News. (2007, February 23, 2007). Canadians fall ill after eating mislabelled oily fish, *CBC News*. Retrieved from http://www.cbc.ca/news/technology/canadians-fall-ill-after-eating-mislabelled-oily-fish-1.649068.
Gregory, J. (2002). Outbreaks of Diarrhoea Associated with Butterfish in Victoria. *CDI, 26*(3), 439-440.;
Ling, K. H., Cheung, C. W., Cheng, S. W., Cheng, L., Li, S.-L., Nichols, P. D., . . . But, P. P.-H. (2008). Rapid detection of oilfish and escolar in fish steaks: A tool to prevent keriorrhea episodes. *Food Chemistry, 110*(2), 538-546. doi: 10.1016/j.foodchem.2008.02.066;
Chung, C. (2007, January 29, 2007). Label mistake revealed in oilfish saga, *The Standard*. Retrieved from http://www.thestandard.com.hk/news_detail.asp?pp_cat=11&art_id=37098&sid=11946643&con_type=1&d_str=20070129&sear_year=2007
[30] Food and Drug Administration. (2012). Bad Bug Book, Handbook of Foodborne Pathogenic Microorganisms and Natural Toxins. Second Edition, 239.
[31] Warner et al. (2013)
[32] The higher percentage includes the "at-risk" species

of seafood they choose in an effort to support more responsibly caught seafood.[33] Using these tools effectively, however, is nearly impossible for consumers if seafood is mislabeled or if key identifiers such as what fish it is, and where and how it was caught, are not provided.

Where the Proposed Rule Falls Short

Many Seafood Types are Mislabeled in U.S.

Oceana and others have documented seafood fraud in the U.S. and globally in numerous investigations. From 2010 to 2014, Oceana collected seafood samples including fish, shrimp and crab, to determine their species identity through DNA analyses. These analyses included more than 1,400 seafood samples from grocery stores and restaurants in 24 states and the District of Columbia and 25 major metropolitan areas. Roughly one-third of the samples tested were not the species they were purported to be. In some regions, and for certain types of seafood, the rates of mislabeling were much higher.[34,35,36,37]

For this report, Oceana reviewed all of the known and available published studies, news reports and government documents describing legal cases where seafood fraud has been identified or suspected in the United States since 2001. These 82 sources, listed in the bibliography, include 37 government reports, 28 news reports/journalist-led investigations and 17 scientific studies, and are used for Tables 2-4. Oceana found that in the U.S. alone, 50 broad categories of seafood types have been substituted involving more than 180 species or species groups, far exceeding the 13 seafood types identified in the proposed traceability rule (Table 1).

Of these 50 types of mislabeled seafood, 37 will not be covered by the proposed rule. Of those 37, 14 are highlighted in Table 3, due to their higher levels of mislabeling uncovered in multiple studies and their importance to the U.S. economy. More than a dozen studies looking at salmon, which was worth more than $600 million dollars to domestic fisheries in 2014, found 115 instances of mislabeling. A single study testing lobster (also worth over $600 million domestically) identified 10 cases of mislabeling. Altogether, these 14 types of mislabeled seafood account for more than $2 billion in U.S. fisheries landings.[38]

Mislabeling of these valuable seafood types cheats U.S. businesses and fishermen who play by the rules, and also defrauds consumers who are paying higher prices for what they think is higher-value domestic fish. The traceability rule as proposed will do nothing to provide these types of seafood with greater transparency and accountability.

[33] Monterey Bay Aquarium. Seafood Watch. Retrieved 4/15/16, from http://www.seafoodwatch.org/
[34] Warner et al (2013)
[35] Warner et al. (2014)
[36] Warner et al. (2015a)
[37] Warner et al. (2015b)
[38] Values from NOAA Fisheries. (2015). Fisheries of the United States, 2014: U.S. Department of Commerce and NOAA Commercial Fisheries Statistics. Accessed 4/15/16 at http://www.st.nmfs.noaa.gov/commercial-fisheries/

Table 3: These Commonly Mislabeled Seafood Types Won't be Traced in U.S. Under Proposed Rule

Mislabeled seafood type	Number of studies	Number mislabeled	Dockside value of fishery (thousands of $)[a]	reference #
salmon	13	115	616,658	1, 4, 6, 7, 16, 20, 21, 22, 35, 40, 42, 79, 80
flatfish (sole, flounder, fluke)	11	48	175,361	1, 2, 7, 12, 17, 21, 22, 40, 42, 80, 82
Bass, sea	7	40	9958	22, 25, 26, 42, 44, 80, 82
caviar/roe[b]	6	253		8, 11, 21, 37, 44, 82
catfish/Asian catfish	6	11	5118[c]	7, 13, 22, 37, 76, 82
halibut	5	21	114,858	7, 12, 26, 80, 82
bass	4	28	21,755	1, 2, 42, 80
mackerel	4	13	54,429	22, 37, 80, 82
yellowtail	2	27	95	42, 80
haddock	2	9	11,469	1, 2
rockfish	2	6	43,719	15, 80
scallop	2	6	428,403	17, 21
butterfish	2	4	4754	2, 80
lobster	1	10	624,896	19
Total			**$2.1 billion**	

[a] Values from NOAA 2015 and NOAA Fisheries Statistics.
[b] Commercial fisheries do not exist for many of the protected species in the caviar/roe group.
[c] Value of domestic catfish production only.
Table 3 highlights types of seafood found mislabeled (e.g. sold as salmon but is actually something else (column 1), the number of studies that identified mislabeling (column 2), the number of individual samples found mislabeled (column 3), the value of the fishery catch at the docks (column 4), and the identity of the studies that found mislabeling in each type of seafood, which correspond to the reference number in the report bibliography (column 5).

Many Seafood Types are Frequent Impostors

Also left out of the proposed traceability rule are many of the impostors — seafood species that have been found substituted for the "sold as" seafood. With adequate tracing and labeling requirements for these fish, it can be much harder for fraudsters to pull a bait-and-switch. Table 3 includes seafood

species that are not covered by the proposed rule and are replaced by lower value fish like those imposter species in Table 2.

Violations of U.S. Supply Chain Sectors Not Covered in Proposed Rule

Seafood fraud does not stop at the U.S. border. The U.S. seafood supply chain has many players, including commercial fishers, importers, brokers, processors, wholesalers, distributors and retailers including grocery stores, markets, restaurants and food service establishments. At each of these steps, the potential for fraud is present, and indeed, government documents, news reports and academic papers have identified cases of seafood fraud at every level of the U.S. supply chain. Oceana identified 27 U.S. cases involving seafood fraud since 2001, in which 38 businesses were implicated (Table 4). Of these 27 cases, only six occurred prior to import. The remaining 21 cases occurred in the United States, once the importer already had the seafood shipment in its possession, or at the wholesale, distributor, processing or retail level. None of these segments of the U.S. seafood supply chain are covered under the proposed traceability rule. Collectively, these fraud cases were worth at least $250 million in unpaid duties and inflated prices as described in government documents and news reports referenced in Table 4.

Table 4: U.S. Seafood Businesses Busted for Seafood Fraud

ID #	Company name	supply chain sector	labeled as	actually was	ref. #
1	Seafood solutions	importer[a]	Paradise grouper, falcon baie grouper, ponga	basa catfish	64
2	Alphin Brothers	distributor	US wild-caught shrimp	foreign farm-raised shrimp	70
3	Consolidated Seafood Enterprises	importer[a]	Wild-caught sole, grouper	sutchi catfish, basa catfish	31, 55, 61, 74
	Reel Fish, Inc.	distributor	snapper, grouper	Lake Victoria perch	
			US wild-caught shrimp	foreign farm-raised shrimp	
4	Garcia Shrimp Co. LLC	distributor	US wild-caught shrimp	Mexican shrimp	71
5	True Nature Seafood LLC	importer[b]	salmon	steelhead trout	69
6	Panhandle Seafood Inc., Panhandle Trading Inc.	importer[b]	grouper, channa (snakehead), bass	sutchi catfish	10, 27
7	Virginia Star Seafood Corporation	importer[a]	sole, grouper, flounder, channa (snakehead), conger pike (eel)	swai catfish	46, 47, 49, 53, 75
	International Sea Products Corp.	importer[a]			
	Silver Seas	importer[a]			
	True World Food Chicago LLC	wholesaler			
	T.P. Company	wholesaler			
	Dakon International	wholesaler			
	Agar Supply	wholesaler			
8	Willis Scott Maxon	retail	king salmon	chum salmon	65
9	Casey's Seafood Inc.	processor	Chesapeake Bay blue crab	imported swimming crab	9
10	US Caviar & Caviar	importer[a]	Russian sevruga caviar	American paddlefish & shovelnose sturgeon caviar	48, 56
	Kenfood Trading LLC	importer[a]			
11	Connoisseur Brands	wholesaler	Russian sevruga caviar	American paddlefish & shovelnose sturgeon caviar	48, 56
12	Southshore Fisheries	packager	Canadian cod Canadian/US flounder	Chinese Pollock Chinese sole	60
13	Universal Group Inc.	wholesaler	grouper	swai catfish	62
14	Seafood Center LLC	wholesaler	shrimp from Panama	shrimp from Thailand,	29,

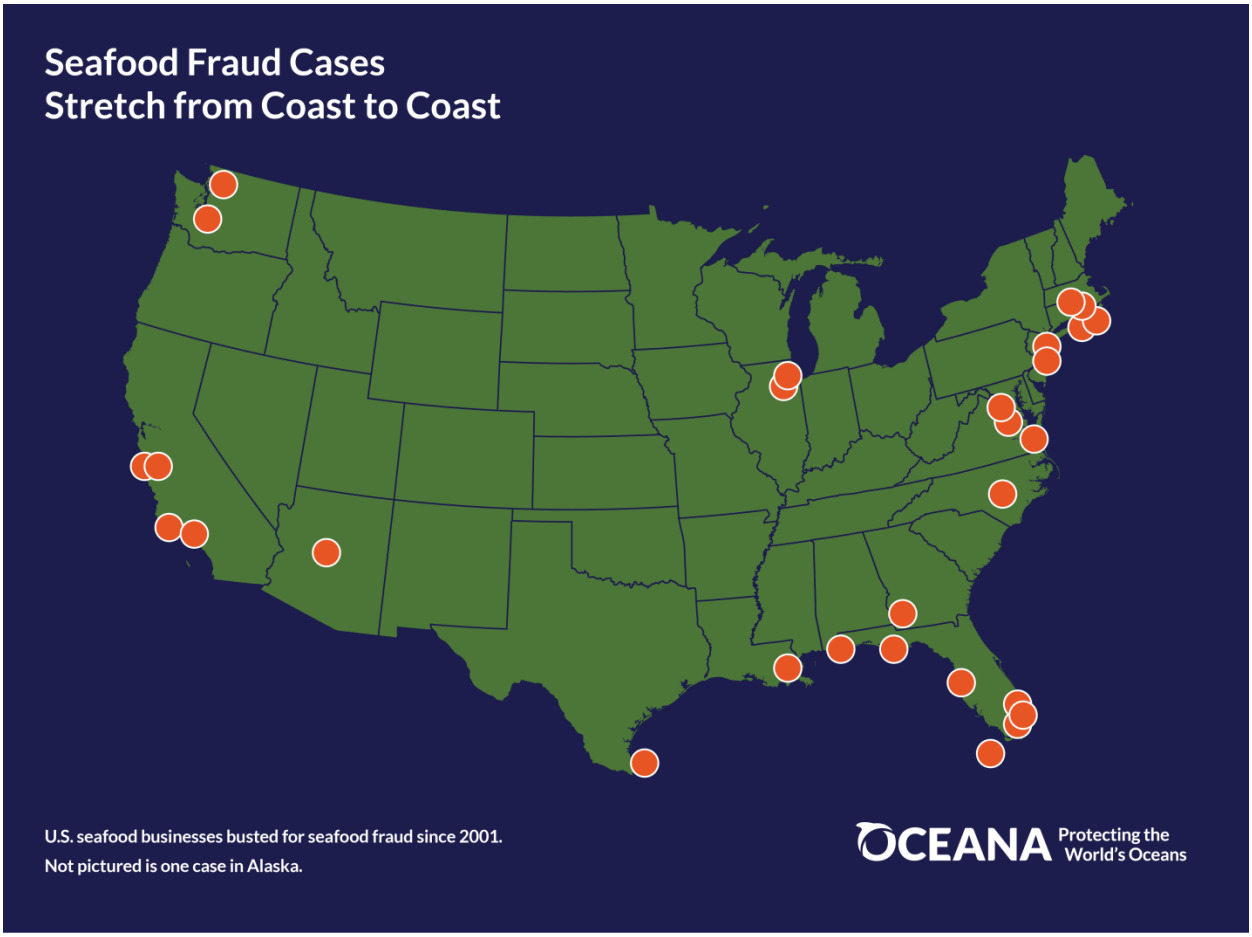
	Culinary Specialties Inc. United Seafood Inc.	wholesaler wholesaler		Malaysia or Indonesia	41, 63, 66
15	Gourmet Express Marketing Inc.	distributor	catfish Pacific snapper, red snapper	swai catfish perch	67, 68
16	Kevin D. Steele	distributor	halibut	turbot	28, 51
17	Bemka Corporation	exporter	bowfin roe	American paddlefish roe	52
18	Carlos Seafood Inc.	importer[a]	golden sea bass, sea bass	snook	50
19	Road Runner Seafood	retail, wholesale	grouper, "grouper pengoseous"	sutchi catfish	50
20	Sterling Seafood	importer[a]	grouper	Vietnamese catfish	54
21	Shifco Inc. Northern Fisheries Ltd.	importer[b] importer[b]	Russian chum salmon Shrimp from Panama, Ecuador, or Honduras	Chinese chum salmon shrimp from Thailand, Malaysia, or Indonesia	59
22	MKG Provision Inc.	wholesaler /processor	haddock (product of USA)	haddock (product of China)	57
23	Typhoon Restaurant Inc.	retail	fatty tuna	sei whale	3, 30
24	Carlos Seafood	fisher, wholesaler	haddock	sole, dabs	38, 39, 73
25	D Jay Enterprises Inc.	processor	chinook salmon	coho salmon	58
26	Gulf Atlantic Fisheries[c]	wholesaler	Mahi mahi (best by Sept. 2013)	Mahi mahi (best by May 2015)	43
27	Upriver Aquaculture Inc. (previously MKG Provisions Inc.)	processor	salmon (product of Scotland)	salmon (product of Chile)	72

[a] mislabeling occurred prior to import

[b] mislabeling occurred after import

[c] According to the State of Louisiana Department of Wildlife and Fisheries, Louisiana law prohibits acts that are falsely represented using any mark, stamp, tag, label or other authorized information. This includes "best by" date (La. Rev. Stat. § 40:636(4) (2016)).

Table 4 lists all of the businesses that Oceana found associated with fraud legal cases, level of the supply chain the company represents, how the seafood was labeled and what type of seafood was actually found. The sources of information about these cases are government documents or news reports, and are represented in the "ref. #" column by a number that corresponds to a reference in the attached bibliography.



Oceana's review identified seafood fraud convictions, court cases and law enforcement investigations that involved 12 broad species groups commonly mislabeled that are not among the 13 "at-risk" seafood types covered by the proposed rule. Four of these — salmon, halibut, flounder and sole — are also among the most valuable U.S. seafood (Table 3). Six of the seafood types identified in this review (sea bass, sole, flounder, channa (snakehead), conger pike and sevruga, or sturgeon caviar) that were already mislabeled when they were imported into the United States are not among the 13 "at-risk" seafood types. The rule in its proposed form would not have identified these shipments as needing extra scrutiny, and they would likely have slipped into U.S. commerce with their mislabeling undetected.

In response to violations and reports on seafood mislabeling, both the state of Florida and the Food and Drug Administration have undertaken their own testing of seafood for species identity. Since 2006, Florida has identified almost 1,500 restaurants advertising one type of seafood but serving another.[39] Of these, 130 were caught mislabeling seafood on a second occasion, and 11 were caught mislabeling seafood a third time. Many of these substitutions led to patrons unknowingly eating escolar, which can cause illness and even hospitalization. A DNA testing study of seafood sold by U.S. wholesalers conducted by the FDA

[39] Florida Department of Business and Professional Regulation, Division of Hotels and Restaurants. Food misrepresentation cases, Retrieved 4/2/16 from http://www.myfloridalicense.com/dbpr/hr/food-lodging/foodmisrep.html

found inaccurate labeling in 15 percent of the lots tested, including 37 percent of the snapper samples and 11 percent of the grouper samples.[40] While grouper and red snapper species are on the identified list of "at-risk" species in the proposed traceability rule (Table 1), these samples were taken mostly at the wholesale level within the United States, a part of the supply chain not covered under the proposed rule.

Case Studies

The seafood fraud busts described in this section occurred because bad actors broke existing laws. In these cases, they were caught. In many other cases, as demonstrated by our seafood sampling and DNA testing, the bad actors are never prosecuted. But these cases serve as examples of how seafood fraud has become so common in the U.S. market. While laws are indeed in place, the enforcement of those laws has not been sufficient to alleviate the problem. The increased transparency that comes with full-chain traceability for all species would deter some of these crimes, and give law enforcement agents the tools to catch more of these criminals, and catch them sooner. Many of the crimes described below were able to continue for as long as they did because of the lack of transparency and traceability in the seafood supply chain.

The case studies summarized in this section reference news reports and government documents listed in the bibliography and are referenced in Table 4.

New England "Codfather" Busted for Selling His Illegal Catch Under False Names on the Black Market

According to news reports and government documents, in February 2016, in New Bedford, Massachusetts, federal agents arrested Carlos Rafael, the largest vessel owner in the Northeast groundfish fishery and owner of Carlos Seafood, a buying and processing operation (Table 4, ID# 24). Government documents indicate that Rafael is accused of conspiring over decades to misrepresent unreported cod, flounder and other species in amounts above and beyond quotas that were set to help rebuild and manage these species. Rafael allegedly landed the illegal fish in his own facility and falsified federal dealer reports by mislabeling depleted species like cod as a more abundant species, haddock, in order to mask his catches. Rafael then allegedly sold the fish illegally through black markets in New York. According to an affidavit[41] from an IRS special agent that was read by Undercurrent News, Rafael said, "When the [dockside inspector] disappears, that's when we got a chance to make that fish disappear and that fish disappears under a different name."[42]

According to the same source,[43] Rafael told undercover federal agents posing as Russians involved in organized crime that he had been altering his records and mislabeling fish for 30 years, which allowed him to hide roughly $154 million.

This case is notable not just for the scale of fraud committed, but also because every step of the process occurred in domestic fisheries or on American soil.

[40] Food and Drug Administration (FDA) (2014). FDA DNA Testing at Wholesale Level to Evaluate Proper Labeling of Seafood Species. Accessed 3/15/16 at http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm419982.htm
[41] An affidavit is a written statement confirmed by oath or affirmation, for use as evidence in court
[42] Seaman, T. (2016a)
[43] Seaman, T. (2016b)

North Carolina Seafood Processor and Distributor Dupes Customers with Tall Shrimp Tales

A government document reports that in August 2015, the Alphin Brothers, a North Carolina-based seafood processor and wholesale distributor, pled guilty to falsely labeling shrimp and misleading customers into buying a cheaper product for more than it was worth (Table 4, ID #2). According to this document, employees were instructed to label roughly 25,000 pounds of farm-raised imported shrimp as wild-caught U.S. shrimp. The company was fined $100,000 and placed under probation for three years for violating laws which stipulate the country of origin must be clearly and accurately reflected on packaging.[44] "It's just horrific to us," said Wendell Verret, Director of Louisiana's Port of Delcambre. "We're trying to survive and we're trying to bring back our industry from these imports and mislabeling is just thievery, plain and simple."[45] Tracing shrimp only to the first point of entry into U.S. commerce is insufficient to prevent the mislabeling of seafood. Under the proposed rule there's no reason to believe that customers will not continue to be duped and domestic shrimpers undercut.

Mislabeling Foreign Crab as Chesapeake Bay Crab by Virginian Seafood Supplier Gives Watermen and Crab Lovers the Blues

A federal search warrant was executed in June 2015, to investigate Casey's Seafood, a Virginia seafood company that sells crab to major retailers in Virginia and elsewhere, for relabeling foreign crab as Atlantic blue crab, according to a local news outlet (Table 4, ID #9). It was reported that initial testing of the company's products from retail stores found that two of the three containers contained only imported swimming crab, while the third container held a mixture of domestic and foreign species. According to reports, the swimming crabs identified in these samples are not found in U.S. waters, but the containers were labeled as "Product of USA." Further testing of the company's crab meat yielded similar results, prompting grocers to pull the products from their shelves and to discontinue sourcing from the company. The same seafood supplier has previously been the focus of a similar mislabeling investigation as well. An article from the Daily Press reported that in 1997, health inspectors witnessed workers packaging Mexican crabmeat into containers labeled "Chesapeake Bay's Finest Crabmeat," and found empty packaging from Brazil, Venezuela, India and North Carolina.[46] The misdemeanor charges were dropped, due to even more lax labeling restrictions in effect at the time, which provided only unenforceable guidelines on repackaging of crabmeat. A staple of the Mid-Atlantic region, true Chesapeake Bay blue crab is not only more valuable than swimming crab from Southeast Asia, but is also considered a "best choice" or "good alternative" for sustainability by the Monterey Bay Aquarium Seafood Watch program, depending on where and how it is caught.[47]

When the story broke, news reports featured interviews with people concerned about the impact of mislabeled foreign crab in the region. Johnny Graham of Graham and Rollins Seafood Market in Virginia said that he knows of "people out there that are violating [blue crab labeling] deliberately… it's been a very lucrative proposition [for them]."[48] U.S. Senator from Virginia Mark Warner also commented about the impact of mislabeling on Virginia fishing industries, stating "Fraudulent labeling is a major problem for Virginia's seafood industry and for the environment, since it allows dishonest producers to avoid

[44] See Table4, ID#2, reference # 70
[45] Gaulden, T. (2015, May 8, 2015). Shrimpers upset over mislabeled seafood Retrieved from WBRZ 2 website: http://www.wbrz.com/news/shrimpers-upset-over-mislabeled-seafood/
[46] Stradling, R. (1997, August 31, 1997). State Food Labeling Regulations Aren't Enforceable Laws. *The Daily Press*. http://articles.dailypress.com/1997-08-31/news/9708310078_1_labeling-robert-croonenberghs-jim-casey Retrieved from http://articles.dailypress.com/1997-08-31/news/9708310078_1_labeling-robert-croonenberghs-jim-casey
[47] Monterey Bay Aquarium. Seafood Watch. Retrieved 4/15/16, from http://www.seafoodwatch.org/
[48] Table 4 Ref ID #9

competing on the same playing field as other watermen… It's also unfair to consumers, who deserve to know that the 'Virginia seafood' they are feeding their families really is [Virginia seafood]."[49]

Even though blue crab is included as one of the "at-risk" seafood types, the proposed traceability rule would not have caught this problem for two reasons. First, the imposter imported swimming crab is not among the 13 seafood types and species groups included in the rule. And second, even if it were included, this fraud occurred within the U.S. border, and so would not be subject to the proposed rule's traceability requirements.

The catfish is out of the bag: More than a dozen U.S. seafood businesses and individuals sentenced for selling cheap Asian catfish as expensive American catches

Asian catfish (sold legally as pangasius, basa, swai, sutchi and tra) is one of the most frequently mislabeled and substituted fish (Tables 3 and 2, respectively). Asian catfish were involved in eight cases involving 16 businesses (Table 4), and in separate investigations of mislabeling uncovered by the State of Florida and the FDA in wholesale testing and restaurant inspections.[50] To help distinguish it from domestic catfish, the federal regulations do not allow Asian catfish (like pangasius) to be sold as "catfish."[51] Also, tariffs were placed on Asian catfish in 2003 to prevent flooding of the cheap Asian product into the American market. An unintended consequence of this has been increased mislabeling of Asian catfish as other, more valuable species, including sole, grouper and flounder, to name a few (Table 4).

A conspiracy that played out over two years in Alabama and Florida led to the sale of more than 100,000 pounds of falsely labeled pangasius, allowing the conspirators to avoid more than $145,000 in tariffs, the details of which are given in a government document describing the case and described below (Table 4, ID #3, reference #61). The co-owners of Phoenix, AZ-based Consolidated Seafood Enterprises imported more than 100,000 pounds of pangasius intentionally mislabeled as sole, with plans to import up to 283,500 pounds. Once imported into the U.S., the seafood was again relabeled, this time as grouper, and some was sold to Reel Fish, Inc. in Pensacola, FL, also owned by Consolidated Seafood. Reel Fish, Inc. then distributed the pangasius to customers in Florida and Alabama. Tests on some of the mislabeled seafood revealed traces of chemicals used in overseas aquaculture like malachite green and Enrofloxin, a chemical prohibited from use in U.S. food due to health risks. The perpetrators were sentenced to up to 33 months in federal prison, fined $11,000, and barred from selling seafood for three years. The U.S. Attorney for the Southern District of Alabama commented that "[t]heir fraudulent scheme artificially deflated the cost of wild-caught fish, and gave them an unacceptable economic advantage over law-abiding fisherman."[52]

Government documents also describe another case unfolding at approximately the same time, which involved seven different businesses and more than 10 million pounds of mislabeled pangasius (Table 4, ID# 7). Two Virginia-based companies, Virginia Star and International Sea Products, imported farm-raised pangasius labeled as a number of other types of fish, including grouper, sole, flounder, snakehead,

[49] Daugherty, S. (2015, June 27, 2015). Feds say Hampton Roads company may have sold foreign crab meat as Atlantic blue crab. *The Virginian Pilot*. Retrieved from PilotOnline.com website: http://pilotonline.com/news/local/crime/feds-say-hampton-roads-company-may-have-sold-foreign-crab/article_575d917c-c317-5955-9842-cdc2d25b9383.html
[50] Florida Department of Business and Professional Regulation and FDA (2014)
[51] FD&C 403 (t)
[52] Table 4, ID #3, Reference #61

channa and conger eel, evading $12 million in tariffs.[53] The imported seafood itself, worth more than $15.5 million, was then sold to seafood companies Dakon International, True World Foods and T.P Company, all of which have been sentenced for their roles in the conspiracy.[54] Together, the businesses and individuals involved were fined or forced to forfeit over $12.5 million, and the president of Virginia Star even faced 63 months in federal prison.[55] One individual remains a fugitive on the FDA Most Wanted List to this day.[56]

Restaurants have been caught switching Asian catfish for more expensive fare as well. A 2009 television station investigation identified farmed catfish being labeled as grouper at a Kansas City, MO location of international restaurant chain Bice Bistro, where the owner admitted in an interview to intentionally making the swap.[57] A total of 308 restaurant violations where Asian catfish was substituted for other fish were issued by the Florida Department of Business and Professional Regulation between 2006 and 2016.[58] Some of these violations involved farmed Asian catfish being used in place of grouper. A number of the Florida violations found packaging for farmed Asian catfish species swai, sutchi and basa, even though the restaurants were advertising grouper on the menu, not farmed Asian catfish. These Florida cases indicate that the fish was correctly labeled when it entered the restaurant premises and were not already mislabeled upon import. With no traceability proposed for trade within the U.S. seafood supply chain, and with the proposed rule not covering all seafood species, these types of fraudulent practices will likely continue.

Conclusions and Recommendations

The proposed traceability rule now being finalized is a historic opportunity to begin the process of tracing seafood sold in the U.S. But by only focusing on the 13 "at-risk" seafood types and by only tracing them up to the U.S. border, many opportunities for continued seafood mislabeling remain. The rule only regulates a small subset of the seafood consumed by the American public. By not including all seafood in the proposed traceability rule, an incentive may be created to instead mislabel seafood as one of the species not covered. As this report demonstrates, the proposed measures would not go far enough to effectively mitigate the problems of seafood fraud found in the remaining seafood species and for all species inside the U.S. seafood supply chain. Nor does the proposed rule require information to be available to consumers about the species-specific identity of seafood, or how and where seafood was caught. Without this information consumers cannot be confident in their ability to make responsible seafood choices. Both consumers and stakeholders throughout the U.S. seafood industry need and want reliable information. As a seafood industry journalist noted in a recent editorial:

> *"Buyers want assurance from the supply chain not only about whether the fish is correctly labeled or not, but also need to know where it was caught, where it was processed, if it was farmed or wild caught, if the farm or fishing vessel involved has any record of labor violations, if antibiotics*

[53] Table 4, ID #7, Reference #53
[54] Ibid
[55] Ibid
[56] http://www.fda.gov/ICECI/CriminalInvestigations/OCIsMostWantedFugitives/ucm389556.htm#nguyen
[57] Wolf, I. (2009, June 11, 2009). Bice busted: Eateries caught in fish fraud. *Chicago Sun-Times*.
[58] Florida Department of Business and Professional Regulation, Division of Hotels and Restaurants. Food misrepresentation cases, from http://www.myfloridalicense.com/dbpr/hr/food-lodging/foodmisrep.html

were used, if third party processing was used, and what additives or treatments the product received. All of these concerns can be addressed by a robust traceability scheme."[59]

The final traceability rule should include a timeline for including all species to be covered by the rule, ensure that all seafood is traced through the entire supply chain from boat to plate, and require that adequate information be available to consumers wherever they purchase seafood.

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