Guidance and Tools for Traceability in Fishery Improvement Projects

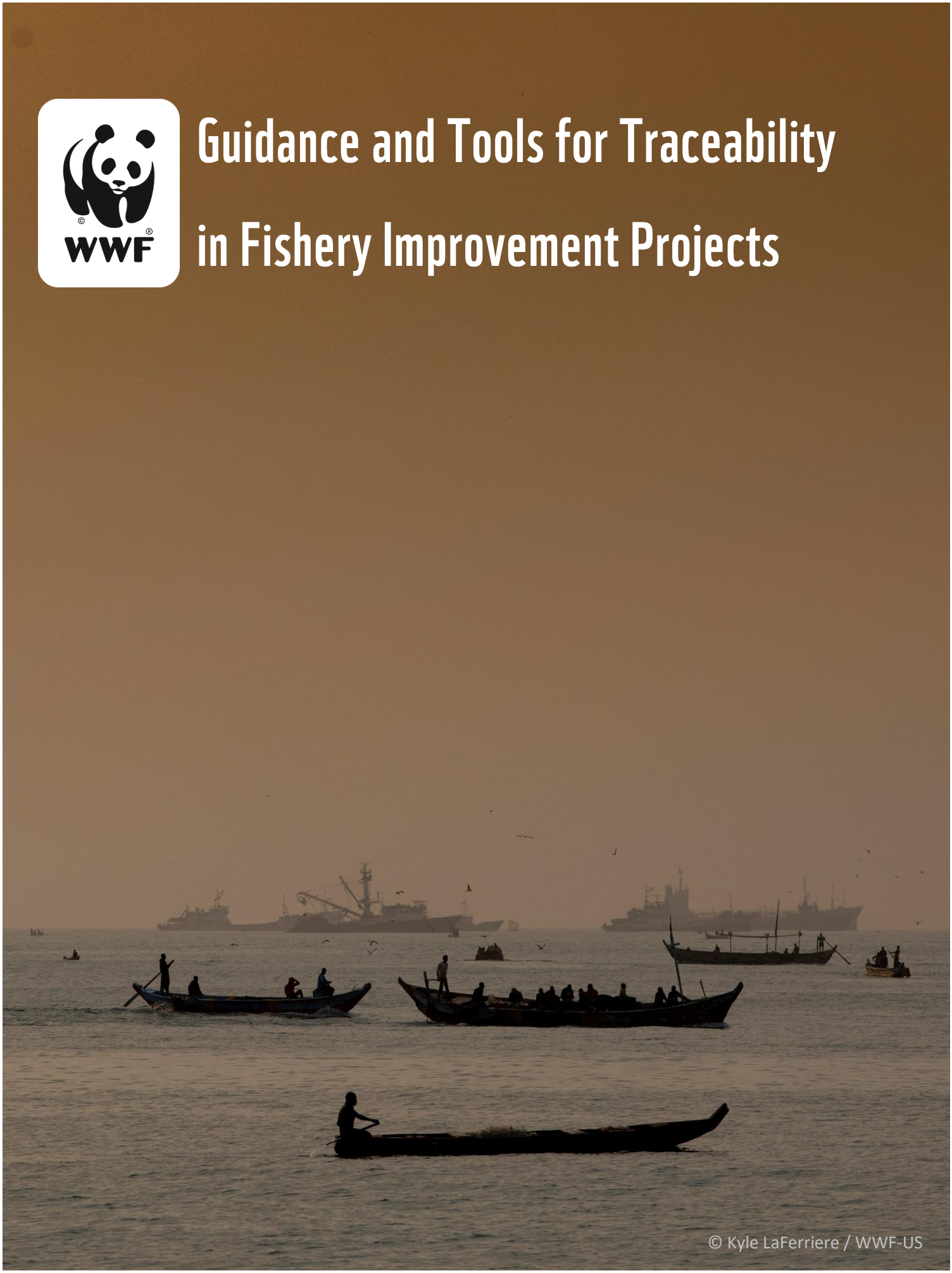

Table of Contents

Purpose and Structure

The purpose of this Guidance is to help Fishery Improvement Project (FIP) practitioners and stakeholders work successfully with the issue of seafood traceability to achieve improved FIP outcomes and to encourage transparent and responsible practices across the fishing industry. This Guidance responds to strong demand expressed by FIP practitioners for education and capacity-building on traceability. Accordingly, this Guidance is divided into two parts to provide both a theoretical introduction to traceability in the context of FIPs and a set of practical tools to help FIP managers and stakeholders integrate traceability into FIP practices:

Part A of this Guidance describes the growing importance of traceability within modern seafood supply chains, with a particular focus on traceability within the first stages of seafood production, from catch to initial processing. Part A also introduces the new industry-wide traceability standards developed by the Global Dialogue on Seafood Traceability (GDST) and discusses the benefits of incorporating GDST implementation into FIP traceability systems.

Part B provides a FIP Traceability Toolkit that includes tools and concrete guidance for integrating traceability into FIP Action Plans. The Toolkit outlines a step-by-step process for assessing the traceability aspects of a FIP, identifying weaknesses in (or lack of) an existing traceability system, and guiding a FIP toward implementing a traceability system that is both appropriate to the fishery and able to work interoperably with other systems. Two of the specific tools included in the Toolkit are (i) a template for conducting a Traceability Gap Analysis to establish a FIP's initial traceability baseline and (ii) a workplan template to help FIP managers set appropriate traceability priorities and integrate them into their FIP Action Plans.

Abbreviations and Acronyms

CCS	Catch Certificate Scheme
COE	Chain of Events
CSR	Corporate Social Responsibility
CTE	Critical Tracking Event
FIP	Fishery Improvement Project
FMP	Fishery Management Plan
GDST	Global Dialogue on Seafood Traceability
ISO	International Organization for Standardization
IUU	Illegal, Unreported, and Unregulated
KDE	Key Data Element
MCS	Monitoring, Control, and Surveillance
MPA	Marine Protected Area
MSC	Marine Stewardship Council
SIMP	Seafood Import Monitoring Program
TGA	Traceability Gap Analysis

Glossary of Key Terms

Critical Tracking Events (CTEs)	Events recorded throughout the supply chain that are essential for achieving food traceability and supply chain visibility. CTEs are dependent on industry standards specific to product categories and growing and processing procedures.
Digitization	The process of converting information from an analog (e.g., paper) format into a digital (i.e., computer-readable) format. For example, entry of logbook data into a database, or scanning of paper records.
Interoperability	The ability to exchange and use data between various systems (e.g., sharing data within different parts of the seafood supply chain); usually requiring some degree of harmonizing of data formats and structures.
First mile	The first mile of a seafood supply chain is generally regarded as the span between when a fish is caught and its first point of sale, including the integration of at-sea or dockside systems with systems used by first buyers/processors.
Key Data Elements (KDEs)	Elements with material impact on an organization's business operations, decisions, and other data demands (e.g., regulatory, compliance, and market demands).
Traceability GAP Analysis (TGA)	A gap analysis is a means of comparing a system's current state to its desired state, showing the gaps in the former compared to the latter; in this case with regard to a FIP's ability to trace fish during the first mile. Filling the gaps identified should result in the system reaching the desired state.

PART A: Seafood Traceability, First Mile, and GDST

1 Introduction

Seafood traceability is increasingly becoming mandatory for seafood products to secure market access or competitive advantage. This growing demand for traceability comes from multiple sources, including the private sector, governments, and civil society. Almost all FIP practitioners are aware of the chain of custody (CoC) requirements established by eco-labeling schemes such as that of the Marine Stewardship Council (MSC). Beyond these, the past decade has seen the emergence of many governmental requirements, including the catch certificate requirements associated with the EU's IUU Regulation, and the United States' Seafood Import Monitoring Program (SIMP). The Japanese government is currently formulating an anti-IUU policy based on robust traceability of imported seafood. Consumers have also demonstrated they want to know more about the seafood they buy, showing a preference for retailers and restaurants that can demonstrate environmental sustainability, social responsibility, and seafood provenance. This in turn has driven many leading seafood brand owners and retailers to increase pressures on their suppliers for improved traceability, a fact that helps explain the increasing attention to traceability among FIPs listed on fisheryprogress.org.

This increasing market and regulatory demand for traceability presents FIP practitioners with both challenges and opportunities. On one hand, meeting demands for traceability can add to the list of FIP goals that require time and resources to accomplish. On the other hand, as discussed in Section 1.2, meeting those demands—and in some cases even working to promote them—can provide important levers for achieving core FIP objectives.

As the demand for seafood traceability has increased, so has the need for a coherent approach to meeting that demand. While it is already well developed in select fisheries (particularly higher-value and local "boutique" fisheries), establishing traceability across the thousands of fishing and fish processing businesses around the world requires broad agreement on what information needs to be gathered and how that information can be transmitted securely and effectively through complex supply chains. The Global Dialogue on Seafood Traceability (GDST) standards, discussed in detail below, provides the norms and guidance needed to make seafood traceability work at a global scale.[1] As will be seen, it also provides tools that FIP practitioners can use to help solve practical challenges at a local level.

[1] Please email info@traceability-dialogue.org for inquiries regarding solutions to address traceability needs.

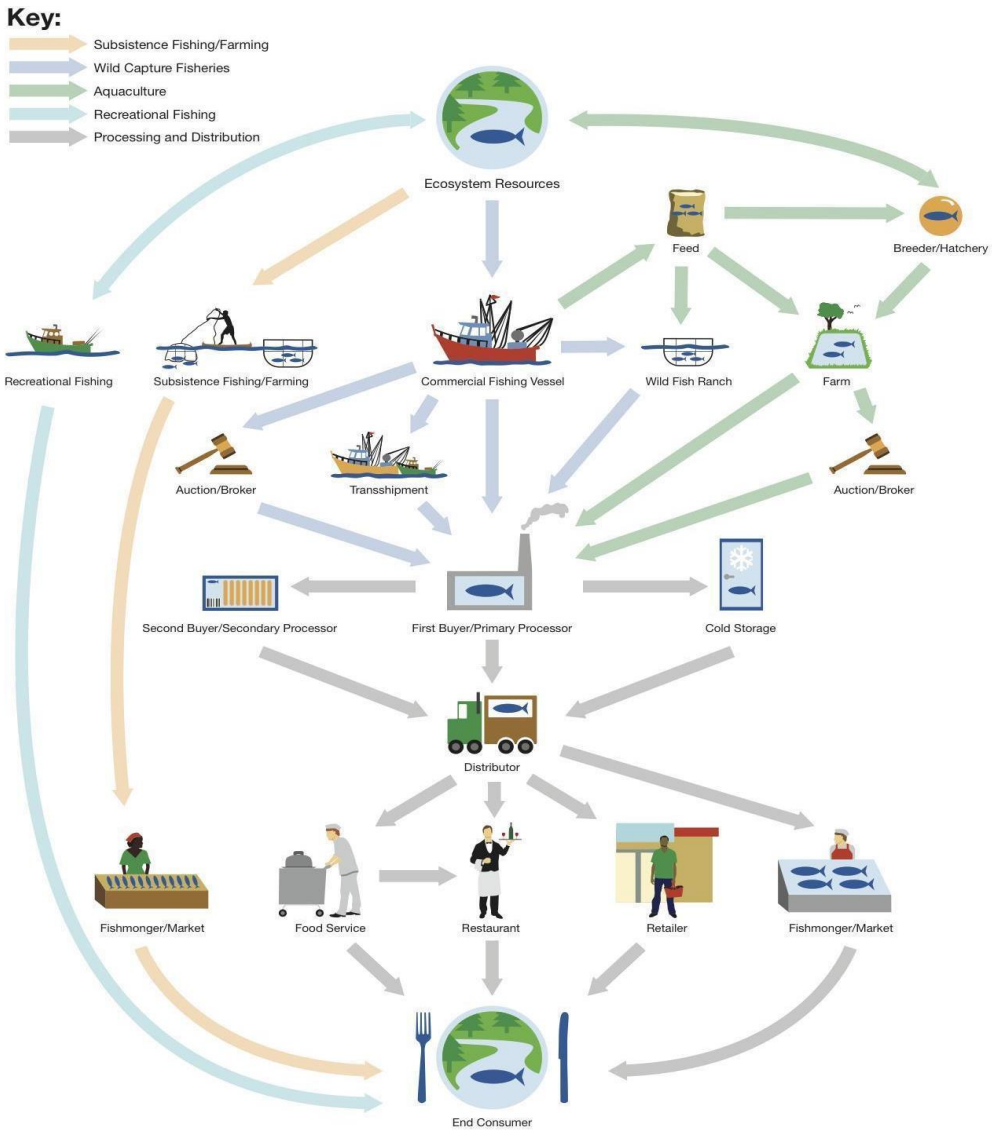

Figure 1.
Schematic of seafood supply chains. This Guidance focuses on traceability within wild capture fisheries indicated by the blue arrows. [Source: FishWise]

In 2020, around the same time GDST released the [GDST 1.0 standards](), WWF carried out an extensive survey across its network and with external FIP practitioners to better understand immediate FIP needs, challenges, and opportunities. The survey results showed FIP practitioners had significant interest in traceability, giving it a high level of priority, especially regarding what needs to happen to secure reliable data and traceability during fishing, landing, and first sale. In turn, WWF decided it would be useful to develop and distribute this guide that will introduce FIP practitioners to seafood traceability and highlight how GDST can assist in their efforts to reinforce existing traceability systems and/or introduce traceability components to their FIP workplans.

To best assist FIP practitioners, this Guidance focuses on traceability requirements within the **first mile** (see box), and has three main objectives:

1. To help FIP managers and stakeholders understand why traceability is important for their specific fishery

2. To assist FIP managers who would like to initiate, or may already be running or helping construct, a traceability system, by indicating what information should be collected, why it should be collected, when it should be collected, and how it should be recorded[2]

3. To explain how the tools developed by the GDST, which resulted from extensive global consultations with the seafood industry, governments, and NGOs, can assist in integrating traceability systems within global seafood supply chains

This Guidance also draws on case studies and pilot projects to illustrate how traceability systems have been implemented across a range of fisheries. These examples explore the experiences of small- and large-scale fisheries in both artisanal and commercial settings, and with exposure to developed and developing markets. They highlight challenges and ongoing efforts in identifying and implementing traceability systems that are most appropriate for varying business and fishery conditions.

Finally, while this Guidance was developed for FIP practitioners, the hope is that it will also be used as a tool for building the competence of other stakeholders associated with these fisheries, including fishery managers, NGOs, development agencies, and certifiers.

The "first mile"

The beginning of a supply chain is often referred to as the "first mile," with the end correspondingly being the "last mile." In a wild-capture seafood supply chain, the first mile is the fishery itself and includes all steps from catch to the first sale, whether that be at transshipment and/or at landing. From a traceability perspective, the participants in a fishery need to think about how to capture data about their catches and operations to transfer downstream to the first buyer. For the purposes of this guide, we focus within the first mile on the four Critical Tracking Events (CTEs) that emerged from the GDST's global consultations:

catch;
on-vessel processing (if any);
transshipment (if any); and
landing.

[2] An up-to-date list of traceability solution providers who have committed to develop traceability solutions that adhere to the GDST 1.0 standards can be found here.

1.1 What is traceability?

While there is no universal definition of "traceability," it is often defined as "the ability to trace the history, application, or location of an item by means of recorded identification" (ISO standard 12875:2011). Thus, traceability in its most basic sense is a means of showing the source of a product and how the product has moved through the supply chain. An essential component of this basic notion of traceability is the ability to identify products in specific batches or lots, and to track how those lots are handled as they move through processing, shipment, distribution, and sale (including how they may be subdivided or aggregated with other batches/lots). For FIP practitioners, this early identification of batches/lots as products enter first sale is often an important challenge.

But for FIP practitioners and all other stakeholders interested in promoting sustainable seafood and responsible fisheries, traceability means more than simply tracking the movement of products—it means providing access to basic information about the conditions under which seafood is produced. GDST, for example, was created to promulgate traceability standards that enable access to the minimum information needed to establish the legal (non-IUU) origin of seafood products. GDST key data elements (KDEs) are also drafted to "contribute to securing the long-term social and environmental sustainability of the sector," but do not seek to define the minimum information needed to prove sustainability.) This focus on the collection and transmission of KDEs is one place where the goals of traceability and fundamental FIP goals of sustainability and social responsibility intersect and reinforce each other.

In short, for the purposes of this Guidance, traceability systems are the means by which critical information is created, securely associated with products, and made available to stakeholders across the supply chain, including to regulators, major buyers (e.g., brand owners), and/or consumers. With regard to FIPs and the first mile covered in this Guidance, this means ensuring that at the moment of first sale, information has been collected and associated with lots or batches of products sufficient to demonstrate the provenance of the products and their basic conditions of production. In general terms, this information includes where the fish were caught, how and by which vessel, and what has happened to them between the point of capture and the point of first sale on land. GDST breaks down this first mile using four Critical Tracking Events (CTEs): (1) catch, (2) on-vessel processing, (3) transshipment, and (4) landing.

1.2 Why is traceability important?

Traceability of seafood is critical for verifying and ensuring the safety, legality, quality, and general provenance of fish and fishery products. Prior to its more recent application in combating IUU fishing and promoting sustainable sourcing, as in other food produce supply chains, traceability was already an important tool in enabling product recalls for food safety purposes. Priorities for traceability therefore differ among stakeholders:

Fishers and their communities can use traceability to capture important information about their catches that they want to pass up the supply chain. For example, fishers may want to show buyers and/or consumers that their fish was caught sustainably and/or locally using a particular fishing method, and that it is fresh. If a fishery is certified as sustainable, all actors in the supply chain will want to be able to verify that the products they are purchasing actually came from that source, so that they, in turn, can sell those products to customers with the same assurance. This engenders trust in both the products that are traceable and the producers associated with them. At the same time, creating and running the traceability systems that engender this trust also helps and requires fishers to be organized and represented effectively and durably. The organization, visibility, and legitimacy that come with a traceability system can also provide a platform for fishers to engage more effectively with government to improve fisheries documentation and support stronger governance structures generally.

FIP managers need traceability to demonstrate who is participating in their FIP and what fish have come from their FIP, and to ensure that fish from outside the FIP do not—inadvertently or otherwise—enter into the same supply line to be sold as if they did. This ensures the integrity of the FIP and that participants in the FIP are the ones to benefit from market access linked to their continued improvement efforts. A fundamental part of this is to show that no IUU catches are entering into supply chains originating from the FIP. The data collected can also be used to establish catch information for the FIP, communicate progress to FIP stakeholders including donors, and drive fisheries governance improvements that will support the FIP (e.g., through preferentially issuing licenses to FIP participants). FIP managers can also discover that creating and running traceability systems is a powerful way to engage key stakeholders, including fishers and the local buyers/processors who are so important to the economic functioning of the FIP.

Government officials and fishery managers can use traceability tools as part of their work to improve the regulatory management of their fisheries. For example, traceability information can complement data used to set up Fishery Management Plans (FMPs) and Marine Protected Areas (MPAs) and in general to establish effective fisheries policies and regulations, which are often required in FIP Action Plans, and can benefit developing countries with data-poor fisheries. Traceability data are also used to combat IUU fishing and to assist with meeting local and export market requirements (legality, food safety, duties, etc.).

NGOs can use traceability and the data collected via the traceability system to demonstrate progress to constituents and donors, thus improving the chances there will be continued support for the FIP. Some NGOs, through their Major Buyer Initiatives (MBIs), can also better advise partners regarding where to source seafood and why, highlighting the assurance the fish originates from sustainable sources and the reduced risk for product substitutions and/or IUU fishing.

Seafood buyers are already likely to be using internal traceability systems for their own business purposes. They are also increasingly sharing traceability data with governments, NGOs, and consumers in order to demonstrate the provenance of their products to gain beneficial market access for seafood coming from certified fisheries and fisheries in FIPs.

Consumers are requesting traceability for a variety of reasons. In essence they are seeking assurances that the seafood they are eating is safe, legal, ethical, and sustainable. Consumers in some markets also appear to enjoy knowing the story behind the seafood they eat, particularly when it is local. They want to know the name of the fisher, the location and date of the catch, the name of the species, and its sustainability status. All these questions can be answered if the proper traceability system is set up within the FIP Action Plan, increasing the chances of the fish from the FIP reaching consumers who will choose that product due to the improvements being made.

Corruption

Corruption is a major challenge to the sustainable management of fisheries, and can affect the supply chain at any point, from access to fishing grounds and registration of vessels to allocation quotas, transportation, processing, and export of products. Bribery, for example, may be used to falsify documentation to change the volumes or origin of products, or it could be used to encourage customs officials to look the other way when reviewing information. Traceability systems can help to combat corruption by facilitating the development of monitoring systems, allowing access to data, and enabling greater scrutiny from stakeholders including civil society, law enforcement, and consumers. However, traceability systems themselves can also be vulnerable to corruption and facilitate the laundering of products, especially if authorities do not conduct necessary audits and investigations to act upon the information provided in the systems. The more transparency that can be brought to traceability systems, the more effective they will be at rooting out corruption. The more review there is of what permits have been authorized, for which fisheries, and how much catch and harvest are taking place, the more difficult it is for fraud and corruption to contaminate the supply chain. It is important for governments to establish an independent auditing process, with the funding, expertise, and authority needed to conduct effective oversight of the fishing activities and operations in the supply chain to help combat corruption and strengthen the reliability of traceability systems for ensuring legal product. (For more information, please see Traceability systems: Potential tools to deter illegality and corruption in the timber and fish sectors?.)

1.3 Traceability in the seafood supply chain

Supply chain actors face different challenges in implementing traceability systems depending on their size, location, product types, and position within supply chains. Companies at the end of the supply chain selling seafood to retailers or consumers have different data needs and challenges than those working in the first mile (e.g., a fishing or transshipment vessel). The physical environment can challenge the way data are collected and managed. For instance, harvesters, while at sea in remote areas and rough conditions, may struggle with collecting and storing reliable data about their catch. Fishers may resist collecting and/or divulging data, including catch areas, that they consider competitive information. Small-scale and artisanal fishers may feel unaccustomed to entering data as they fish or upon landing, either on cell phones or on paper forms. Much of the difficulty in data collection and capture comes from the first mile event, where incentives or regulatory requirements may be needed.

Traceability in the seafood supply chain should be able to link the seafood products from the end user (consumer, retailer, restaurant, etc.) back to their origin (e.g., vessel or farm). To be able to do this, all actors in the supply chain need to implement and participate in a coordinated traceability system, which includes data collection techniques, data formats, and data management protocols. In the globalized and complex seafood sector, with thousands of diverse actors around the world, accomplishing effective and affordable traceability also depends heavily on achieving **interoperability** among traceability systems. Interoperability simply means the ability of different traceability systems to share information easily or even automatically. It requires having common definitions of what data is to be shared, and of the data formats and communications protocols to be used when transferring the data from machine to machine. This kind of sector-wide interoperability is what makes it possible for cell phones to be used in different countries, or for ATM cards to be accepted at thousands of different banks around the world.

Recognizing that no standards to achieve interoperability previously existed for traceability in the seafood sector, WWF and the Institute of Food Technologists' Global Food Traceability Center took the lead in organizing the GDST. The GDST process quickly emerged as a major set of stakeholder consultations, with more than 60 companies participating from around the world, across the seafood supply chain, and across a range of enterprise sizes from the very largest multinationals to the associations of the smallest operators. These consultations led to the development of interoperable industry standards to improve the reliability of seafood information, reduce the cost of seafood traceability, contribute to supply chain risk reduction, and help secure the long-term social and environmental sustainability of the sector. Specifically, GDST focused on four core areas: (i) defining which Key Data Elements (KDEs) should be collected and when, (ii) aligning industry expectations around criteria for reliable data verification, (iii) fostering data sharing and interoperability by defining technology standards and data access protocols that allow proprietary traceability systems to communicate with one another, and (iv) aligning seafood traceability systems with modernizing regulatory standards. In this Guidance, we will draw from the first core area, "defining which KDEs should be collected and when," as it

is most relevant to establishing and/or implementing traceability systems in FIPs. Additional information on GDST key traceability concepts is provided in Part B, the Traceability Toolkit.

It is important to keep in mind that the first mile events are critical because they collect the source data that serves as the baseline for downstream product transformation events, such as mass balancing checks. In addition, the first mile events carry the greatest risks, including IUU fishing, human rights abuses, and unsustainable harvest methods, alongside fraud and mislabeling that can happen at any point in the supply chain. Noting the critical role of the first mile, GDST has outlined which KDEs should be considered during each of the four CTEs (see Table 1).

Table 1

GDST Standard v1.0 Key Data Elements Within Critical Tracking Events (CTEs) of the First Mile.[3]

Basic Universal List of Key Data Elements (Wild-Capture Products)	CTEs						
	Catch	On-Vessel Processing	Transshipment	Landing	Aggregation/ Disaggregation	Ship/Receive	Processing
VESSEL DATA (master level)							
Vessel Name	X	X					
Vessel Registration	X	X					
Unique Vessel Identification	X	X					
Public Vessel Registry Hyperlink	X	X					
Vessel Flag	X	X					
Availability of Catch Coordinates	X						
Satellite Vessel Tracking Authority	X						
Transshipment Vessel Name			X				
Transshipment Vessel Unique Vessel ID			X				
Transshipment Vessel Registration			X				
Transshipment Vessel Flag			X				
CATCH DATA							
Catch Area	X						
Fishery Improvement Project	X						
Vessel Trip Date(s)	X						
Date(s) of Capture	X						
Gear Type	X						
Production Method	X						
TRANSSHIPMENT DATA							
Transshipment Location			X				
Dates of Transshipment			X				
LANDING DATA							
Landing Location				X			
Dates of Landing				X			
PROCESSING DATA							
Expiry/Production Date		X					X
Product Origin		X					X
CERTIFICATIONS AND LICENSES							
Fishing Authorization	X						
Harvest Certification	X						
Harvest Certification Chain of Custody		X	X		X	X	X
Transshipment Authorization			X				
Landing Authorization				X			
Existence of Human Welfare Policy	X	X	X	X			X
Human Welfare Policy Standards	X	X	X	X			X
TRACEABLE OBJECT INFORMATION							
Species	X	X	X	X	X	X	X
Product Form	X	X	X	X	X	X	X
Item/SKU/UPC/GTIN	X	X	X	X	X	X	X
Linking KDE (batch, lot, or serial number)	X	X	X	X	X	X	X
Weight or Quantity	X	X	X	X	X	X	X
Unit of Measure	X	X	X	X	X	X	X

It is important to recognize that Table 1 represents a "universal list," which is applicable to all species. FIP practitioners may need or wish to add species-specific KDEs when reviewing or developing their own traceability system(s). The table tells us that if a KDE is present in a specific fishery, it should be captured as part of the traceability system.

[3] To assist FIP practitioners wishing to integrate these KDEs into their traceability systems, GDST has developed the GDST Basic Universal List KDEs worksheet.

2 Examples of Monitoring Tools Supporting First Mile Traceability

Here we present a few examples of existing monitoring tools that already contribute to traceability during the first mile, along with the pros and cons of each. This is a non-exhaustive list intended to represent those tools that can be applied across a broad scope of situations.[2]

TABLE 2

Monitoring Tools That Contribute to Traceability in the First Mile.

Monitoring Tool	Role in Traceability	Advantages to Traceability	Limitations in Contributing to Traceability
Paper log-book (catch record)	Logbooks are records of catch and effort registered at the time of the catch operation. The records can be paper-based or on electronic media. The need to record KDEs of fishing operations in logbooks is globally recognized and is usually a mandatory requirement across many countries and Regional Fisheries Management Organizations (RFMOs). The requirement for the use of logbooks may be based primarily on the size of the fishing vessel. For example, the European Union requires that all vessels over 10 meters in length use logbooks, except when absent from port for less than 24 hours. Logbooks should ideally be completed at sea, while the fish are being caught. However, challenging working conditions on fishing vessels may mean the first opportunity to accurately record the catch data is at the time of landing or during transshipment to larger vessels. Paper-based logbooks can be used in combination with vessel monitoring systems (VMS) to provide the location of fishing activities.	A well-established requirement in many countries. Easy to implement (low level of technology). Low cost. Tailored to specific fisheries. Already very familiar to most fishers and common practice for vessel captains.	Must be aligned with other documentation, such as landings declarations and sales notes. Catch on board is usually estimated less accurately than landings records. Data must ultimately be entered into an electronic database to be practically useful for traceability.

Monitoring Tool	Role in Traceability	Advantages to Traceability	Limitations in Contributing to Traceability
Paper log-book cont.	Logbook templates and guidelines may be in place to ensure all relevant KDEs are accurately and consistently recorded.		
Electronic logbook (e-logbook)	An electronic logbook (e-logbook) is essentially a version of a paper logbook in electronic form, such as on a phone, tablet, or computer application. In some instances, this can allow for the catch data to be transmitted to a shore station while or shortly after the data are being recorded. The e-logbook can securely submit information about catch and fishing effort via electronic files using either satellite or other information and communications technology (ICT). An e-logbook can be used in combination with VMS to provide location of fishing activities and a real-time verification of data.	Can help reduce misreporting at the point of harvest. Can provide data in near-real time. Can help secure the integrity of the data, for example with enhanced verification of data through comparison with other independent data sources such as VMS and observer data.	Cost and logistical challenge for small-scale and artisanal fisheries (e.g., expensive communication technology, need for scales that work at sea). Training requirements for applications/software. Possible system failures. Low acceptance by fishers/skippers.
Vessel Monitoring System (VMS technology)	VMS automatically records and transmits the position of the fishing vessel via satellite, telephone, or radio to a land-based station. The frequency of transmission varies from every few minutes (near-real time) to much longer intervals (several hours depending on the monitoring requirement and technology available). Some systems may store the data for downloading once a vessel is back in port. The primary purpose of VMS is control and enforcement purposes (e.g., closed areas/seasons). VMS should be used in combination with logbooks, catch forms, or other documents to triangulate the KDEs being recorded (e.g., dates of harvest, catch locations, and harvest vessel identity). Many governments require vessels above a minimum tonnage or capacity to have installed a VMS system, although VMS	Independent and accurate means of monitoring fishing vessel position and tracking as well as fishing activity. Information is capable of being highly confidential and regulated. Enhances safety by enabling detection of and rapid response to vessels in distress. RFMOs in the management of high seas fisheries generally require the use of VMS.	Requires a consistent and reliable power supply. Requires enhancements to monitor operational aspects of fishing activities, such as gear deployment. Records mainly location and time.

Monitoring Tool	Role in Traceability	Advantages to Traceability	Limitations in Contributing to Traceability
Vessel Monitoring System cont.	technology has been adapted for small-scale artisanal fisheries. VMS technology is now also compatible with the scale and geographies of many small-scale artisanal fisheries. With the development of small, lightweight, and durable transceivers that can operate with only solar power, or with cell phone technology, vessel monitoring solutions are now available at almost any scale.[4]	Now relatively common in commercial fisheries. Can be installed on many different types of vessels (e.g., large- and small-scale).	
Vessel tracking tools/system (e.g., AIS)	Vessels equipped with AIS (Automatic Identification System) transmit their position in real time for safety purposes so other ships are aware of their position, the primary aim being to avoid vessel collisions. This system records the same type of location information as VMS, but it is publicly available. The International Maritime Organization (IMO) mandates the use of AIS in vessels larger than 300 gross tonnes that travel in international waters. Many national governments have mandated AIS on vessels that fall outside the IMO regulation. Ground stations and satellites pick up this information, meaning a ship's movements can be followed even in the most remote parts of the ocean. Although the use of AIS is not globally mandated for fishing vessels, it is required by many RFMOs and countries. It is estimated that over half of the fishing operations more than 100 nautical miles from shore and about 80% of vessels fishing more than 200 nautical miles from shore have AIS installed.[5]	Required by many RFMOs and governments. Widely used in high seas and large-scale vessels. Low cost. High level of transparency.	Least applicable and utilized tool among small-scale vessels. AIS systems can be hacked, and the data altered, whereas VMS systems have proven to be more tamper-proof. It can be turned off.

[4] Sara G Lewis and Mariah Boyle, "The Expanding Role of Traceability in Seafood: Tools and Key Initiatives," *Journal of food science* Vol. 82, S1 (2017): A13-A21, doi:10.1111/1750-3841.13743
[5] M. Taconet, D. Kroodsma, and J.A. Fernandes, *Global Atlas of AIS-based fishing activity - Challenges and opportunities*, (Rome, FAO, 2019).

Monitoring Tool	Role in Traceability	Advantages to Traceability	Limitations in Contributing to Traceability
Electronic monitoring system[6] (e.g., onboard cameras and sensors)	An electronic monitoring system (EMS) integrates a set of components for continuously video-recording information during fishing trips. EMS largely consists of cameras installed in key positions and a recording system integrated with satellite positioning and sensors that start recording when they detect specific actions such as setting or hauling fishing gear. The camera and sensor systems are protected from external manipulation of data. A basic EMS records video of activities on board. Once the vessel returns to shore, the video record may be reviewed by a trained observer who can infer information about the catch and gear operations. More advanced systems can automatically identify key activities and potentially interactions with larger protected species (e.g., turtles, seabirds, and marine mammals). Identification of catch at the species level is not yet generally reliable or widely available. EMS is fostered and encouraged as a way of complying with minimum mandated observer coverage requirements where onboard observer placement is challenging (e.g., longline vessels).	Offers key benefits with regard to monitoring of compliance and safety during fishing. Can be used to complement existing observer programs and other monitoring tools. Can help with meeting observer coverage requirements without the need to deploy human observers on board vessels. The data recorded by camera and sensor systems are protected from external manipulation. Potential for recording 100% of fishing activities for later viewing and analysis.	Means of verifying catch by species is not yet in widespread use and is likely to be highly proprietary. Policy and regulatory requirements not yet well developed. Capital and installation costs can be prohibitive. Additional costs associated with training and deployment of video monitoring staff (observer time and labor). Privacy and data ownership concerns.

3 Answering Key Questions About Traceability

In 2020, WWF carried out an extensive survey of FIP practitioners, stakeholders, and its own fisheries staff. The results showed that there were concerns regarding several aspects of traceability, which would benefit from added clarity. Below, we explore these concerns and explain how they can be addressed to build confidence. For concerns not covered here and/or

[6] Taconet, Kroodsma, and Fernandes, *Global Atlas of AIS-based fishing activity*.

when FIP practitioners would like to consult with a seafood traceability expert, consider reviewing the Seafood Alliance for Legality & Traceability (SALT) Seascape directory. This resource maintains a list of NGOs and stakeholders involved in seafood traceability globally.

Confidentiality. There is understandable hesitancy among fishers in sharing information about target species, fishing locations, catch volumes, and sales figures (to name a few examples), particularly in digital formats, without a clear understanding of how data security will be maintained. These concerns need to be addressed transparently as part of the design of the traceability system. Traceability systems must strike an appropriate balance between increasing the transparency of seafood supply chains and protecting the legitimate commercial privacy of fishers and other seafood businesses. In other words, it is important that FIP practitioners understand how data are handled and where they are stored, depending on the traceability system, and whether or not government regulations on data privacy exist. It is also important that FIP practitioners become comfortable with the increased visibility that comes with traceability, so that they can properly discuss the topic with their constituents. The GDST standards encourage the collection of GPS coordinates, but do not require they be made public. Rather, they need to be part of the traceability system with a limited and agreed upon set of stakeholders having access, so that claims about catch provenance can be independently verified without compromising data confidentiality. For example, contracts for audits in MSC's Chain of Custody system include the requirement to maintain data confidentiality. Confidentiality agreements can also be signed between FIP participants, stipulating how data are to be collected, with whom they can be shared, and in what format and degree of aggregation they should be presented. The key to addressing these issues is to start with a simple system requiring minimal aggregation of data and to elaborate it over time as participants see how it operates, experience the benefits, and gain confidence in its application.

Cost. The traceability system must be tailored to the FIP of which it is part. If a FIP has limited resources,[7] a simple paper-based system may be a good starting point. However, as noted earlier, there is an increasing need for, and there are increasing benefits from, adopting digitization, and the GDST guidance document advises digital data transfer of information should be required from point of first sale onward. Therefore, the next step, with minimal additional cost, might involve capturing data in an Excel spreadsheet. This software is easily accessible, relatively affordable, and user friendly, and facilitates the transfer of data up the supply chain, albeit with the necessary security features enabled. There are of course many further steps/system elaborations beyond this that increase the complexity and cost. Decisions on what kind of system to use (paper-based, spreadsheet, database, etc.) should be driven by the FIP's objectives, including whether to aim for a specific certification, meet client requirements, or access a specific export market. FIP funders are vested in the FIP reaching its goals, and thus are likely to have a strong interest in supporting a traceability system that will meet their own needs. The key is to establish a clear protocol, agreed to by all participants, which lays out what information will be collected (fish name, size, weight, etc.), how it will be collected (e.g., paper versus electronic), by whom (fisher, FIP manager, etc.),

[7] This may be the case for small-scale or artisanal fisheries.

and for what use. Lastly, with increased demand for seafood traceability, a FIP with a sound traceability system in place is more likely to benefit from preferential market access.

Frequency. Data should be collected frequently enough to be representative of the fishery(ies) included in the FIP. Ideally, specific information on all catches will be recorded, but aggregate data may be sufficient. The key is to ensure there are no data gaps (e.g., missing fish or missing days) and that all fishers within the FIP are participants in the traceability system in place.

Government regulations. Local and national authorities worldwide have differing regulations addressing how fisheries data should be captured and how it can be used. However, a FIP can independently set up its own data capture systems as part of a traceability system. This approach can build on existing government requirements, but it can also operate independently. Further, when a government sees how a FIP's traceability system is supporting the FIP and generating incremental benefits to stakeholders, such as market access, that government may be encouraged to take a more cooperative approach to management, including fewer top-down "command and control" measures that might actually be stifling the fishery's development.

Perceived lack of market incentives/demand for traceable products. The global seafood industry is quickly moving toward all seafood being traceable through the supply chain. Not only is this becoming a government-mandated requirement for market entry in a greater number of countries and regions (e.g., the EU), but it is also a means to manage risk for seafood buyers and is being requested by consumers. FIP practitioners are encouraged to review the case studies and look to their peers to see what may lie ahead and how they can embrace it. There is no clear evidence that having a traceability system generates more revenue for FIP participants, but it is increasingly becoming a base requirement to retain market share and/or access new markets.

Paper-based or electronic. As noted above under Cost, starting with a traceability system based on paper records is acceptable if resources are limited, and could even be a better fit for a small fishery with a short supply chain to a local market (e.g., directly into the restaurant or hotel industry). However, data are increasingly being recorded and reported electronically (e.g., e-logbooks), and even if data originate on paper, they are being entered into electronic databases. This is for good reason: There are obvious advantages to having data available electronically for analysis, cross-checking, transmission, and backup. The world is moving rapidly in this direction, and electronic reporting is becoming a requirement for entry into many key markets. Digitization is also being required by major seafood buyers and NGOs, which wish to limit risk of exposure to IUU fishing, substitution, and unethical and unsustainable fishing practices. Digitization and traceability protocols such as the GDST standard v1.0 also address the "language" issue because data are recorded in an agreed-upon format that can be used globally and does not require transformation or translation. Finally, establishing an electronic system may help stakeholders better respond to various government regulatory requirements, especially when it comes to reporting data to fisheries managers (for quota management, stock assessments, establishing trigger points, etc.).

Training. Many survey participants noted they were concerned about the lack of training on seafood traceability systems. This Guidance was developed as a direct response to this concern. The aim is to simplify and demystify what a traceability system is and needs to do, and to provide FIP practitioners with the necessary tools to adopt or participate in existing traceability systems, or to set up new ones.

4 Examples of Traceability Systems in FIPs

Example N. 1 – Philippines yellowfin tuna

- Species: Yellowfin tuna
- Gear: Handline
- Location: Philippines
- FIP Partners: The Oceans and Fisheries Partnership Activity, funded by the United States Agency for International Development's Regional Development Mission for Asia (USAID Oceans); WWF-Philippines
- Characteristics: Small-scale
- URL: https://www.seafdec-oceanspartnership.org/wp-content/uploads/USAID-Oceans_KDE-ROI-Case-Study_approved.pdf

Aims of the FIP

- address the lack of fish catch reporting for the municipal fisheries
- provide a tool to support compliance with the international regulations
- replace the current paper logbook system with electronic catch documentation and traceability (eCDT) technologies

Background of the FIP

With the rising demand for sustainable seafood by European consumers, this FIP looks to ensure that yellowfin tuna fisheries from the Philippines are sustainably caught. The FIP harnesses market power and consumer demand to promote legally and sustainably caught tuna. It supports sustainable fishing techniques, including artisanal fishing with handline reels, and the subsequent transition to sustainable management of two artisanal handline yellowfin tuna fisheries. These fisheries, found in Mindoro Strait and Lagonoy Gulf, involve around 5,000 fishers, 112 fishing villages, and over 50 local tuna-buying stations.

The FIP has supported the introduction of a registration and licensing system to improve regulation and monitoring of the fisheries. Over 70% of the tuna fishing vessels in the project regions have now registered, with 25% of tuna fishers having obtained fishing licenses. The system provides local authorities the ability to monitor and control fishing activities while combating illegal and undocumented fishing in their waters. To ensure compliance with fisheries laws, WWF has also trained fish warden-volunteers to help patrol fishing areas and detect and report noncompliant fishing activities.

The project has also helped in the design and improvement of a catch documentation and traceability system, a vital component of ensuring the sustainability of the yellowfin fishery at both sites. Through the WWF FIP, groups of fishers are now using the system to document their catch and provide relevant information such as the location, time, species, weight, and length.

FIP actions

The FIP has been engaging with technology providers to identify and develop traceability software suitable for use in small-scale handline tuna fisheries in the Philippines. The purpose of this engagement has been to establish an electronic database in collaboration with the Philippine government and the whole handline tuna fisheries supply chain. This will enable further testing and assessment of use of the eCDT system in small-scale artisanal fisheries and prove its interoperability with the systems of EU and US catch certificates and other electronic monitoring, control, and surveillance (MCS) systems.

The eCDT system will be customized based on the guidelines developed by local government for the small-scale fisheries that will be implemented country-wide. The project is continuously coordinating with the local government for the finalization of the guidelines on a municipal catch documentation and traceability system. In any case, the project will continue to use and promote available and existing electronic catch documentation systems with minimum KDEs to input essential data for traceability.

Technology used

Futuristic Aviation and Maritime Enterprise, Inc. (FAME), is a low-cost, local technology that was used to establish eCDT technology for small-scale tuna handline fisheries. It offers a maritime transponder that can track and monitor maritime vessels in real time using a PC or a mobile device. The transponder can be installed in different types of maritime vessels including small-scale fishing vessels. FAME uses radio frequencies to send and receive information through gateways that receive information from a transponder attached to the handline tuna fishing vessels. Fish catch data are sent through the FAME transponder to a cloud server that can be accessed up to the processor/exporter level through the FAME eCDT platform. FAME technology is interoperable with other systems and has been modified to incorporate GDST and regulatory required KDEs.

The system could greatly help small-scale fishers comply with the fish catch reporting requirement. For fishers that have smartphones, a proprietary application can be used to send text messages to other users on land or at sea. For those without smartphones, FAME is launching a new version of its system with an integrated touchscreen so that fishers can send messages from the vessel and see their position data. Transponders can currently transmit from 50 to 100 kilometers from shore based on weather conditions. However, as more users adopt the system, the range will be extended because the transponders themselves function as signal repeaters.

Benefits

- It is interoperable with other systems that are key to achieving full traceability of the small-scale handline tuna fisheries of the Philippines.
- Fishers have demonstrated a willingness to learn and adapt to newly available technologies.
- The transponder can be installed in different types of maritime vessels, including small-scale fishing vessels.

- The technology features include independent messaging, meaning it does not need a telecommunication service provider.
- It helps fisheries comply with government regulations.

Challenges

- The novelty of the system raises the need for comprehensive training for many fishers.
- There is risk of noncompliance by local fisheries authorities with the mandatory catch reporting.
- There is no facility where the fish catch report may be submitted, and not all local governments have the capability to digitally receive, collate, and analyze the fish catch data recorded by the fishers.
- The lack of strict enforcement at the local level may lead to the mismanagement of the fisheries resources and an unreliable traceability system.

Opportunities

- Traceability is a vital part of any certification that is needed for exporting fish, such as MSC certification.
- The processors and/or exporters should be part of the process because of the direct link with both the fishers and the buyers.

The Fish Processors Organization, which will be a part of the small-scale handline tuna MSC chain of custody, is willing to pay for the services of an eCDT technology provider rather than charge the fishers.

Example N. 2 – Peru mahi-mahi - longline

- Species: Mahi mahi
- Gear: Longline
- Location: Peru
- FIP Partners: WWF-Peru and Peru Mahi Alliance
- Traceability measures: Mobile application called TrazApp, an eCDT system
- URL: Peru mahi-mahi FIP WWF site; TrazApp website; TrazApp Facebook Group; TrazApp YouTube channel

Aims of the FIP

- move the fishery in a stepwise approach toward Marine Stewardship Council (MSC) certification by the end of 2023
- address the high number of unlicensed artisanal vessels in the fishery by helping fishers gain fishing permits
- improve national and international management regulations of mahi mahi, a highly migratory species
- improve the collection of catch, bycatch, and gear loss information and reduce the likelihood of illegal products entering the supply chain by scaling up the use of an eCDT mobile application, TrazApp, across the fishery

Background of the FIP

Peru's mahi mahi fishery supports 4,200 fishers and serves as a key link in the marine food chain, providing sustenance for sharks, dolphins, and other ocean predators. Peru is the leading producer of the world's mahi mahi, with over 70% of its exports going to the United States, where buyer influence on the fishery to make improvements is important. In 2018, exports to the US generated over US$92 million. FIP efforts address governance, fishing practices, and environmental impacts of the fishery so that it can meet the MSC standard.

Traceability measure adopted: eCDT

WWF worked with fishers, government, and suppliers to develop a mobile eCDT system, TrazApp, for use in the Peruvian mahi mahi and jumbo flying squid fisheries. TrazApp provides information in real time that gives fishers greater control over their catches and their commercialization; makes supply chain actors visible by providing new business opportunities; and provides processing plants with a tool to ensure the legal origin of their products and thus meet the import requirements of important markets. Additionally, it replaces paper-based bureaucratic processes (reducing corruption), and facilitates decision-making processes and monitoring, control, and surveillance efforts by authorities to address unsustainable and IUU fishing.

FIP actions

One of the key goals of the Peru mahi mahi FIP is to increase the number of licensed and permitted vessels in the fleet. Under Peruvian regulations, fishers who form cooperatives will be issued fishing permits if they adopt a digital catch documentation system to record their catch and share their data with the government. WWF co-developed TrazApp with fishers, government, and other supply chain actors to meet this requirement, and under the FIP has been training fishers in three fishing cooperatives in northern Peru (La Tortuga, La Islilla, and San José) on the use of TrazApp. Approximately 1,500 fishers have been engaged directly to pilot WWF's TrazApp and are now actively reporting their catch. FIP efforts are focused on expanding the TrazApp pilot to encourage more uptake by fishers, test the traceability of the information generated down the supply chain with exporters and US importers, and ensure it meets the US SIMP requirements and GDST standards. WWF is also working with the Peruvian government to integrate TrazApp with SITRAPESCA, a traceability system managed by the government, which will help improve data management, monitoring, and control of the fisheries.

In addition, WWF has partnered with the Matarani Artisanal Landing Site in a pilot project to improve the site's operations and digitize information collected, with the goal of scaling up this work to other landing sites in the future. In January 2019, WWF completed an assessment of current operations and developed a workplan for modernization. A digital scale, laptop, tablets, and two-way radios were acquired and have been donated to the administration of the landing site as part of the workplan. WWF also trained fish "weighers" to communicate through radio with a gatekeeper, who will register information on a laptop instead of using the traditional paper-based system. Processes will gradually improve toward a better data collection system capable of cross-validating information registered in TrazApp. This will be a significant improvement for landing sites, as most currently register financial losses due to insufficient administration and corruption due to poor documentation processes.

Benefits

- Addresses IUU fishing by registering the participants of the fisheries who legally document their catch and helps identify those who are potentially contributing to IUU fishing.
- Allows fishing effort data to be collected in real time, which is helpful for implementing management measures in the fishery.
- Fishers have access to systematized information and a historical record of their activity to better manage their vessel trips and differentiate themselves in a fishery with a high number of unlicensed vessels.
- Traders/middlemen can demonstrate the origin of the product, which allows them to access new markets and meet the demands of processing plants.
- Processing plants have the tools to ensure the legal origin of their products and comply with the import requirements of important export markets.
- TrazApp has a user-friendly interface for fishers, making it easy for fishers to use the app and record their catch, as reflected in the more than 5,000 fishing trips and 60,000 mt landings recorded to date.
- Safety at sea: fishers and family members can track vessels at sea and determine when vessels might return.
- Certain TrazApp profiles can work offline in areas with little or no network coverage, where the data are stored in the application and sent to the cloud when network access is restored.
- Allows the generation of PDF formats with the requirements established by the SIMP.
- The results to date have shown that every time there is a capacity-building workshop, the updating of the traceability system increases. With user feedback, improvements are made to the system and user value and word of mouth both increase. For example, the ability to know when a family member at sea might return is an added benefit for fishers and their families.

Challenges

- Every user who wants to have an account in TrazApp must have an email address enabled; however, not all users have an email account, so accounts must be created before people can use the app.
- Comprehensive training and constant presence at the beginning are required to train users on the application. There is also a need to train local community members as focal points who can address any questions or concerns from users.
- A smartphone and internet access are needed to use the system, and not all users have these privileges.
- There is a lot of informality (unlicensed/unregistered vessels) in the artisanal fishing sector, and users in some cases fear recording their information, arguing that sanctions or fines may be issued.

Opportunities

- TrazApp is in the process of being made interoperable with the maritime authority, the entity in charge of granting departure certificates. Currently, each vessel owner needs to request a

departure certificate in person, spending time and money. However, through TrazApp fishers can now request the departure certificate digitally via cell phone.

- Since TrazApp is open source, it can be shared with anyone who wants to replicate it in other fisheries, countries, regions, and beyond.
- Key international import markets are demanding that the products they purchase be traceable back to the origin, thereby using market leverage to encourage the use and expansion of tools like TrazApp.
- Financial information is being included in the app to comply with government tax and legal requirements. Fishers who are empowered with this information as well as catch data and better accounting management can seek future opportunities with financial institutions that currently do not allow them to access formal credit because they are unlicensed and/or unable to demonstrate their fishing activity. We hope to solve this issue and will continue to include in the app additional information required by financial institutions so that fishers can get access to credit.
- The collection of historical catch data through TrazApp will empower fishers with information to help inform their buying and selling decisions in the marketplace, and may help them increase their income in the long term.
- Linking to processing plants will provide information that processing plants can use for their exports to meet market requirements and inform fishers where their product ends up—a question they have been asking themselves.

PART B: FIP Traceability Toolkit

1 Outline

The FIP Traceability Toolkit provides a step-by-step process to guide FIP practitioners toward establishing a traceability system in the first mile that is consistent with the GDST standard (see text box for key GDST traceability concepts). Following these steps will help FIPs to identify the traceability gaps, incorporate traceability goals into their workplans, and identify and design a traceability system that best meets their specific needs, including interoperability with other systems. While not all FIP traceability systems are expected or need to fully meet the requirements of the GDST standard, FIPs should aim to be as closely aligned as practicable to best position themselves with respect to modern seafood supply chain traceability requirements.

Key GDST Traceability Concepts

All parties involved in a seafood supply chain should be able to link the physical flow of products with the flow of information about them. There are three main components within any traceability system that should work together across the supply chain to provide accurate information about the history of the product.

Identification: Any unit and any actor in the supply chain that modifies the product or may have an impact on the product shall be uniquely identified as the product moves along the supply chain.

Information collection and management: For fisheries, information related to seafood production such as gear, vessel name, catch area, transshipment details (e.g., transshipment vessel and location), landing location, farm or grow out location, etc. should be captured and recorded as the product moves along the supply chain.

Communication: Various actors in the supply chain must be able to exchange information. This communication among the actors in the supply chain should then be *interoperable*, which allows distinct traceability systems to communicate with one another along a value chain, easily sharing the information that should be shared while protecting the information that should remain secure.

Each of these components must be compiled at Critical Tracking Events (CTEs) along the supply chain and be capable of recording and communicating requisite Key Data Elements (KDEs) for each of these events. In short, KDEs comprise the minimum data elements that need to be documented and transmitted for each product consignment, and CTEs are the points in the supply chain where custody of that product changes hands or undergoes transformation, and at which data need to be captured to follow the product's movement.

Step 1 – FIP Traceability Gap Analysis

Ideally, FIP stakeholders should start thinking about traceability at the commencement of the FIP by including an assessment of the traceability requirements as part of the needs assessment/MSC pre-assessment. Undertaking this at the outset can deliver further efficiencies, such as when there is overlap with other environmental or social actions that the FIP needs to undertake. These efficiencies may also arise when traceability considerations occur after the instatement of the FIP. Regardless of the timing, the Traceability Gap Analysis (TGA) is the first step in identifying the supply chain events (CTEs) from the catch to the first sale, what data (KDEs) are currently being captured, and how data are transmitted along the chain of events (COE) to the point of first sale. The TGA will not only help identify and assess the fishery's traceability issues, but can also identify any current traceability technology and practices established by downstream supply chain partners who will use the data. Understanding the existing traceability landscape in the supply chain will facilitate system interoperability.

To enable this early consideration of traceability, this Toolkit includes a **FIP Traceability Gap Analysis Template**. The TGA Template guides FIP practitioners in the benchmarking of their existing regulatory systems and processes and the identification of KDEs that are already being recorded at each of the CTEs (e.g., as part of existing business processes or internal traceability systems). The TGA also covers how the KDEs that are currently collected are recorded, who is recording the information, and how the data are stored, communicated, and transferred. Finally, the TGA should identify the key challenges the FIP is facing with respect to instating, improving, or modernizing any existing traceability systems.

Step 2 – Analysis and scoping

The TGA Template includes a scoping section to

- summarize the results of the gap analysis;
- outline challenges and opportunities; and
- provide recommendations on the actions and priorities to address the traceability challenges.

This step will support the development of the FIP Traceability Workplan (see Step 3) for achieving the traceability objectives.

The TGA should also include a description of those tracking, tracing, and segregation systems in place within the fishery and how these systems will ensure that FIP products can be clearly distinguished from non-FIP products and can be traced back to their Unit(s) of Assessment (UoA) and Unit(s) of Certification (UoC).

Step 3 – FIP Traceability Workplan

Based on the foregoing steps, FIP practitioners can prepare a workplan for implementing a traceability system that will be consistent with the GDST standard requirements. A **FIP Traceability Workplan Template** is provided for this purpose. The Template is not intended to be prescriptive and should be used as a guide to support development of a fishery-specific workplan to implement a traceability system that best meets the FIP's requirements. The workplan is a management tool that details the critical steps, priorities, milestones, and resources needed to carry out the traceability strategy. To be achievable, the plan must establish reasonable and realistic timelines and clarify the resources required by various sector stakeholders and trading partners to enable implementation requirements to be met.

The traceability workplan should, wherever practicable, be incorporated into the overall FIP workplan. In many instances, the FIP traceability actions can be integrated into, and prioritized with, the other environmentally or socially focused FIP actions. The goal of this workplan should be to enable products from FIPs to verifiably enter supply chains with appropriate traceability in place

2 FIP Traceability Gap Analysis Template

How to use the FIP Traceability Gap Analysis Template

The TGA Template is for FIP practitioners to (i) determine what will be needed when establishing a new traceability system, or (ii) use in assessing their existing traceability systems. The template is designed to present key information about the fishery traceability tools (whether paper-based or digital), identify the kind of information currently being recorded (KDEs/CTEs—if any), and note the major deficiencies and gaps in compliance with the GDST standard, specifically during the first mile. Text in italics provides additional guidance about information that should be included in each section but that should be removed from the final version of the document. Below is an outline of the six main components of the gap analysis process that the FIP practitioner will need to complete.

1. Basic fishery information

Provide a written description of the fishery/FIP. This should already be available as part of the FIP documentation. It can be copied here or provided as a link.

Information may include the history of resource extraction, the main targeted species, the fishery location, vessel and gear types used, the approximate number of vessels, the estimated catch quantity of the fishery, and the management authorities (the regulatory authority with fishing management responsibilities; there may be multiple authorities where joint jurisdictional responsibilities occur).

Optional: a table of catch quantities of all target species that are part of the Unit(s) of Assessment (UoA) for the last 3–5 years.

2. Unit(s) of Assessment

Fill in the following table (from the FIP), which will be considered the scope for the Traceability Gap Analysis.

UoA 1	Description
Target species (common and scientific name)	*Example: Mahi mahi (Coryphaena hippurus)*
Stock	*Example: Eastern Pacific*
Geographical area	*Example: The exclusive economic zone (EEZ) of Peru*
Fishing method or gear type	*Example: Surface longline*
Fishing fleet or group of vessels, or individual fishing operators pursuing stock	*Example: Artisanal Peruvian fleet*
Transshipment	*No*
Processing onboard	*No*

3. Traceability risk within the fishery

Provide a description of the tracking, tracing, and segregation systems within the first mile and how these systems enable products to be traced back to the UoA. Include an evaluation of the management systems related to traceability.

Assess the traceability risks in a particular fishery by completing the following table. For each risk factor listed in the template, describe whether it is relevant to your FIP and, if so, describe the relevant mitigation measures or traceability systems in place.

Factor	Description
Does the fishery use gear types that are not within the scope of the FIP? If Yes, please describe ● whether this may occur on the same fishing trip, on the same vessel(s), or during the same season; ● whether it is possible to match catches to the gear types with which they were caught through records; and ● how the risks of mixing FIP and non-FIP fish are mitigated.	*None of the vessels within the UoA use gear types that are not included in the UoC, so by this there is minimal risk of mixing FIP and non-FIP fish.*
Do vessels in the FIP also fish outside the FIP geographic area? If Yes, please describe ● whether this may occur on the same fishing trip; ● whether it is possible to link fish caught outside the FIP area to the location where they are caught and I f so, how this link is made; ● the accuracy of the vessel location data; ● whether the data are verified and if so, how and by whom; and ● how the risks of mixing FIP and non-FIP fish are mitigated on board the vessel before unloading.	*All vessels have VMS monitored by an independent control center.*
Does transshipment occur within the fishery? If Yes, please describe ● whether transshipment takes place at sea, in port, or both; ● whether the transshipment vessel may also handle product coming from non-FIP vessels or outside the FIP area; ● which KDEs are recorded and communicated at transshipment; ● whether these data are verified, and if yes by whom; and ● how the risks of mixing FIP and non-FIP fish during transshipment are mitigated.	*There is no at-sea transshipment, and in-port transshipment is monitored.*
Are there any other risks of mixing or substitution between FIP and non-FIP fish, different species of fish, different catch locations, or different fishing vessels?	*There are vessels with the same gear that are not part of the FIP.*

4. KDEs currently captured by data system by CTE

The GDST has developed a comprehensive and standardized set of KDEs, i.e., basic information related to seafood production that companies can incorporate into their traceability systems. These KDEs are listed in the table below. Please indicate which KDEs you currently capture in either paper-based or digital formats and show where they are captured (by CTE).

Recorded			KDE Name	CTE	Description/rationale[8]
N	Y (digital)	Y (paper)			
			Vessel Name		
			Vessel Registration		
			Unique Vessel Identification		
			Vessel Flag		
			Vessel Trip Dates		
			Date(s) of Capture		
			Gear Type		
			Fishing Authorization		
			Availability of Catch Coordinates		
			Satellite Vessel Tracking Authority		
			Catch Area		
			Species		
			Product Form		
			Transshipment Location		
			Dates of Transshipment		
			Transshipment Vessel Name		
			Transshipment Vessel Unique Vessel Identification		

[8] *How, when, by whom, and in which format (paper-based or digital) is each recorded and communicated? This column should also cover comments, i.e., challenges in collecting, etc. It should also include alignment with standard formats and data sources identified in the v1.0 GDST standard.*

Recorded			KDE Name	CTE	Description/rationale[9]
N	Y (digital)	Y (paper)			
			Landing Location		
			Dates of Landing		
			Expiry/Production Date		
			Production Method		
			Product Origin		
			Harvest Certification		
			Harvest Certification Chain of Custody		
			Fishery Improvement Project		
			Transshipment Vessel Flag		
			Transshipment Vessel Registration		
			Landing Authorization		
			Public Vessel Registry Hyperlink		
			Transshipment Authorization		
			Existence of Human Welfare Policy		
			Human Welfare Policy Standards		

5. Scoping (traceability weaknesses and FIP challenges)

Provide a scoping section that summarizes the results of the gap analysis in the previous section (highlight which KDEs/CTEs are currently being captured and recorded in the fishery and what KDEs/CTEs are not being captured by the FIP).

[9] *How, when, by whom, and in which format (paper-based or digital) is each recorded and communicated? This column should also cover comments, i.e., challenges in collecting, etc. It should also include alignment with standard formats and data sources identified in the v1.0 GDST standard.*

KDEs/CTEs not recorded/or communicated paper-based/or not communicated	Summary information for each KDE/CTE

6. Recommendations for improvements by KDE/CTE

Using the table below, list each KDE/CTE not recorded by the fishery (from the table above) and describe the priority level for addressing these gaps on a scale of high, medium, or low depending on sequencing of actions (e.g., output of one action needed to begin another action), and available funding for specific actions. Include a brief description of the type of information and/or action that might help the fishery implement a traceability system consistent with the GDST standard. Use these recommendations to help inform the development of the FIP workplan with stakeholders (see separate template).

Example text is provided in the table below (delete this text before entering your own information).

KDE/CTE not recorded	*Vessel registration/catch*
KDE/CTE description	*Standardized number or identifier for distinguishing vessels registered under the same flag nation.*
Rationale for not recording	*Not all vessels have registration or a license, and there is a high risk of IUU. It is likewise reported that the system for vessel registration is not consistent between provinces.* *In some regions, there are no government offices locally that can issue licenses. Fishers are not aware of the licensing process.*
Improvement recommendations	*The evaluation determined that there are vessels without a license, high risk of IUU, and complexities in the process of registration of vessels. An important requisite of the GDST standard is that vessels have and record the vessel registration issued by the flag state regulatory body. The objective is to ensure vessels have a valid registration and license and that it is recorded and communicated. The FIP should support the introduction of a registration and licensing system. In order to facilitate the registration of vessels, the FIP could work with local authorities and vessels to improve regulation and monitoring.*
Priority	*High*

3 FIP Traceability Workplan Template[10]

How to use the FIP Traceability Workplan Template

The FIP Traceability Workplan is a management tool that sets out the critical steps, priorities, milestones, and resources to deliver on the traceability strategy and meet the GDST standard. To be achievable, the plan must consider reasonable timelines and resources required by various sector stakeholders and trading partners to meet implementation requirements. The Action Plan should outline the activities, resources, etc. necessary to meet the traceability goals.

The purpose of this template is to outline the information that must be included in a FIP Traceability Workplan. The workplan should be developed in collaboration with FIP stakeholders. This template includes the important components of a workplan and provides the information needed to track progress. *Text in italics provides additional guidance about information that should be included in each section and should be removed from the final version of the document*. Example text should be replaced to reflect the information for your fishery.

The critical elements that need to be included in the FIP Traceability Workplan are:

1) **Actions:** Defined as a major activity in the FIP's workplan that must be completed to address specific traceability deficiencies identified in the rapid assessment.
2) **Completion dates:** To ensure accountability, an expected completion date should be included for each action.
3) **Priority:** High, medium, or low priority, taking into account the scoping document.
4) **Estimated cost:** Costs for each action.
5) **Responsible parties:** Organizations/individuals responsible for completing the actions as agreed upon by FIP stakeholders.
6) **KDEs/CTEs:** All KDEs/CTEs that will be addressed by the action.
7) **Electronic reporting:** While not a current FIP requirement, it is useful to make plans for moving away from paper-based traceability to an electronic and interoperable system.
8) **Tasks:** This section breaks down the actions identified above into specific steps that describe how the action will be accomplished. Tasks provide more clarity on how the FIP intends to complete each action. This allows participants to better track progress over time and communicate about progress being made in the FIP.

[10] Template adapted from FisheryProgress.org Download

FIP Traceability Workplan overview

Fill in the following table providing an overview of the workplan:

FIP name or code	
Workplan version and date	
Start date (expected)	
End date (anticipated month/year)	
FIP lead (organization/individual responsible for Action Plan)	
Improvements recommended by (meeting/group that supported the development)	
FIP coordinator (organization/ individual responsible for reporting on fishery progress)	
Workplan developed by (consultant or person)	
References (document/s (e.g., TGA, MSC PA) on which the workplan was based)	

FIP Action Plan table

Fill in the following table listing actions for the workplan (copy and paste table for additional actions needed as appropriate):

Action Number and Name (One-sentence description)	*Vessel registration*
Action Goal (One sentence that describes the result of the action)	*Ensure that vessel registration is recorded*
Action Description (Brief summary of the steps involved in the action and importance of the action in achieving the traceability objectives)	*To record the vessel registration, first the vessels without registration should be identified. For vessels that do not have registration or a valid license, registration should be facilitated by engaging with relevant authorities to issue or update the relevant documents.*
Expected Completion Date	*March 2018*
Priority (Based on the implementer's criteria; actions that are necessary to complete before beginning other actions are high priority)	*Medium*
Estimated Cost (An estimate of the budget needed to complete the action)	*US$10,000*
Responsible Parties (List of participants)	*FIP lead*
KDEs/CTEs Addressed by the Action	*Vessel registration*
If relevant, plan for transition to digital (see GDST Technology Solution Providers).	*Moving away from paper-based to fully digitized*

Actions to record vessel registration

The following table sets out a summary template (which can be converted into Excel) that will help with tracking progress and linking tasks and actions in an Action Plan. A snapshot of this is provided below, with an example where the KDE vessel registration needs to be recorded. You may add additional actions as appropriate:

KDE / CTE	Action	Task / Milestones	Responsible (lead)	Responsible (supporting role)	Evidence of completion	Start Date	Expected Completion Date
Vessel registration / catch	*Register vessel*	*Determine whether, how, and in which format vessel registration is recorded. It could be that the vessels are not registered, or they have registration but the information is not being recorded properly.*	*FIP lead*	*Local authorities, WWF*	*Registration certificates*		
		If vessels lack registration, the FIP should first identify all the vessels, fleets, etc. within the FIP and confirm/identify the vessels without proper registration.					
		Where vessels do not have registration or a valid license, the FIP lead should facilitate the registration of vessels by engaging with relevant authorities to issue or update the relevant documents.					
		Before departing and at landing, conduct monitoring and inspection to confirm vessels are properly registered.					
		Record the vessel registration in the logbook or landing report, or using electronic traceability.					
		Identify key areas and requirements for capacity building within the FIP.					

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