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Delivering on seafood traceability under the new U.S. import monitoring program

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PERSPECTIVE

Delivering on seafood traceability under the new U.S. import monitoring program

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Abstract The United States is the world's largest fish importer. Recent reports, however, indicate that 25–30% of wild-caught seafood imported into the US is illegally caught, heightening concerns over the country's significant role in driving Illegal, Unreported, and Unregulated (IUU) fishing. In January 2017, NOAA enacted the Seafood Import Monitoring Program in an effort to combat IUU fishing through mandating improved seafood traceability requirements. This program requires reporting of fisheries data from harvest to arrival at the US border. Given the role of the US as a major global importer of seafood, this regulation could be a transformative action on fisheries worldwide if implementation includes two key components—(1) applying best available and most appropriate technologies and (2) building monitoring and enforcement capacity among trading nations. This paper provides insightful commentary on the potential for this US policy to lead by example and improve an essential natural resource that over a billion people worldwide depend on for nutrition and livelihoods.

Keywords Fisheries · IUU fishing · Marine Policy · Seafood Import Monitoring Program · Seafood mislabeling · Traceability

INTRODUCTION

The United States now stands as the world's largest fish importer, receiving more than 2.6 trillion kilos of seafood in 2015 alone. However, recent reports indicate that 25–30% of wild-caught seafood imported into the US is illegally caught (Pramod et al. 2014), underscoring the likely substantial role the US plays in driving Illegal, Unreported, and Unregulated (IUU) fishing worldwide. At the start of this year, the US National Oceanic and Atmospheric Administration (NOAA) enacted a program which aims to combat IUU fishing through mandating more stringent and improved seafood traceability requirements. The Seafood Import Monitoring Program (SIMP) requires reporting of fish and fish product data to verify each imported shipment from the initial harvest event to arrival at the US border (NOAA 15 CFR part 902, Vol 81) (Table 1). Given the US is a primary importer for some of the highest-producing fisheries nations of the world, this regulation has the potential to accelerate progress towards greater transparency and even sustainability for global fisheries management. Reaching such a goal, however, will depend on widespread compliance from exporting nations and a re-envisioning of existing approaches to monitoring and enforcement.

The US has a history of implementing policy aimed at improving seafood traceability and labeling. The US FWS Lacey Act of 1900 and its subsequent amendments make it unlawful to import and sell fish and other wildlife in violation of state, federal, or foreign law (US 16 U.S.C. §§ 3371–3378). The 1970s NOAA National Seafood Inspection Program established the National Seafood Inspection Laboratory, whose current mission is to provide scientific expertise and data on seafood safety, risk analysis, and technology transfer for fisheries management (60 stat. 1087, U.S.C. 1621). In 2005, the USDA extended Country of Origin Labeling (COOL) regulations to fish and shellfish, which required importers, suppliers, and retailers to provide and maintain records on the country of origin and production method of seafood (USDA 7 CFR Part 60). Distinct from the SIMP, labeling requirements under the COOL policy track begin at the US port of entry. However, within this suite of policies governed by multiple agencies, there are still rampant rates of mislabeling observed

Table 1 Purpose of key provisions mandated within the NOAA Fisheries Seafood Import Monitoring Program (SIMP) based on Final Rule released on December 9th, 2016

Provision	Purpose and/or specifics
Seafood data are collected through U.S. International Trade Data System (ITDS)	Directs all reporting to a single data portal; the portal is maintained by U.S. Customs and Border Protection.
Importer reports and retains seafood chain-of-custody records from harvest to point of entry into U.S. commerce	Chain-of-custody data follow the seafood products, thus providing record of origin, species, and harvest method, and to verify seafood product was lawfully harvested or produced
Regulations applies to 13 priority seafood species	This initial phase of SIMP focuses on 13 types of seafood identified to be particularly vulnerable to IUU fishing and/or seafood fraud
Recordkeeping documents may be reported in any language	Allows broad reporting of information, with importer of record responsible for reviewing and verifying accuracy of data regardless of language
Requires reporting of harvester or producer information	Record includes name and flag state of harvesting vessel, unique vessel identifier, fishing permit or license number, type of fishing gear, and name of farm or aquaculture facility (when applicable)
Requires reporting of fish information	Record includes species name (ASFIS three alpha code), landing date(s), point of first landing, form of fish at landing (e.g., quantity and weight), location of wild-capture or aquaculture harvest, and name of entity to which fish was landed or transferred to
Requires reporting of importer of record	Record includes importer's name, affiliation, contact information, and NOAA Fisheries-issued international fisheries trade permit (IFTP) number
Requires importer retain detailed product information	Detailed product information includes all chain-of-custody data, information on any transshipments, processing, re-processing, and/or commingling of product
Reporting is exempt for individual small-scale vessels	Importer is exempt from reporting individual seafood harvests by small-scale vessels (12 meters or less in length, or 20 gross ton or less), so long as importer provides aggregated harvest data for all small vessels from a single collection point or landed by a vessel which received transshipments from small-scale vessels at sea
Reporting requirements apply to all seafood that transfers through a foreign country	Existing regulations already apply to domestically caught and landed fish; however, all SIMP reporting requirements do apply to U.S. domestically captured fish that are subsequently sent abroad for processing, re-processing, and/or storage
Provides assistance for compliance	Assistance to exporting nations and domestic importers to support compliance will be offered, pending available resources. Priorities for building compliance capacity are outlined in the NOAA Strategic Action Plan for Building International Capacity to Strengthen Fisheries Management and Combat IUU Fishing

throughout the US, suggesting that current regulations remain inadequate.

This new federal rule complements recent efforts by other organizations around the world including the United Nation's Food and Agricultural Organization (FAO), the European Union (EU), the Asian-Pacific Fisheries Commission (APFIC), and Southeast Asian Fisheries Development Center (SEAFDEC) to combat seafood fraud and IUU fishing. Central to this effort is the development of personnel expertise and tools in accurate and cost-effective monitoring, control, and surveillance of fisheries. Yet many developing countries, principal suppliers of US seafood, cite monitoring capacity as a major obstacle in improving fisheries management (Morgan et al. 2007). Furthermore, the effectiveness of conventional monitoring tools is limited because they require expertise in fish identification and are highly time-consuming to conduct (Mora et al. 2009). Particularly, the combination of low enforcement and compliance capacity and high international demand has opened the door for vessels operating illegally to proliferate. Thus, without adequate and appropriate incentive for actors to legally engage, IUU fishing will continue to run rampant.

The SIMP is implemented under the US Magnuson–Stevens Fishery Conservation and Management Act's prohibition on importing or trading fish captured, transported, or sold in violation of U.S. and foreign treaties and regulations (FWS 16 U.S.C. 1801 MSA § 2). Compliance with this rule has the potential to reshape the global fight against IUU fishing activities. Past estimates place the cost of IUU fishing to the fishing industry at upwards of $23 billion USD, reflecting an amount equal to approximately 20% of all global captured fisheries (WWF 2016). The cost to US fishermen alone is estimated at $1 billion USD. Furthermore, improved traceability of seafood beginning at harvest through delivery to the consumer may also increase consumer confidence in the product quality and reduce the incidence of seafood fraud, the accidental or intentional substitution of one species or variety of seafood for another for profit or to circumvent environmental regulations

(Parreno-Marchante et al. 2014), and may also have positive spillover effects on the conservation of non-fished species and imperiled habitats (Newton et al. 2007; Lubchenco et al. 2016).

How then can we reconcile the mandate of new policy with the monitoring needs of this fungible commodity? Effective implementation of the SIMP and similar policies requires well-designed and adequately funded monitoring and compliance schemes that (a) utilize best available technologies to increase monitoring efficiency, and (b) increase the enforcement capacity of actors at all parts of the supply chain.

APPLYING BEST AVAILABLE TECHNOLOGIES

Use of existing and emerging technology can provide powerful monitoring of where, when, and what fishing boats are harvesting. For example, existing automatic ship identification systems (AIS), a type of on-board transponder that publicly broadcasts a vessel's identity and position, can now be paired with satellite technology to allow for the mass detection of AIS dispatches (McCauley et al. 2016). Vessel Monitoring Systems (VMS) are a similar, yet typically proprietary tracking system equipped to fishing vessels currently used for specific fisheries such as scallops in the U.S. and Patagonian toothfish in the Southern Ocean (DeSombre and Barkin 2011). Already several partnerships have developed algorithms using AIS or VMS data that scrutinize the transit patterns of fishing vessels and refrigeration carriers (or reefers) to visualize legal and potential illegal fishing activities in near real-time, including unauthorized harvests in closed areas or foreign Exclusive Economic Zones (EEZs) (Eyes on the Seas 2015; Jablonicky et al. 2016; Kroodsma et al. 2017). Identification of suspicious activity can then be reported to authorities as the vessel arrives to port. Fishing documents can be inspected and increasingly accessible molecular genetic tools can be used to corroborate landing reports. For example, the use of DNA barcoding to identify animal products is common in food monitoring programs, and the rapidly falling cost of genetic sequencing makes such tools progressively more attractive in cost and time (Willette et al. 2014). More accurate and time-efficient than some conventional monitoring tools, DNA barcoding has been effective in identifying fresh, frozen, and processed fish and fish products to species level (Huxley-Jones et al. 2012; Warner et al. 2013; Maralit et al. 2013; Willette et al. 2017). Commercial fish species are well represented in publically available genetic databases used in DNA sequencing (i.e., FishBase http://fishbase.sinica.edu.tw; Barcode of Life www.boldsystems.org; NCBI www.ncbi.nlm.nih.gov), and continued growth of these resources will only broaden the range species that may be identified. Furthermore, the emergence of environmental DNA (eDNA) monitoring shows tremendous promise in detecting the presence of species in an area solely from the biological material they shed or leave behind in the soil or water (Kelly et al. 2014). eDNA methods have been successful in identifying multiple species at once in water from aquaria, streams, and the ocean (Thomsen et al. 2012; Sigsgaard et al. 2016). This tool could be applied to fisheries. For example, it could be used to screen and identify the contents of an entire fish landing using just 1 l water sample from the fishing hold. Preliminary eDNA testing to profile fish composition from fishing vessel hold water is showing promise (Willette, unpubl.).

BUILDING CAPACITY

Successful implementation of trade controls and regulations, like SIMP, requires effective and efficient systems for monitoring, compliance, and enforcement. While laws and regulations established to ban, restrict, and/or regulate trade (e.g., quotas, illegal commodities) are the most commonly implemented approach, many efforts have failed to effect change in trade practices because they lacked enforcement along the supply chain (see review in Weber et al. 2015). A particularly relevant example is the growing debate over the success of wildlife trade bans, in particular, the Convention on International Trade in Endangered Species (CITES) for recovering wildlife populations at risk (e.g., Bowman 2013; Vandergrift 2013; Challender and MacMillan 2014). While CITES has been lauded for spurring the establishment of secondary compliance structures through the Conference of Parties, many remain concerned that despite almost 40 years of regulation, these trade bans have been ineffective, as evidenced by continued high volumes of trades in listed species (Phelps et al. 2010; Rosen and Smith 2010). In part, continued trafficking has been linked to widespread noncompliance, lack of knowledge/capacity to monitor species, and driving market forces (Challender et al. 2015). However, recent efforts to increase training and employment for patrolling and enforcement have seen increased compliance and population recovery in several at-risk species such as those in African grassland communities (Hilborn et al. 2006), indicating the potential for success when regulations are carried out in parallel with building capacity and providing incentives for stewardship at the supply end of the chain.

Stipulating strict requirements for chain of custody and traceability will be important for building infrastructure and clear compliance rules that are necessary to reduce rates of mislabeling. However, this is entirely dependent on the origin country's ability to not only enforce these requirements for flagged-ships, but also detect forgeries and non-compliance. At the worst, for nations who import to the US without the protection of established trade partnerships, mislabeling could actually increase in an effort to not lose a key market. Thus, in order for the SIMP to succeed, we urge that this program builds and actively and responsibly engages in partnerships with other organizations, development agencies, and foreign governments to help build necessary infrastructure and provide the tools and training necessary to ensure compliance.

LIMITATIONS OF SIMP

A potential shortfall with the SIMP regulation is that NOAA has specifically stated that this program is not a labeling scheme and that the resulting traceability data collected will not be made available to the public. Consumers can be a major driver of change in the behavior and practices of the fishing industry, including past campaigns for 'dolphin-safe' tuna and the bans on shark fin soup (Bradsher 2005; Ward 2008). Numerous recent studies have reported widespread mislabeling of seafood in markets, grocers, and restaurants in Europe, Asia, Africa, and the Americas (Willette et al. 2017), raising the demand for better traceability measures. While labeling and certification schemes may not be panacea for achieving sustainability and traceability, consumer awareness and demand are considerable forces driving the seafood market that cannot be discounted (Jacquet et al. 2009). For example, an examination of consumer purchase response to the FishWise Advisory, an eco-labeling scheme adopted by a regional supermarket on the west coast of the United States, found that the labeling led to significant declines in the sale of non-good choice seafood (Hallstein and Villas-Boas 2013). Providing access to, and building awareness of traceability and its inherent complexities to purveyors and consumers can help build a more informed market audience. Specifically, providing detailed information on trade can serve as a strong complementary force in sparking an evolution in how the global seafood market operates. We urge that the data from SIMP, traceability of seafood from the net to the U.S. border, be streamlined with existing domestic regulations for food labeling such as COOL, which require labeling of source country, common name, and method of harvest on the product from entry into US commerce to the end-consumer.

Another challenge of the SIMP is the likely substantial added cost of complying with traceability requirements by the seafood-producing countries. Pending availability of resources, the SIMP final rule directs NOAA Fisheries to assist both exporting nations and domestic importers with compliance, namely through capacity building outlined in a recent Strategic Action Plan (NOAA 2016). Recent multilateral agreements by FAO, APFIC, and SEAFDEC have also set a complementary framework for improving traceability, primarily through developing personnel expertise and tools to achieve accurate and cost-effective monitoring, control, and surveillance (MCS) of fisheries. As mentioned above, many of these conventional MCS tools are limited because of expertise and time-constraints (Mora et al. 2009). In contrast, the cost of high-powered computing capacity and advanced genetic methods continue to decline precipitously (Willette et al. 2014), making best available technologies, such as AIS algorithms and DNA barcoding, more accessible. Likewise, recent pushes to expand international scientific education and research partnerships are training the next generation of scientists and resource managers with the skill sets to utilize these technologies (Barber et al. 2014).

SIMP reporting requirements apply only to seafood entering the US from a foreign country and does not apply to domestic seafood. US produced seafood is among the world's most sustainable (Walsh et al. 2015). The SIMP regulation does, however, apply to US-caught seafood that is processed abroad and imported back to domestic markets. US fisheries are second only to France in size, and currently meet the FAO's minimum substantive requirements and criteria for eco-labeling (Walsh et al. 2015). Given the favorable state of U.S. fisheries, a more logical solution to improving traceability and sustainability would be to source more seafood domestically. One challenge of boosting domestically sourced seafood, however, is that many of these fisheries are already operating at their maximum capacity (Walsh et al. 2015) and further exploitation may jeopardize long-term sustainability for short-term considerations. Another challenge is low domestic demand for US-caught species, that otherwise net top prices around the world. A peek at the American diet shows red meat consumption is more than twice that of seafood (Global Dietary Database 2017). The seafood that is consumed is dominated by just a few types—tuna, salmon, shrimp, and ever ambiguous "white fish" (FUS 2015). Thus, while America has strong, vibrant fisheries for sea urchin, sardines, and squid, the majority of these are shipped overseas, while 90% of seafood consumed by Americans is imported from foreign fisheries (NOAA 2017).

CONCLUSION

Solutions to build compliance in the transforming, data-driven seafood industry exist, but will require governments and agencies to provide the much needed financial support for training, innovation, and partnership building to design and bring crucial tools to the front lines. Importantly, the approach cannot and should not be focused on cracking down on policy violators. Limiting the export opportunities of fishermen in developing nations that do not yet meet certification schemes will only work to depress livelihoods by limiting access to more lucrative markets and direct their catches towards nations with less stringent rules. Export bans have had mixed impacts, for example, an export ban on shrimp originated from Benin to the EU due to failure to comply by standards led short-term negative impacts on local fishers and processers that did not revive even after compliance was reached (Houssa and Verpoorten 2015). Moreover, widespread trade bans and restricted markets have the potential to further incentivize illegal operations as vessels scramble to make profits while market access close, exacerbating illegal working conditions where migrants are sold into slavery on fishing vessels (Mendoza et al. 2016). Thus, achieving traceability seafood while also improving conditions for fishers in developing nations cannot be improved solely through more stringent regulations, but must consider solutions that equitably consider the rights and needs of local stakeholders (see Bennett et al. 2017). Working to ensure sustainable livelihoods will require careful consideration of the unique governance and socio-economic context of each fishery and/or nation that US agencies work with (Challender et al. 2015). This will require devising implementation plans with substantial local stakeholder input from national- through to community-level scales to ensure equal participation and representation of all parts of the supply chain. Rather, the aim should be to implement the SIMP with accessible, well-developed, and adequately funded monitoring and compliance training and resources. Lastly, we encourage the alignment among the policies and activities of involved enforcement agencies, inclusive of utilizing available technologies and building capacity, and harnessing the power of informed consumer choice, to reach the target of a sustainable global fishery industry.

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