

March 2015

Recommendations for a Global Framework to Ensure the Legality and Traceability of Wild-Caught Fish Products

FINAL REPORT

Expert Panel on Legal and Traceable
Wild Fish Products

SUMMARY OF RECOMMENDATIONS

1. **Minimum information standards** for wild-caught fish products should be adopted
2. **Authoritative data sources**, including a global record of fishing vessels, should be established or identified as soon as possible
3. **A harmonized system of “landing authorizations”** should be established to provide primary assurances of the legal origin of fish products
4. **Multiple points of verification** should be added throughout seafood supply chains
5. **A transition to fully electronic traceability systems** should be accomplished for all commercial wild fish products within the next five years
6. **Support and capacity building** must be provided to those producers who will need help with the transition to electronic traceability systems, particularly SMEs and commercial fishers in developing countries
7. **A global architecture for interoperability systems** should be developed
8. **Where applicable, non-discriminatory border measures** setting minimum standards for seafood traceability and proof of legal origin should combat trade in IUU products while facilitating legitimate commerce through a “risk-based, tiered, and targeted” approach



ABOUT THE PANEL

The Expert Panel on Legal and Traceable Wild Fish Products is a multi-disciplinary expert group convened to promote a global framework for ensuring the legality and traceability of all wild-caught fish products. Organized by WWF and facilitated by Resolve, Inc., the Panel was established in early 2013 to identify complementary regulatory and private-sector mechanisms for overcoming common obstacles to establishing such a framework.

The Panel began with a shared vision of a desired outcome:

We seek a world in which all fishers, processors, traders, retailers, and consumers of wild-caught fish can be reliably assured that all fish products are legal and fully traceable. We envision a global framework—based on an appropriate combination of private-sector and governmental mechanisms—that ensures the legal provenance and “boat-to-plate” traceability of fish products, thereby reducing incentives for illegal fishing while promoting socially, economically, and environmentally sustainable fisheries.



The Panel consists of the eight following experts who participated with the support of their respective institutions.

- Tejas Bhatt, Institute of Food Technologists
- Francisco Blaha, independent consultant
- Mariah Boyle, FishWise
- Bill DiMento, High Liner Foods
- Michele Kuruc, WWF
- Hans-Jürgen Matern, Metro Group
- Petter Olsen, Norwegian Institute of Food, Fisheries and Aquaculture Research (Nofima)
- Steve Trent, Environmental Justice Foundation

The Panel's vision unites the theme of ending trade in illegal fish products with the theme of traceability. This twinning is fundamental to the Panel's mission.

- Comprehensive boat-to-plate traceability is an essential precondition of reliably establishing the legal provenance of fish products;
- and a basic infrastructure for establishing legal provenance is a precondition of reliable traceability.

Taken together, the two themes are vital to creating a more transparent seafood market framework that rewards responsible fishing and effectively shuns illegal practices.

ABOUT THIS DOCUMENT

This document presents eight concrete recommendations from the Expert Panel on Legal and Traceable Wild Fish Products, which are also supported by the institutions that each panelist represents. These recommendations together provide a comprehensive global framework for legal and traceable seafood products. This document follows the publication in November 2014 of a preliminary, summarized version of this report, which contained all of the Panel's recommendations. This new and final version of the report provides expanded content and more technical detail than the preliminary report. A summary of the material added or substantially amended in this version is noted in the section immediately below.

The objectives of the Panel's recommendations are to articulate a functional vision for a global framework to ensure legal and traceable fish products, to identify the key subcomponents of such a framework, and to suggest solutions—or at least paths toward solutions—to some of the problems that must be overcome to establish the framework as envisioned. In particular, these recommendations aim to identify the needs and opportunities for joint or cooperative action among stakeholders to advance solutions. Further, the Panel hopes that the recommendations will provide a strong call for action and coordination among key players across industry, government, and civil society.

Although this document was authored by the Expert Panel on Legal and Traceable Wild Fish Products and the recommendations can only be attributed to the Panel, the recommendations were also heavily informed by several other expert consultations. The authors wish to thank the following individuals for their contributions.

- David Agnew from the Marine Stewardship Council, Britta Gallus from Metro Group, and Jens Kungl from Metro Systems, who the Panel extensively consulted and who contributed greatly to the creation of these recommendations.
- A number of experts who were consulted via telephone and in-person interviews and during an expert workshop held in Washington, DC, in August 2014 that was convened to discuss the design of a framework for border measures to address illegal, unreported, and unregulated seafood. These consultations included technical dialogue with a number of experts within government agencies. Non-government experts included Marcus Asner, Arnold & Porter LLP; Igor Gorlach, Foley Hoag LLP; and Kevin Lewis, PricewaterhouseCoopers.

New Material in This Report

This final report of the Panel is an expanded version of the Panel's preliminary report, published in November 2014. The Panel's recommendations, highlighted throughout the report in blue text with → bullets, have not changed from the preliminary report. This final version reflects some editorial adjustments as well as the following new material:

A new chapter (Building Momentum, p. 15–24) which highlights complementary efforts on the part of governments, non-governmental organizations, and the private sector to build and adopt best practices for legality and traceability, and which further articulates the value of traceability systems for both businesses and governments.

Additional technical analysis, information, and commentary

on the following subjects:

- “key data elements” for use in traceability systems, including identification of outstanding harmonization challenges (**p. 26**);
- landing authorizations, as a cutting-edge approach to combining catch documentation, licensing verification, and initial product tracing (**p. 30–32**);
- current momentum toward electronic traceability systems (**p. 35**);
- implementing traceability for multi-input products (**p. 38**);
- interoperability, including examination of current complementary, multi-stakeholder efforts to design and develop the architecture for interoperable systems, and reference to analogous processes in other sectors (**p. 39**); and
- best practices for border measure design (**p. 40–47**).

A new appendix (The Range of Approaches to Risk-Based, Tiered and Targeted Import Control Systems) (**p. 53–56**).

Suggestions for further reading have been added throughout the document.

ACKNOWLEDGMENTS

The Panel was convened by WWF, the global conservation organization, as part of WWF's Smart Fishing Initiative. WWF's work to convene the Panel was led by David Schorr, with support from numerous staff, including Benjamin Freitas, Robin McNamara, Kim Vosburgh, Simmy Singh, and Elizabeth Schueler. Throughout its tenure, the Panel was facilitated by Resolve, Inc., a neutral non-profit organization supporting multi-sector collaboration and decision-making. California Environmental Associates supported the development of these recommendations with research and drafting. Funding for this work was supported by the Oceans 5 funder consortium and the Gordon and Betty Moore Foundation.

ACRONYMS

AQSIQ General Administration of Quality Supervision, Inspection and Quarantine (China)	IOTC Indian Ocean Tuna Commission
ASC Aquaculture Stewardship Council	ISO International Organization for Standardization
ATM Automated Teller Machine	ISSF International Seafood Sustainability Foundation
CCAMLR Convention for the Conservation of Antarctic Marine Living Resources	IT Information Technology
CDS Catch Documentation System	ITIS Integrated Taxonomic Information System
CPC Children’s Product Certificate	IUU Illegal, Unreported, and Unregulated
CITES Convention on International Trade in Endangered Species	KDE Key Data Element
CTE Critical Tracking Event	LAC Landing Authorization Code
DEVFISH II EU Development of Tuna Fisheries in the Pacific ACP Countries Project II	MSC Marine Stewardship Council
EDI Electronic Data Interchange	MOU Memorandum of Understanding
EEZ Exclusive Economic Zone	NAFO Northwest Atlantic Fisheries Organization
EPC Electronic Product Code	NGO Non-Governmental Organization
FAO Food and Agriculture Organization of the United Nations	OECD Organisation for Economic Cooperation and Development
FDA US Food and Drug Administration	PSMA Port State Measures Agreement, or The FAO Agreement on Port State Measures to Prevent, Deter, and Eliminate Illegal, Unreported, and Unregulated Fishing
FFA Pacific Islands Forum Fisheries Agency	PTI Produce Traceability Initiative
FFAW Fish, Food and Allied Workers	RFID Radio-Frequency Identification
FIMS Fisheries Information Management System	RFMO Regional Fisheries Management Organization
FSMA Food Safety Modernization Act	SEC US Securities and Exchange Commission
GFTC Global Food Traceability Center	SME Small and Medium-Sized Enterprise
GLN Global Location Number	SPRFMO South Pacific Regional Fisheries Management Organization
GSTS Global Standard Traceability Solution	TED Turtle Excluder Device
GT Gross Tonnage	TSN Taxonomic Serial Number
GRT Gross Registered Tonnage	VMS Vessel Monitoring System
HACCP Hazard Analysis and Critical Control Points	VOI Vessel of Interest
IATTC Inter-American Tropical Tuna Commission	WWF World Wide Fund for Nature / World Wildlife Fund
ICCAT International Commission for the Conservation of Atlantic Tunas	XML Extensible Markup Language
IFT Institute of Food Technologists	
IMO International Maritime Organization	

CONTENTS

About the Panel	iii
About this Document	iv
Acknowledgments	v
Acronyms	vi
Preface	8
Vision and Principles for a Global Framework	11
Building on Momentum	15
Recommendations of the Panel	25
Recommendation 1: <i>Minimum information standards</i>	26
Recommendation 2: <i>Authoritative data sources</i>	29
Recommendation 3: <i>A harmonized system of landing authorizations</i>	30
Recommendation 4: <i>Multiple points of verification</i>	33
Recommendation 5: <i>A transition to fully electronic traceability systems</i>	35
Recommendation 6: <i>Support and capacity building for SMEs and developing countries</i>	36
Recommendation 7: <i>A global architecture for interoperability</i>	37
Recommendation 8: <i>Non-discriminatory border measures (where applicable)</i>	40
Conclusion and Call for a Global Dialogue	49
Appendices	51
Appendix A	52
Appendix B	53
Bibliography	57
Photo Credits	59

PREFACE

The long-term sustainable management of wild fish stocks is critical to ocean ecosystems, global food security, and the \$136 billion annual trade in global seafood (FAO, 2014). Over the last several decades, the majority of the world's fisheries have faced fishing pressure up to or beyond their biological limits. The unprecedented scale of this depletion stems from unsustainable and irresponsible fishing practices that still represent “business as usual” in far too many fisheries around the world. Some of these practices are explicitly illegal, while others are enabled by weak fisheries management and enforcement infrastructure. Despite decades of international effort, illegal, unreported, and unregulated (IUU) fishing remains rampant, accounting for as much as thirty percent of seafood harvested globally (Agnew et al., 2009).

In order to address the risks of unsustainable fishing and enable consumers to rely on seafood markets to deliver legally and responsibly caught fish products, a number of leading commercial actors, governments, and regional fisheries management organizations (RFMOs) have taken pioneering steps to improve transparency in seafood supply chains. These laudable efforts have proved that *traceability* in complex supply chains is possible and can connect markets to sustainable supply (Magera and Beaton, 2009). These voluntary efforts alone will not solve the problem, however; best practices need to be adopted on a much wider scale.

Wild fish—one of the most highly traded food commodities—move from producers to consumers through a supply chain that is global, diffuse, complex, and in most cases highly opaque. Seafood markets are unable to distinguish between fish products that are sustainably and legally caught and those that are not. The absence of *full chain traceability* (Magera and Beaton, 2009) is a fundamental obstacle to achieving comprehensive sustainability in the seafood trade. Poor traceability, combined with the widespread absence of basic minimum practices for establishing and verifying the legal origins of wild fish products, leads to markets that inadvertently generate handsome profits for illegal fishing activities. At the same time, insufficient traceability makes it harder and more expensive for traders, processors, retailers, and consumers to make informed decisions and demand more sustainable seafood products. It also makes it extremely difficult for regulators to enforce existing laws against the trade and sale of illegally caught fish.

Yet a different world is possible: we have the capacity to ensure that all wild-caught fish are fully traceable and demonstrably linked to legal fishing activities. As a global community, we are poised to make great strides in addressing seafood traceability and legality in the next few years.

There is a groundswell of momentum toward traceability in seafood markets.

- The main obstacles to achieving “fully traceable and demonstrably legal” seafood are no longer technical. Remote monitoring, electronic record-keeping, and globalized systems for sharing digital information now make it entirely possible for all seafood to be traceable from “boat to plate.” More than a few individual companies already provide this level of

traceability
the ability to systematically identify a unit of production, track its location, and describe any treatments or transformations at all stages of production, processing, and distribution (Magera and Beaton, 2009)

full chain traceability
the ability to track forward and trace back (one step up, one step down as a minimum) at any point along the full supply chain, no matter how many trading or traceability partners and business process steps are involved



transparency, and even small-scale producers and businesses in developing countries can affordably access these technologies.

- Since 2009, the EU has required that all fisheries products marketed in the EU be adequately labeled and fully traceable at all stages of production, processing, and distribution (European Commission Council Regulation, 2009).
- As of February 2015, an inter-agency task force in the United States is considering ways in which the United States might deter trade in IUU seafood. The initial recommendations of the task force, issued on December 18, 2014, appear to be putting the United States on track toward requiring new traceability and information requirements as a condition of market access (Recommendations of the Presidential Task Force, 2014). Thus, the global seafood market appears to be heading for border measures that require traceability and proof of legality from its two largest importers, a situation that would truly represent a new paradigm.

As the private sector and governments move toward traceability and legality in seafood, it will be important to follow a shared global framework. Such a framework would allow efforts to scale much more quickly and build upon a combination of existing private-sector voluntary standards and harmonized governmental regulations. Seafood traceability practices should employ the same tools and practices that already enable globally interoperable phone systems, banks and automated teller machines (ATMs), package delivery services, and many other products and services common in worldwide commerce today. The time has come to bring the global seafood business into the 21st century.

Achieving this vision will require the parallel and symbiotic development of new voluntary industry standards and new government regulations. It will require industry initiatives to establish viable standards and protocols, to create market rewards for best practices throughout commercial supply chains, and to develop new technology platforms and services. Simultaneously, it will require governments to generate the underlying information and infrastructure to ensure the legality of seafood and to establish minimum standards as a way to raise the performance of all industry actors. Governments can also help by providing financial and technical support to those producers who need help with this transition. But most importantly, this transition will require broadening the set of actors and stakeholders who are ready to undertake a significant shift in the culture of the fishing and seafood industries—a purposeful shift toward transparency and more responsible patterns of production and consumption.

The recommendations presented in this document constitute the consensus output of an interdisciplinary and international expert panel convened to help envision a global framework for traceable and legal fish products and to recommend paths toward making that framework a reality. This report makes eight concrete recommendations to industry and government that together provide a comprehensive framework for legal and traceable seafood products.

The Panel's goal is to promote practical steps toward fully traceable and demonstrably legal seafood as a means to achieving sustainable fishing and secure livelihoods around the world for generations to come. The Panel acknowledges that implementing these recommendations will take time, but encourages actors to take immediate steps to accelerate these necessary changes. The Panel believes that with concerted action and coordination, tremendous gains can be made within the next few years.



VISION AND PRINCIPLES FOR A GLOBAL FRAMEWORK



*The Expert Panel on Legal and Traceable Wild Fish Products was established in early 2013. At its first meeting, the Panel adopted the following **vision statement**:*

“We seek a world in which all fishers, processors, traders, retailers, and consumers of wild-caught fish can be reliably assured that all fish products are legal and fully traceable. We envision a global framework—based on an appropriate combination of private-sector and governmental mechanisms—that ensures the legal provenance and “boat-to-plate” traceability of fish products, thereby reducing incentives for illegal fishing while promoting socially, economically, and environmentally sustainable fisheries.”

The Panel believes that a global framework for legal and traceable fish products is urgently needed in order to meet the following **overarching goals**:

- to support the generation and flow of reliable information about the sustainability and legality of wild fish products to all relevant stakeholders, including commercial actors, consumers, and regulators;
- to help make seafood traceability systems interoperable across geographies, jurisdictions, markets, and product classes, so that access to necessary information is not a barrier to commerce and dynamic competition;
- to help establish a level playing field and a coherent international regulatory environment for commercial actors, particularly with regard to minimum voluntary and mandatory standards for traceability, transparent fishing, and the documentation of legality; and
- to facilitate the implementation and enforcement of laws banning commerce in illegally caught fish products, and to promote compliance with these laws.

In the Panel’s view, a global framework for legal and traceable fish products would provide a powerful lever for encouraging sustainable fishing and combating IUU practices, thus generating substantial **benefits to fishers, businesses, consumers, and governments**. The Panel takes note of consumers’ increasing demand for information about the origins of their seafood, and of governments’ progress toward implementing more robust regulations to strengthen traceability and to prevent trade in illegal seafood products.

The Panel also believes that a global framework for legal and traceable fish products would build upon and accelerate a number of related trends, including national and international policies to increase the transparency of fishing, strengthen anti-IUU requirements, and harmonize catch documentation (e.g., the Food and Agriculture Organization of the United Nations’ (FAO) Port State Measures Agreement (PSMA)). Although there is considerable momentum toward increased seafood traceability, the Panel finds that several significant **gaps and obstacles** remain to be overcome before the Panel’s vision for fully traceable and legal fish products can be achieved. The most important of these are:

interoperability

the ability of information technology systems to manage data using a set of standardized protocols

key data elements

the pieces of information that establish the who, what, where, when, and how of fishing and fish products

- lack of agreement on the minimum basic data that should be required to accompany wild-caught fish products or to establish legality;
- gaps in the availability and/or *interoperability* of basic data about fishing operations, due to one or more of the following:
 - gaps and/or lack of transparency in fisheries monitoring and management systems (e.g., absence of catch documentation, non-publication of licenses, and absence of unique vessel identifiers);
 - lack of agreement over the level of detail needed for some *key data elements* (KDEs) (e.g., necessary level of precision about location or time of fishing); and
 - the absence of harmonized nomenclatures for describing basic facts (e.g., for naming fisheries, and identifying gear types);
- absent or weak governmental mechanisms for proactively and authoritatively establishing the legality of fish products entering market chains;
- the persistence of paper-based documentation systems, which are cumbersome and prone to falsification;
- the absence of a shared vision for a basic information technology (IT) architecture to allow interactions among disparate traceability systems, to enable the tracking of fish through complex processing stages of aggregation and disaggregation, and to provide easy data access for authorized actors; and
- weak implementation of widespread laws banning commerce in illegally caught fish products.

To help address these challenges, the Panel envisions **a global framework** (i.e., a combination of standardized commercial practices and adequately harmonized governmental regulations) that includes the following **key elements**:

1. A shared definition of KDEs about the “who, what, where, when, and how” of fishing that should be associated with wild seafood products.
2. Common nomenclatures and data standards so that this information can be easily shared and universally interpreted.
3. A shared approach to recognizing authoritative sources of information and mechanisms that generate this information reliably.
4. A shared approach to government mechanisms for proactively and authoritatively establishing the legality of fish products entering market chains, creating formal judgments on which market actors can rely.
5. Auditing and *verification* mechanisms at each critical step in the supply chain that ensure the integrity and strength of the information and infrastructure that support global production and trade of legal seafood.
6. A vision for achieving fully electronic seafood traceability within five years.
7. A shared approach to a global IT architecture that enables the interoperability of data and traceability platforms, and that provides data access and information sharing in accordance with a standardized system of appropriate access rights.

verification

the process of establishing the truth, accuracy, or validity of something

8. Financial and technical support for those producers who will need help with this transition, particularly small and medium-enterprises (SMEs) and commercial fishers in developing countries.
9. A shared vision for the role of supportive and “adequately harmonized” government regulations, including for appropriate export and import controls.

Prior to elaborating detailed recommendations to meet these nine objectives, the Panel articulated some **basic characteristics necessary to the success of a global framework**. The Panel believes that an effective global framework must promote solutions that are efficient, credible, commercially viable, and equitable. The Panel further believes that a global framework should:

- include both public institutions/regulations and private-sector mechanisms/practices working in tandem and developed through cooperative dialogue;
- achieve a proper balance between the public’s need for information about products consumed and the rights of market actors to legitimate commercial privacy;
- simultaneously combat trade in illegal fish products and facilitate trade from “best practice” supply chains;
- to the greatest possible extent, be based on (and be integrated with) existing regulatory and commercial mechanisms and practices; and
- provide a level playing field for diverse industry actors, ranging from large multinational traders to SMEs and small-scale developing country businesses.

BUILDING ON MOMENTUM



A global framework for legal and traceable fish products will accelerate existing efforts across industry and government.

Over the last several years, a growing list of governments, industry groups, multi-national organizations, and non-governmental organizations (NGOs) have built demand for sustainable seafood in key markets, developed the enabling conditions for traceability, and proven the concept of boat-to-plate traceability for discrete fisheries. A focused push from industry and government to adopt harmonized standards and regulations will turn the current set of important but diffuse efforts into a coordinated and highly effective global system for traceability. Dialogue and collaboration between government and industry is essential so that their respective efforts build on and support each other.

A wide range of actors has already taken impressive steps to improve traceability. These efforts lay the foundation for the global framework.

Governments have taken steps to deter trade in IUU seafood and increase seafood traceability:

- In 2008, the Council of the European Union adopted Council Regulation No. 1005/2008, establishing a community system to prevent, deter, and eliminate IUU fishing, and in 2009, the European Commission adopted Commission Regulation No. 1010/2009, which set forth detailed rules for the implementation of Council Regulation No. 1005/2008. Often referred to jointly as “the EU IUU Regulation,” the new rules took effect on January 1, 2010. Marine fisheries products entering the EU must now be validated as legal by the competent flag state or the exporting state before being imported to or exported from the EU via a catch certificate (European Commission Council Regulation, 2008).
- The EU’s Control Regulation No. 1224/2009 addresses traceability in its Article 58, which mandates that fisheries products marketed in the EU must be adequately labeled and fully traceable at all stages of production, processing, and distribution, from catching to the retail stage (European Commission Council Regulation, 2009). Additionally, Article 58 details minimum labeling requirements for fisheries products (but also generally exempts from those rules any fisheries products imported into the EU with catch certificates, in accordance with the EU IUU Regulation).
- In 2011, President Obama signed into law the Food Safety Modernization Act (FSMA), which gives broad license to the US Food and Drug Administration (FDA) to enforce prevention- and risk-based food safety standards (FDA, 2014 A). Section 204 of the statute includes provisions for improving traceability across the food sector, and many elements of the FSMA will result in enhanced information documentation and access.
- In the US, attention to IUU seafood has increased by virtue of President Obama’s directive of June 17, 2014, which called for an interagency task force to make “recommendations for the implementation of a



comprehensive framework of integrated programs to combat IUU fishing.” On December 18, 2014, the task force delivered its official advice to the White House and also published it in the US Federal Register (Recommendations of the Presidential Task Force, 2014). The task force recommendations include a focus on international cooperative efforts (including the PSMA and the Global Record of Fishing Vessels), voluntary industry action toward best standard practices in traceability, and “risk-based” regulatory approaches to halting trade in IUU seafood products. Because the United States is one of the largest global markets for seafood, implementation of these recommendations would represent a momentous step toward creating demand for increased traceability throughout the seafood industry. Together with the existing EU requirements, new traceability requirements for seafood entering US markets would establish a new paradigm for traceability and legality in global seafood trade.

- A 2014 report by the Institute of Food Technologists’ (IFT) Global Food Traceability Center (GFTC) found that 13 of 21 Organisation for Economic Cooperation and Development (OECD) countries surveyed have comprehensive and mandatory traceability regulations/policies on the national level for domestic food commodities. The same study found that 14 out of 21 OECD countries surveyed have comprehensive and mandatory traceability regulations/policies for imported food commodities, and 17 out of 21 OECD countries surveyed have electronic databases in place to monitor and trace livestock registration, identification, and movements (Charlebois et al., 2014).
- A number of leading examples include:
 - Canada put in place The Safe Food for Canadians Act in 2012. This legislation specifically prioritizes “strengthening food traceability,” along with stronger enforcement around food safety, a



more consistent inspection regime, and better control over imports (Canadian Food Inspection Agency, 2012).

- Over the last couple of years, the Australia New Zealand Food Standards Code has added some basic traceability requirements for all food products, in an effort to ensure food safety. Specifically, food businesses in Australia must operate under a “one up, one down” system of traceability, so that the origin of food imports can be known and unsafe food can be recalled. The code specifically states that production records and batch or lot identification must be readily accessible. Additionally, Section 4.2.1 of the code requires that a seafood business “systematically examine all of its primary production and processing operations to identify potential seafood safety hazards and implement controls that are commensurate with the food safety risk” (Food Standards Australia New Zealand, 2013).
- China has accelerated its regulatory requirements around food traceability in recent years. On December 31, 2012, the General Administration of Quality Supervision, Inspection and Quarantine of the People’s Republic of China (AQSIQ) published GB/T 29373-2012, known as the national standard “Traceability requirement for agricultural products – Fruits and vegetables.” A national standard on fish and fishery products followed; GB/T 29568-2013 was published on July 19, 2013. These standards establish the requirements for traceability system development and record collection in these two sectors. All stakeholders in the supply chain are required to collect basic product traceability data in a “one up, one down” manner through the supply chain (Zhang and Bhatt, 2014).



NGOs have supported private-sector adoption of traceability practices:

- The Marine Stewardship Council (MSC) has established a chain of custody certification capable of ensuring traceability back to the source fishery. The Aquaculture Stewardship Council (ASC) and other farmed certification schemes have similarly demonstrated the viability of boat-to-plate traceability.
- Over the last decade, NGOs including WWF, Sustainable Fisheries Partnership, Monterey Bay Aquarium, FishWise, and several other NGOs within the Conservation Alliance for Seafood Solutions have been working with the largest North American and European retailers to help them establish sustainable procurement practices and increase the transparency around their sourcing.
- IFT's GFTC, a public-private partnership with 19 sponsors from industry, academia, and NGOs, has been coordinating efforts across multiple food sectors, including seafood, to ensure alignment of requirements and harmonization of approaches to interoperable traceability.

Movement toward establishing the building blocks of traceability in seafood markets is burgeoning across the international arena:

- A number of national governments and international bodies are calling for harmonized catch documentation systems (CDSs), including the FAO, the Norwegian government, and Maria Damanaki, the former EU Commissioner for Maritime Affairs and Fisheries.
- The PSMA, adopted in 2009, is the first binding global instrument focused specifically on keeping IUU seafood out of world markets. It establishes minimum standards for dockside inspections and inspector training, and

requires parties to restrict port entry and port services for vessels known or reasonably suspected of having been involved in IUU fishing. A growing number of governments have ratified the PSMA, including the EU, Norway, Chile, Mozambique, and New Zealand. Further, a growing number of RFMOs are adopting conservation measures that bind their member states to implement the PSMA.

- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) established a CDS in 2003 that is designed to track toothfish from the point of landing. Its purpose is to distinguish between legal and IUU product and to prevent IUU product from entering the market.
- There are currently efforts to operationalize the global registry of vessels based on individual International Maritime Organization (IMO) numbers. Additionally, several RFMOs have established near-term deadlines for IMO adoption by large portions of the fleets operating in their jurisdictions.*

Major companies across the seafood industry are adopting a range of traceability practices such as using bar code or RFID tagging systems for individual fish, requiring that fish be sourced from boats that use VMS, and conducting DNA tests at points of retail to assure customers of the accuracy of seafood labeling. In many cases, these monitoring approaches are being integrated into new commitments to full chain seafood traceability. Both traceability and monitoring are now tools that are readily available at a broad scale thanks to important technological advancements in product tracking, such as bar codes and remote sensing (e.g., satellite vessel monitoring). Examples illustrating this strong trend toward traceability across the seafood industry include the following:**

- The International Seafood Sustainability Foundation (ISSF) has established requirements for its members regarding trade of tuna: members are to

* Specific RFMO requirements include the following:

International Commission for the Conservation of Atlantic Tunas (ICCAT) – Vessels 20m in length or greater (on the ICCAT record of fishing vessels) must have IMO numbers by January 1, 2016 (ICCAT, 2013).

Indian Ocean Tuna Commission (IOTC) – All eligible vessels on the IOTC record of licensed vessels (24m and above or operating outside of the EEZ of their flag state) must have IMO numbers by January 1, 2016 (IOTC, 2014).

Inter-American Tropical Tuna Commission (IATTC) – All vessels authorized to fish in the convention area that are at least 100GT or 100GRT must have an IMO number issued by January 1, 2016 (IATTC, 2014).

Northwest Atlantic Fisheries Organization (NAFO) – All eligible vessels must have an IMO number by January 1, 2016 (NAFO, 2014).

South Pacific Regional Fisheries Management Organization (SPRFMO) – All vessels authorized to fish in the convention area and that are at least 100 gross tonnage (GT) or 100 gross registered tonnage (GRT) in size must be issued an IMO number (SPRFMO, 2014).

CCAMLR – Contracting parties may only issue licenses to fish in the convention area to vessels that have an IMO number (CCAMLR, 2013).

** Please note that the information provided about company activities relies on web-based or other material originating with the companies mentioned. The Panel did not review and does not endorse the assertions offered as examples here.



source seafood from vessels that have an IMO number and withdraw product from the marketplace if it is found to be from any vessel on a RFMO's IUU list (ISSF, 2014).

- In 2012, Delhaize America, part of the global food retailer Delhaize Group, worked with the Gulf of Maine Research Institute to review the fishery governance of each of the seafood product it sells. Further, Delhaize reports that it established traceability requirements for over 2,500 seafood products whereby suppliers must document how and where the fish were harvested and share the information through an online database (Delhaize Group, 2012).
- The Fish, Food and Allied Workers (FFAW) union in Newfoundland implemented a new management regime in its halibut fishery in 2013 whereby all fish are given a uniquely coded tag. The purpose of this traceability project is to strengthen monitoring and enforcement in the Gulf of Saint Lawrence competitive fishery, and to spread out the fishery effort. In 2014, some of the 300 harvesters also used tags that were electronically traceable through ThisFish. ThisFish is an online traceability tool (ThisFish, 2014 A).
- ThisFish has also launched a marketing pilot project whereby canned sockeye salmon is traceable through ThisFish and the cans are also branded with the name, image, and signature of the fisherman who caught the salmon inside. The product is being sold online in North America and Europe, as well as in select specialty retail shops in Vancouver, Kelowna, Calgary, Toronto, and Ottawa (ThisFish, 2014 B).
- In the Gulf of Mexico, and beyond, the Gulf Wild TransparenSea traceability system provides a uniquely numbered gill tag for every fish caught using its system. This tag includes information about the fisherman and where the fish was caught and landed, and can be traced all the way



to the end consumer. The system includes 19 different species of seafood, including American red snapper and Red grouper (Gulf Wild, 2015).

In addition to the foregoing, information about other specific traceability efforts is available on the websites of many other seafood companies that are undertaking traceability efforts, including Norpac, Aqua Star, Trident Seafood, and Beaver Street Fisheries, to name a few.*

These trends reflect a strong perception that increased traceability is good for business and good for governments.

Business Benefits of Traceability

In September 2011, the FDA established a number of traceability pilots run by the IFT, as described by Section 204 of the FMSA. The companies participating in these pilots reported a number of business benefits as a result of the pilots. Specific examples included a pilot participant that experienced shrinkage cost savings of \$3,000 per week, a pilot participant that was able to secure a business relationship worth \$4 million because it could provide product traceability, and a pilot participant that was able to realize financial benefits of \$200,000 from improved supply chain management (IFT, 2012).

* <http://www.aquastar.com/seafoodforever.aspx>
<http://www.norpacexport.com/about/arts>
<http://www.megafishnet.com/news/9321.html>
<http://www.rfidjournal.com/article/purchase/3060>

Industry is voluntarily embracing traceability because it is increasingly recognized as good for business. As noted above, many processors, distributors, and retailers of fish products are already improving their ability to know the origin of their supplies and to eliminate the risk of dealing in illegally or irresponsibly caught fish. However, strong traceability systems not only serve as a kind of insurance, reducing financial, regulatory, and reputational risk and allowing companies to respond quickly to scandals or recalls, but also provide tangible business benefits (Future of Fish, 2014). Such benefits include increased consumer confidence and loyalty, better access to profitable markets, decreased spoilage, improved inventory management, and generally increased operational efficiency (IFT, 2012 and Future of Fish, 2014). Often, traceability commitments coincide with, and enable, sustainability commitments. For example, leading restaurants (e.g., Red Lobster, Legal Seafood, and McDonald's) and grocery chains (e.g., Aldi Australia, Edeka, Hannaford, Hy-Vee, Kroger, Safeway, Target, and Walmart) have made significant sustainability commitments, some working toward a 100 percent sustainable and traceable seafood supply by 2015 or 2020.

It is worth noting that the trend toward traceability in seafood is part of a larger, global trend toward traceability across all food products. This trend is fueled both by consumer demands and government regulations concerning food safety and legality. A 2014 report from Allied Market Research predicts that the global market for food traceability technology will grow by 8.7 percent annually for the rest of the decade, reaching revenue of \$14.1 billion by 2020 (Allied Market Research, 2014).

Similarly, governments have a host of reasons to improve seafood traceability, as well as traceability of many other food products traded within and across their borders. The risks of foodborne illness and plant or animal disease are top concerns. Ensuring that law-abiding, domestic producers are not undercut in the marketplace by imports from producers that flout international protocol or the laws of their flag state is another priority for governments. Further, adoption of strong traceability regulations for domestic producers can provide trading partners with increased confidence. Finally, there is a growing recognition that when a preponderance of governments establish traceability requirements for seafood imports—particularly when they employ a single global standard or a harmonized set of standards—there is a ripple effect that encourages improved regulation, reporting, and management in source fishing countries. Improvements of this kind on the part of governments around the world can have far-reaching effects on the ecological health of ocean ecosystems and fishery stocks, as well as the economic health of fishing communities and even the revenue streams of governments.

Given the groundswell of attention to seafood traceability and legality from all corners of the sector, it is an opportune time to push forward a global dialogue on a framework for legal and traceable wild-caught fish products.

METRO GROUP — A Case Study on GS1 Implementation

Germany-based Metro Group, one of the world's largest and most international retailing and wholesaling companies, has been developing a decentralized traceability system for some of its key commodity inputs since 2012. The company's initial interest in traceability was driven by the need to comply with the EU's Control Regulation, meet customer demand for more information, increase supply chain efficiencies, and respond to food scandals or product recalls.

In 2013, Metro Group launched its first traceability pilot in partnership with relevant players (e.g., retail, wholesale, fisheries, and scientists). The pilot is based on fTRACE and is the first implementation of the Global Standard Traceability Solution (GSTS) provided by GS1 Germany. Metro Group selected the GS1 standard because its widespread adoption by some segments of the seafood industry enhanced the interoperability capacity along Metro Group's supply chain. In 2014, the pilot was expanded from lot-based traceability for some fish products in some stores in Germany, to all fish suppliers (fresh, frozen, deli) and meat suppliers in Metro Cash & Carry stores in Germany. In 2015 the rollout will be extended to numerous other EU countries, such as France, Spain, the Czech Republic, Slovakia, and Hungary, as well as to non-EU countries, including China and Turkey. Furthermore, GSTS will expand to cover other food products, such as fruit and vegetables, and eventually to some non-food products. The aim of Metro Group's traceability program is to provide lot-based or even item-instance-level traceability.

Metro Group works toward a GSTS at an internationally harmonized level, covering sustainability and safety aspects, but also advanced marketing, efficient recall handling, and anti-counterfeiting. This system is strictly based on open global standards to ensure global interoperability and to avoid the cost associated with the proliferation of one-off, or "island" solutions that only cover one specific type of product, jurisdiction, or geography.

This GSTS approach is based on:

- Agreement on necessary attributes/events and data that should be stored
- Decentralized data storage
- A kind of search engine for linking the data within a global traceability network
- Standardized data capture, data recording and data exchange technologies (e.g., barcodes, RFID tags, extensible markup language (XML), and electronic data interchange (EDI))
- Identification of raw material, transport units, ingredients, products, and partners via globally unique identifiers

This information was provided by Metro Group. The Panel is not specifically endorsing the approach of Metro Group, but rather is offering it as one example of emerging industry efforts to implement traceability systems.

RECOMMENDATIONS OF THE PANEL



In order to achieve its vision for fully traceable and demonstrably legal fish products outlined above, the Panel unanimously issues the following recommendations:

1 Minimum information standards for wild-caught fish products should be adopted

Seafood traceability systems should reliably link products to data about the “who, what, where, when, and how” of fishing, including primary information about vessel registrations, fishing licenses, and catch documentation sufficient to provide strong evidence of legality. Accordingly, seafood traceability systems need to converge on a shared vision of KDEs that should be captured and made available for wild-caught fish products.

→ The Panel recommends that KDEs for wild-caught fish products should include, at a minimum, information that establishes the following facts:

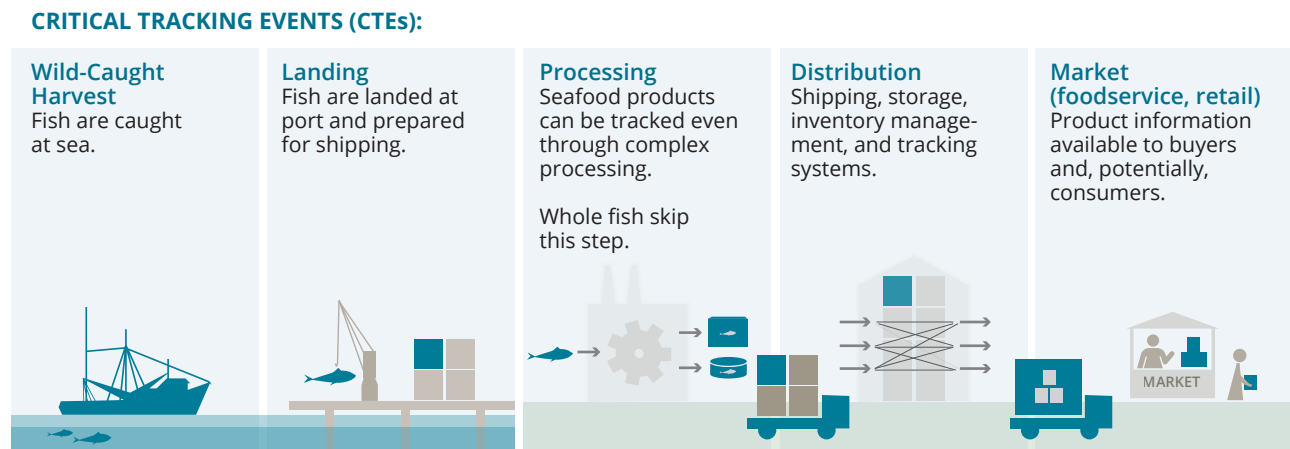
- Identity of the fishing vessel, including name, registration number, and flag state
- Applicable fishing license(s), including issuing authority and license number
- Identity and volume of the fish caught, including species name (and stock, if applicable)
- Quantity
- Time and location of catch
- Gear and/or catch method
- Time and location of landing (including any at-sea transfers)

The Panel notes that KDEs can be collected and accessed in different ways. KDEs can be physically attached to the fish or lot with a tag or barcode, or they can be made accessible upon request within a reasonable timeframe to authorized personnel. Businesses may treat KDEs differently, or may employ both methods for varying kinds of information. Optimal collection and access protocols for KDEs must be addressed by commercial policy (such as supplier-customer contracts) and, possibly, public policy (such as labeling regulations).

Some standards for traceability in the fisheries sector (and for product traceability generally) already exist, both at national and international levels (e.g., GS1 and International Organization for Standardization (ISO) 12875). The Panel recognizes the need for evaluation, selection or development, and, most importantly, widespread adoption of one, or very few such standards. The Panel further recognizes that standard(s) must be commercially practicable, contribute to interoperability, build upon current industry adoption, and avoid creating proprietary silos. As such, the Panel recommends the use of an

FIGURE 1: Critical Tracking Events for Seafood Traceability

Critical tracking events (CTEs) identify those core business processes where traceability data capture is vital to a successful traceability process. The following figure illustrates those key events for the seafood supply chain. Adapted from National Fisheries Institute, 2011. **See Appendix A** for more detailed information about CTEs and a full list of KDEs.



An abbreviated list of Key Data Elements (KDEs):

- | | | | | |
|--|---|--|---|---|
| <p>✓ PRODUCTION DATA:</p> <ul style="list-style-type: none"> -Product ID -Timestamp -Location | <p>✓ LANDING DATA:</p> <ul style="list-style-type: none"> -Product ID -Timestamp -Location | <p>✓ PROCESSING DATA:</p> <ul style="list-style-type: none"> Inputs/Outputs -Batch/Lot# -Quantity -Shipping# | <p>✓ DISTRIBUTION DATA:</p> <ul style="list-style-type: none"> -Date, Time -Batch/Lot# -Quantity -Shipping# | <p>✓ RETAIL DATA:</p> <ul style="list-style-type: none"> -Date, Time -Batch/Lot# -Quantity -Received# |
|--|---|--|---|---|

existing standard or set of standards wherever possible and appropriate, so as to avoid duplication of work and proliferation of standards.

critical tracking events points along the seafood supply chain at which fish products change form, location, or ownership

As an illustration, the Panel has outlined some sample KDEs relevant for documenting legally caught and landed fish and relating to common **critical tracking events** (CTEs) in seafood production and trade (**attached as Appendix A**). The Panel recommends that the existing standards be evaluated for compatibility with the documentation and **electronic** exchange of these and similar KDEs. If the current standards are insufficient, then a new standard should be developed, preferably on the international level. In all cases, strong industry support and widespread adoption of the selected or developed standard(s) is a prerequisite for consistent and transparent documentation and exchange of information relating to provenance and legality of wild-caught fish products. Widespread adoption of traceability standards enables interoperability, while allowing a competitive field of service providers to develop implementation systems.

→ The Panel recommends that detailed KDE standards for wild-caught fish products be either fully adopted from an existing standard(s) or, if necessary, more completely developed and adopted through appropriate industry-based processes.

Even more fundamentally, the Panel recognizes the need for standardization of a common vocabulary for the recording and sharing of KDEs for wild-caught fish products. A number of KDEs related to fishing (e.g., fishing gear and methods, identification of fisheries, ports of first landing, and even sometimes fish species and products) do not have authoritative and widely adopted sets of definitions. The Panel notes that some international nomenclatures (e.g., FAO alpha codes, integrated taxonomic information system (ITIS) taxonomic serial number (TSN) codes, and GS1 global location number (GLN) codes) already exist, while some processes are already underway to address certain needs for standardized vocabulary. The Panel recommends that the existing and forthcoming data lists be evaluated to see if they can represent the KDEs in question. If notable gaps remain, new nomenclatures should be developed, preferably at the international level. Again, strong industry support and widespread use of the respective data lists are prerequisites for consistent and transparent documentation and exchange of information relating to provenance and legality of wild-caught fish products.

→ The Panel recommends that standardized vocabularies and definitions for wild-caught fish product KDEs—in all major commercial languages—be established by building off of existing standards. An industry-based and international process should be used to make modifications, to the extent they are needed.

Suggestions for Further Reading:

- Jianrong Zhang and Tejas Bhatt. "A Guidance Document on the Best Practices in Food Traceability." *Comprehensive Reviews in Food Science and Food Safety* 13, no. 5 (2014): 1074-1103.
- National Fisheries Institute and GS1. "Traceability for Seafood U.S. Implementation Guide." March 2011.

2 Authoritative data sources, including a global record of fishing vessels, should be established or identified as soon as possible

Although in most fisheries much of the necessary data mentioned above exists, there are some critical gaps in coverage on the global scale that must be addressed in order to realize a comprehensive traceability system. Addressing these gaps will require strengthening international and national mechanisms to produce authoritative, reliable, and accessible data.

Among the gaps most urgently needing attention is the absence of a system for unambiguously identifying individual fishing vessels. In the view of the Panel, filling this gap is one of the highest priority steps that governments must take to enable global seafood traceability and combat illegal fishing.

→ The Panel recommends that governments, working together at the FAO and/or other appropriate global fora, move rapidly to operationalize a global record of fishing vessels. This global record should include the use of the IMO vessel numbering scheme as a basis for assigning unique vessel identifiers.

The Panel further recognizes that national governments must take additional actions to establish authoritative data sources (e.g., linking national vessel registries to the global record and requiring licenses for all fishing activity). The Panel also takes note of the role to be played by RFMOs in verifying and disseminating information about fishing vessel authorizations.

→ The Panel recommends that all governments and RFMOs ensure the registration of all vessels and the licensing of all fishing under their jurisdictions through mechanisms that are fully transparent, verified, and open to public inspection.

Suggestions for Further Reading:

- Bertrand Le Gallic and Anthony Cox. "An economic analysis of illegal, unreported and unregulated (IUU) fishing: Key drivers and possible solutions." *Marine Policy* 30, No. 6 (2006): 689-695.
- Food and Agriculture Organization of the United Nations International Plan of Action to Prevent, Deter, and Eliminate Illegal, Unreported and Unregulated Fishing. "Voluntary Guidelines on Flag State Performance." Updated June 30, 2014.

3

A harmonized system of “landing authorizations” should be established to provide primary assurances of the legal origin of fish products

A global system to ensure that all wild fish products are traceable to legal fishing activities must rest ultimately on authoritative judgments by governments about the legality of the underlying behavior. The Panel takes note of some existing systems that include mechanisms for rendering such judgments, such as the “catch certificate” trade controls implemented under the EU’s IUU Regulation and the CDS employed under the CCAMLR for Patagonian toothfish. The Panel believes that mechanisms to provide reliable and authoritative official judgments of the legality of fish catches should be refined and universalized. To be effective and reliable, such systems must be able to combine information from vessel registrations, fishing licenses, catch documentation, and vessel inspections. Moreover, the Panel believes that the critical time and place for establishing the legal origin of fish products is at the dockside upon first landing.

The Panel takes particular note of the “landing authorization” system now being pursued through the Pacific Islands Forum Fisheries Agency (FFA) in the Solomon Islands. In that system, which is funded by the EU Development of Tuna Fisheries in the Pacific ACP Countries Project II (DEVFISH II), multiple sources of information about a vessel and its catch are aggregated at port. In one key step, consistent with implementation of the PSMA, vessels seek authorization to land from government officials at dockside. The risk profile of the vessel, which is based on factors such as flag state and licensing status, as well as observer coverage and VMS access, determines the time required for arrival notification (e.g., 12, 24, or 48 hours in advance of landing), as well as the amount of information the vessel must provide to dockside officials.* Officials can access catch documentation records, vessel licenses, and VMS tracking, as well as information about the compliance history of the vessel in question. Additionally, dockside officials are able to inspect vessels and catches directly, at their discretion. Based on this aggregation of information, dockside officials are empowered to make judgments about the legality of the landings on a case-by-case basis. Vessels that are allowed to dock with the intention to unload are provided a “landing authorization code” (LAC). Landings may be denied or authorized under bond if the results of the inspection show non-compliance.

LACs can then be used in a variety of ways farther down the supply chain. They can become important KDEs associated with specific batches of fish. They can move through the supply chain from landing to customer, help with mass-balancing inventory systems often employed by processors and cold storage, and become the basis for catch certificates generated at a later point in the supply chain. For example, LACs couple well with the EU’s “catch certificates” for seafood imports.

* For example, domestic vessels fishing in the port state Exclusive Economic Zone (EEZ), with VMS and on-board observers, may be in the lowest-risk tier. Foreign vessels with local licenses, domestic vessels fishing in other EEZs or on the high seas, and vessels with patchy observer coverage may be in the middle-risk tier. Foreign vessels with no direct VMS access by the coastal or port state, or vessels identified as a Vessel of Interest (VOI) by any country or RFMO, may be high-risk vessels.

The structure and nature of LACs can be determined by the port state or RFMO, but would likely include information such as country identification, trip and port traceability, fishing effort measurements, and observer reporting. LACs should be interoperable with vessel coding systems as well as relational databases used by authorities, such as a Fisheries Information Management System (FIMS).

The FFA experiment could serve as one model for consideration in developing a harmonized global approach to mutually recognized landing authorizations. The success of this pilot program in the remote and relatively undeveloped Solomon Islands bodes well for the replicability of this approach to establishing legality. Although landing authorizations, as piloted by DEVFISH II, is a new program, the concept has been employed on a case-specific basis already. Specifically, the CCAMLR CDS for Patagonian toothfish effectively uses the same concept to establish legality for fish caught under its jurisdiction.

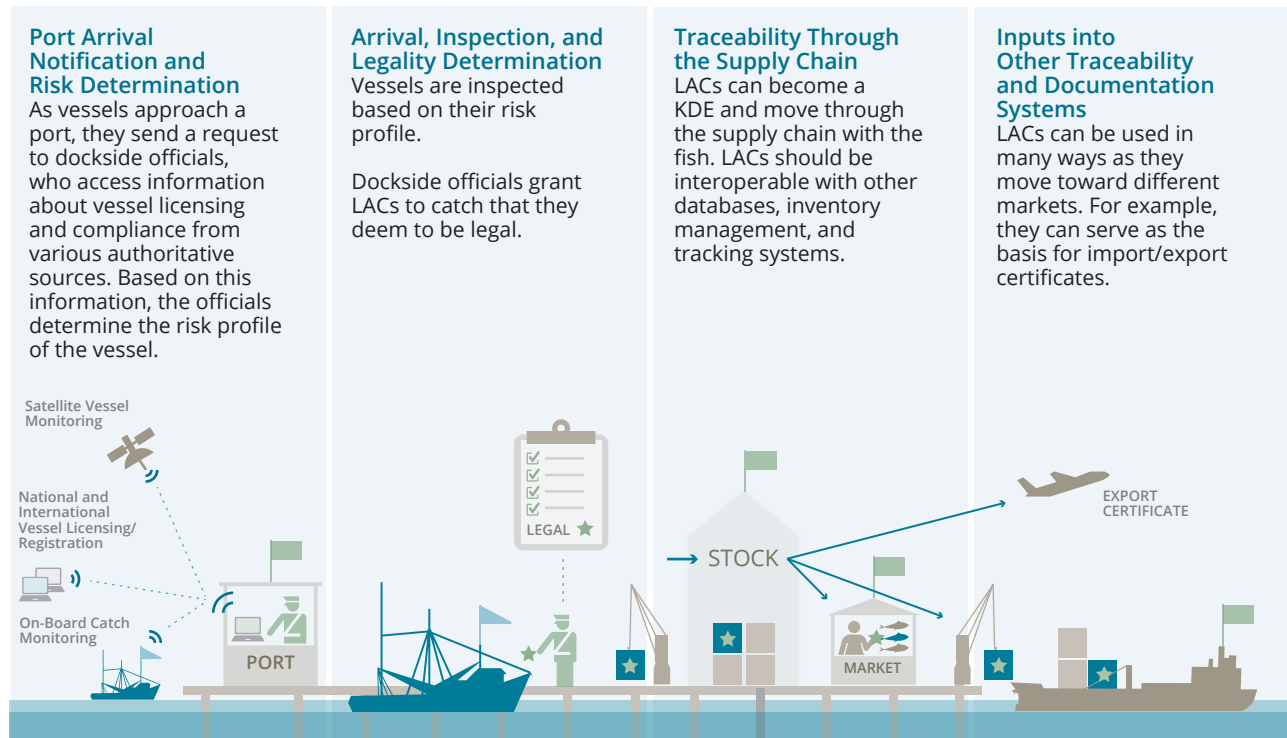
→ The Panel recommended that governments work quickly, in dialogue with private industry and other stakeholders, to establish harmonized landing authorization mechanisms as a basis for assuring and authoritatively declaring the legality of fish products as they come off the boat. Landing authorization numbers should become a high priority KDE for all wild-caught fish products.

The Panel further recognizes that several current international processes could make important contributions to the functioning of a harmonized landing authorization system. In particular, the ratification and effective implementation of the PSMA would directly support and provide a vehicle for establishing a landing authorization system. Similarly, a recently launched program of work at the FAO is exploring paths toward harmonization of CDSs.

→ The Panel recommends that governments move quickly to ratify and implement the PSMA. Governments should also support and participate in the FAO work program in pursuit of harmonized approaches to catch documentation.

FIGURE 2: Landing Authorization Codes

This graphic shows how LACs can be used to authorize and trace catches, landings, and exports.



Suggestions for Further Reading:

Flothmann, Stefan, Kristin von Kistowski, Emily Dolan, Elsa Lee, Frank Meere, and Gunnar Album. "Closing Loopholes: getting illegal fishing under control." *Science* 328, no. 5983 (2010): 1235-1236.

4 Multiple points of verification should be added throughout seafood supply chains

The validity of any information-based system depends upon assurances of the accuracy of the information through robust verification mechanisms. Any information-based system will have parties that generate the information and parties who depend upon the information. Either of these parties can establish rigorous verification systems of their own. For example, government regulators concerned about the entry of illegal product at their border, or commercial retailers concerned about the quality of their own supply, could have their own audit functions to ensure legality and to identify and prevent fraudulent activity. Alternatively or additionally, verification could be conducted by a third party.

A system requiring information about the legal provenance of fish products is in reality asking for claims rather than facts. These claims can easily be falsified (especially in paper-based systems), and therefore require verification. Verification is typically complex, regardless of the step in the supply chain, because multiple aspects of information must be verified. Information must be complete (e.g., meet all information requests) and accurate, employ the correct terminology, and follow any and all procedural requirements.

Verification functions must be layered across each step in the seafood supply chain to ensure that the information generated at each step is secure and reliable and that the systems generating and stewarding the information are functioning with integrity. Specifically, each of the following elements of the supply chain requires verification:

- **The primary information about seafood** (e.g., the minimum information standards described in **Recommendation #1**, including vessel registrations, fishing licenses, and catch documentation).
- **The strength and integrity of landing authorization systems and the information that they generate.** Importing governments should establish criteria for what makes a good landing authorization system and require traded products that rely on such systems to meet these criteria. Importing governments should also inspect and verify the landing authorization systems directly, or have a third party do so.
- **Claims of *chain of custody* (i.e., the chronology of the ownership, custody or location of product from the time it is obtained to the time it is presented).** Specifically, claims made about both the actors in the chain and the product itself should be verified.
- **Systems that are trusted to supply markets with legal and traceable fish.** Any importing government that provides swift entry to product from a trusted party (e.g., an exporting government agency, an industry association, a certification scheme, or an RFMO) must verify that the system used by that party has integrity and can produce reliable information.

chain of custody
the chronology of the ownership, custody, or location of product from the time it is obtained to the time it is presented

- **Trade documentation.** Records and data presented at the border must be verified (i.e., if we rely on trusted systems to provide legal and traceable product, then we must verify that those systems are trustworthy; and if we rely upon direct evidence, then we must verify that the evidence is accurate).

Any government system that requires verification might employ a risk-based approach so that commercial actors who can demonstrate that they have low-risk products and/or conduct verification on their own supply chains face the least burdensome verification requirements and/or the least likelihood of being audited.

→ The Panel recommends that both governments and industry establish mechanisms for verifying the information that is generated about fish products at each critical step in the seafood supply chain, including through the routine use of independent third-party auditing systems.



5 A transition to fully electronic traceability systems should be accomplished for all commercial wild fish products within the next five years

full electronic traceability
systems that store information digitally and exchange information electronically

Paper-based recordkeeping and traceability systems cannot meet the needs of the seafood industry in the 21st century. They are simply too slow, cumbersome, open to fraud and abuse, and expensive to be effective. The Panel notes that the EU IUU Regulation is still heavily paper-based in its implementation and so suffers from some of these weaknesses. The Panel firmly believes that the transition to *fully electronic traceability* systems for the seafood industry is inevitable, and is already rapidly taking place. The only open question discussed by the Panel is simply the speed of transition.

There are two common assumptions regarding the obstacles to making a rapid transition to electronic data systems: (1) that small businesses often cannot afford to make the transition; and (2) that businesses in developing countries lack the resources or the infrastructure to do so. The Panel finds that both of these assumptions are largely wrong. Small businesses and developing country merchants know that integration into the digital world is vital to their competitive success. Indeed, small enterprises often prove more nimble and adaptive than large multinationals, and modern technologies (such as smart phones) are already being employed in some of the most remote fisheries. The Panel also finds evidence that electronic data is in widespread use for inventory management in companies that do not have electronic traceability systems per se, suggesting that many companies are more ready for a transition to electronic traceability than is often perceived. Further, a 2011 implementation guide for traceability in seafood, published by the National Fisheries Institute in association with GS1, and produced in partnership with a range of industry stakeholders, states clearly that “the best practice for all supply chain partners is to build a traceability process that allows for electronic data capture, storage, and retrieval of critical product traceability information for all product hierarchy levels throughout the supply chain, from the farm to the ultimate consumer” (National Fisheries Institute, 2011).

Finally, other food-based industries that have embarked on electronic traceability initiatives have met with success. For example, the Produce Traceability Initiative (PTI), a voluntary, industry-wide effort to transition to electronic traceability and establish common nomenclature across produce supply chains, published recommendations in 2010 that include the adoption of electronic traceability systems (PTI, 2010). Today, a majority of reporting member companies claim that electronic traceability systems are used for over 75 percent of their products (PTI, 2015).

→ The Panel recommends that commercial actors and governments commit to completing a transition to fully electronic traceability systems for all commercial wild fish products within the next five years.

6 Support and capacity building must be provided to those producers who will need help with the transition to electronic traceability systems, particularly SMEs and commercial fishers in developing countries

The Panel recognizes that the technology transition will be challenging for some small-scale fishing communities and SMEs, particularly in developing countries, and that these actors will need assistance in order to meet the rapid timeline for transition to electronic systems proposed by this report. Industry and government actors must provide incentives and assistance to help those segments of the sector that need support with this transition. Specifically, the onus will be on commercial actors to create market rewards and incentives for best practices throughout their supply chains, on governments to initiate capacity building programs for SMEs, and on multilateral and bilateral organizations to provide loans and aid for fisheries. Together, these efforts can support the adoption of electronic systems by all segments of the seafood industry.

→ In order to help speed the transition and ensure that small-scale fishers and SMEs are not excluded from global trade, the Panel recommends that governments provide bilateral and multilateral loans and aid to fisheries that need support in adopting electronic systems, and that commercial actors establish market rewards for best practices throughout commercial supply chains.

Suggestions for Further Reading:

The US Agency for International Development's Regional Development Mission for Asia, Regional Environment Office is seeking to provide technical assistance, services, and goods toward the implementation of "The Oceans and Fisheries Partnership." The goal of the five-year partnership is to strengthen regional cooperation for sustainable and legal management and trade of natural resources in Asia. The purpose is to increase the ability of RFMOs to conserve marine biodiversity and combat IUU fishing in the Asia-Pacific region (Federal Business Opportunities, 2014).

7 A global architecture for interoperability systems should be developed

The seafood industry today is a truly globalized business, with large numbers of independent producers, processors, traders, distributors, and retailers working in ever-shifting patterns across borders and market sectors. If traceability and proof of legal origin are to become routine, traceability systems must be made interoperable in a way that is affordable, universally practical, and secure.

The essence of interoperability is the ability of IT systems to manage data using standardized protocols for storing, communicating, and granting authorized access to information. This requires, for example, collecting and communicating KDEs (**see Appendix A**) using standardized nomenclature and in common formats. Once standardized KDEs for wild-caught fish products are established and agreed upon, and once actors have transitioned to fully electronic traceability systems, the value of these management tools can be greatly enhanced by making them adhere to international interoperability standards. Interoperability can enable rapid and accurate full chain traceability, making it much easier and less expensive to ensure the legal origin of products.

There are two common fears associated with full chain traceability for seafood. First, that full chain traceability requires the continuous and cumulative transfer of information through each link in the entire market chain. Second, that full chain traceability will reveal critical, confidential information, especially to competitors. Similarly, an obstacle to establishing interoperability among traceability systems is the perception that interoperability may require businesses to “opt in” to vertically integrated proprietary systems.



These perceptions rest on an outdated conception of how traceability systems can be designed. Interoperability is simply the ability of IT systems to manage data using a set of standardized protocols. Interoperability greatly increases the speed and accuracy with which an actor may share relevant information with suppliers or customers (and in cases of outbreak investigations or recalls, with regulators) by reducing the labor-intensive manual mapping of non-standardized inputs and outputs of disparate electronic systems. It also overcomes some of the data integrity challenges associated with existing one-up, one-down systems. Once a transition to fully electronic traceability systems is made, data about a product can be created at any point in the market chain and can reside on computers under the control of the actor who owns or first collects the information.

An interoperable system has multiple advantages. First, it can assimilate information nearly instantaneously for authorized users. Second, suppliers and customers may use different proprietary traceability systems that can communicate when authorized to do so (such as during shipping and receiving, or any other CTEs between suppliers and customers). Third, the system has the potential to link products to primary information sources. Fourth, it can be deployed at a small scale by first movers and built up, iteratively, as additional actors, both government and private, transition to the system. Finally, by allowing the linking of multiple data inputs to data records associated with product batches, it opens possibilities to new solutions to the problem of tracing the sources of highly aggregated processed products and/or complex multi-ingredient products.

Conducting full chain traceability for products that are either highly aggregated or that have a large number of ingredients is challenging. The challenge is not a technological one, however. Traceability practices and protocols for multi-input products have been established and are straightforward in their design and implementation. Instead, the challenge is simply one of adoption because products that have a wide range or large volume of inputs require very widespread adoption of traceability standards. Traceability for these kinds of products will, by definition, lag behind traceability for products with less-complex supply chains, simply because broader adoption is required.

As noted above, the key challenge to establishing a framework for interoperable traceability is agreement on a detailed set of data and communications protocols, along with a standardized approach to establishing access rights and distinguishing authorized from unauthorized queries. This should be the work of industry-led initiatives and should be coordinated with work to devise harmonized approaches to KDEs, as mentioned above. Indeed, this work is beginning through multi-stakeholder proceedings facilitated by the GFTC, in partnership with WWF and with the participation of multiple Panel members, among others. The goal of the GFTC proceedings is to discuss the design and implementation of a seafood traceability technology architecture that is interoperable, open, and secure, and to facilitate the “business-to-business” public-private dialogues needed to promote widespread adoption.



The Panel takes note of the importance of designing IT infrastructure to allow for the inclusion of low-cost, low-effort technology (e.g., smart phones), so as to enable and encourage the participation of developing country fisheries that may not have ready access to technology beyond smart phones or other simple mobile devices.

Finally, the Panel has noted that the challenges of achieving interoperability among disparate systems is one that has been faced and successfully addressed in other sectors beyond the seafood industry. Leading examples include the banking and telecommunications industries, which have achieved a very high level of interoperability. These and other sectors have also relied on the kind of process the Panel is recommending here: multi-stakeholder dialogues, industry participation, and standard development. Another ongoing process of note is the Open Geospatial Consortium, an international industry consortium composed of over 500 companies, government agencies, and universities working in a consensus process to develop publicly available interface standards so that geoprocessing technologies can interoperate.

→ The Panel recommends development of technical standards and protocols to enable an architecture for interoperable seafood traceability, through appropriate industry-based and international processes. Such standards should aim to facilitate a pre-competitive infrastructure for global traceability and should be designed to be flexible and compatible with very low-cost, low-effort technologies.

8

Where applicable, non-discriminatory border measures setting minimum standards for seafood traceability and proof of legal origin should combat trade in IUU products while facilitating legitimate commerce through a “risk-based, tiered, and targeted” approach

As evidenced by the preceding recommendations, the Panel believes that a global framework for ensuring the full chain traceability and legal provenance of fish products should rest in substantial part on successful commercial practices and voluntarily harmonized business standards. Business-based approaches will help ensure the efficiency and effectiveness of systems whose implementation ultimately rests in the hands of the private sector. However, governments and regulatory systems also have important roles to play.

By providing clear legal standards, and by helping to collect and verify data (e.g., via catch documentation), governments can promote traceability, minimize risk, reduce private-sector costs, and help ensure consumer confidence. Appropriate regulations can also create the enabling conditions for fair competition and reduce uncertainty about industry liability. Since anti-IUU traceability practices will inevitably be subject to some regulation, governments also have a role to play in harmonizing regulatory systems to ease compliance and promote international trade. Finally, governments have an obligation to enforce laws, including those designed to reduce trade in IUU-based products and to eliminate IUU fishing itself.

There are many points along the supply chain at which regulatory bodies can check, verify, and enforce the legality of seafood, especially once pertinent electronic data is linked to fish products and readily accessible to authorized actors. The discussion in **Recommendation 3** of systems for assigning LACs is one example of new ideas for efficient verification. Additionally, it is conceivable that legality of seafood could be integrated into the food safety inspections regularly conducted at food processing facilities (e.g., Hazard Analysis and Critical Control Points (HACCP) systems in the US).

→ In order to ensure that seafood products are fully traceable to demonstrably legal sources, the Panel recommends that governments consider modifications to a variety of regulations, including consumer labeling, food safety, and trade documentation, to streamline compliance and ensure regulatory consistency and predictability.

In considering the role governments can play to ensure the traceability and legality of fish products, the Panel focused principally on the use of trade controls, and particularly on border measures. Given the high percentage of fish products traded internationally, border measures are an important control point in the global seafood supply chain. Moreover, border controls are already widely employed as a tool for combating illegal commerce in a wide range of products that are vulnerable to illegal production and/or trade (e.g., conflict minerals, timber, endangered wildlife, and certain species of seafood).

As noted above (**see p. 16**), recent years have seen a strong trend among leading market nations toward increased use of border measures to require seafood traceability and to combat trade in IUU products. The anti-IUU border measures in place in the EU since 2010 are already proving their merit (European Commission Council Regulation, 2009). In its first years of implementation, the EU IUU regulation has been successful in catalyzing improvements in fisheries management regimes in the scores of countries that export to the EU. Similarly, systems such as the CCAMLR toothfish CDS (mentioned above) have proven their environmental and commercial value by creating an incentive for the adoption of best practices on the water, and by reducing the risk of a hold or audit on seafood imports. Meanwhile, the effort being undertaken by the United States at the time of this report's publication (February 2015) to strengthen a range of agency and industry initiatives, programs, and strategies that can combat trade in IUU seafood and seafood fraud, and potentially require traceability and information requirements for imports, is a strong example of increasing attention to this issue (Presidential Memorandum, 2014).

Given the growing list of border measures addressing IUU seafood products, and the even wider proliferation of policy discussions in many countries





on this issue, the Panel believes that this is an opportune time to focus on strengthening border measures to combat trade in IUU seafood. Indeed, as governments develop and adopt new IUU regulations, there is an increasing need for a coherent approach to border measures. Effective harmonization of anti-IUU/pro-traceability seafood border measures has the potential to create a level international playing field for competitive trade while helping ensure adherence to minimum anti-IUU and traceability standards at the production and early processing levels.

The Panel is also aware, however, that improperly designed border measures can pose unnecessary or inequitable barriers to trade, or can simply create excessive burdens on both private industry and government regulators.

The Panel further recognizes that border measures may be designed to meet multiple objectives. One objective is to effectively fight the trade of illegal seafood products through stronger policing mechanisms—creating a system to screen out contraband while identifying and punishing bad actors and closing the door to their products. Such a system requires stiff penalties and a significant threat of discovery to create a strong disincentive for illegal action. A second objective is to encourage policies that promote traceability and prevent IUU fishing in the first place. To meet this objective, border measures should reward improved supply chain management as well as improved governance, reporting, and enforcement in source fishing countries. In addition, best practices must be encouraged while foreign governments and stakeholders not yet able to meet initial standards must be engaged. The Panel recognizes that these objectives are complimentary, but that a greater emphasis placed on one or the other of the objectives could lead to different choices in system design.

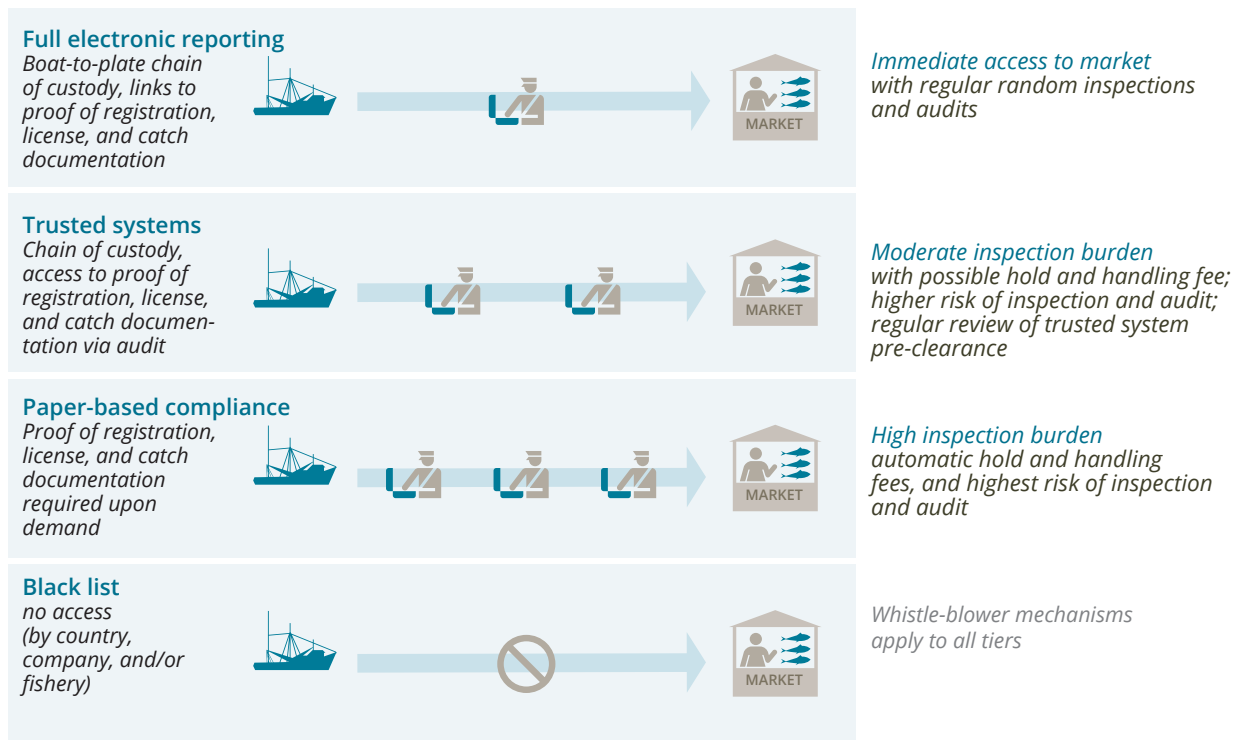
→ The Panel recommends that governments seeking to employ anti-IUU/pro-traceability seafood border measures do so in a manner that maximizes their effectiveness, entails reasonable compliance and enforcement costs, and ensures their equitable implementation.

To accomplish this, the Panel recommends that all **anti-IUU/pro-traceability border controls** meet the following **design criteria**:

- Clearly define **minimum standards for traceability and proof of legal provenance** (through direct evidence or judgments of that evidence, such as landing authorizations), erecting effective barriers to trade in IUU products while promoting legitimate trade with reduced brand risk;
- Be **comprehensive**, ending the proliferation of “species by species” anti-IUU trade regulation and providing certainty across the full range of wild seafood products;
- Effectively **distinguish high-risk from low-risk** sources and product flows, classifying them into two or more “risk tiers”;
- Define and treat “low-risk” sources and flows in ways that **reward industry best practices** and encourage effective “monitoring, control, and surveillance” of fishing and fish product trade;
- Define and treat “high-risk” sources and flows in ways that discourage irresponsible practices and effectively **remove IUU products from market streams**;
- Be effectively **linked with anti-IUU enforcement mechanisms**, such as intelligence gathering, detection of violations, and police actions against illegal fishing;
- **Mesh with existing (and emerging) laws, industry practices, and international norms**, avoiding duplicative or inconsistent requirements;
- Provide **clear guidance** regarding the protocols and minimum expectations for relevant standards to promote the development of interoperable solutions and to reduce uncertainties about industry responsibilities and potential liabilities;
- Ensure the validity of data being presented at the border through **verification requirements** and regular audits;
- Allow **cost-effective compliance and enforcement** in the context of high-volume, multi-product, time-sensitive trade;
- Be **interoperable and coherent internationally** among all major import markets and producer/exporter states;
- Be **transparent** in administration, allowing maximum public oversight and preventing abusive barriers to trade; and
- Be **equitable internationally and across market sub-sectors**, taking particular account of small-scale producer and developing country contexts.

FIGURE 3: A Tiered and Targeted Approach

This graphic shows a possible design for a border measure for IUU seafood. Under this scheme, products that do not offer quick access to proof of legality would have an increased likelihood of inspection at the border.



These design criteria can best be met through a **“risk-based, tiered, and targeted”** approach.

- “Risk-based” means that import flows should be distinguished based on their relative risk of including IUU products. This distinction can be based on facts or judgments about governmental and/or private-sector systems in place at the foreign points of production, processing, and/or export to reduce the risk of IUU infection of trade flows. Products could also be classified as “high-risk” based on case-specific information about shipments.
- “Tiered” means that products should be subject to differentiated treatment at the border in accordance with their risk categories. Products falling into lower-risk categories should be subject to less stringent controls, while those in higher-risk categories should be subject to stronger controls.
- “Targeted” means inclusion of mechanisms to proactively identify suspicious product flows that should be subject to strict verification and enforcement.

To meet these goals, anti-IUU/pro-traceability border measures should build on a broad set of successful, risk-based systems currently in use in sectors where high volumes of imports must be screened for compliance with standards implemented by foreign authorities and parties. Such models employ a range of system designs to ensure compliance. For example, US HACCP standards for seafood imports rely on the identification of trusted facilities and

exporters. The current EU IUU Regulation and the Convention on International Trade in Endangered Species (CITES) rest on government-to-government certifications. In the fields of children's toys and "conflict minerals" (e.g., avoiding imports of "blood diamonds"), current systems rely on approval by private-sector mechanisms that provide a reliable degree of accountability.

Drawing on these and other existing models, the Panel identified a set of basic approaches to border measures as "building blocks" that can be applied, modified, and combined into a multi-part system. **See Appendix B** for a fuller treatment of these building blocks. The Panel wishes to emphasize that design and development of anti-IUU/pro-traceability border measures could, and should, benefit from the design work that has already been undertaken by existing systems. We do not need to start from scratch. Further, existing systems need not be adopted wholesale, but rather a new border measure could be composed of many building blocks pulled from various systems. The Panel makes particular note of the FSMA, which integrates a number of building blocks to achieve a flexible and responsive system.

The FSMA: Employing a Hybrid Approach to Border Measures

As part of the FSMA, the FDA has been granted authority to better ensure that imported products meet US standards and are safe for US consumers. The import controls that will be employed under the FSMA have parallels to the range of building blocks identified by the Panel. For example, the statute specifies the following:

Importer accountability: For the first time, importers have an explicit responsibility to verify that their foreign suppliers have adequate preventive controls in place to ensure the food they produce is safe. (*Self-declaration*)

Third-party certification: The FSMA establishes a program through which qualified third parties can certify that foreign food facilities comply with US food safety standards. This certification may be used to facilitate the entry of imports. (*Third-party certification*)

Certification for high-risk foods: The FDA has the authority to require that high-risk imported foods be accompanied by a credible third-party certification or other assurance of compliance as a condition of entry into the United States (*Third-party certification, direct evidence, or government assurance*)

Voluntary qualified importer program: The FDA must establish a voluntary program for importers that provides for expedited review and entry of foods from participating importers (for example, importers offering food from certified facilities.) (*Pre-clearance*)

Authority to deny entry: The FDA can refuse entry into the United States of food from a foreign facility if the FDA is denied access by the facility or the country in which the facility is located. (*Black list*)

(FDA, 2014 B)



The Panel spent significant time—including a day-long workshop with outside experts—to consider how a risk-based, tiered, and targeted system meeting the Panel’s design criteria could work in practice. Using the building blocks distilled from existing border measures the Panel developed **a strawman concept** of how properly designed border controls might work.

Summarized graphically in **Figure 3**, this concept would operate as follows:

1. **As a baseline obligation, all wild-caught seafood products would be subject to both traceability and “proof of legality” obligations.** The traceability obligation would require that the identity of every actor in a market chain be known or at least knowable to border control agents (subject to appropriate confidentiality requirements), and that those actors be verified or verifiable. The “proof of legality” obligations would require that all products originate in fisheries subject to transparent vessel registration, fishing licensing, and catch documentation requirements, where direct evidence of compliance with those requirements is available, and where the basic “who, what, where, when, and how” of fishing can be reliably ascertained and associated with specific product flows.
2. **The lowest-risk tier (Tier 1) for wild-caught imports would consist of products covered by electronic full chain traceability systems** capable of giving border agents the immediate ability to know the identity of all actors in the market chain, as well as immediate access to basic data and official documentation needed to demonstrate legality. Subject to verification systems for ensuring data validity, products in this risk tier would be “innocent until proven guilty” and granted swift entry. However, these products would be subject to periodic audits.

3. **The next-lowest-risk tier (Tier 2) would consist of products originating in systems that employ best practices for reduction of IUU risk.** These systems could be defined in various ways (the Panel did not express a preference), such as through identification of “low-risk” commodity/country combinations, third-party certification systems, and/or independently audited industry-based systems. Strict criteria for qualifying for this tier would have to be carefully crafted, and should include requirements (i) that independently verified full chain traceability is in place and (ii) that the basic registration, licensing, and catch documentation be discoverable upon audit in reasonable time. A process for determining qualification would be needed (possibly including pre-clearance inspections, formal identification of qualified certifiers, etc.). Qualified systems would also need to be subject to random, unannounced inspections and audits. Products in this risk tier would be subject to a higher level of scrutiny at the border than Tier 1 products (e.g., greater likelihood of inspection and audit) and could be subject to handling fees.
4. **Products not meeting Tier 1 or Tier 2 criteria (primarily any paper-based system not qualifying for Tier 2) could face greater resistance at the border.** For example, these products might be subject to additional handling fees to reflect greater costs, automatic “holds” for preliminary inspection, and a much higher likelihood of audit.
5. **In addition to the above, the system could establish procedures** to allow identification of specific shipments where direct evidence of likely IUU infection is present. Another possibility is to honor black lists established by foreign or international authorities.
6. **A system such as this would likely need to be phased in over an appropriate period.** The Panel suggests a five-year transition period.

→ The Panel recommends that any border measures adopted to promote wild-caught seafood traceability and to combat trade in IUU products should meet the criteria stated above, and should adopt a risk-based, tiered, and targeted approach. The Panel recommends its proposal as one possible starting place for border measure design. It further recommends that both the design and implementation of border measures (and any other pro-traceability/anti-IUU regulations) should be fully transparent and carried out in close dialogue with industry and civil society actors. Governments should move swiftly to harmonize all existing and future border requirements to reduce burdens on trade and ensure equitable treatment.

CONCLUSION AND CALL FOR A GLOBAL DIALOGUE



This document presents a comprehensive vision for a global framework to ensure that all wild-caught seafood is fully traceable to legal fishing activities.

Our analysis and recommendations combine the knowledge and perspectives of diverse actors and experts and are based on wide-ranging consultations. The Panel believes that the vision set out here is one that is both practical and urgently needed. The Panel urges concerted action toward the goals set forth by this set of recommendations, without delay.

Accordingly, the Panel calls on all stakeholders to act.

The Panel calls on governments to give increased priority to the issues and needs discussed in this report, and particularly to act promptly to advance the Panel's second, third, fourth, sixth, and eighth recommendations.

In addition, in order to facilitate a deep and positive engagement by the seafood industry, the Panel calls for the convening of a global dialogue to develop and begin implementing the framework described above, in particular to advance the Panel's first, fourth, fifth, sixth, and seventh recommendations. The Panel suggests that this global dialogue be convened among seafood industry actors, with appropriate participation of civil society experts and representatives, and in consultation with government policymakers. Such a dialogue should include participants from diverse and representative geographies and market sub-sectors. The Panel believes that the need for such a dialogue is real and immediate, and that its prompt initiation would contribute significantly to speeding and smoothing the transition to a world where all wild seafood is fully traceable to demonstrably legal fishing activities.

APPENDICES

APPENDIX A: Sample Critical Tracking Events and Key Data Elements

KEY: ■ Required (Req.) ■ Best Practice (B.P.) ■ Conditional (Cond.)

CUSTOMIZED CTES based on Critical Tracking Events (CTEs)

CUSTOMIZED KDEs Key Data Elements (KDEs)	KDE CATEGORY	Fishing Transformation: (creation/ manipulation of products)—Input	Bycatch Depletion: (exit from system) —Disposal	At-sea transfer: Shipping Transportation: (exchange of goods)—Shipping	At-sea transfer: Receiving Transportation: (exchange of goods)—Receiving	Landing Transportation: (exchange of goods)—Shipping	Landing Transportation: (exchange of goods)—Receiving
Identity of event owner Event owner (entity recording the information)	Who	(Req.) Identity of vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of shipping vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of receiving vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of landing vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of the persons or enterprises to whom legal and physical custody of the fish is transferred upon landing
Identity of trading partner Trading partner ¹	Who	(Req.) Identity of the inter-governmental authority		(Req.) Identity of receiving vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of shipping vessel (nationality, name, registration details, captain, type, ownership, home port)	(Req.) Identity of the persons or enterprises to whom legal and physical custody of the fish is transferred upon landing	(Req.) Identity of landing vessel (nationality, name, registration details, captain, type, ownership, home port)
Fish Item (the good)	Who	(Req.) Species, stock, size	(Req.) Species, stock of bycatch	(Req.) Species, stock, size	(Req.) Species, stock, size	(Req.) Species, stock, size	(Req.) Species, stock, size
Unique identifier Lot/Batch/Serial#	What	(Req.) Catch certificate / license	(B.P.) Catch certificate / license	(B.P.)* Catch certificate / license	(B.P.)* Catch certificate / license	(B.P.)* Catch certificate / license	(B.P.)* Catch certificate / license
Quantity	What	(Req.) Quantity of fish	(Req.) Quantity of bycatch	(Req.) Quantity of fish	(Req.) Quantity of fish	(Req.) Quantity of fish	(Req.) Quantity of fish
Unit of measure	What	(Req.) Variable	(Req.) Variable	(Req.) Variable	(Req.) Variable	(Req.) Variable	(Req.) Variable
Date/Time	When	(Req.) Date and time of fishing	(Req.) Date and time of bycatch	(Req.) Date and time of transfer	(Req.) Date and time of transfer	(Req.) Date and time of transfer	(Req.) Date and time of transfer
Location Event location	Where	(Req.) Location of fishing (specific geographic area)	(Req.) Location of bycatch (specific geographic area)	(Req.) Location of transfer	(Req.) Location of transfer	(Req.) Location of transfer	(Req.) Location of transfer

LINKING KDEs based on Key Data Elements (KDEs)

Carrier ID	Who			(Cond.)	(Cond.)	(Cond.)	(Cond.)
Trailer number	Who			(Cond.)	(Cond.)	(Cond.)	(Cond.)
Issuing authority Activity type (e.g., PO, BOL, Work Order)	Why	(Req.) Identity and issuing authority of applicable licenses		(Cond.)* Invoice	(Cond.)* Purchase order	(Cond.)* Invoice	(Cond.)* Purchase order
License Activity ID (number associated with PO, BOL, Work order)	Why	(Req.) Fishing license		(B.P.)* Invoice #	(Cond.)* Purchase order #	(Cond.)* Invoice #	(Cond.)* Purchase order #
Method Transfer type ²	How	Method of fishing used	Bycatch reduction techniques	(Cond.)	(Cond.)	(Cond.)	(Cond.)
Transfer number ²	How			(Cond.)	(Cond.)	(Cond.)	(Cond.)
Lot/Batch relevant date ³	Why	(Cond.)	(B.P.)	(Cond.)	(Cond.)	(Cond.)	(Cond.)

Conditional Field: The need for this field would be determined by business circumstances. Where transport events do not capture batch/lot numbers, this field may be required (*).

Best practice is to capture the batch/lot number or relevant date whenever possible; however, in recognizing the current difficulty in capturing this information for transport and depletion events, Activity ID or other KDEs that provide links, as identified in the table, must be

provided (*) as the industry prepares to meet a future requirement to capture lot/batch numbers.

1 For a shipping CTE, the trading partner is the immediate subsequent recipient of the shipment. For a receiving CTE, the trading partner is the immediate previous supplier of the product. For a transformation CTE, the trading partner is the supplier of the input into the transformation.

2 If the Activity type and ID are not linked to a particular

shipment of a product (e.g., a purchase order that is fulfilled by multiple shipments over time), then the Transfer type and ID are used to indicate the particular shipments that are linked to the Activity type and ID.

3 If there is a different lot/batch designation on a consumer-level product, such as a "best by" date, it must link to the manufacturer-assigned lot number.

APPENDIX B: Building Blocks: A Range of Approaches to Risk-Based, Tiered, and Targeted Import Control Systems

In designing import controls that employ a risk-based, tiered, and targeted approach, the questions of how to define risk tiers, what kind of evidence needs to be presented at the border, and who is responsible for making judgments regarding legality all must be addressed. Import control systems for a wide range of goods and commodities, including conflict minerals, food safety, illegal wildlife, and certain species of seafood, have already addressed these questions in various ways. As background for its discussions, the Panel considered examples drawn from these systems, all of which apply to goods and commodities that arrive in large quantities from multiple sources globally.

In its review of existing systems, the Panel identified a set of building blocks that should be considered as options for designing a risk-based, tiered, and targeted import control system for fully traceable and legal fish products. These building blocks provide multiple approaches to defining elements of an import control system.

One set of building blocks addresses the level of specificity with which risk tiers can be assigned. Some systems assign risk on a shipment-by-shipment basis. Others assign risk by country of origin, or by the identity of the producing or exporting enterprise or sets of enterprises. For example, as part of the US Dodd Frank Wall Street Reform and Consumer Protection Act (2010), the US Securities and Exchange Commission (SEC) requires that companies disclose the use of “conflict minerals.” Conflict minerals are defined as four minerals coming from ten countries (the Democratic Republic of the Congo and its bordering countries) that have a high potential for conflict.*

* Note that these conflict mineral provisions are not “border controls” but rather are SEC reporting requirements.

Another set of building blocks addresses the nature of the evidence to be required or accepted to demonstrate compliance with import requirements. These building blocks differ with respect to how compliance is established at the border and with respect to who is responsible for establishing and verifying compliance. The various approaches include:

- **Direct evidence:** Direct evidence approaches require that primary documentation proving compliance with border requirements be presented at the border. In the case of IUU fish, this could involve proof that the seafood was landed in compliance with the laws and regulations of the source country (e.g., a LAC presented in conjunction with vessel licensing and registry information). Ideally, direct evidence would be provided electronically; however, paper documentation is also an option. Electronic data is much more difficult to falsify and allows for analytics of large volumes of seafood designed to find irregularities and discrepancies that can be helpful in identifying IUU seafood. Examples:
 - Since 2007, the United States has required that all imports of toothfish must be accompanied by electronic catch documents (US Department of Commerce, 2007).

- Human travelers are required to carry passports in order to gain entry into foreign countries.
- **Self-declaration:** Individual exporters or importers declare compliance with the border requirements and are subject to liability for false statements. In the case of seafood, importers could be required to declare the legal origin of their products, be subject to inspections and possible audits, and be held liable or risk product forfeiture if legal origin is not properly established. Alternatively, fees could be assessed if the auditor is unable to trace the product back to legal, reported, and regulated sources. Example:
 - The US Lacey Act prohibits commerce in the United States in illegally-sourced wildlife, fish, plants, and plant products (including timber). Wildlife, fish, plants, and plant products are illegally-sourced if they are taken in violation of any law, treaty, or regulation of the United States, any Indian tribal law, any state law or regulation, or any foreign law. The underlying law, regulation or treaty must regulate the taking, possession, importation, exportation, transportation, or sale of fish or wildlife or plants. The Lacey Act requires importers to provide a declaration attached to every shipment of plants or plant products (US Department of Agriculture, 2015).
- **Foreign government declarations:** Foreign governments of producing or exporting states could certify that the requirements to demonstrate legal origin have been met. In the case of seafood, this could involve the exporting country declaring that each shipment was caught in compliance with all applicable laws. Example:
 - In accordance with the EU IUU Regulation, marine fisheries products entering the EU must now be validated as legal by the competent flag state or the exporting state, via a catch certificate, before being imported to the EU (European Commission Council Regulation, 2008).
- **Importing government pre-clearance:** Importing governments can use a variety of techniques that effectively “pre-clear” imports on the basis of their presumed compliance with border measures. Pre-clearance can be done on a shipment-by-shipment basis, a facility or enterprise basis, or even on a country-level basis.

Pre-clearance systems might include mutual recognition agreements, under which the standards and enforcement procedures of foreign authorities are taken as equivalent to those of the importer government. Alternatively, pre-clearance can be based on inspections or other enforcement carried out by agents of the importing government in the territory of the exporter or producer. Shipments or exporters that are pre-cleared (or identified as low-risk) may thus be subject to fewer burdens at the border through a formal process controlled by the importing government. In the case of seafood, this could involve relaxing some of the immediate evidentiary requirements for pre-cleared shipments or sources. Such systems do not, however, preclude inspections on the part of importing government agencies. Examples:

- The US HACCP scheme has a mechanism that allows importers to demonstrate compliance with the regulation by importing seafood products from a country that has an active memorandum of understanding (MOU) with the US. In this scheme, the FDA evaluates the equivalency of the HACCP programs in exporter countries before establishing an MOU (FDA, 1999).
- Shrimp imports to the United States must be caught using vessels that employ turtle excluder devices (TEDs). Countries are not allowed to export shrimp to the United States unless they have received a passing inspection score and a certificate from the US government. Inspections are conducted regularly, and well-performing countries are rewarded with less-frequent inspection visits. Individual shipments can be imported from countries that have not been approved, if they are accompanied by documentation (National Oceanic and Atmospheric Administration, 2014).
- The FSMA requires that the FDA establish a voluntary program for importers that provides for expedited review and entry of foods from participating importers (FDA, 2014 B).
- **Third-party verification or certification:** Third-party verification or certification is a means of establishing a presumption of compliance with standards, and could be used alone or in combination with other building blocks (including “pre-clearance” as a basis for “low-risk” treatment under anti-IUU border measures). Certification turns on the reliability and dependability of certifying systems. The certification (or verification) could be directly aimed at establishing compliance with border measures (as is the case with US import controls on children’s toys, for example), or could establish conformance to standards that are considered equivalent to the border requirements (as might be the case, for example, for a reputable environmental certification and labeling regime). In the case of seafood, this could involve an ecolabel (e.g., MSC) or other accredited system (e.g., Global Trust or an industry initiative such as the ISSF) reviewing the source fishery and confirming the absence of IUU. In all cases, third-party certification or verification systems would themselves have to be subject to testing and regular review for compliance with standards to be included in border measure regulations. Examples:
 - The FSMA establishes a program through which qualified third parties can certify that foreign food facilities comply with US food safety standards. This certification may be used to facilitate the entry of imports (FDA, 2014 B).
 - Importers of children’s products must provide a Children’s Product Certificate (CPC) to distributors and retailers and, upon request, the US government. The CPC certifies that the accompanying children’s product complies with all applicable children’s product safety rules. Certification must be based upon the results of third-party testing (Consumer Product Safety Commission, 2015).

Mechanisms may place the costs and burden of proof on the importing government, the exporting government, or industry. Some operate at broad scales, while others operate on the basis of specific enterprises or specific shipments. These approaches also vary in terms of complexity, infrastructure requirements, and likelihood of catching the target contraband.

As noted in **Recommendation 8**, another approach to making border controls efficient and cost-effective is to **target** verification and enforcement resources at certain shipments or sets of shipments identified as suspicious by specific information. For anti-IUU border controls, this points to the general questions of how suspicions of IUU activity are raised, and how mechanisms for identifying those suspicions could be built into the system.

Among some possible indicators of the presence of possible IUU behavior are the following:

- **Suspicious trade data** — such as when officially recorded exports of a given product from a producer or exporter country do not match the officially recorded imports of the same product into the market state.
- **Official enforcement data** — such as arrest or conviction records, license or registration revocations, and IUU vessel black lists.
- **Shared government intelligence** — such as tips or monitoring information made available from one government to another on the basis of police, military, or other intelligence (either on a bilateral basis or through intergovernmental mechanisms such as Interpol or RFMOs).
- **Non-governmental intelligence** — such as when groups like Environmental Justice Foundation or industry actors collect direct evidence of IUU activities and turn that evidence over to authorities.

Structures for the international transmission of actionable information about IUU behavior and IUU trade flows are still relatively weak (in comparison, for example, with structures for sharing anti-terrorism information), but are beginning to grow through bilateral and regional cooperation agreements, RFMO activities, and even the recent establishment of an anti-IUU project within Interpol.

Bibliography

- (Agnew et al., 2009) Agnew, David J., John Pearce, Ganapathiraju Pramod, Tom Peatman, Reg Watson, John R. Beddington, and Tony J. Pitcher. "Estimating the Worldwide Extent of Illegal Fishing." *PLoS one* 4, No. 2 (2009): e4570. doi:10.1371/journal.pone.0004570.
- (Allied Market Research, 2014) Allied Market Research. "Food Traceability Market (Tracking Technologies) Global Industry Analysis, Size, Share, Trends, Opportunities and Forecast, 2012–2020." January 2014.
- (CCAMLR, 2013) The Convention on the Conservation of Antarctic Marine Living Resources. "Conservation Measure 10-02 (2013) Licensing and inspection obligations of Contracting Parties with regard to their flag vessels operating in the Convention Area." Available at <https://www.ccamlr.org/en/measure-10-02-2013>.
- (Canadian Food Inspection Agency, 2012) Canadian Food Inspection Agency. "Safe Food for Canadians Act." Last modified November 27, 2012. <http://www.inspection.gc.ca/about-the-cfia/acts-and-regulations/regulatory-initiatives/sfca/eng/1338796071420/1338796152395>.
- (Charlebois et al., 2014) Charlebois, Sylvain, Brian Sterling, Sanaz Haratifar, and Sandi Kyaw Naing. "Comparison of Global Food Traceability Regulations and Requirements." *Comprehensive Reviews in Food Science and Food Safety* 13, no. 5 (2014): 1104-1123.
- (Consumer Product Safety Commission, 2015) Consumer Product Safety Commission. "Children's Product Certificate." Accessed February 18, 2015. <http://www.cpsc.gov/Business--Manufacturing/Testing-Certification/Childrens-Product-Certificate/>.
- (Delhaize Group, 2012) Delhaize Group. "Two Sound Approaches to Sustainable Seafood." Accessed February 13, 2015. <http://www.delhaizegroup.com/SustainabilityReport/2012/Case-studies/SPB/sustainable-seafood.html>.
- (European Commission Council Regulation, 2008) Council Regulation (EC) No. 1005/2008. September 29, 2008. Commission Regulation (EC) No. 1010/2009 October 22, 2009. http://ec.europa.eu/fisheries/cfp/illegal_fishing/index_en.htm.
- (European Commission Council Regulation, 2009) Council Regulation (EC) No. 1224/2009. November 20, 2009. http://ec.europa.eu/fisheries/cfp/control/index_en.htm.
- (FAO, 2014) Food and Agriculture Organization of the United Nations. "The State of World Fisheries and Aquaculture." 2014.
- (FDA, 1999) US Food and Drug Administration. "Guidance for Industry: HACCP Regulation for Fish and Fishery Products; Questions and Answers for Guidance to Facilitate the Implementation of a HACCP System in Seafood Processing." January 1999. <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm176892.htm#x-c>.
- (FDA, 2014 A) US Food and Drug Administration. "The Food Safety Law and Rulemaking Process: Putting FSMA to Work." Last modified August 5, 2014. <http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm277706.htm#primer>.
- (FDA, 2014 B) US Food and Drug Administration. "Background on the FDA Food Safety Modernization Act." Last modified August 5, 2014. <http://www.fda.gov/Food/GuidanceRegulation/FSMA/ucm239907.htm>.
- (Federal Business Opportunities, 2014) US Agency for International Development. "The Ocean and Fisheries Partnership." Posted December 1, 2014. https://www.fbo.gov/index?s=opportunity&mode=form&id=813773082c30c5a6e6e9121e93c641&tab=core&_cview=1.
- (Food Standards Australia New Zealand, 2013) Food Standards Australia New Zealand. "Food Standards Code." Accessed February 17, 2015. <http://www.foodstandards.gov.au/code/Pages/default.aspx>.
- (Future of Fish, 2014) Future of Fish. "Getting There from Here: A Guide for Seafood Traceability." August 2014.
- (Gulf Wild, 2015) Gulf Wild. "TransparenSea." Accessed February 17, 2015. <http://www.gulfwild.com/transparensea.php>.
- (IATTC, 2014) Inter-American Tropical Tuna Commission. "Resolution (Amended) on a Regional Vessel Register." July, 2014. Available at <https://www.iattc.org/PDFFiles2/Resolutions/C-14-01-Regional-Vessel-Register.pdf>.
- (ICCAT, 2013) International Commission for the Conservation of Atlantic Tunas. "Recommendations by ICCAT Concerning the Establishment of an ICCAT Record of Vessels 20 Meters in Length Overall or Greater Authorized to Operate in the Convention Area." Posted at <http://www.iccat.int/Documents/Recs/compendiopdf-e/2013-13-e.pdf>.
- (IFT, 2012) Institute of Food Technologists. "Pilot Projects for Improving Product Tracing along the Food Supply System—Final Report." August 2012.
- (IOTC, 2014) Indian Ocean Tuna Commission. "Resolution 14/04 Concerning the IOTC Record of Vessels Authorised to Operate in the IOTC Area of Competence." Posted at <http://www.iotc.org/cmm/resolution-1404-concerning-iotc-record-vessels-authorised-operate-iotc-area-competence>.
- (ISSF, 2014) Miguel Jorge. "ISSF: A Holistic Approach to Ending IUU." Posted July 2, 2014. <http://issf-foundation.org/2014/07/03/issf-a-holistic-approach-to-ending-iuu/>.
- (Magera and Beaton, 2009) Magera, Anna, and Sadie Beaton. "Seafood traceability in Canada: traceability systems, certification, eco-labeling and standards for achieving sustainable seafood." *Ecology Action Centre* (2009): 1-47.
- (NAFO, 2014) Northwest Atlantic Fisheries Organization. "Proposal to require the use of the IMO numbering scheme for NAFO vessels." September 2014. Available at <http://archive.nafo.int/open/fc/2014/fcdoc14-09.pdf>.

(National Fisheries Institute, 2011) National Fisheries Institute and GS1. "Traceability for Seafood U.S. Implementation Guide." March 2011.

(National Oceanic and Atmospheric Administration, 2014) US National Oceanic and Atmospheric Administration. "Shrimp Import Legislation for Sea Turtle Conservation." Last updated August 18, 2014. <http://www.nmfs.noaa.gov/pr/species/turtles/shrimp.htm>.

(PTI, 2010) Produce Traceability Initiative. "Produce Traceability Initiative Action Plan." Updated June 18, 2010. <http://www.producetraceability.org/documents/PTI%20Action%20Plan%20final%2061810.pdf>.

(PTI, 2015) Produce Traceability Initiative. "Self-Reported Scorecard—Grower/Packer/Shipper." Accessed February 17, 2015. http://www.producetraceability.org/documents/G_P_S_Scorecard_REV_102413.pdf.

(Presidential Memorandum, 2014) US White House. "Presidential Memorandum—Comprehensive Framework to Combat Illegal, Unreported, and Unregulated Fishing and Seafood Fraud." July 17, 2014. <http://www.whitehouse.gov/the-press-office/2014/06/17/presidential-memorandum-comprehensive-framework-combat-illegal-unreported>.

(Recommendations of the Presidential Task Force, 2014) "Recommendations of the Presidential Task Force on Combating Illegal, Unreported and Unregulated Fishing and Seafood Fraud." 79 Fed. Reg. 243, 75536-41 (December 18, 2014). Available at <https://www.federalregister.gov/articles/2014/12/18/2014-29628/recommendations-of-the-presidential-task-force-on-combating-illegal-unreported-and-unregulated>).

(SPRFMO, 2014) South Pacific Regional Fisheries Management Organization. "Conservation and Management Measure for the establishment of the Commission Record Vessels authorized to fish in the Convention Area." January 2014. Available at <https://www.sprfmo.int/assets/Meetings/Meetings-2013-plus/Commission-Meetings/2nd-Commission-Meeting-2014-Manta-Ecuador/SPRFMO-Commission-REPORT-31Jan2014-20.03pm.pdf>.

(ThisFish, 2014 A). ThisFish. "Traceability to help Newfoundland tell its unique story to the world." Posted April 24, 2014. <http://thisfish.info/generic/article/newfoundland-traceable-seafood/>.

(ThisFish, 2014 B) ThisFish. "Savour our wildly delicious and traceable canned sockeye salmon." Posted September 5, 2014. <http://thisfish.info/generic/article/canned-sockeye/>.

(US Department of Agriculture, 2015) US Department of Agriculture. "Lacey Act." Last modified February 12, 2015. http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/planthealth?1dmy&urile=wcm%3apath%3a%2Faphis_content_library%2Fsa_our_focus%2Fsa_plant_health%2Fsa_import%2Fsa_lacey_act%2Fct_lacey_act.

(US Department of Commerce, 2007) "Implementation of Measures Adopted by the Commission for Conservation of Antarctic Marine Living Resources (CCAMLR) to Facilitate Conservation and Management of Antarctic Marine Living Resource (AMLR); Final Rule." 72 Fed. Reg. 163 (August 23, 2007). Available at http://www.nmfs.noaa.gov/sfa/domes_fish/FRNotices/CCAMLR_FR_8-23-07.pdf.

(Zhang and Bhatt, 2014) Jianrong Zhang and Tejas Bhatt. "A Guidance Document on the Best Practices in Food Traceability." *Comprehensive Reviews in Food Science and Food Safety* 13, No. 5 (2014): 1074-1103.

Photos Courtesy of

cover: © Meridith Kohut/WWF
p.ii: © Sylyvann Borei/WorldFish/Flickr
p.9: © Josh Thomas/WWF
p.10: © Khánh Hmoong/Flickr
p.11: © Richard Fangrad/Flickr
p.15: © Tanya Petersen/WWF
p.17: © Francisco Blaha
p.18: © U.S. Department of Agriculture/Flickr
p.19: © Francisco Blaha
p.21: © Francisco Blaha
p.22: © Meridith Kohut/WWF
p.25: © Meridith Kohut/WWF
p.34: © Janine Cheung/Flickr
p.37: © Ingrid Taylar/Flickr
p.39: © Hellebardius/Flickr
p.41: © Coast Guard News/Flickr
p.42: © Province of British Columbia/Flickr
p.46: © Evgeni Zotov/Flickr
p.49: © Aulia Erlangga/Center for International Forestry Research (CIFOR)

We seek a world in which all fishers, processors, traders, retailers, and consumers of wild-caught fish can be reliably assured that all fish products are legal and fully traceable. We envision a global framework—based on an appropriate combination of private-sector and governmental mechanisms—that ensures the legal provenance and “boat-to-plate” traceability of fish products, thereby reducing incentives for illegal fishing while promoting socially, economically, and environmentally sustainable fisheries.

Website: solutions-network.org/site-legaltraceablefish/



METRO GROUP

