U.S. SEAFOOD TRACEABILITY AS FOOD LAW AND THE FUTURE OF MARINE FISHERIES

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DRAFT – NOT FOR CIRCULATION – DO NOT CITE

While the global seafood business is valued at approximately $U.S. 148 billion, many commercial fishing stocks are struggling to recover. Large seafood importing States such as the United States should avoid fish that have been illegal captured or that are harvested using poor environmental practices such as not reporting discards associated with the harvest. Traceability is a critical component of food law to inform consumers not just of the origin of the food but also of the transit of a food through complex supply chain. The U.S. has recently adopted a new rule on traceability designed to combat illegal fishing imports. As this article suggests, the federal rule as drafted will be unlikely to change much in industry practice without additional targeted investments in traceability including better implementation of wildlife crime whistleblower statutes, a more comprehensive set of environmental reporting standards for seafood sold in the U.S. or transiting through the U.S., and additional support for the industry to better manage fishery-related processing waste.

"In 1994, seafood may have peaked. According to an analysis of 64 large marine ecosystems, which provide 83 percent of the world's seafood catch, global fishing yields have declined by 10.6 million metric tons since that year. And if that trend is not reversed, total collapse of all world fisheries should hit around 2048." –David Biello[1]

I. OVERVIEW

Is there a future for abundant marine fish? Or are we past peak wild seafood? This article explores the nexus between food law and marine fisheries production to conclude that as oceans

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[1] David Biello, Overfishing Could Take Seafood Off the Menu by 2048, (November 2, 2006), https://www.scientificamerican.com/article/overfishing-could-take-se/ (Reporting on a paper released by 14 ecologists and economists on global trends in fishing)

empty, greater investments will be needed to ensure compliance with the rule of law and to restore marine fisheries to cope with rapid environmental change. At least some of the needed investments will be in the form of legal interventions including implementation of verifiable traceability practices within the global fish trade. This article will focus on recent regulatory programs designed to promote traceability within the United States, the largest national import market in the world.[2]

As consumers including corporate consumers strive to improve their sustainability profiles, traceability is becoming increasingly important. In fact, 80% of American consumers from a 3000 person poll conducted in 2012 who regularly eat fish indicated indicate that the use of sustainable catch methods to harvest fish is "important" or "very important."[3] Approximately one third of these individuals were willing to pay more for sustainable fish.[4] Large consumer multinationals such as Wal-Mart are trying to meet this market demand by reconfiguring their supply chain through improved traceability.[5] While some of the early increase in demand driven by large buyers has strained the ability to deliver reliable and credible levels of sustainability,[6]

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[2] Food and Agriculture Organization, The State of World Fisheries and Aquaculture 2016: Contributing to Food Security and Nutrition for All (2016): Table 15 at 53. (Noting that the U.S. imported US$ 20,317,000 of seafood in 2014 which accounts for about one-quarter of the imports from the top-ten fish importing States)

[3] Eliza Barclay, Most Americans Eager to Buy Seafood That's 'Sustainable', (February 12, 2013), http://www.npr.org/sections/thesalt/2013/02/11/171743185/most-americans-eager-to-buy-seafood-thats-sustainable (Describing a poll conducted by National Public Radio and Truven Health Analytics in August 2012)

[4] *Id.*

[5] Walmart Policies and Guidelines, Seafood Policy (Noting that Walmart's "goal is to build transparency and continuous improvement in the seafood supply chain" and that Walmart is "working with our suppliers and partners to track the management of fisheries from which our suppliers source so that we can promote a sustainable supply." Further providing that "By 2025, based on price, availability, quality, customer demand, and unique regulatory environments…Walmart…will require all fresh and frozen…wild seafood suppliers to source from fisheries who are: Third-party certified as sustainable using Marine Stewardship Council [standards]…or certified by a program which follows the FAO Guidelines and is recognized by the Global Sustainable Seafood Initiative as such…or….actively working toward certification or in a Fishery Improvement Project…that has definitive and ambitious goals, measurable metrics, and time bound milestones.")

[6] Critics of sustainability certification argue that certifiers are ignoring ecosystem-based impacts of fisheries. For example, in Marine Stewardship Council certified swordfish fishery some boats catch more sharks than swordfish leading to unsustainable levels of bycatch for ecologically important shark species. *See* Brian Palmer, Is the Demand for Sustainable Seafood Unsustainable?, May 7, 2015, Pacific Standard, https://psmag.com/is-the-demand-for-sustainable-seafood-unsustainable-69510e8e339b#.lpl4rw7j5

the desire of consumers to know the origins and the journey of seafood from hook or net to plate is an established norm for a majority of American fish consumers.

The traceability of fish back to sustainable fisheries for Global North consumers who have options about what they eat has consequences for fishing families that may not be benefiting from the global boom in seafood. Today, fish remain a critical part of the daily diet for many coastal communities particularly in Global South States by providing basic high-quality protein and key amino acids for people with no other access to this type of nutrition.[7] The UN Food and Agriculture estimates that around 2.6 billion people depend on seafood for at least 20 percent of their protein needs.[8] The number of people relying on fisheries products may increase in the years to come as population numbers increase and other sources of protein such as livestock become increasingly unreliable due to desertification.

Without traceability, there is little hope for disrupting current industrial practices where marine fishing resources across the globe are increasingly exploited at unsustainable levels of fishing effort or where marine habitat is being destroyed by land-based human acts and omissions. Once abundant fishing grounds are in jeopardy due to the overcapacity of fleets. Commercial marine fisheries that are tracked by the Food and Agriculture Organization are generally declining.[9] Excess nutrients from the land have additionally turned "near-shore ecosystems into marine graveyards."[10] Eutrophication caused by excess nutrients contributes to

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[7] Fish include long-chain omega-3 fatty acids including eicosapentaenoicacid (EPA) and docosahexaenoic acid (DHA). DHA is essential for brain and neurological development among children. While there are other sources of omega-3 fatty acids in, for example, vegetable oils, these acids need to be converted in a process that is inefficient and may not result in sufficient intake for necessary brain development. Consuming omega-3 supplements does not have the same benefits as consuming fish. *See* Jogeir Toppe, The Nutritional Benefits of Fish are Unique, GLOBEFISH-Analysis and Information on World Fish Trade, Food and Agriculture Organization, http://www.fao.org/in-action/globefish/fishery-information/resource-detail/en/c/338772/

[8] Don Hinrichsen, THE ATLAS OF COASTS & OCEANS (Earthscan, 2011): 51.

[9] Food and Agriculture Organization, The Status of World Fisheries *supra* note 2 at 38. (On the basis of assessed commercial stocks, FAO calculates that fish being harvested within biologically sustainable parameters have declined from 90% of the fish stocks being sustainable fished in 1974 to 68.6% of the fish being fished sustainably. As of 2013, 31.4% of assessed commercial stocks are overfished. The ten most productive commercial species including important food fish such as the Southwest Pacific anchoveta , Alaskan Pollock, and Atlantic herring are fully fished and cannot sustain any additional production pressures.)

[10] *Id.* at 36-37 (Observing that "most of these dead zones are found in the waters of developed countries, and many of them in prime fishing grounds.")

harmful algal blooms (HABs) leading to the deterioration of aquatic ecosystems and in some case food poisoning from toxin-producing phytoplankton.[11] The rapid loss of key habitats such as coral reefs due to both inadequate coastal zoning protection and warming oceans is impacting breeding areas for fish and shellfish.[12] Sustainable fish production is not just desirable to soothe consumers' consciences but essential for the future viability of the industry.

This article starts with a few basic observations about the profitability of the industry and overfishing of marine wild fish. The second part of the article identifies two fishing supply transparency challenges for marine captured fish brought into the U.S. market (illegal fishing and unreported fishing/discards) and the existing U.S. legal responses to tackling these fishing supply chain issues. States that are major consumers of fish products such as the United States must take precautionary management approaches when regulating the fish supply chain. While most regulatory attention has focused on food handling and safety concerns, additional regulatory attention is needed to ensure that food is sourced from well-managed fisheries that do not jeopardize the future of fishery resources. While a growth in aquaculture technology may meet the needs of certain consumers of fish and seafood who have the capacity to pay certain premiums, aquaculture is unlikely to meet the needs of many artisanal and community fishing communities who do not have the existing financial capacity to invest in viable fish farms. Any global transition from marine fishery resources to aquaculture resources will take time and systematic planning. In order to better protect existing marine fishery resources from further declines, the paper concludes with recommendations that: (1) legal protection be bolstered for

[11] *Id.* at 40-41 (Noting that in Asia, China observed 84 HABs between 1990 and 2004, Japan observed 150 HABs between 1998-2002, and South Korea observed 304 HABs.)

[12] NOAA, 'NOAA declares third ever global coral bleaching event', October 8, 2015, http://www.noaanews.noaa.gov/stories2015/100815-noaa-declares-third-ever-global-coral-bleaching-event.html (Indicating that due to warming waters NOAA has been observed unprecedented bleaching of coral in American waters that are expected to continue into the future); See e.g. Ryukyu Shimpo, Majority of Sekisei shoko coral reef dies with 97% extremely severely bleached, November 10, 2016 https://coralreefwatch.noaa.gov/bleachingreports/press/PR20161110_Ryukyu_Islands.pdf (Reporting on an October 2016 survey); Australian Government Great Barrier Reef Marine Park Authority, Coral Bleaching, June 2 2016, https://coralreefwatch.noaa.gov/bleachingreports/press/PR20160602_bleaching_GBR_GBRMPA.pdf (Reporting on a 2016 survey of the Great Barrier Reef finding a range of coral loss depending on the location within the reef. In the far Northern Management Area, there is a 50% average coral loss.)

commercial fishing industry whistleblowers particularly foreign crew who are harvesting fish outside of U.S. waters, (2) environmental traceability beyond the current minimal traceability efforts be a requirement for all fisheries products traded or transiting within United States territory, and (3) the U.S. further regulate fish processing waste and seafood waste in order to both recover greater value for the industry and avoid food waste.

II. Global Trade in the Fishing Industry and Overfishing

Global trade is a significant driver of fish supply with 78% of seafood products exposed to international trade competition. [13] Fish is one of the most traded commodities and is a major driver to national economic growth and development.[14] Two hundred countries reported exports and imports of fish and fishery products. [15] Among the largest exporters are China, Norway, Vietnam, Thailand, and the U.S.; the largest importers include the U.S., Japan, China, and the European Union. [16]World trade has increased 245% in quantity of fish being traded from 1976 to 2014 and 515% for human consumption.[17] Exports account for over half of aquaculture and marine fish production as measured by value for developing countries.[18] Not just fish are being traded but also fisheries services including chartering of fishing vessels, fisheries research, and monitoring efforts.[19]

Some of this rapid increase in global trade of fishery products is the result of processing where preparation of fish (fileting) is outsourced.[20] Other drivers of an increase in the

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[13] Food and Agriculture Organization, The State of World Fisheries supra note 2 at 51.

[14] World Bank and Food and Agriculture Organization, Sunken Billions: The Economic Justification for Fisheries Reform (2009):5 (13% of the global "food" trade is in fish); *id.* at 51 (9% of the total agricultural exports are fish and seafood)

[15] Food and Agriculture Organization, The State of World Fisheries supra note 2 at 51.

[16] *Id.* at 53 and 54 (the EU and U.S. together import 63% of the value of traded fish and 59% of the quantity of traded fish).

[17] *Id.* at 51 and 52 (approximately 29% of the current trade in fish is for human consumption; the remainder is for fish meal used in feed and fish oil).

[18] *Id.* at ii and 55 (54% of total fishery export value comes from developing economies).

[19] *Id.* at 51

[20] *See e.g.*, Choy Leng Yeong, NW Salmon Sent to China Before Reaching U.S. Tables, The Seattle Times (July 16, 2005). Available at http://www.seattletimes.com/business/nw-salmon-sent-to-china-before-reaching-us-tables/

globalization of the fishing industry include better transport, technological innovations in fishing, and trade liberalization. [21] The expanding interest in the fishery trade is in part due to its profitability. The global fish trade has increased from US$8 billion in 1976 to US$148 billion in 2014 with an annual average growth rate of approximately 8% over the period.[22]

Some fisheries are being actively managed for sustainability criteria. Catches from some of these fisheries accounted for 47% of the world's total marine catch in 2013 are considered to be "oscillating around a globally stable value."[23] These fisheries include the Eastern Central Atlantic, Northeast Pacific, Eastern Central Pacific, Southwest Atlantic, Southeast Pacific, and Northwest Pacific.[24] Other fisheries that account for 21% of the global marine catch in 2013 are declining from historical peaks.[25] These fisheries include Northeast Atlantic, Northwest Atlantic, Western Central Atlantic, Mediterranean and Black Sea, Southwest Pacific, and Southeast Atlantic. [26] Finally, there are fisheries that contribute about 21% of the world's marine catch where catch has been increasing since 1950s. These fisheries include the Western Central Pacific, Eastern Indian Ocean, and Western Indian Ocean.[27]

Export fisheries production is particularly important for areas such as the Western Central Pacific where production grew to 12.4 million tons in 2013 with at least a quarter of the landings including high-value fish such as tuna that are depending on the species either fully fished or overfished. [28] Even though the human population is relatively low in the Western Central Pacific, this region is responsible for 15% of the global marine production and estimates have 23% of these fish being fished beyond biologically sustainable levels.[29] As the FAO commented in its

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[21] FAO, State of the World Fisheries, *supra* note 2 at 51.
[22] *Id.* at 52.
[23] *Id.* at 39
[24] *Id.*
[25] *Id.*
[26] *Id.* at 42.
[27] *Id.*
[28] *Id.* at 44. (Fully-fished species are still within biologically sustainable levels)
[29] *Id.*

2016 Status of the World Fisheries report, "[t]here is a need for effective management to restore the overfished stocks."[30]

The FAO recognizes that while fisheries management varies greatly across regions depending on governance capabilities, States can take measures to harmonize practices to eliminate avenues for destructive fishing practices. In 2009, the FAO championed the adoption of the Port State Measures Agreement to combat illegal, unreported and unregulated (IUU) fishing by encouraging states to exercise port state controls to prevent IUU fishing vessels from accessing domestic ports and trading IUU fish.[31] States are expected to empower port inspectors with the ability to review documentation including catch, transshipment and trade documents.[32] States following best fishing management practices are also expected to implement the Voluntary Guidelines for Flag State Performance which remind States of their obligation to domesticate international obligations involving flag state responsibility including taking effective action against non-compliance by vessels flying its flag. [33] Flag States are expected to have "as a minimum...mandatory requirements regarding fisheries-related data that must be recorded and reported in a timely manner by the vessels" includes "catches, effort, bycatches and discards, landings, and transshipments."[34] Flag States are also expected to have appropriate enforcement regimes with the "capacity to detect and take enforcement action."[35]

Unfortunately from a global fisheries management perspective, States offering registration under so-called "flags of convenience" (FOC) assert little to no control over FOC vessels.[36] Vessels owners desiring to shirk conservation and management rules will register

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[30] *Id.* at 39.

[31] Food and Agriculture Organization, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing (2009) available at http://www.fao.org/3/a-i5469t.pdf ("Port State Measures Agreement")

[32] *Id.* at Annex B(d)

[33] Food and Agriculture Organization, Voluntary Guidelines for Flag State Performance (2015) http://www.fao.org/3/a-i4577t.pdf

[34] *Id.* at Paragraph 31(d)

[35] *Id.* at Paragraph 32(a)

[36] States that have issued or are issuing flags of convenience according to the International Transport Union include Antigua and Barbuda, Bahamas, Barbados, Belize, Bolivia [land-locked], Cambodia, Cayman Islands, Comoros, Cyprus, Equatorial Guinea, Faroe Islands, Georgia, Honduras, Jamaica, Lebanon, Liberia, Malta, Mauritius,

under a FOC and may even register under multiple FOCs as an added barrier to traceability. These same vessel owners to avoid detection are likely to engage in transshipment that involves a fishing vessel off-loading catch onto a refrigerated cargo vessel into holds where fish from various harvest events are mixed. Researchers discovered by tracking satellite images that transshipments are likely to be associated with regions with more IUU fishing such as Russia's Exclusive Economic Zone (EEZ), Africa's EEZ and the High Seas.[37] Most of these transshipments are linked to vessels registered with FOCs, the Russian Federation, Kiribati, Taiwan, South Korea, or China.[38] According to researchers, a large quantity of fish from these transshipments eventually end up in Vladivostok and Murmansk, Russia; Montevideo Uruguay; Busan, South Korea, and Abidjan, Cote d'Ivoire.[39] As of February 2017, Russia and Cote d'Ivoire had not yet ratified or acceded to the Port State Measures Agreement raising questions about the commitment of these States to combatting IUU fishing.[40]

The existing governance gap involving FOC vessels and perhaps other fishing nations suggest that States receiving imports of large quantities of fisheries products such as the United States must be increasingly vigilant regarding what fish are permitted to enter the supply chain. For a bulk commodity where shipments arising from different regions of the world can be easily mixed, this is not an easy proposition. Credible catch documentation and reliable traceability mechanisms become essential for ensuring sustainable fishery supply chains. Recognizing the extensive trade in fisheries products highlighted in this section, the following section explores in more detail the two primary challenges for providing sustainable marine fish to consumers:

Moldova (land-locked), Mongolia (land-locked), Myanmar, North Korea, Panama, Sao Tome and Principe, St. Vincent and the Grenadines, Sri Lanka, Tonga, and Vanuatu. *See generally* http://www.itfglobal.org/en/transport-sectors/seafarers/in-focus/flags-of-convenience-campaign/

[37] D.A. Kroodsma, N.A. Miller, and A. Roan, "The Global View of Transshipment: Preliminary Findings." Global Fishing Watch and SkyTruth, February 2017: 8 (Noting that 43% of likely/potential transshipment events are on the high seas, 30% are in Russia's EEZ, and 10% are in the EEZ of African States), Available online at http://globalfishingwatch.org

[38] *Id.* at 11 (FOCs account for 44% of potential transshipments)

[39] *Id.* at 13.

[40] Status of the Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, http://www.fao.org/fileadmin/user_upload/legal/docs/037s-e.pdf

illegal fishing activity and unreported fishing activity. The following section will also discuss U.S. legislative and regulatory efforts intended to improve fishery supply chain transparency.

III. Transparency and 21st Century Fish Production

If you happen to be in a cafeteria line and the baked fish or the fish fingers look appetizing today, what can you as a consumer know about that fish? What can you as a cafeteria manager know about the fish? Do you know what ocean the fish came from? Do you know how the fish might have been caught? Were there ecosystem based conservation measures in place where the fish might have been caught? Do you know if the fishing vessel that caught your fish was in compliance with those measures? An average consumer remains blissfully unaware of how the fish came to be in the cafeteria.

This section will examine two topics impacting the 21st fish supply chain. The first topic is illegal and unregulated fishing ("illegal fishing") that remains pervasive across global fisheries. The second topic is unreported fishing which may or may not accompany illegal fishing. Today, some percentage of unreported fish that have been captured are ultimately discarded. Without information about the discarded fish, fishery management projections for thresholds such as "maximum sustainable yield" become increasingly unreliable. For both the topics of illegal fishing and unreported discards, the current U.S. federal response to improve traceability of fish in order to combat destructive marine fishing practices is discussed.

A. Illegal Fishing

Policymakers have grouped a number of undesirable fishing practices under the rubric of "illegal, unreported and unregulated fishing" or IUU fishing. While it has generally not been a helpful policy development to group these three fishing practices together because it does not differentiate between the array of legal responses needed to change commercial fishing behavior, these practices do share a key aspect in common. Each of these practices arises when there is inadequate knowledge about supply practices due to low transparency in the supply chain.

For a given shipment of fish, the fish may have passed through numerous locations. The fish may have been caught, for example, in the Pacific oceans. Some of the fish may have gone to a local processing plant on one of the Pacific Islands. Other fish may have been off-loaded while still at sea to a transshipment vessel. This vessel may have travelled West across the Pacific and off-loaded the fish in Hong Kong where they might have been processed for shipment to the European Union or the United States after being possibly fileted or reconstituted into other products such as fish paste or fish patties. Or perhaps the vessel travelled East across the Pacific to off-loaded in Seattle, Washington. Some of the fish may have be inspected and then sent back across the Pacific to China for gutting and fileting because labor is less expensive than in the United States' plant.[41] Repackaged, the fish is sent back across the Pacific, sold to a wholesaler, and then eventually appearing at a grocery store in the frozen food aisle. At each stage that a fish travels from harvest to plate, there are opportunities for illegal fish or fish that were captured outside of regulated areas to be "laundered" through the fishing supply chain. Given the profitability of fisheries trade especially for high value fish such as tuna or toothfish, there are incentives for engaging in illicit practices.

Because industrial fishing fleets are dispersed so widely across the globe, illegal fishing is generally not easy to detect reliably without the assistance of a fisheries observer who might be required to be onboard a vessel or a whistleblower from the crew who has first-hand knowledge of questionable practices. While notable progress has been made with refining satellite detection of IUU fishing practices in such a few years,[42] the satellites are still unable to be collect enough evidence to change the effectiveness of global fisheries enforcement. States recognizing that illegal fisheries products are entering ports have responded. At the international level, a number of key States that are large fishery product importers including the United States have ratified the Port States Measures Agreement.[43] Since most IUU vessels will go to great

[41] Choy Leng Yeong supra note 20.
[42] See generally Global Fishing Watch, http://globalfishingwatch.org
[43] FAO, Port State Measures Agreement, supra note 31.

lengths to hide their illegal activity, some form of verification system is necessary to uncover illegal activity in fisheries products. For States trying to track the origin of fish shipments, some form of catch documentation is usually required.

1. Regional Catch Documentation Schemes for the U.S.

Regional fisheries management organizations (RFMOs) that the United States is a member of have undertaken specific measures to combat illegal fishing by improving the transparency of the fishing chain through a strategy of catch documentation. For example, in 2000, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) introduced a "Catch Documentation Scheme" (CDS) for all toothfish species (*Dissostichus spp*.) because the toothfish were being rapidly depleted.[44] Catch documentation was considered a necessary regulatory intervention given the remoteness of the CCAMLR Convention Area and the potential danger associated with enforcement at sea of fisheries measures.[45] As of 2016, the CDS was reformed to address some loopholes that existed in the former conservation measures.

The new CDS requires individuals involved in the supply chain of toothfish to record the fish at each stage from capture to trade including landing, transshipment, import, export, or re-export.[46] If the movements of the fish are recorded in good faith by suppliers then this should improve transparency in the market and expose illegal transports of fish. As of February 1, 2017, any transfer of toothfish requires a catch document that might include a *Dissostichus* catch document, a *Dissostichus* export document, or a *Dissostichus* re-export document. For countries that are CCAMLR members, the CDS must be used for all toothfish captures regardless of where the toothfish were captured.[47]

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[44] CCAMLR, Catch Documentation Scheme, available at https://www.ccamlr.org/en/compliance/catch-documentation-scheme-cds (Noting that toothfish are marketed under a variety of names bacalao de produndidad (Chile), butterfish (Mauritius), Chilean sea bass (the United States and Canada), merluza negra (Argentina), mero (Japan) and ròbalo (Spain).

[45] G. Bruce Knecht, Hooked: Pirates, Poaching and the Perfect Fish (Rodale, 2006)

[46] Export and re-export are defined broadly under CCAMLR to include movements through free-trade zones.

[47] The Commission has membership from Argentina, Australia, Belgium, Brazil, Chile, China, European Union, France, Germany, India, Italy, Japan, Korea, Namibia, New Zealand, Norway, Poland, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom, United States, and Uruguay.

In combination with Vessel Monitoring System (VMS) data that is required to be reported at least every four hours from vessels operating within the CCAMLR Convention Area, CDS data can be used to verify the legality of fishing activity. States are expected to verify VMS data and fishing authorizations to ensure that the toothfish were actually taken from a particular region defined either by CCAMLR or, if outside of the CCAMLR region, by the FAO and were legally taken. CDS data includes at a minimum information about the vessel (e.g. name, home port, national registry number, IMO/Lloyd's number where available), the license, the catch, the fishing plan, landing port information, transshipment details (e.g. vessel name, name of the master, and name of port authority if transshipped at a port), and the ultimate recipient of shipment, when known. For export shipments, States must also collect transport details of a shipment including cargo data. If States are satisfied with their review of the information, they can issue a Flag State Confirmation Number vouching for the legality of fishing activity by its fishing vessel. Relying on good faith, States are not supposed to issue catch documentation "if there is reason to believe that the information submitted by the vessel is inaccurate or that the *Dissostichus* sp. were taken in a manner inconsistent with CCAMLR conservation measures if fishing occurred in the CAMLR (Convention on Antarctic Marine Living Resources) Convention Area."[48]

Access to the catch documentation information by potential enforcers is critical. The National CDS contact officer for each CCAMLR member States has access to all CDS data related to an import.[49] States that are not Parties to CCAMLR may receive limited data in order to validate an individual toothfish shipment. [50] These States are expected to become Contracting Parties to CCAMLR or to at least attain the status of a "non-Contracting Party cooperating with CCAMLR."[51] What this means in practice for the United States as an active participant in the

[48] CCAMLR, Conservation Measure 10-05, Catch Documentation Scheme for *Dissostichus spp*. (2016) para. 5. Available at https://www.ccamlr.org/en/measure-10-05-2016

[49] CCAMLR, Rules for Access to Catch Documentation Scheme Data https://www.ccamlr.org/en/system/files/e-pt12.pdf

[50] *Id.*

[51] CCAMLR, Conservation Measure 10-05, *supra* note 48 at Annex 10-05/C.

CDS is that any "Chilean Sea Bass" that enters the United States will have a documented and verifiable track record of its supply chain.

The CCAMLR CDS focused on toothfish is, however, still not a watertight enforcement system because it still relies upon the good faith involvement of the flag State to ensure that a Flag State Confirmation is merited as part of the CDS. Providing such a confirmation may prove tricky when the Flag State officials have no means of making a visual confirmation about, for example, the quantity of catch. Even though States are expected to verify compliance with CCAMLR conservation measures through inspections of all of its flagged vessels that leave from or arrive at its ports or "where appropriate" transit its Exclusive Economic Zone, this provision does not cover distant water fishing fleets that may rarely enter the ports of their flag State. [52] While some regions such as the European Union have publicly available information about distant water fleets that might be operating in the CCAMLR Convention Area, this information is difficult to obtain from States.[53]

In addition, to the United States commitment to catch documentation under CCAMLR, the U.S. has also agreed to a Bluefin tuna catch documentation scheme for the International Commission for the Conservation of Atlantic Tunas. This scheme created in 2008 is similar in concept to the CCAMLR scheme and requires every Contracting Party or "Co-operating Non-Contracting Party, Entity or Fishing Entity" to submit information electronically that will be used to identify the origin of harvested bluefin tuna.[54] Specifically parties must prohibit any landing, transfer, delivery, harvest, domestic trade, import, export or re-export of bluefin tuna without a completed and validated blue catch document, bluefin tuna re-export certificate or ICCAT transfer declaration.[55] Regional observers are on-board certain types of vessels including all tropical tuna vessel during area-time closures, all transshipment vessels, and 20%-100% of

[52] CCAMLR, Conservation Measure 10-02, Licensing and inspection obligations of Contracting Parties with regard to their flag vessels operating in the Convention Area, (2016) https://www.ccamlr.org/en/measure-10-02-2016

[53] Databases on EU External Fleet, http://www.whofishesfar.org/

[54] The electronic requirement became operational in June 2016.

[55] 2nd Performance Review of ICCAT (2016): 48 (ICCAT Rec. 11-20) available at https://www.iccat.int/Documents/Other/0-2nd_PERFORMANCE_REVIEW_TRI.pdf

eastern Bluefin tuna fishing vessels.[56] In addition to the catch document program for Bluefin tuna, ICCAT States are required to have "statistical documents or re-export certificates that have been validated by the relevant government" for imports of bigeye tuna and swordfish. [57] ICCAT is considering phasing out these "statistical documents" and requiring instead catch documentation as in the Bluefin program that could be shared across regional tuna management organization.

2. United States Implementation of RFMO Transparency Obligations and Catch Documentation Schemes

The United States has implemented some of its obligations under CCAMLR, ICCAT and the U.S. Security and Accountability for Every Port Act of 2006 by requiring parties to file electronically in the government-wide International Trade Data System when they are importing, exporting or re-exporting certain fish products such as Bluefin tuna, toothfish, or shark fins. [58] The rule consolidated permits for regulated seafood products under the Antarctic Marine Living Resources Program, Highly Migratory Species Program, and the Tuna Tracking and Verification Program. Importers are expected to provide information about "place of catch" defined as "area of the ocean where the fish was harvested."

In addition to its obligations to implement international catch documentation for tooth fish and Atlantic Bluefin tuna, the United States is in the process of implementing its own Catch Documentation Scheme that will only initially focus on at-risk fisheries. On December 9, 2016, the National Oceanic and Atmospheric Administration concluded a final rule regarding permitting, reporting and recordkeeping procedures for the importation of certain fish and fish products, identified as being at particular risk of IUU fishing or seafood fraud.[59] The "Seafood Import Monitoring Program" rule was created in response to recommendations from the National

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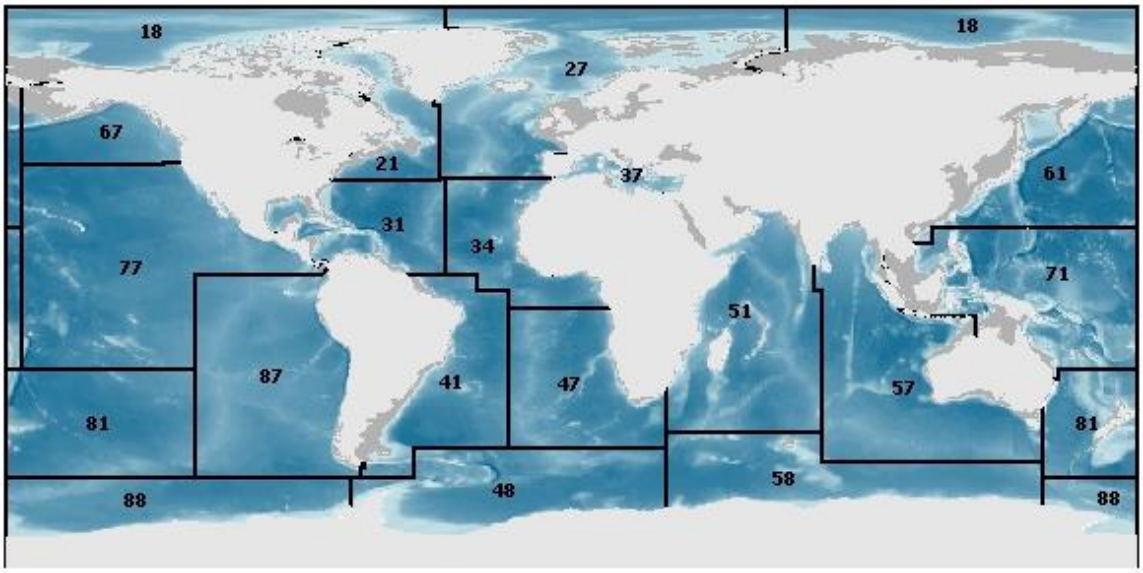
[56] *Id.* at 47.

[57] *Id.* at 48.

[58] National Oceanic and Atmospheric Administration, Trade Monitoring Procedures for Fishery Products: International Trade in Seafood; Permit Requirements for Importers and Exporters 81 FR 51126 (August 3, 2016)

[59] National Oceanic and Atmospheric Administration, Seafood Import Monitoring Program, 81 FR 88975 (December 9, 2016) available at https://www.federalregister.gov/documents/2016/12/09/2016-29324/magnuson-stevens-fishery-conservation-and-management-act-seafood-import-monitoring-program

Ocean Council on how best to implement President Obama's proposed "Comprehensive Framework to Combat Illegal, Unreported, and Unregulated Fishing and Seafood Fraud."[60] Importers are now required to obtain an annually renewable International Fisheries Trade Permit to trade the fish and fish products regulated under this rule. Under this permit, importers must collect catch and landing documentation on certain fish and fish products and electronically report these to a central data base that will be used by the National Marine Fisheries Service to verify that the fish were not illegally harvested. In theory, this should improve the traceability of species deemed to be "at risk." In terms of harvest location, the importer, however, only needs to provide the general FAO region where the fish or seafood was harvested. As of 2017, there are 20 major FAO fishing regions.



[61]

What this means is that harvest location information will yield little useful information particularly in an area as broad as the Pacific or the Arctic. The U.S. approach has yet to be tested but in terms of broadly protecting ocean resources may be too limited in its reach. As currently structured, there is no specific consumer labeling required for fish except for the market name of the fish, general place of origin, and whether a fish is wild caught or farm

[60] National Ocean Council, Task Force Report (Recommendation 14 and 15 called for a risk-based traceability program)
[61] BLANK CITE.

raised.[62] This information leaves a great deal unstated for a consumer may not know how fish were harvested. Non-governmental organizations have tried to fill the gap with Seafood Watch lists trying to indicate fish products that are more likely to have been harvested sustainably.[63]

B. Unreported Fishing

Discards are harvested fish, aquatic life and seaweed that are returned to the sea.[64] Discards may be reported but are often not reported because of concerns that reporting will result in reductions in future harvest numbers. In many cases, discards may be lawful because a fishing operator is either required to return something to the sea (e.g. a protected species such as a shark) or is allowed to return something to the sea after reporting the discard. In some instances, returning species alive to the sea is consistent with sustainable fisheries management because the practice returns a species with a high probability of survival (e.g. crab) or a healthy egg-bearing individual to the sea.[65]

Discards practices may become problematic when an organism that is returned to the sea is unlikely to survive or is dead. Three types of discard practices are more likely to involve either illegal practices or undesirable management practices: high grading for economic profit which often happens with the capture of smaller fish, unreported releases of discards to avoid regulatory enforcement, and unreported releases of aquatic life that exceed fishery management quota levels.[66]

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[62] *See generally* Agricultural Marketing Act of 1946 7 U.S.C. 1621 et. seq; 60 CFR §§ 101- 133

[63] Seafood Watch Standards, Monterey Bay Aquarium, http://www.seafoodwatch.org/seafood-recommendations/our-standards

[64] Definitions of bycatch and discards are often inconsistent across jurisdictions. The term discards implies a return to the sea. The term bycatch is frequently used in laws and regulations and can refer to both discarded catch and incidental catch (non-target fish that are retained). This paper will use both terms but the substantive focus will only be on fish and shelllfish returned to the sea and not related bycatch issue involving seabirds and mammals.

[65] J.P. Johnsen and S. Eliasen, Solving Complex Fisheries Management Problems: What the EU can Learn from the Nordic Experiences of Reduction of Discards, 35 Marine Policy (2011): 130-139

[66] T.A. Branch, K. Rutherford and R. Hilborn, Replacing Trip Limits with Individual Transferable Quotas: Implications for Discarding 30 Marine Policy (2006): 281-292

1. U.S. Response to Managing Discards

Managing discards is challenging in most global fisheries. The U.S. has tried a variety of approaches to address illegal discarding within U.S. fisheries. Under the regulations implementing the Magnuson-Stevens Fishery Act, U.S. commercial vessels operating under a federal fishing permit may be required to submit "vessel monitoring system" catch reports or "vessel trip reports" that include information about the vessel's fishing activity, including data on the catch composition (species and weight) of both landed and discarded fish.[67] Some of the regulations are very specific in relation to commitments under regional fisheries management organizations' measures such as the Western and Central Pacific Fisheries Commission. For example, U.S. fishers operating with purse seines are expected to report all at-sea discards of bigeye tuna, yellowfin tuna and skipjack tuna on a specific form because these tuna should not be discarded unless the fish are unfit for human consumption, there is insufficient storage space for the fish, or a serious malfunction of equipment occurs requiring that fish be discarded.[68] In common pool fisheries in the Northeast, a vessel may not discard any legal-sized cod prior to reaching its landing limit.[69] In shared multi-species fisheries with Canada, under a current special access program, U.S. fishers are expected to daily report every discard of haddock, cod, yellowtail flounder, winter flounder, witch flounder, American plaice, and white hake.[70]

In order to minimize discards in a variety of fisheries, the United States has a variety of discard management rules in place to enhance environmental stewardship; these include restrictions on harvesting juvenile fish, gear restrictions to minimize capture of non-target species, and prohibitions on fishing in known spawning areas. Occasionally, exemptions are made such as an exemption for summer flounder mesh size, but these exemptions may be

[67] 50 CFR 300.218 (a) (Observing that commercial fishing operators must submit reports that identify amount of fish discarded as part of a trip to capture highly migratory species in the Pacific Ocean); 50 CFR 300.341 (Requiring that U.S. flagged high seas vessels record the amount of fish discarded)

[68] 50 CFR 300.218 (e) and 50 CFR 300.223 (d)

[69] 50 CFR 648.86 (a)(7)(vi)(C)

[70] U.S./Canada Management and Special Access programs for Sector Vessels (May 21, 2015) https://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/sectoruscanadaandsaps.pdf

revoked if a vessel is found to be discarding more than 1% of its catch of summer flounder per trip.[71]

U.S. Fishery Management Councils responsible for regional U.S. fisheries offer a variety of approaches to managing discards. In some West Coast fisheries, certain vessels participating in individual fishing quota (IFQ) programs may discard IFQ species as long as the species have been recorded and deducted from the quota package for the vessel. Certain other species must be discarded such as Pacific Halibut when it is captured by the limited entry bottom trawl sector.[72]

Other U.S. fisheries including multi-species fisheries in the Northeast are operated under "sectors." In this context, "sectors" refer to a group of persons with a limited access vessel permit operating under a fishery management plan who have received a shared total allowable catch and who have entered into a contract imposing certain fishing restrictions for the course of one year.[73] In order to benefit from the sector's total allowable catch (TAC) as well as several exemptions,[74] a sector must consist of at least three people who don't have ownership in each other's operations. The Council must approve the sector and each approved sector must submit a fisheries operation plan to NOAA including how it will handle discards.

In a multispecies sector, a sector must have quota available for all stocks in the area even where it is targeting one fish such as monkfish. Any catch including discards of multispecies stocks will count against a sector's quota.[75] Sectors must not discard any legal-sized groundfish of allocated stocks, including legal-sized, unmarketable fish of stocks allocated to the sectors, unless that vessel's sector is otherwise exempt. Legal sized but unmarketable fish must be

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[71] 50 CFR 648.108 (b)(3)

[72] E. Heery, M.A. Bellman, and J. Majewski. 2010. Pacific halibut bycatch in the U.S. west coast groundfish fishery from 2002 through 2009. West Coast Groundfish Observer Programme. Northwest Fisheries Science Centre. Available at http://www.pcouncil.org/wp-content/uploads/D2b_NMFS_SEPT2010BB.pdf

[73] For an example of sectors, see Sector Manager Contact Information (May 12, 2015) http://www.nefsc.noaa.gov/fsb/asm/sector_manager_contact.pdf

[74] Exemptions available for vessels participating in a sector include no trip limits on allocated stock, no groundfish Day at Seas restriction, no seasonal closures in certain designated fishing grounds, and the ability to use certain types of mesh.

[75] Sector Vessel Regulations Overview Fishing Year 2015, https://www.greateratlantic.fisheries.noaa.gov/sustainable/species/multispecies/sector/2015sectorguide.pdf

landed.[76] Undersized fish that are discarded must be reported daily. In addition, vessels within a sector are prohibited from retaining certain species such as ocean pout, windowpane flounder, and Atlantic wolf fish. Sector vessels not fishing in exempted fisheries are also required to have in place an at-sea monitoring program funded by the industry and to collect data on vessel operations and discards. Where there is problematic activity by a member of a sector, all members agree to comply with "stop fishing" order from the Sector until NOAA reviews next steps. Sector members are expected not to exceed quotas or all of the members may be held jointly and severally liable for quota overages, discarding of legal sized fish, and misreporting catch including discards.

In 2006, the North Pacific Fishery Management Council adopted Amendment 80 to the Bering Sea and Aleutian Islands Fishery Management Plan, providing for the formation of harvesting cooperatives in the Bering Sea and Aleutian Islands for non-pollock trawl groundfish.[77] Under this amendment, cooperatives were given limited access privilege with the expectation that the members of the cooperatives would lower their discard rates and potentially improve the value of their harvested species. The reforms proved to be effective because they offered flexibility in the system, with fishers having a large choice of fishing grounds and no longer having to compete as actively with other fishing fleets in order to exercise harvest capacity.[78]

In 2009, the North Pacific Fishery Management Council implemented a new incentive plan agreement for managing discards in the Bering Sea Pollock Fishery as part of its "Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area."[79]

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[76] 50 CFR 648.87 (b)(1)(v)(A)

[77] Bering Sea and Aleutian Island Fishery Management Plan, Allocation of Non-Pollock Groundfish and Development of a Cooperative Programme for the Non-AFA Trawl Catch Processor Sector, June 10, 2006, Amendment 80; http://www.npfmc.org/wp-content/PDFdocuments/catch_shares/AM80/IRIU80motion606.pdf (Providing Council Motion)

[78] J. Abbott, A. Haynie, and M. Reimer "Hidden Flexibility: Institutions, Incentives and the Margins of Selectivity in Fishing" Land Economics 91 (1) February 2015: 169-195

[79] Amendment 91, Fisheries Management Plan for Groundfish of the Bering Sea and Aleutian Islands Management Area, North Pacific Fishery Management Council (75 FR 53026, August 30, 2010) (Under the incentive plan agreements, groups of pollock fishers operating as a "fleet" could agree to actively reduce their bycatch/discards of

2. Global Fisheries Response to Discards

Given the challenges inherent for U.S. fisheries to properly manage discards especially those discards that might qualify as food waste, many questions remain about the transparency of discard practices within fisheries that export to the United States. In some fisheries such as regional tuna fisheries in the Pacific Islands, observers are required on-board vessels to evaluate whether a vessel is complying with conservation measures.[80] In other fisheries such as the European Union, there is a no-discard policy for certain regional fisheries operating under quotas.[81] The challenge for managing discards as a perverse externality of a growing global fish supply chain is finding some mechanism for measuring the level of waste and harvest inefficiency at the fleet level. Some undesirable levels of industry-wide discarding can be addressed with innovations in equipment and introduction of new practices.[82] Other possibilities for addressing underreporting due to illegal discarding are discussed in section 3 including potentially protecting foreign whistleblowers and facilitating increased processing of fishery products that are currently regarded as industry waste.

III. RECOMMENDATIONS TO IMPROVE ECOLOGICALLY MEANINGFUL TRANSPARENCY ACROSS THE FISHERY SUPPLY CHAIN

The article concludes with several recommendations intended to enhance the ability of the U.S. to address illegal and unreported fishing in the fisheries supply chain. The three

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chinook salmon in order to ensure access to productive fishing grounds. Each fleet would be assigned an aggregated available base cap which is shared at the outset among the vessels comprising the fleet. Fleets with low chinook salmon bycatch/discard rates could continue to fish across the region, while fleets with average or high rates of bycatch/discard would be excluded from fishing in areas where there were likely to be high levels of salmon bycatch/discards. Once a fleet's available cap had been reached, a fleet must stop fishing for pollock unless it can obtain additional "base cap" from another vessel, fleet, or sector to take chinook.)

[80] *See e.g.* Parties to the Nauru Agreement, http://www.pnatuna.com/Observer-Program

[81] European Parliament and the Council Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/ 2002 and (EC) No 639/2004 and Council Decision 2004/585/EC (This larger reform of the Common Fisheries policy includes the "discard ban" at Article 15)

[82] International Smart Gear Competition http://www.worldwildlife.org/initiatives/international-smart-gear-competition (Describing an initiative by the World Wildlife Fund to provide start up capital for technological ideas that might reduce discards such as the air-powered sampler for purse seine fishing. This innovation permits a vessel to take a sample of the fish that it is likely to be bringing onto deck before the net is lifted out of the water so that a fishing vessel can decide to release the net before taking it out of the water if the species makeup is unprofitable.)

suggestions that follow include: bolstering legal protection for industry whistleblowers operating in the fishing industry; requiring enhanced environmental traceability for all fisheries products traded or transiting within United States territory; and tackling waste generated by both fish processors and consumers.

A. Legal Protection for Industry Whistleblowers particularly foreign whistleblowers

The front line of compliance efforts is the crew of fishing vessels. These men and women see firsthand how a vessel is fishing and whether the vessel is complying with bycatch and discard regulations or whether the vessel is engaging in IUU fishing practices. Obtaining eyewitness information from fishing crews can be challenging particularly from foreign fishing crews. Given the vulnerability of many crew members to retaliation by fishing vessel owners and the concern over losing their livelihood, crew members are unlikely to report illegal activity associated with their own vessel. Even if crew members might be willing to raise concerns about the operation of other vessels, this information may not be reliable as evidence because the information may be the product of hearsay or may be eyewitness data but taken from afar.

Because it is more likely that illegal fishing will take place on a vessel that has little state oversight such as a vessel sailing under a flag of convenience, crews on these vessels are likely to be an important source of information for government prosecutions. As of 2016, there has been inadequate attention given by federal agencies to seeking information from potential whistleblowers for wildlife crimes such as IUU fishing.[83] Whistleblowers can receive monetary awards under a number of Statutes including the Lacey Act, the Endangered Species Act, the Rhinoceros and Tiger Conservation Act, the Antarctic Conservation Act, the Fish and Wildlife Improvement Act, and the Wild Bird Conservation Act for information that leads to an arrest, conviction, or forfeiture.[84] Under the Fish and Wildlife Improvement Act, the National Marine

[83] Stephen Kohn, Monetary Rewards for Wildlife Whistleblowers: A Game-Change in Wildlife Trafficking Detection and Deterrence, 46 Environmental Law Report 10054, (2016)

[84] Lacey Act 16 U.S.C. § 3375 (d); Endangered Species Act 16 U.S.C. § 1540(d), the Rhinoceros and Tiger Conservation Act 16 U.S.C. § 5305a(f); Antarctic Conservation Act, 16 U.S.C. § 2409 and 16 U.S.C. § 2439; Fish and Wildlife Improvement Act 16 U.S.C. § 7421(c)(3); Wild Bird Conservation Act 16 U.S.C. § 4912(c) and 16 U.S.C. § 4913(b)

Fisheries Service can provide whistleblower payments from agency appropriations for information that can be used to prevent IUU fishing under a wide range of national laws including the High Seas Driftnet Act; the Illegal, Unreported and Unregulated Fishing Enforcement Act; the Magnuson-Stevens Fishery Conservation Act; the Shark Finning Prohibition Act; and the Sustainable Fisheries Act.[85] While Congress has amended both the Lacey Act and the Endangered Species Act so that there is no cap on the amount of money that a potential whistleblower might be entitled to collect, there has been little effort to implement these amended laws as evidenced by "no reported cases under these laws, no published regulations, and no reward application procedures."[86]

With an estimate that between 20% and 32% of marine seafood worth between $US 1.3 and 2.1 billion is being illegally imported into the United States,[87] it is surprising that the government offers such limited rewards to whistleblowers.[88] If the statutory rewards are to generate information likely to result in prosecutions for systematic violations of conservation and management measures, the government must do a better job of promoting the existence of whistleblower rewards to potential informants. For example, the U.S. might identify specific communities where larger IUU fishing operations are likely to recruit crew and advertise the conditions for receiving awards within the community. With the widespread use of cellular technology, the U.S. could also devise a social media strategy so that individuals searching on-line for fishing crew opportunities might also find as part of their search websites describing whistleblower awards.

Kohn, one of the founders of the National Whistleblower Center offers a number of proposals of how to strengthen the possibility of crew members being willing to inform once

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[85] For a complete list of statutes that NMFS can provide whistleblower payments, see Kohn, supra note 82 at Appendix B.

[86] *Id.* at 10055.

[87] Ganapathiraju Pramod et al. Estimates of Illegal and Unreported Fish in Seafood Imports to the USA, 48 Marine Policy 102 (September 2014)

[88] Kohn, supra note 82 at Appendix C and Appendix D (noting that over the course of 12 years, only $300,000 of rewards were offered to whistleblowers under both the Endangered Species Act and the Lacey Act)

they have knowledge of the whistleblower provisions of the wildlife trafficking Statutes. He suggests guaranteed minimum awards such as $25,000 that might exceed the amount of a collectable fine in order to increase potential participation, and the provision of awards to individuals who may have participated in a crime but did not organize or plan the crime.[89]

Key to any successful whistleblower program is the ability of the agencies to maintain confidentiality of informants. Because at least some IUU fishing activity is linked to organized crime,[90] ensuring that informants whose information is the basis for a prosecution remain safe from harm is critical. While the witness security program coordinated under the U.S. Marshals Service of the Department of Justice has typically been used to protect individuals who provide key evidence for the prosecution of gangs members, terrorists, and drug traffickers, the program may also be appropriate for informants whose lives might be threatened by reporting fisheries crimes.[91] The current program would authorize the protection of key witnesses threatened by bodily injury if they can be identified as the informants whose evidence forms the basis of an organized crime or other serious offense case.[92]

B. Extending Environmental Traceability for all Fisheries Products Traded or Transferred within the U.S. and its territories

While the requirement to have catch documentation seems to be making a difference in changing behavior by fishing industry actors, catch documentation under the existing U.S. law is currently restricted to just a few key species because the focus has only been on illegal fishing. This approach while potentially pragmatic in terms of rolling out the implementation of the program does not address ecosystem based fishery management concerns. Catch documentation if it is to serve a role in improving overall fisheries management, by perhaps driving consumer

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[89] *Id.* at 10065-10066

[90] United Nations Office on Drugs and Crime, Fisheries Crime, (Noting that Fisheries Crime is often transnational and organized and includes illegal fishing, money laundering, and other forms of fraud) http://www.unodc.org/documents/about-unodc/Campaigns/Fisheries/focus_sheet_PRINT.pdf

[91] U.S. Marshals Service Fact Sheet, Witness Security (2017) https://www.usmarshals.gov/duties/factsheets/witsec.pdf

[92] 18 U.S. § 3521 (providing the Attorney General with the discretion to provide for relocation or protection of a witness or potential witness if "an offense involving a crime of violence directed at the witness" for testifying is "likely to be committed.")

behavior towards more sustainably managed fisheries, should be applied to all species traded within the U.S or transiting through the U.S. The information slated to be collected by the U.S.'s new program will be of limited use to implementing an ecosystem based approach because it is not only stock specific but specific to a small subset of fish. Even though the National Oceanic and Atmospheric Administration who is responsible for implementing the Seafood Import Monitoring Program agrees in principle with the recommendation to trace all fishery products, it is unclear when NMFS will propose a more comprehensive approach to seafood imports. Because the U.S. approach will rely on a risk assessment approach to ocean fishery management problems and is currently only identifying "at risk" fish and seafood species, the U.S. will not be contributing substantially to a necessary normative shift for the fishing industry to be more forthcoming about its practices.

While acknowledging that it is difficult to design a program that will be comprehensive from its inception, the existing program adopted in December 2016 appears to be already problematic in terms of attempting to achieve its goals of identifying illegally harvested products. There are three problems: inadequate geographical harvesting information, insufficient coverage of all fish products, and ability to mix fishery products reducing incentives to improve environmental performance.

First, the program only requires that importers collect information based on the FAO regions. These regions are so broad that knowledge that a given shipment of tuna came from the Pacific is unlikely to provide much information to a regulator trying to understand whether the fish was illegal harvested or not. Second, the program fails to address all sources of fish products. The Seafood Importing Monitoring Program does not apply to "fish oil, slurry, sauces, sticks, balls, cakes, puddings, meal and other similar highly processed fish products for which the species of fish comprising the product or the harvesting event(s) or aquaculture operation(s)

of the product being entered, cannot be feasibly identified, either through inspection, labeling, or HTS [Harmonized Tariff Standard] code."[93]

Third, the regulators are not requiring that fishery products be identifiable by a given harvest event. The issue of segregation was a subject of concern for fish importers who believed that any requirement to segregate shipments would place an undue burden on the industry. In responses to comments, NOAA indicated that while segregation of shipments based on the harvests would not be required the importer of record must document each harvest event "relevant to the contents of the shipment…however, specific links between portions of the shipment and a particular harvest event are not required."[94] This "bulk" identification of fish that permits aggregation of fish in one shipment may reduce some of the incentive to improve environmental performance that would otherwise exist in a system with clear linkages between a given fish harvest and a given market.

While it is understandable that industrial vessels due to multiple tows of a trawl do not want to have the additional burden of paperwork, not all tows for a given vessel are necessarily legal. For example, a vessel may as part of its permit be required to comply with certain conservation rules that might include retaining a certain amount of ocean biomass that would otherwise be discarding. A largely legal fishing trip can also have some degree of illegal fishing attached. For example, on a particular trip, a vessel deploys the net 3 times. The first 2 tows are successful, the hold is almost full, and the vessel has almost harvested its allotment of a commercially valuable fish. The last tow is filled with low economic value fish. Because of the conservation measures in the permit, the vessel should retain these fish but depending on whether there is an observer on board or a camera, these fish may be jettisoned and the boat may deploy its net again. This last fishing event should not be a deemed a "legal" event because it is contrary to conservation measures. Under the U.S. reporting rules, fish from an "illegal" tow can then be added to the hold and mixed with the other fish making it impossible to distinguish

[93] CFR 300.324 (a)(1).
[94] CFR 300.324 (b)(3)

between which fish were legally caught and which fish were illegally caught due to the failure to report a quantity of discards. While traceability should not lead to onerous regulatory burdens for members of the fishing industry, the information currently being requested under the U.S. regulations does not seem to be adequate to address the purpose of the program—to deter illegal fishing.

Finally, the regulation does not require that transshipment information be reported even though transshipment activity particularly from certain regions of the world or under FOCs has been associated with facilitating IUU fishing.[95] The government acknowledged the value of transshipment information but declined to include it in the initial seafood importing monitoring program. The government did not give a specific reason for leaving out transshipment information which would provide credible traceability but simply commented that "NMFS will consider key chain of custody data elements that could be established as mandatory reporting requirements" through a future rulemaking.[96]

Some segregation among catches on a vessel before imports are approved seems necessary to provide incentives for better fishing practices even if all of the fish are legally harvested. For example, if a fishing vessel harvests 1000 tons of fish using excellent implementation of bycatch conservation measures and 10,000 tons of fish using mediocre conservation measures, all of the harvest events associated with these fish would need to be recorded but then could be mixed at point of import. The potential increased market value of the 1000 tons of fish that were caught using superior conservation measures would be lost if the traceability measures allow for commingling of fish. For the rule to benefit fish stocks and fishing companies who use best practices, the rule should require some collection of data regarding the adequacy of the implementation of conservation measures for "bulk fish." While there are fishing companies that are doing this type of tracing in order to secure better market

[95] Kroodsma et al. supra note 37.
[96] National Oceanic and Atmospheric Administration, Seafood Import Monitoring Program, supra note 59 at 88980.

value, these companies are the exception and little is known about the production of most fish flowing into U.S. trade channels.

Given the existing political momentum behind the Port State Measures Agreement, catch documentation programs are expected to expand to other RFMOs, intergovernmental organizations, and States. In response, the Food and Agriculture Organization is finishing drafting a set of Voluntary Guidelines for Catch Documentation Schemes.[97] As presently drafted, these guidelines are very narrow in their application. The Guidelines emphasize that a catch documentation scheme must avoid creating trade barriers and should be based on "risk analysis and be proportionate to the risk that IUU fishing poses on the relevant stocks and markets."[98] These Guidelines like the U.S. Seafood Import Monitoring Program fail to take account of the need for environmental traceability across the fishing industry and not just for a handful of commercially significant stocks. Even though a given stock such as herring may not be currently threatened by IUU fishing, the future of currently abundant stocks still depends on robust management. Keeping track of global management of fisheries is an essential safeguard for the fisheries of tomorrow.

Policymakers might be concerned that a broad traceability program will trigger concerns over technical barriers to trade. As long as the United States requires all suppliers including U.S. based suppliers to provide certain basic information about the source of a shipment of fish including what conservation or pollution control measures were implemented, a challenge to traceability rules on the basis of trade rules is unlikely to succeed. At first glance, this requirement might seem to penalize small producers particularly in the Global South who do not have the infrastructure or know how to create a traceability system. The inability for small foreign producers to sell into a market requiring traceability is not a foregone conclusion. The Marine Stewardship Certification of a number of species not fished in U.S. waters proves that

[97] Voluntary Guidelines for Catch Documentation Scheme, Annex 1 (2016) ftp://ftp.fao.org/FI/DOCUMENT/tc-cds/wpAnnex.pdf
[98] *Id.* at Article 4(d)

partnerships between U.S. seafood importers and foreign coastal communities can succeed in improving sustainable fishing practices.[99]

While achieving transparency through traceability is beset with larger reporting challenges such as systemic fraud, requiring basic information to be transferred from hook to plate for all fish and fish products as they travel in the supply chain is an excellent first step towards bringing light to an industry where much remains hidden. Creating a culture of traceability should reward producers who can demonstrate that they have been conscientious in how they harvest. A consumer in a cafeteria line should be able to rest assured that the breaded fish sticks they are contemplating eating were not intentionally harvested in a manner with no regard for the future viability of the ecosystem.

C. U.S. needs to intervene to reduce fish processing waste and create strategies to reduce consumer waste

While most traceability efforts have focused on reducing illegally harvested fish or identifying what and how much is being discarded in a fishery, there has been little attention given to post-harvest waste associated with fish processing. In well-managed fisheries including the Alaska fisheries, there are estimates that 1.1 million tons of fish processing waste and generated and that about a quarter of this waste is ultimately discarded.[100] While much of the waste from the larger producers is processed into fish meal or oil and the government has required new seafood processing plants operating in locations such as the Bering Sea to include machinery to handle seafood processing byproducts, there remains a substantial portion of waste that is simply left to spoil rather than being further processed.[101] Individual States have a variety of means for managing fish processing waste including the use of landfills.[102] A large quantity of

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[99] *See generally* Fishing & Living, http://fishing-living.org/#sthash.Qtg1xG8s.dpbs (Describing a number of projects to improve tuna fisheries in Indonesia, Vietnam, Cook Islands, and the Federated States of Micronesia, Fiji and the Solomon Islands)

[100] Peter Bechtel et. al., Developing the Potential of Fish Processing Byproducts takes Guts, Case Study 1 (2010) http://www.nmfs.noaa.gov/aquaculture/docs/feeds/casestudy1_fish_processing_byproducts.pdf

[101] *Id.*

[102] See e.g. State of Michigan, Department of Environmental Quality, Fish Waste Exemption (Providing for disposal in landfill, composting, disposal at a wastewater treatment plant, burial of fish waste, or land application of fish waste) https://www.michigan.gov/documents/deq/deq-whmd-swp-Exemption-FishWaste_247536_7.pdf

fish waste may also be generated abroad as U.S. fishing companies send fish to be processed overseas to save on labor costs. Local communities may use some of this waste in the form of fish heads or other fish parts deemed less desirable in a U.S. market where the fish processing plants are located. Other processing waste may be dumped.

In addition to waste generated by the U.S. fishing industry both at home and abroad, consumers are a primary source of waste. Of an estimated 2.3 billion pounds of seafood wasted annually in the United States, 1.3 billion pounds are wasted by consumers.[103] If the protein available in the 2.3 billion pounds of seafood were recovered, this would in theory meet the protein needs of 10-12 million people and the caloric needs for 1.5 million adults.[104]

In addition to raising awareness of the extent of the waste problem, the government may want to begin to track where post-harvesting waste is most prone to happen and help producers to identify appropriate strategies. Given the existence of producer waste, the government might facilitate offering low-interest or no-interest loans through the Small Business Administration or NOAA to assist small producers in investing in machinery to transform their processing waste into fishmeal, fish oil or other marketable products. For processors who use overseas processing plants particularly in Global South countries, USAID may want to provide loans or grants to assist processors in better managing fish processing related waste for use as food, fertilizers, or other products. Consumer fish waste is more difficult to manage because it is a dispersed problem across thousands of households. In terms of trying to reduce the quantity of consumer waste, the government may want to help companies identify marketing and sale strategies to reduce waste as part of U.S. food security strategies. One strategy may be the repackaging of products so that they are less likely to spoil (e.g. splitting a fish into individual packages) or a broader social media and education campaign to remind consumers about proper storage of fish.

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[103] Dave Love et al. Wasted Seafood in the United States: Quantifying Loss from Production to Consumption and Moving Toward Solutions, 35 Global Environmental Change (2015): 116.

[104] *Id.* at 122 (Some of the so-called lost "protein" in this study is not recoverable for human use because it originates from discard practices that need to be addressed.)

IV. CONCLUSION

This article opened with the questions of whether there is a future for abundant marine fish or whether we are past peak wild seafood? The answer to these questions depends on whether future fishery management interventions are effective. Increasingly, because consumers are not apathetic to the sourcing of their food and are uneasy about consuming food that causes ongoing harm to the environment, there is increasing leverage at the import end of the multi-billion dollar trade in global fisheries products to change current secretive industry practices about sourcing. A commercial fishing culture built around verifiable traceability is central to understanding whether fish are being harvested in a manner more likely to boost long-term sustainability for both fisheries and fishing communities. While the U.S. embarks on its first regulatory efforts towards providing some form of standardized reporting for imported fish and seafood through the Seafood Import Monitoring Program, this program as currently designed will not alleviate the pressures associated with premeditated illegal fishing or unreported fishing. Given the global nature of fishing, large-scale but undetected fish poaching is likely to continue without insiders offering information that could lead to prosecutions. As suggested above, if the U.S. government hopes to combat IUU fishing at the source, it should invest sufficient financial resources in implementing existing whistleblower provisions under existing wildlife protection statutes. Technology in the form of affordable forensic DNA testing to identify the origin of a specific fish may in the future also play an increasing role in U.S. prosecutions based on seafood fraud.[105]

For fishing operations that may not currently be participating in best environmental practices, the current Seafood Import Monitoring Program also offers little feedback in terms of how fishing practices might be improved to avoid unintentional environmental harms such bycatch. Importers are not required to collect information about how fish is collected or whether harvests comply with best environmental practices. Without the requirement to report on this

[105] To Fight Illegal Fishing, Forensic DNA Gets Local, 330 Science 1468 (December 10, 2010) (Describing European researchers' efforts to track "single nucleotide polymorphisms" as a means to distinguish between populations of fish)

information, there is little incentive for fishing vessels to improve their at-sea performance. As also suggested above, additional and verifiable mandatory reporting on environmental and social practices on board fishing vessels should improve industry-wide practices. Fishing companies that have been early adopters of best environmental and labor practices will benefit from immediate market access.

With a multi-billion dollar market for seafood products, the United States can utilize its market position for broader change outside of the U.S. In addition to looking outwards, the U.S. should also take stock of what is happening internally with both fish processed in U.S. processing plants and fish originating in U.S. waters that are sent to overseas processing plants. Fish processors should be prepared to report on how waste streams are handled and whether there are additional economic opportunities for producing fish oil and feed? The future of abundant marine fish depends on economizing the use of existing fishery resources.