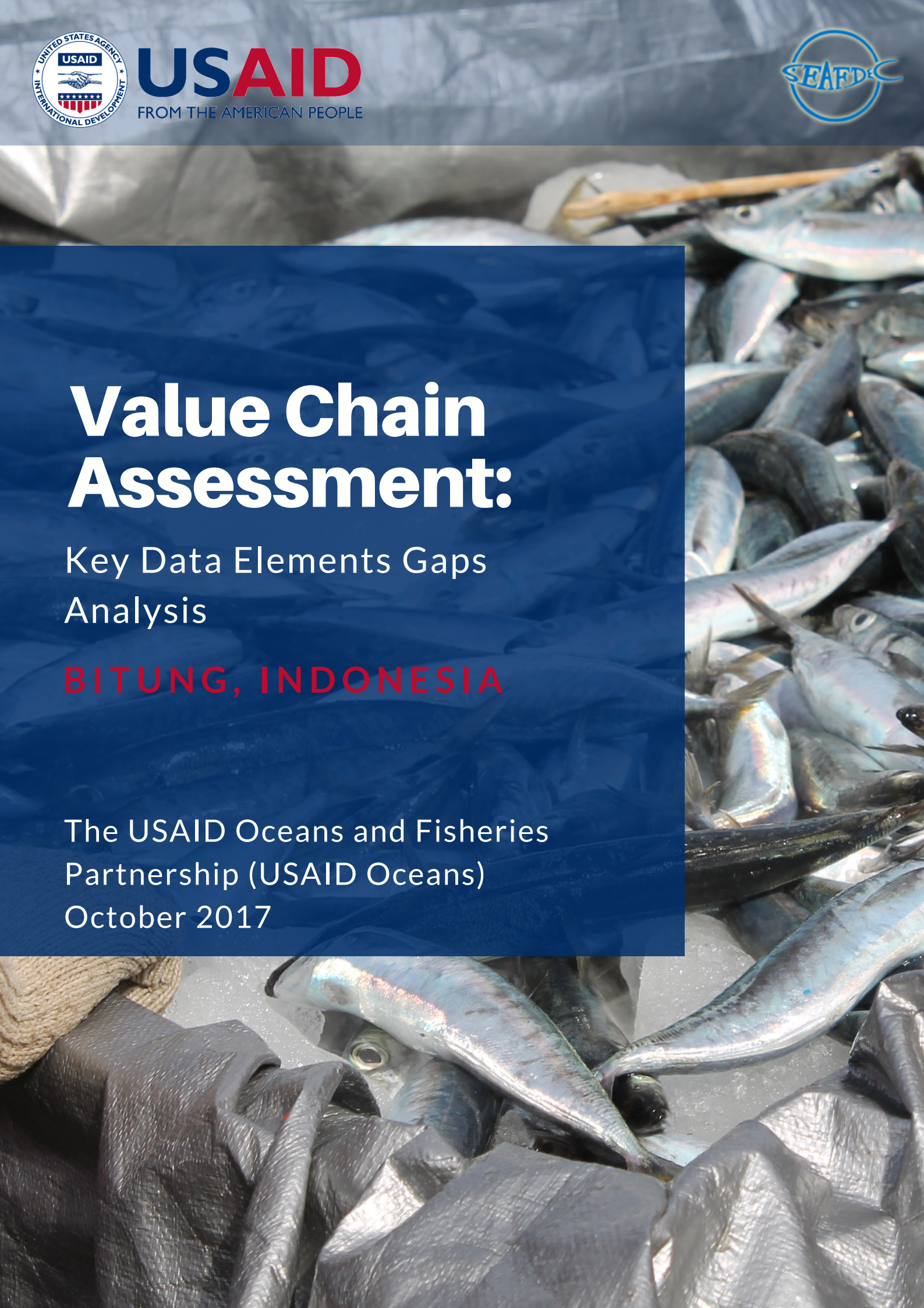

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Value Chain Assessment:

Key Data Elements Gaps Analysis

BITUNG, INDONESIA

The USAID Oceans and Fisheries Partnership (USAID Oceans)
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ACRONYMS AND ABBREVIATIONS

ACDS	ASEAN Catch Documentation Scheme
AP2HI	Asosiasi Perikanan Pole & Line and Handline Indonesia
BPKP	Bukti Pencatatan Kapal Perikanan (Fishing Vessel Documentation Proof)
CC	Catch Certificate
CCP	Critical Control Point
CDTS	Catch Documentation and Traceability System
CTI-CFF	Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security
e-systems	electronic systems
EU	European Union
FT	Fair Trade
GT	gross tons
HC	Health Certificate
ICTSA	Indonesian Coastal Tuna Sustainability Alliance
IPNLF	The International Pole and Line Foundation
IUU	Illegal, Unreported, Unregulated
KDE	Key Data Element
MDPI	Masyarakat dan Perikanan Indonesia
PSDKP	Ministry of Marine and Fishery
SFMP	Sustainable Fisheries Management Plan
SHTI-LA	Initial Catch Certificate
SKA	Surat Keterangan Asal (Certificate of Origin)
SKAI	Surat Keterangan Asal Ikan (Certificate of Fish Origin)
SKPI	Surat Keterangan Pendaratan Ikan (Certificate of Fish Landing Information)
SKAT	Surat Keterangan Aktivitas Transmiter (Certificate of Transmitter Activity)
SIMP	[United States] Seafood Import Monitoring Program
SIPI	Surat Ijin Penangkapan Ikan (Fishing License)
SIUP	Surat Ijin Usaha Perikanan (Licensing of Fisheries)
SLO	Sertifikat Laik Operasi (Certificate of Operation Feasibility)
SOP	Standard Operating Procedure
SPB	Surat Persetujuan Berlayar (Port Clearance)
STBLK	Surat Tanda Bukti Lapor Kedatangan Kapal (Proof of Ship Arrival)
Pas Kecil	Certificate of Small Vessel (<20 GT)
PEB	Pemberitahuan Ekspor Barang (Notification of Export)
PHP	Pungutan Hasil Perikanan (Levies of Fishing)
US	United States of America
WWF	World Wildlife Fund

EXECUTIVE SUMMARY

The USAID Oceans and Fisheries Partnership (USAID Oceans) works to strengthen regional cooperation to combat illegal, unreported and unregulated (IUU) fishing and promote sustainable fisheries, in order to conserve marine biodiversity in the Asia-Pacific region. The objectives of USAID Oceans program are to: (i) develop a financially sustainable regional catch documentation and traceability system (CDTS) to combat IUU fishing and seafood fraud in areas where sustainable fisheries management plans (SFMP) are being applied; (ii) expand use of the CDTS to priority biodiversity areas in the Asia Pacific region; (iii) strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through SFMPs, including actions to combat IUU fishing and seafood fraud; and (iv) enhance public-private partnerships (PPPs) to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud.

USAID Oceans commissioned FishListic to carry out five on-site traceability audits in the program learning site of Bitung, Indonesia, in October 2016. The supply chains audited consisted of one vertically integrated, one semi-vertically integrated, two non-contractual vessel aggregator and one disaggregated independent node supply chains. Furthermore, the different categories of supply chains were spread across all three types of gears being considered, i.e., Pole & Line, Handline and Purse Seine.

The traceability audits focused on the front end or "first mile" of the supply chain from the point of fishing vessels offloading catch to transfer the first receiver (processor/cold storage), and through to packaging into sealed export freezer containers. Processors and cold storage facilities within this "first mile" where audited with specific focus on operations that source Pole & Line, Handline and Purse Seine product. All sites where chosen by the Indonesia Coastal Tuna Sustainability Alliance (ICTSA).

This report presents a summary of the five audits together with a Key Data Element (KDE) gap analysis, and recommendations and solutions for continuous improvement to enable companies to meet and satisfy the traceability requirements of various international import standards such as the European Union (EU) and United States (US).

The assessments identified several gaps in KDEs being collected versus those required by various traceability standards, including EU, US, ASEAN Catch Documentation Scheme (ACDS) and the Worldwide Wildlife Fund (WWF), and indicated that all five companies of the selected companies required several improvements before being able to satisfy the standards fully. The below not only includes the identified gaps for actual KDE requirements, but also those areas that are critically important to ensuring that the KDE data is maintained and carries throughout the supply chain. These gaps included lacking:

- Robust labelling and identification systems throughout;
- Use of unique identifiers for products through various stages of the chain, including packaging used, which relate back to initial source of raw material;
- Standard Operating Procedures (SOP) and the availability of SOP reference materials to appropriate staff;
- A clear segregation processes and procedures, identification and labelling;
- Clear identification or record keeping at key areas within the supply chain;
- Appropriate coding on packaging that enables product to be traced back to batch number and vessel;
- Availability of clear statements of gear type on sales documentation specifically invoices.
- VMS units on vessels <30 GT;
- IMO/Lloyds numbers;
- Inmarsat numbers;
- E-systems for data collection; and
- Detail concerning transshipment of product at sea on catch certificates.

Anonymous sources also indicated that there is also a history of a lack of data for fishing license numbers, captains; names, crew lists, scientific names, as well as a failure to segregate yellowfin tuna (known locally as "baby tuna") from bigeye tuna. In-field observations did not confirm this information, and all paper records provided the above information. Upon inspection, the team also did not find evidence of bigeye tuna being present in the raw material inspected—however, this should be continually monitored and verified.

The field audits revealed that a majority of the KDEs required to ensure robust traceability throughout a supply chain are readily available and accessible to key actors at the beginning of the chain when fish are first offloaded by vessels at port and ownership is taken by first receiver suppliers. Only five KDEs were found to be lacking across the audited supply chains, with numerous gaps identified in companies maintaining that information's accuracy and completeness throughout the entire system. Compliance gaps were also observed among small-scale vessels (<5 gross tons (GT)), with noted uncertainty in what requirements would be asked of them—particularly by upcoming US regulations. Overall, all five companies audited were found to be likely to satisfy the various international traceability standard requirements (i.e., EU, US, WWF, ACDS). The majority of the gaps identified can be remedied with low-cost, low-technology solutions, including additional staff training to implement the improvements into everyday operational activity.

The government of Indonesia plays a critical role in the traceability process and is the only body that can verify company catch records, facilitated by a completed Catch Certificate. This process must be supported by robust enforcement, compliance, and implementation as well as consistent application of legal requirements for fishing vessels which are clear, concise and readily available for all vessels across all regions and be able to be issued by the various levels of regional, national and provincial governments.

1. INTRODUCTION

The USAID Oceans and Fisheries Partnership works to strengthen regional cooperation to combat illegal, unreported and unregulated fishing and promote sustainable fisheries, in order to conserve marine biodiversity in the Asia-Pacific region. USAID Oceans works in close collaboration with the South East Asia Fisheries Development Center (SEAFDEC), the Coral Triangle Initiative on Coral Reefs Fisheries and Food Security (CTI-CFF) and national fisheries agencies.

The objectives of USAID Oceans activity are to: (1) develop a financially sustainable regional catch documentation and traceability system (CDTS) to combat IUU fishing and seafood fraud in areas where sustainable fisheries management plans (SFMP) are being applied; (2) expand use of the CDTS to priority biodiversity areas in the Asia Pacific region; (3) strengthen human and institutional capacity of regional organizations to conserve marine biodiversity through SFMPs, including actions to combat IUU fishing and seafood fraud; and (4) enhance public-private partnerships (PPPs) to conserve biodiversity, promote sustainable fisheries management, and combat IUU fishing and seafood fraud.

An increased focus by the Indonesian government and regional bodies on seafood traceability and catch documentation, motivated by increasing compliance demands, which deter IUU fishing from major importer countries and regions, requires increased investigation and understanding of the Indonesian context on these matters.

As such and in support of the above objectives, USAID Oceans conducted a comprehensive independent traceability assessment of tuna supply chains in Eastern Indonesia (Bitung region) through subcontractors Marine Change and FishListic. This project also consisted of a consortium of organizations including Asosiasi Perikanan Pole & Line and Handline Indonesia (AP2HI), Masyarakat dan Perikanan Indonesia (MDPI), and the International Pole and Line Foundation (IPNLF), which have formed the Indonesian Coastal Tuna Sustainability Alliance (ICTSA). The primary objective of the ICTSA is to contribute to Indonesia's restoration and protection of marine and coastal ecosystems while also providing sustainable harvests of tuna to local communities. ICTSA further aims to strengthen Indonesia's market competitiveness by promoting transparency in the supply chain, ensuring traceability and accountability throughout the tuna value chain[1].

The research, conducted in October 2016, consisted of five site-specific supplier traceability audits in USAID Oceans' learning site of Bitung, Indonesia for Pole & Line, Handline and Purse Seine caught tuna in Indonesia. The scope of the traceability audit only considered traceability through the "first mile" of the supply chain, which is from point of first off-loading at port by vessels, through the associated supply chain, and to loading into secure containers for shipment to the processing factory or for export. The overall objective was to achieve a comprehensive understanding of the Bitung area's tuna supply chains and where they are currently situated in

[1] Note: The ICTSA objectives and aims are currently in draft and yet to be finalised.

relation to international traceability regulations. These assessments aimed to gain an understanding of the actors involved in the fisheries; the supply chains within which these actors participate; the catch documentation and traceability systems already in use and the gaps which exist within these to meet international traceability requirements.

The audits focused specifically on the traceability of tuna, and did not consider food health safety, quality control or assurance aspects. The audit procedure included:

- In-person interviews with person responsible for operations;
- Physical on-site investigation and walk-through of operations and facilities (from point of vessel docking to when products are loaded into shipping container for export);
- Review of processes and procedures (vessel, fishing, port, transportation, supplier facility and head office, etc.);
- Review of all relevant documentation and cross referenced throughout the supply chain (vessel, fishing, port, transportation, supplier facility and head office, etc.); and
- Analysis against pre-identified Key Data Elements (KDEs) required by regional and international regulations, such as the US, EU, WWF and EU.

KDEs are data that support tracking and tracing of products as they travel through the supply chain, allowing them to be traced back to the initial source of raw material. KDEs essentially inform and establish the who, what, where, when and how of seafood products. KDEs may also be related to other aspects of the seafood supply chain, such as its human welfare and social aspects.

KDEs remain with the product, on all records, as it travels through the supply chain from vessel through to end processing and sometimes to end consumer. Existing traceability requirements from regional and import markets (EU, US[2], WWF[3] and ACDS[4]) have established sets of KDEs to prove the origin of seafood being imported into those countries, with the main objective of combating IUU practices, assuring legality, and improving compliance and enforcement within the seafood sector. KDEs include unique identifiers, operational data (fishing operation, processing operation, cold storage operation), government data, transformations into value-add products, etc. The KDEs considered in this report focus on EU, US, ACDS and WWF requirements. (Appendix 7)

KDE's are critically important for robust traceability within a supply chain, ensuring legality of product, combating IUU and meeting market access demands from other countries, such as the EU and US. Benchmarking against the current international traceability standards and implemented KDEs, allows the identification of critical gaps currently present in Bitung's tuna supply chains and will help to support the learning site's companies/supply chains to comply with the various international seafood traceability requirements, decreasing the barriers to international seafood markets.

KDEs should be captured at Critical Control Points (CCP)—a point, step or procedure within the supply chain at which there is a high risk of potential issues to occur, such as identification, labeling, or recording.

This report presents a summary of the site audits and recommendations and solutions for continuous improvement.

2. METHODOLOGY

The methodology and process implemented involved a combination of techniques starting with a desktop review of materials sourced by FishListic and ICTSA members. Secondly, ICTSA worked to identify Bitung-area companies as candidates for the audit. Five companies were selected for participation, and audits were conducted following the high-level step-by-step process outlined below. Ahead of any interviews or other research engagements, companies were provided with a "pre-audit checklist" that provided guidance to help the relevant

[2] The US standard is still draft at time of writing this report and is yet to be clarified, especially with regards to small scale vessels (i.e., <5 GT).
[3] Not a standard, currently developed a set of traceability Principles and hosting global traceability dialogues.
[4] Not a standard, currently developing the CDS for trial and adoption with member countries from 2016 onwards. ASEAN has developed a set of guidelines for its members.

persons at each of the audit locations to familiarize and prepare for the processes. FishListic also requested that each site provide relevant documentation and information for the purposes of the audit, prior to conducting the site visits. This ensured that the research was conducted as efficiently and effectively as possible, with participants informed upfront on the research process and expectations.

The research process included:

- Conduct of **product audit** to follow the product through all stages of the first mile of the supply chain (from offloading to transport), considering:
    - the extent to which the systems provide credible documentation for all legally-caught fish of the species/fishery in question;
    - the extent to which the systems exclude illegal fish; and
    - the extent to which the systems are audited by those other than the parties directly responsible for filling out and validating the forms.
- **Stakeholder interviews** of company representatives (i.e., Operational Managers, General Managers, floor staff, etc.), and suppliers;
- **Records reviewed, analyzed and cross referenced** through the supply chain (e.g., catch certificates, catch records (e.g., vessel logs), vessel licenses, invoices, floor records, packing lists, etc. further details provided in below sections);
    - Identity and registration of vessel(s), identity of vessel owner(s) / operator(s);
    - Captains statement(s);
    - Vessel stowage plan;
    - How wastage is accounted for in processing;
    - Bill of landing/invoices;
    - Facility storage plan (i.e., cold storage);
    - Location of catch;
    - Authorization to fish (permits, licenses);
    - Species and product name;
    - Fishing method;
    - Date and time of fishing;
    - Quantities of target and non-target catch, discards, etc.;
    - Information on transshipments;
    - At-sea processing/transformation or any transformation occurring once landed;
    - Location, date, time and details (product and volumes) of landings;
    - Person / enterprise with custody after offloading;
    - Labeling/tagging of product and packaging used;
- **Reviewed data records, data methods and retention policies, document security, oversight processes and compliance/penalties for infringements;**
- **Reviewed fish segregation processes** (e.g. Pole & Line from Purse Seine, skipjack from other tunas, etc.);
- Analyzed product and record flow through the supply chain to assess how product and records are transferred between each link (one up-one down, full chain); and
- Assessed legalities of all operations.

Each site visit involved key informant interviews and onsite inspection of all relevant materials and systems. The audit physically followed the fish from the point of first landing, through the "first mile" of the processing supply chain, until the fish were loaded into containers ready for transport to secondary processors for export markets.

For the site audits, FishListic was supported by the ICTSA and partners with regards to logistics planning, field based work planning, introductions to supply chains and translation (Bahasa to English).

Furthermore, as part of the site audits, key participants (AP2HI, the United Nations Industrial Development Organization, and company stakeholders) were fully informed regarding the assessment methodologies, the KDE comparison matrix, potential gaps initially identified and the potential solutions. This helped to provide first-hand, real-time experience and knowledge to the participants to begin capacity building within the sector.

The KDE gap analysis was conducted in Bitung, with five participating companies and three separate gear types: Pole & line, Handine and Purse Seine. The audits considered traceability from point of first offloading (from capture vessel) at port through to loading into containers for shipment to secondary processors to be exported.

The audits sought to:

a) Identify all supply chains, actors, documentation and traceability systems (Pole and Line, Handline, Purse Seine);
b) Conduct a detailed robust gap analysis on the supply chains against current international requirements and recommended KDEs, with specific focus on US traceability requirements;
c) Illustratively map each supply chain; and
d) Develop a matrix comparing each identified supply chain against international requirements.

The key deliverables included:

- Identified critical control points (CCP) and associated gaps, as well as recommended solutions to address these failings within the current systems;
- A benchmark review analysis comparing the current systems with current international requirements and recommended KDEs, with specific focus on US traceability requirements;
- A supply chain flow diagram, and written description of product flow, identifying high risk areas;
- Master report, collating all observations and outcomes of individual analysis, providing non company specific key findings and results, recommendations for each supply chain category;
- Conclusions and recommendations for compliance to relevant international standards; and
- A matrix comparing each supply chain against the international requirements.

Prior to audits, all operations were provided, with a "pre audit checklist" (similar to that listed in the "Methodology" section below regarding step through process) for guidance to help familiarize and prepare for the process. The objective of the checklist was to ensure there were no surprises for the supplier and that the audit would be conducted as efficiently and effectively as possible. FishListic also requested that each site provide relevant documentation and information for the purposes of the audit, prior to conducting the site visits.

3. INTERNATIONAL TRACEABILITY REQUIREMENTS

This report does not intend to provide detailed summaries of the various international traceability requirements, but rather an overview of standards and the associated KDEs that need to be satisfied by operations in Indonesia to continue having the ability to export product into those countries successfully.

The below KDE requirements have been summarized and developed into a matrix by ICTSA and USAID Oceans members (Appendix 7). This matrix was used to compare the five companies supply chains and current baseline of traceability data being collected throughout the system, against the requirements of the international standards. These results are presented in Table 1.

3.1 European Union IUU Regulation

European Union (EU) Regulation 1005-2008 entered into force on 1 January 2010 via Regulation 1010-2009. The objective of the Regulation is to ensure that IUU fish does not enter the supply chains in the EU, and countries who wish to import product into the EU are required to have in place port state controls and a Catch Documentation System (CDS). Products entering the EU must be accompanied by a catch certificate that provides sufficient information to show that there is a low risk of the product coming from IUU fisheries, and therefore documentation must be sufficient to provide for robust traceability back to individual vessels. The Regulation can limit or restrict market access if seafood products do not carry a catch certificate which certifies compliance with fisheries laws, conservation measures, and anti-IUU measures.

Article 3 of the EU Regulation defines traceability as the "ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution."

Documentation must contain the following information:

- Unique document number;
- Name and address;
- Validating authority;
- Fishing vessel name;
- Flag State, home port and registration number;
- Call sign;
- IMO/Lloyds number;
- Fishing license number and valid date;
- Description of product;
- Type of processing authorized on vessel;
- Reference of applicable conservation and management measures;
- Species;
- Product code;
- Catch area and date;
- Estimated live weight (kg);
- Estimated weight to be landed (kg);
- Verified weight landed (kg);
- Name of master of fishing vessel, signature and seal;
- Declaration of shipment at sea;
- Flag State authority validation; and
- Transport details.

Where the EU considers that there is a risk of IUU entering their supply chains, they have given out a 'yellow card', and worked with the country in question to improve their systems over a specified timeframe. Where this has failed, the EU issues a 'red card' and imports of fish products from that country into the EU are banned. Currently, the EU has not issued Indonesia with a yellow or red card. Indonesia is considered to be presently in "good standing."

With regard to small scale, developing world fisheries (specifically artisanal fisheries) the EU Regulation 1010-2009 provides for a 'simplified catch certificate' for vessels <12 meters (or <8 meters for towed gear), or without a superstructure, or <20 GT. However, this "simplified catch certificate" still requires identification of the catch to individual registered vessels.[5]

3.2 United States Traceability Requirements

In 2015, a US Presidential Task Force on Combating IUU Fishing and Seafood Fraud developed and published an action plan[6] for implementing 15 recommendations to address IUU in the seafood sector. The action plan, among other matters, identifies working with foreign partners to strengthen international governance, enhance cooperation, and build capacity to combat IUU fishing. Such actions will strengthen enforcement, create and expand partnerships with state and local governments, industry, and non-governmental organizations, and create a risk-based traceability program to track seafood from harvest to entry into the US.

In February 2016, as part of the action plan, the US National Oceanic and Atmospheric Administration (NOAA) announced a new seafood traceability program —the US Seafood Import Monitoring Program (SIMP).[7] Following the program being put forward as a proposed rule and undergoing a public comment period, NOAA announced the program, to be enforced as of January 2018. The SIMP focuses on a set of priority species identified as particularly vulnerable to IUU fishing. Setting it apart from the EU requirements, the onus is put on the importing company—not the country of origin. However, the US have also introduced similar traceability data

[5] http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32008R1005 & https://ec.europa.eu/fisheries/sites/fisheries/files/docs/body/handbook_original_en.pdf
[6] http://www.nmfs.noaa.gov/ia/iuu/noaa_taskforce_report_final.pdf
[7] https://www.federalregister.gov/documents/2016/02/05/2016-02216/magnuson-stevens-fishery-conservation-and-management-act-seafood-import-monitoring-program

requirements to that of the EU IUU Regulation, implementing the NOAA Fisheries Certificate of Origin (NOAA form 370[8] (Appendix 2)) requirements for all imported products.

Under the SIMP, data will be required to be electronic, and all fresh and/or frozen tuna products being imported into the US must be accompanied by a Fisheries Certificate of Origin which is provided to the US Customs and Boarder Protection before being allowed to be imported. This form requires the following traceability information to be included:

- Species and product form;
- Weight (kg);
- Ocean area (e.g. Indian Ocean, Western Pacific);
- fishing gear;
- vessel flag;
- trip start and end dates;
- vessel name;
- If "dolphin safe" is declared on product then all fishing trips must have a captains statement that reads "no purse seine net or other fishing gear was intentionally deployed on or used to encircle dolphins during the fishing trip and that no dolphins were killed or seriously injured in the sets or other gear deployments in which the tuna were caught, and 2) completion of the NMFS TTVP dolphin-safe captain's training course".

While the US regulations do not specifically specify that a Catch Certificate is required, majority, if not all, of the information being requested by the NOAA form 370 can be found on the Catch Certificate for Indonesian fisheries (see below sections).

Further details on the US SIMP can be found at www.iuufishing.noaa.gov/.

3.3 ASEAN Catch Documentation Scheme

In support of global efforts to combat IUU fishing, in 2011 ASEAN Member State (AMSs) requested SEAFDEC to provide assistance to develop guidelines to prevent the entry of fish and fishery products from IUU fishing activities into the global supply chain. In 2013, the proposal to develop an ASEAN Catch Documentation Scheme (ACDS) was supported by AMSs. The objectives of the ACDS is to:

1. Provide a unified framework that will enhance traceability of fish and fishery products for effective marine fisheries management in AMS;
2. Enhance the credibility of fish and fishery products for intra-regional and international trade; and
3. Prevent entry of fish and fishery products from IUU fishing activities into the supply chain of AMS.

The proposed ACDS is a voluntary scheme that covers both large- and small-scale vessels. The ACDS is still in draft form and under the ASEAN strategic plan for 2016 – 2020. SEAFDEC has operationalized the ACDS with an electronic traceability tool, the eACDS, which is currently being piloted in Brunei Darussalam and is intended to be regionally expanded.

3.4 Word Wildlife Fund Recommendations

The WWF is currently conducting a global dialogue on seafood traceability with all stakeholders, ranging from industry and experts to governments, in order to work towards a consistent global framework to facilitate robust seafood traceability within global supply chains. The global dialogues are aimed at aligning all the current systems/standards in terms of data demands, data quality standards, data communication systems and alignment of data access rules.

In 2013, WWF convened an Expert Panel on Legal and Traceable Wild Fish Products to promote a global framework for ensuring the legality and traceability of all wild-caught fish products. The panel was established to identify complementary regulatory and private sector mechanisms for overcoming common obstacles to

[8] http://www.nmfs.noaa.gov/pr/dolphinsafe/docs/fisheries_certificate_of_origin_370_-_july_2019.pdf

establishing such a framework. The panel produced a final report in 2015 titled "*Recommendations for a Global Framework to Ensure the Legality and Traceability of Wild-Caught Fish Products.*"[9] The report developed a vision and principles for a global traceability framework and provided eight recommendations.

In 2015, WWF also released a set of traceability principles[10] that informed stakeholders as to WWF's expectations regarding traceability within the seafood sector. The objective of these principles is to ensure the exclusion of IUU fish from supply chains (Appendix 3).

These Principles require the following KDEs to be captured and recorded:

- vessel identity and registration
- identity of vessel owner / operator
- location of catch
- authorization to fish (permits, licenses)
- species and product name
- fishing method
- date and time of fishing
- quantities of target and non-target catch, discards and habitat impacts
- information on transshipments
- at-sea processing
- location, date, time and details (product and volumes) of landings
- person / enterprise with custody after landing
- other compliance data if required by law

4. SITE AUDITS

The Indonesian Coastal Tuna Sustainability Alliance (ICTSA) members and partners internally pre-selected the supply chains and the companies that were to be audited in the field during this project. Prior to the site visits, ICTSA members defined several categories of likely supply chains that would be audited during the project for Pole & Line, Handline and Purse Seine, these included:

1. **Vertically Integrated:** The entire chain is owned by one company. Vessels and crew are under control of the processor/exporter.
2. **Semi-Vertically Integrated:** The aggregator owns vessels and sells to a company under contract.
3. **Contractual vessel-aggregator:** Processor/Exporter: all nodes in the supply chain are independent, yet work with each other on a contractual basis.
4. **Non-Contractual vessel-aggregator**: Processor/Exporter: all nodes in the supply chain are independent. Parties work together on a case by case basis.
5. **Disaggregated independent nodes:** Vessel owners/aggregators decide who to sell to on a daily basis, based on price. Spot buying. Mixed gear sourcing.

Four of the above ICTSA defined categories of supply chains were audited during the project and included one vertically integrated (Pole & Line and Purse Seine), one semi-vertically integrated (second stage processor), two non-contractual vessel aggregator (Handline) and one disaggregated independent node (second stage processor) supply chain.

All audits were of tuna supply chains sourcing predominately Skipjack tuna (Katsuwonus pelamis) and Yellowfin tuna (Thunnus albacares). Some supply chains also sourced Marlin (Istiophoridae), Bigeye tuna (Thunnus obesus), Bonito (Sarda australis) and Swordfish (Xiphias gladius).

Most of the supply chains audited exhibited simple product flows from point of first offloading by vessel, through

[9] http://www.solutions-network.org/site-legaltraceablefish/files/2015/03/EPLAT_FinalReport_March2015_Webview.pdf

[10] http://www.worldwildlife.org/publications/traceability-principles-for-wild-caught-fish-products

to packaging and export. However, audits of second stage processors were slightly more complex as the source of raw materials had to be considered. Examples of the audited supply chain product flows are located in Appendices 1 – 3. It should be noted that, due to commercial confidentiality, the supply chain product flows described in Appendices 1 – 3 are examples only and do not represent any one company's supply chain.

5. OVERVIEW OF TRACEABILITY ASSESSMENT FINDINGS

5.1 Record Keeping Systems

In order to meet and satisfy the above regulations and requirements successfully, a robust process must be implemented. At the heart of the process must be accurate and complete record keeping systems that are credible and consistently applied throughout the supply chain.

There are commonly two types of record keeping systems available to seafood supply chain: paper-based systems and electronic systems (e-systems). All five supply chains audited were operating with paper-based systems from vessel through to export of product.

All five audited supply chains were implementing paper-based systems for record keeping and KDE capture. The systems were found to vary in complexity, depending on the supply chain, with some simple and others requiring a complex recording system to capture numerous data entry points and KDEs throughout the chain. All fishers and suppliers involved within these supply chains were operating basic paper-based systems, usually recorded in an exercise book or a receipt book (not including fisher's logbooks and other government required forms, see sections below regarding vessel requirements).

All companies audited had an approved list of suppliers and/or vessels as part of their paper-based records, in which they sourced raw material from. Most of these lists are maintained and updated annually. These lists were often simple and provided a vessel name and identification or a supplier name and code. They did not provide any required KDEs as presented in Appendix 7, with the exception of vessel identification and in some cases the captains name.

Paper-based systems are very common and can be created to capture any amount of data from across all areas of the supply chain and processing stations. Multiple paper records are required in order to capture information at each of the processing stations and enable accurate transfer of data between stages in the supply chain to maintain product identification and traceability back through the chain. There were several companies identified as to having a lack of paper records in place to capture data at critical control points or using the same paper record form to record data from several stations in one day. This is considered to be inefficient and often has the potential to lead to inaccurate and incomplete records, compromising KDEs. However, most companies audited, had implemented a robust paper based system that was simple and straight forward, enabling the capture of all the KDEs at each of the processing stations on separate forms, as required by various traceability standards. The data records from these companies were found to be accurate and complete.

Paper-based systems often lack efficiency and ease at which product information can be recalled and used to trace a specific product back through the entire supply chain. Companies with accurate and complete paper-based records with robust systems and procedures would be well suited to transition from a paper-based system to a simple e-system platform. By transitioning to an e-system, it is expected that companies would recognize great savings in efficiencies, data recall, product traceability, processing yields, improved accuracy and completeness of records, reduced data errors, productivity improvements, accurate and timely transfer of information from one station to another, as well as real time data access and analysis.

Companies with gaps in their paper-based system(s) should first address the identified gaps and process breakdowns before transitioning to an e-system. It is best to have a paper-based recording system that is accurate and complete with staff buy-in and training before introducing a new e-system when there are clear gaps in current processes, systems and procedures.

5.2 Product Identification

It is fundamental that all seafood products can be identified and as coming from legal operators throughout all stages of the supply chain and include appropriate physical identification with supporting record keeping documents such as sales records and invoices. Identification records, labels and tags must capture at bare minimum the appropriate KDEs that enable a seafood product to be traced back to its point of catch. Depending on what stage in the supply chain an actor is present, each actor must record the required KDE to allows at least a one-down and one-up track and trace to occur. For example, a second stage processor must capture KDEs that enable the product to be traced back to supplier; the supplier must capture KDEs that allow the product to be traced back to middleman or cold storage; and the cold storage actor or middleman must capture KDEs that allow the product to be traced back to a vessel that can demonstrate legal operation in accordance with all local and national government regulations. Ideally, captured KDEs from the start of the supply chain (the vessel) would be passed up the chain to all other actors, allowing efficient and effective traceability to occur at any stage within the supply chain.

Product identification through the use of unique identifiers such as labels or tags, either on each fish or batches of fish, was highly variable across those companies audited. The majority of companies were found to have developed and implemented good tagging and labelling systems, supported by appropriate processes and procedures. One company used tags or labels at the receiving stage, but did not implement consistently through all stages. Despite the gaps in their tagging system, they were able to produce traceability documents that were able to trace the product back to a vessel or supplier in the chain, however, this information cannot be verified as correct or valid.

Overall, identification systems and procedures were found to be inconsistent across the supply chains, with Handline and vertically integrated Pole & Line and Purse Seine companies showing particular strengths in efficient and consistent systems. Two out of the five companies audited demonstrated robust, accurate and complete tagging and labelling systems, processes and procedures that were consistently applied throughout their respective supply chains. Apart from these two companies, most other companies, if required to trace back to the vessel, were unable to demonstrate that their systems, processes and procedures were capable of identifying products with any real confidence at all stages throughout the chain.

The primary issues identified with tagging and labelling systems included:

- Old label still present when new product enters, leading to potential for confusion and mixing;
- Tag material inappropriate for the environment of use (i.e., paper in wet areas);
- Inconsistent application of tags and labels throughout the supply chain (i.e., some trays/trolleys labelled others are not); and
- Poor recording of tags/labels when moving through different stages and processing stations within the supply chain, often on paper based systems.

5.3 Storage Plans

Well-developed site or vessel stowage plans are critical in maintaining product identification and verification of were product has originated from and is legal product.

Only one company that was audited could provide vessel stowage plans (for purse seine only), and some record of which batch of fish went into which air blast freezer unit. None of the companies had storage plans for land-based facilities or vessel stowage plans, nor related systems, processes or procedures in place.

5.4 Segregation

Overall, segregation of product was observed to be quite good with the majority of companies keeping gear types (i.e., Pole & Line from Purse Seine) separated from one another throughout the supply chain. Segregation between vessels and batches was witnessed to be more difficult and less complaint. This could pose an issue when required to trace back to specific vessel under the EU and US traceability regulations. While some supply chains, such as Handline and vertically integrated companies, already have in place robust and accurate systems

to capture and maintain segregation at this finer level, most other companies will require better systems, processes and procedures to be developed and implemented to enable compliance.

5.5 Summary Findings and Analysis

While all companies demonstrated the ability to trace specific product back to a specific vessel, not all were able to do so with proven accuracy and credibility (especially from cold storage actors where several months of fish from several vessels could be stored without segregation). Traceability of product back to a specific vessel was the highest confidence in Handline supply chains and some vertically integrated companies or those second stage processing companies that sourced from vertically integrated suppliers. It should be noted that while the end processor (for example a Handline processor) might not be able to trace back directly to a specific vessel, they demonstrated that they could trace back to a specific supplier, with the supplier then able to trace back to a specific vessel upon request.

While all companies provided the required paper trails to allow the audit to trace back to a vessel and therefore the associated Catch Certificate, there was some uncertainty and questionable credibility concerning the catch certificates that are allocated to each shipment of exported fish. Catch Certificate credibility may be challenged by the fact that some supply chains can hold several months of fish from several vessels in cold storage without any segregation of vessel, and Catch Certificates are inconsistently issued, ranging from just a few weeks to up to four months in some cases. The ability for a company to be able to allocate a specific Catch Certificate to a specific container load of fish under these circumstances raises serious questions regarding the accuracy and credibility of the Certificates.

All companies, due to the economic requirements to parties up and down the chain, did maintain accurate and complete records concerning quantities or weights of product being bought and sold in the supply chain, as well as the ability to identify to whom the product was sold. It was possible to conduct mass balance exercises for all companies audited based on these records from first receivership through to export container and invoices. Records were straight forward for cold storage facilities where whole fish are bought and sold and therefore two weight records are usually kept (i.e., weight record when fish first received and a second weight record when fish bought and dispatched). The records for other companies, such as second stage processors, were more complex and required numerous records to be maintained through key stages—first receivership, butchering, loining, packaging, etc. Each of these stages requires a separate record form.

There was no evidence that any company supply chain was sourcing from vessels that were, or are, on any Regional Fisheries Management Organization's vessel black list for IUU practices.

6. DOCUMENTATION REQUIREMENTS

The legality of the source vessels operations, the authority in which they conduct fishing activities and adherence to regulatory and legislative frameworks are key indicators of a traceability system that is robust and effective. While Indonesian tuna fisheries, and Pole & Line, Handline and Purse Seine vessels operating in Indonesia are required to abide by the laws and regulations of the government (Appendix 4), it was observed through the audit process, that the below requirements were inconsistently applied across Indonesia with adherence varying between regions under district or national authority. The below vessel requirements may not be applicable to certain vessel size classes (i.e., <5GT). For the purposes of this audit, all vessels being sourced from were considered to be legal and registered.

In Indonesia, all vessels are required to have an annual license and registration in order to operate. The government maintains an electronic registration system that contains all vessel data for internal record and review. While all government agencies conduct internal audits of this data each year, there is uncertainty regarding the consistency of this process and the accuracy of records throughout the various regions of Indonesia, particularly when considering the smaller vessel size classes of <20 GT. The accuracy and credibility of the system is further compounded when including vessels <5 GT in the system, especially from remote regions where there is currently a lack of government fisheries or port authorities to manage such processes and procedures, to collect data, and issue licenses, registrations and other regulatory requirements. Such procedural gaps raise questions concerning the technical legality of such vessels operating.

Vessels <5 GT are not required to have a Surat Ijin Usaha Perikanan (SIUP, Licensing of Fisheries) and Surat Ijin Penangkapan Ikan (SIPI, Fishing License). Instead, they must have Bukti Pencatatan Kapal Perikanan (BPKP, Fishing Vessel Documentation Proof). They also use a special, simplified format of the Sertifikat Laik Operasi (SLO, Certificate of Operation Feasibility) and Surat Persetujuan Berlayar (SPB, Port Clearance). The SPB may be used for one week, instead of once per departure to simplify for small-scale vessels with short trips. Furthermore, there is a special format for small-scale vessel logbooks. Small-scale vessels must have a Pas Kecil (certificate for small vessels under 20 GT),

6.1 Fishing Vessel Legality

While the Indonesian government does have processes and regulations in place to deem fishing vessels legal, they vary considerably between vessel size classes (0 – 5 GT, 5 – 30 GT, >30 GT), location and type of government (i.e., region, provincial, national). This can result in uncertainty, inconsistency and confusion regarding the exact requirements for fishing vessels. The following requirements were applicable to this audit, with alternate requirements for small-scale vessels.

All vessels are required to obtain an SLO, issued by the Directorate General of Surveillance and Monitoring Control of Marine and Resources and Fisheries (PSDKP) under the Ministry of Marine and Fishery who must first validate the following information:

- Sticker and barcode;
- Pungutan Hasil Perikanan (PHP, Levies of Fishing)
- Surat Keterangan Aktivitas Transmiter (SKAT, Certificate of Transmitter Activity)
- Crew list;
- Pemberitahuan Ekspor Barang (PEB, Notification of Export)/Surat Keterangan Asal (SKA, Certificate of Origin)/Health Certificate
- Type of gear: number, size, specification, catch; and
- Physical vessel verification: machine, size, power, engine, vessels size (GT), size of holder, etc.

Once these documents are validated and approved, the SLO is issued. If the documents are incorrect, the SLO is not issued and an improvement notice is served to the fisher prior to reapplying. The SLO is required to apply and obtain an SPB.

Relevant Vessel and Fishing Certifications and Documentation

BPKP - Bukti Pencatatan Kapal Perikanan (Fishing Vessel Documentation Proof)
HC - Health Certificate
SIPI - Surat Ijin Penangkapan Ikan (Fishing License)
SIUP - Surat Ijin Usaha Perikanan (Licensing of Fisheries)
SKA - Surat Keterangan Asal (Certificate of Origin)
SKAI - Surat Keterangan Asal Ikan (Certificate of Fish Origin)
SKPI - Surat Keterangan Pendaratan Ikan (Certificate of Fish Landing Information)
SKAT - Surat Keterangan Aktivitas Transmiter (Certificate of Transmitter Activity)
SLO - Sertifikat Laik Operasi (Certificate of Operation Feasibility)
SPB - Surat Persetujuan Berlayar (Port Clearance)
STBLK – Surat Tanda Bukti Lapor Kedatangan Kapal (Proof of Ship Arrival)
Pas Kecil - Certificate of Small Vessel (<20 GT)
PEB - Pemberitahuan Ekspor Barang (Notification of Export)
PHP - Pungutan Hasil Perikanan (Levies of Fishing)

6.2 Approval to Fish

A Surat Persetujuan Berlayar (SPB, Port Clearance) is issued by the Harbor Master if a vessel is legally registered, complies with safety requirements (i.e., lifejackets, rafts, lights, etc.), has filed a sailing plan, and has submitted a list of all persons on board. All vessels exiting a registered harbor must undergo this process. Vessels operating from Fish Landing Centers or private landing facilities may not require a SPB. The fisher applies for the SPB by providing the Port Master with the following:

- Skipper's statement for the fishing trip;
- Log book, list of fishing crew, SLO, Surat Tanda Bukti Lapor Kedatangan Kapal (STBLK, Proof of Ship Arrival);
- Previous SPB;
- Receipts of port service payment; and
- Vessel documents.

The Port Master then must validate the information provided, and once validated, conduct a final verification, approve, and issue the authority to fish. Authorisation for vessels to leave port authorises the number of people, GT, gear type, time allowed to fish, skipper, owner, mechanic, name, flag, and registration number from transport authority, etc. This must be obtained prior to every trip, before the vessel leaves port.

6.3 Landing of Fish

In order to legally land fish in Indonesia, all vessels must obtain a letter for fish landing (an SKAI or SKPI) to verify that the catch complies with government regulations to prevent, deter and eliminate illegal, unreported and unregulated fishing. The SKAI/SKPI is the initial document needed to initiate the Catch Certificate and is issued by either the head of the village for small-scale vessels, or by Marine and Resources and Fisheries; under the Ministry of Marine and Fishery (PSDKP) and is based on the Ministry Decree. No. 13/ 2012, which aims to fulfill Indonesia's traceability requirements.

To receive an SKPI, the skipper of the vessel must first apply and be recommended for the letter by a government officer. The officer then conducts a physical verification, matches the appropriate documentation and issues the SKPI if all documentation is satisfactory.

6.4 Logbooks

Marine and Fisheries Ministerial Regulation 48/2014 stipulates the logbook obligations for fishers in Indonesia. These obligations include the following:

- Logbooks are only required to be maintained and submitted by vessels that are larger than 5 GT;
- Logbook forms are differentiated by fishing gears (i.e., Form 1 - Tuna Longline and Tuna Handline; Form 2 - large Pelagic Purse Seiner, Pole & Line, and Troll; and Form 3 - other fishing gears); and
- Logbooks are to be submitted to the Harbor Master or to the relevant Marine and Fisheries Officer.

Fishers must complete logbooks and submit them to the government agency for every trip. Hard copies of these logbook sheets are archived and entered into the main database housed in the Jakarta head office. There are sanctions and penalties associated with logbook infringements that use a four-strike approach. The first three strikes are associated with strong warnings from the government, but the fourth strike results in loss of fishing license.

6.5 Catch Certificates

Robust traceability systems are supported by accurate and comprehensive documentation and accompanying processes and procedures. One of the most important documents for verification of Pole & Line and Handline fish is the official Catch Certificate (CC) (Appendix 5). This document provides all fishing information required by a robust traceability system. The CC for Indonesian fisheries is essential for exporting seafood product into Europe, but other markets such as the US and Japan currently do not require a CC with imported seafood products. It should be noted, particularly with regard to the US market requirements, that this situation may change in the near future.

Information included on the CC included:

- Unique CC identification number (this number is unique to each CC issued and is provided to both the government and processing company and supplier);
- Identity and registration of vessel;
- Identity of vessel owner(s)/operator(s);
- Fishing area;
- Species name (scientific name);
- Fishing method;
- Date and duration of fishing activity; and
- Quantities of catch (kg).

There are two separate master CCs that can be issued to a fishing operation and catch, these are:

- CC covering vessels <20 GT; and

- CC covering vessels >20 GT.

The >20GT form only tracks one vessel and its operations, while the <20GT form often contains several vessels. The information for the <20 GT form is not as detailed and often relates to multiple vessels and trips, making the robustness of these CC's questionable when considering EU and US requirements. Furthermore, many small-scale (<5 GT) vessels have difficulty claiming fish through the CC process (either due to remote locations, small number of fish, or not understanding the correct procedures) and therefore often do not undertake the process to get a CC for their fish. However, these vessels and their catch often appear on CCs for vessels <20 GT at time of processor needing to export the product. This raises credibility issues with CC processes and procedures, as well as the government and processors' tracking systems.

Marine and Fisheries Ministerial Regulation 13/2012 outlines the CC obligations. This Regulation, under Articles 10 to 13, states that applications for a CC must be reviewed by the competent authority and a response provided within two days of the application. However, Catch certificates are not developed and issued automatically, they must be requested by the supplier/processor and as noted in previous sections, CCs can take anywhere between two weeks to four months to be issued. Steps to generate a CC include:

1. Original copy of logbook is sent to the supplier and a copy goes to the local Port Master;
2. The logbook is provided to the local fishing control authority from the government agency to verify the data;
3. If the data is verified, the authority issues a letter of verification to the company;
4. The letter of verification, the logbook, and all other documents relating to the vessel authorisation (registration, licences, authority to fish, etc.) are provided to the Port Master in order to have CC issued;
5. The weight of fish contained on the CC is verified by both the logbook data and either by the company weighing the fish at first stage of the supply chain or by a government authority who carried out the initial port weigh in of offloaded fish;
6. The CC is signed and verified by the Port Master and counter signed by the owner/vessel co-ordinator verifying that the information provided on the CC is accurate and correct;
7. The CC is only then issued following a request by a supplier who has a purchase order; and
8. The CC is not considered legal unless it is accompanied by the fishing license for the corresponding vessel.

The process includes three stages:

1. Initial catch certificate (SHTI-LA):

   The fisher submits a CC application, but first needs to satisfy the other requirements (SKPI, SIUP and an SPB). A draft initial CC is provided and the documentation (vessel monitoring, logbooks, fishing approval letter, etc.) are validated. Once validated, the CC is prepared and a certificate number is issued and the initial CC is issued.
2. Derivate SHTI:

   An application is made for the CC (documentation includes copy of initial CC, draft SHTI, fish purchase invoice, packing invoice from processing company and letter of product shipment). These documents are then verified and the SHTI derivate issued.
3. Simplified Derivate SHTI (SHTI-LTS):

   An application for the simplified SHTI-LTS is submitted (documentation required includes draft SHTI-LTS, fish purchase invoice, packing invoice from processing company, letter of product shipment and SKPI). The documents are verified through fishing license and logbook data and then a SHTI-LTS is issued.

7. KDE GAP ANALYSIS

If the five company supply chains audited, none were implementing a purposefully built traceability system or platform, apart from the everyday paper records that are produced as a course of doing business. While these systems provided the required components to prove the origin and legality of raw material through the supply chain and to the export market, the systems have limited confidence, credibility and robustness.

The KDE Gap Analysis results[11] indicated that all of the companies audited were able to meet, and therefore were likely to achieve and satisfy, a majority of the traceability requirements of the EU and US[12] systems, as well as the WWF and ACDS recommendations. However, all companies failed to satisfy five KDEs (Table 1): VMS unit[13]; IMO/Lloyds number, Inmarsat number, electronic data and dolphin safe statement from vessel Captain. While vessels >30 GT are required to have a working VMS unit, a record of this was not able to be located during any of the site audits in any of the records maintained by the supply chain actors.

The KDE regarding date/time/location of transshipment was only applicable for Handline as there was no evidence of transshipment occurring for either Pole & Line or Purse Seine. However, a collection vessel was used by some Handline supply chains. There is still some question and debate regarding the actual definition of transshipment and the legality of such practices at time of writing this report. However, a new regulation (Peranturan Direktur Jenderal Perikanan Tangkap Nomor 1/PER-DJPT/2016)[14], does allow transshipment to occur but with a number of controls and vessel requirements. Some of the requirements include:

- Collecting vessels must be between 30 – 200 GT;
- No distinction between gear types;
- Fishing vessels must have an MoU with the collecting vessel and only one MoU can be entered into by a fishing vessel (i.e., only one collection vessel can be used);
- Collecting vessels can only collect from three sets or fishing vessels in one trip;
- Fishing vessels >30 GT must have VMS; and
- Collecting vessel must:
    - allow observer onboard;
    - receive fishing logbooks from fishing vessels it is collecting from;
    - activate VMS;
    - install cameras on vessel in accordance with regulations;
    - only collect from those vessels it has an MoU.

A further three KDEs were only partially met by the Handline supply chains, these included name of vessel, unique vessel identifier/registration, and fishing license. It should be noted that vessel name was not present on some of the Handline product that was sourced through use of collection vessels given the small-scale (< 3 m in length) nature of these. However, fisher name was available. For similar reasons, some Handline vessels did not have a unique identifier/registration or fishing license (due to small boats being used <3m) as the catch was allocated to a fisher and not a particular vessel. In all cases, fisher name was recorded and attributed in the catch records.

With regard to the IMO/Lloyds and Inmarsat number requirements, these are all components that are not currently required by the Indonesian government and are unlikely to be in the near term. Indonesia only requires VMS on vessels >30 GT. Small-scale use would require adoption of innovative technologies that are adapted to weather extreme elements and with designed to use alternative power sources. These KDEs are especially impractical for a companies as they source from a number of small-scale vessels ranging in size from <1 GT to <30GT, although some companies source from or own larger vessels up to 90GT.

Transshipments were observed to occur occasionally, but was referred to as collection from a "collection vessel" that collected tuna from between 10 to 15 small-scale vessels (dories measuring < 3 meters in length) fishing in the same area as one another. These smaller vessels belonged to the collection vessel and the company that was audited. The collection vessel maintained records of each source vessel, area fished, fisher name and date, but the Catch Certificate (which included multiple vessels due to small-scale nature) did not state that transshipment had occurred, as is required under the international requirements. It should be noted that at time of writing this report, the regulations concerning transshipment, and its actual definition according to Indonesian government, were under discussion by the government. Therefore, it was not clear whether this type of transshipment was a permitted, legal activity.

Although the audit identified several key KDE gaps, many current gaps may have relatively solutions that are low

[11] Note: specific individual KDE gap analysis results are not included in this report due to commercial confidentiality. However, the results from each of the five audits have been compiled into one master analysis to allow presentation of the main findings that are generic to most of the supply chains assessed.
[12] Note: US requirements and KDE's are still "proposed" and yet to be confirmed.
[13] VMS is required on all vessels >30 GT, however, no actor within the supply chain records if vessel has an active VMS unit.
[14] https://drive.google.com/file/d/0B2nX9RCxb67gcGV6cWxPZnc4U3c/view

cost and usually associated with low technological solutions supplemented by some additional staff training to implement the improvements into everyday operational activity. It is not envisioned that companies would require any additional staff to develop and implement the traceability systems, but instead an existing staff member could be appointed and made responsible for the development, implementation and adoption of traceability systems. Other more resource-intensive gaps, such as VMS, will require more intensive investment and support from the Indonesian government.

Some of the key areas (at a high level) identified needing improvement to meeting the full list of expected KDEs, included:

- A lack of robust labelling and identification systems throughout;
- A lack of the use of unique identifiers for products through various stages of the chain, including packaging used, which relate back to initial source of raw material;
- A lack of Standard Operating Procedures (SOP);
- A lack of Relevant SOP reference martials for all staff operating on the floor;
- A lack of clear segregation processes and procedures, identification and labelling;
- A lack of clear identification or record keeping at key areas within the supply chain;
- A lack of appropriate coding on packaging that enables product to be traced back to batch number and vessel;
- A lack of clear statement of gear type on sales documentation specifically invoices;
- Lack of VMS units on small scale vessels <30 GT;
- Lack of vessel name, unique identifiers/registration and fishing licenses;
- Lack of IMO/Lloyds numbers;
- Lack of E-Systems;
- Lack of Inmarsat numbers;
- Lack of Captains statement regarding dolphin safe requirements; and
- Lack of detail concerning transshipment of product at sea on catch certificates.

From the five companies audited during the project, it was apparent that majority of the required information components that are needed to ensure robust traceability throughout a supply chain, is readily available and accessible to key actors at the beginning of the chain when fish are first offloaded by vessels at port and ownership is taken by first receiver suppliers. Most first receiving suppliers access and record this important information for their own purposes, usually for their own business requirements, i.e., regarding payments to fishers for product.

Unfortunately, for many of the supply chains, this information is not passed up the chain (mainly as there has not been a need/requirement to do so in the past), or if it is passed up the chain, the companies requiring and accessing this data often suffer from either a lack of or inconsistent application of a system that captures this information and applies it across their supply chain through the various stages. In most cases, the paper records kept throughout supply chains appear to capture the information, however, the processes and procedures on the floor of facilities to facilitate the capture of important identification data and physically attach to each product, usually through labelling and tagging each batch of fish at each stage in the chain, is lacking or inconsistent.

The government of Indonesia plays a critical role in the traceability process, being the only body that can provide the accurate verification of company records regarding catch (i.e., catch certificates) which is supported by the various vessel requirements. This of course must be supported by robust enforcement and compliance and implementation through legal sanctions as well as consistent application of legal requirements for fishing vessels which are clear, concise and readily available for all vessels across all regions and be able to be issued by the various governments such as regional, provincial and National. The Indonesian government is the only authority that can direct and control these matters and therefore is a key to effective catch documentation systems into the future. Therefore, it will be important to identify and determine which government agencies, on both a regional, national and local level, play in improving the traceability in the tuna fisheries (Pole & Line and Handline).

There were several areas identified that would benefit from government involvement and support. One of the main areas for government to be involved concerns the Catch Certificates. The current Catch Certificates could be improved in several ways to enable provision and transfer of information more efficiently to the industry and external parties (i.e., buyers). This is the case when considering the gear type used on a trip to harvest the fish. Presently the CC does not state what gear type was used to harvest the catch. Instead, this information is contained on another document relating to the vessel and not a particular trip or batch of fish. This could be

easily resolved by including a gear code on the CC for quick reference and validation of raw material and exported product to buyers.

The audit showed considerable inconsistencies in the timing of issuing the CC to a processing or cold storage company from government authorities, some being issued within weeks of catch being landed while others taking several months. This was witnessed across multiple supply chains, from cold storage through to second stage processing facilities and exporters of product. The inconsistency of CCs raises a creditability issue with the accuracy of information and process regarding these important documents. The CCs are a fundamental component to the success of any traceability system and its robustness and credibility for users and buyers globally. It is important that the government improve its processes and procedures regarding the use and issuing of CCs across Indonesia that will ensure consistent application that restores confidence, credibility and robustness.

Suppliers and processers within the supply chain need to form strong working relationships and inform and educate one another regarding each other's roles and responsibilities within the supply chain in terms of traceability requirements and needs. Suppliers and processers need to come together to develop and implement ways in which their associated supply chains can share information up and down the chain in an effective, efficient and robust way without compromising commercial confidentiality—the goal being to enable identification of product through every step within the chain from catching, sourcing, processing and export.

Assessments indicated that the majority of companies were collecting or had access to most of the pre-identified KDEs required under the various other traceability systems such as the US, EU, ACDS and WWF requirements (Table 1). Therefore, it is likely that majority of Indonesian tuna companies could have the potential to be able to satisfy most other traceability system requirements with improvements as identified above, particularly regarding labelling and record keeping to ensure that identification of the product is consistently applied throughout the supply chain. All supply chains and companies within, would benefit greatly from the development and implementation of a basic, purpose-built traceability system. Transitioning to a purpose-built traceability system (preferably an e-system) would enable the companies to recognize great savings in efficiencies, data recall, product traceability, processing yields, improved accuracy and completeness of records, reduced data errors, productivity improvements, accurate and timely transfer of information from one station to another, as well as real-time data access and analysis.

Table 1: Assessment outcomes against pre-identified KDEs

KDE	WWF	Required US Wild Harvest	Required EU	ACDS	Gear Type		
					Pole & Line	Handline	Purse Seine
Point of Catch							
Scientific name (species)	X	X	X		X	X	X
Common market name		X			X	X	X
ASFIS # or product code		X		X	X	X	X
Estimated weight				X	X	X	X
Verified weight/volume (quantity)	X	X	X	X	X	X	X
Location of catch	X	X		X	X	X	X
Catch description			X		X	X	X
Date of departure					X	X	X
Date & time of catch	X	Date only		Date only	X[15]	X	X[16]
Date of landing					X	X	X
Type of gear/method	X	X	X		X	X	X
Name of fisher(s)					X	X	X
Name of captain/master			X	X	X	X	X
Nationality(ies) of fishers/crew					X	X	X
Company name		X			X	X	X
Fishing vessel owner name			X		X	X	X
Address & contacts		X	X		X	X	X
Name of vessel	X	X	X	X	X	partial[17]	X
Unique vessel ID/register #[18]	X	X	X	X	X	partial[19]	X

[15] Fishing trip date only (e.g., September 4 – September 10). Not specific day of catch.
[16] Fishing trip date only (e.g., September 4 – September 10). Not specific day of catch.
[17] Vessel name was not present on some of the handline product that was sourced through use of collection vessel given the small scale (< 3 m in length) nature of these. However, fisher name was available.
[18] UVI used by companies was the government issued vessel registration number for each vessel being sourced from.
[19] Not present on some Handline vessels due to small scale nature. However, AP2HI have been registering some of these small scale vessels.

VMS unit #[20]			X				
Vessel type/ tonnage			X		X	X	X
Fishing license #	X	X	X	X	X	partial[21]	X
Flag state of vessel	X	X	X	X	X	X	X
Date, time, location of transshipment	X	X		Declaration	N/A	X[22]	N/A[23]
Trip #		X (if applicable)			X	X	X
Electronic data	X	X					
Dolphin Safe statement		X					
IMO/Lloyd's #			X	X			
Inmarsat #			X	X			

[20] Required in Indonesia for vessels >30 GT only.
[21] Vessel license number was not present on some of the handline product that was sourced through use of collection vessel given the small scale (< 3 m in length) nature of these. However, fisher name was available.
[22] If it occurs.
[23] No evidence found of transhipments for purse seine.

When comparing the level of risk, lack of important traceability components and considering the KDE outcomes for different nodes within each supply chain across the three different gear types (Table 2), Handline was identified as having the greatest risk compared to the other two gear types, but only marginally.

Table 2: Comparison of level of risk associated with each gear type for key nodes within each of the supply chains audited

Supply Chain Node		Pole & Line	Handline	Purse Seine
Vessel (catching)				
Transshipment		N/A		N/A
Offload				
Supplier (cold storage)	labelling			
	segregation			
	records			
	Cold storage plan			
Transport				
Processing	Receiving			
	Butchering/trimming			
	Cooking		N/A	
	Skinning/Loining or retouching			
	Gassing	N/A		N/A
	Packaging			
Export				

Low Risk	Medium risk	High risk

While the three gear types were fairly evenly matched across most nodes, Handline showed much greater risk at the vessel (catching) node. This is primarily due to the small-scale nature of the vessels used for this type of fishing activity that can result in a lack of fishing vessel names, registrations or any other unique identifier, licenses, and inability to accommodate VMS units and electronic data capture. Furthermore, transshipment of raw material at sea via the use of a collection vessel is also seen to be of high risk, particularly given that there is no mention of such activities contained on the Catch Certificates. These risks can lead to mixing of fish species (example Yellowfin tuna with Bigeye tuna) and increased risk of IUU products, especially from unregistered vessels and unidentified sources. These risks impact the ability of the fishery/operations to gain access to lucrative international markets resulting in lost revenue and potential further impact on the long term sustainability of the fish resources.

During the audit process, several traceability systems (Tally-O and OurFish) were identified as being used within only a few select supply chains. However, there are numerous other traceability systems available and being piloted within Indonesia, especially in tuna fisheries and their associated supply chains. As part of this program, a desktop review was conducted on identified traceability systems (identified by ICTSA members) that are currently operational in Indonesian tuna fisheries. This review compared each of the various systems in use against the pre-identified international traceability standards and KDE requirements (Table 3). It is important to

note that this was conducted only through a desktop review. Ideally these systems require on site auditing in real time throughout the supply chains to ensure accuracy and completeness.

While Table 3 illustrates only one traceability system that could potentially satisfy all the international standards' required KDEs, most other systems had the ability to develop functionalities to enable additional data capture. The reality is that until now, demand for this has been limited. Therefore, where the table illustrates that a system did not meet the KDE requirements, this does not mean that it could not with future product development.

Several systems were reviewed that offered vessel tracking system capabilities, but did not offer any ability to capture and report required KDEs. These systems are still very much required and essential to robust traceability as they provide a vital, verified record of where the vessel fished and the location of catch, which can be used to verify the other traceability records.

It is highly unlikely that one system will be able to deliver 100% full chain traceability that satisfies all the KDE requirements and verification needs at the same time. It is more likely that a combination of systems will be required, such as a robust vessel tracking system combined with a robust supply chain traceability system. Therefore, system interoperability is paramount to ensure effective and efficient transfer of data and readability by all actors within the chain.

Table 3: Desktop comparison of current traceability systems available in Indonesia against International KDE requirements.

Traceability system	actor	Main purpose	International KDE Standard				KDE Gaps	comments
			WWF	**EU**	**US**	**ACDS**		
Trace-all[24]	Current Indonesian MoU for e-logbooks only (i.e., vessel and government) However, it offers a range of modules that can be put together to capture full chain.	Current Indonesian MoU for e-logbooks only to capture vessel data and remove paper logbooks and stop IUU.	✓ Highly likely	✓	✓ Has ability to.	✓ Highly likely	US: potential to omit dolphin safe statement.	This system has yet to be implemented on the ground in Indonesia and therefore is difficult to verify that it does meet all four international traceability standards KDE requirements. However, according to the company's website the system meets all the EU requirements and in Indonesia the system is being developed with WWF and therefore assumed to be meeting all WWF KDE requirement's also. It is unlikely though at this stage to be capturing a dolphin safe statement from the captain of the vessel.
Seasoft[25]	Supplier, processors, export, retail and customer. However, can be designed for vessel.	Primary function is for supply chain actors after offload from vessel but can be designed to collect from vessel.	✗	✗	✗	✗	All: date/time of catch, fishing license, flag State, date/time of transshipment. EU: VMS unit, vessel type, IMO/Lloyds and Inmarsat numbers. US: dolphin safe statement. ACDS: IMO/Lloyds and Inmarsat numbers.	While the current system appears not to collect date on all the required KDEs, it should be noted that the system can be re designed to capture this information. Seasoft could be developed to capture this information if required.
Trace register[26]	Vessel offload – consumer	Data collection from vessel offloads through to all other actors within the supply chain to provide robust, effective full chain	✗	✗	✗	✗	Currently same as identified in Table 1.	Trace Register does not currently have the ability to collect data direct from the fishing vessel operations, but rather relies on the data that would result from an offload recording sheet or on another interoperable system. Trace Register does have the ability to capture this

[24] http://www.traceallglobal.com/tracking-tracing.html
[25] http://www.caisoft.com/seasoft.html
[26] http://www.traceregister.com

		traceability for individual products.						vessel data and include in the traceability data being sent through the entire chain as it has been illustrated with other country fisheries using the system have accomplished. This would need to be developed with each of the various supply chain categories and actors to ensure credibility of data being captured direct from vessel. Therefore, Trace Register is capable of meeting and satisfying all international traceability standards KDE requirements if designed accordingly.
Pelagic data systems[27]	Vessel	Tracking operation only. But has ability to capture operational fishery data in future.	✗	✗	✗	✗	all KDE's with the exception of vessel location.	Currently this system is only applicable as a sophisticated vessel tracking system but does not capture any fishery operational data concerning the actual catch. Although the company has stated that this function may be available in the future.
Skytruth[28]	Vessel	Tracking operation only.	✗	✗	✗	✗	all KDE's with the exception of vessel location.	this system is only applicable as a sophisticated vessel tracking system but does not capture any fishery operational data concerning the actual catch.
Ships in sight[29]	Vessel	Tracking operation only.	✗	✗	✗	✗	all KDE's with the exception of vessel location.	This system is only applicable as a sophisticated vessel tracking system but does not capture any fishery operational data concerning the actual catch.
Spot trace[30]	Vessel	Tracking operation only.	✗	✗	✗	✗	all KDE's with the exception of vessel location.	This system is only applicable as a sophisticated vessel tracking system but does not capture any fishery operational data concerning the actual catch.
IFISH[31]	Vessel Government	Data collection from vessel	✓	✗	✗	✗	US: Dolphin safe statement and ASFIS # or product code. EU: IMO/Lloyds number, Inmarsat number. ACDS: ASFIS # or product code,	IFISH is currently only used on selected vessels from selected fisheries using certain gear types and targeting certain species (i.e., yellowfin tuna, skipjack tuna, etc.) Vessels that are participating in the program do not have their data from every trip recorded, instead the sampling program captures 20% of vessels landing. While the IFISH system itself does not contain a statement as such regarding dolphin safe fishing, it should be noted that the system does record ETP species interactions and therefore could arguably be considered

[27] http://www.pelagicdata.com/#pds
[28] http://skytruth.org/
[29] http://www.shipsinsight.com/pages/features
[30] http://www.findmespot.com/en/index.php?cid=109&utm_source=direct&utm_medium=website&utm_campaign=trace
[31] http://ifish.id/?q=en/content/about

							IMO/Lloyds number, Inmarsat number.	such a statement if no dolphins were recorded.
I-FITT	I-FISH through full chain	Develop and facilitate information rich consumer facing traceability.	✓	✗	✗	✗	US: Dolphin safe statement and ASFIS # or product code. EU: IMO/Lloyds number, Inmarsat number. ACDS: ASFIS # or product code, IMO/Lloyds number, Inmarsat number.	I-FITT is a program that aims to join data streams which collect fisheries data with those that collect supply chain/traceability data such as the I-FISH program. As such it relies on these other vessel data collection systems to provide and feed data into the other parts of the processing supply chain. Therefore, the information collected by I-FISH is the same information used by I-FITT throughout the chain. While the IFISH system itself does not contain a statement as such regarding dolphin safe fishing, it should be noted that the system does record ETP species interactions and therefore could arguably be considered such a statement if no dolphins were recorded.
OurFish[32]	Supplier	Track and analysis business operations.	✗	✗	✗	✗	WWF: location of catch, fishing license, flag State, transshipment. US: product code, location of catch, company name, fishing license, flag State, transshipment, dolphin safe statement. EU: fishing license, flag State, transshipment, IMO/Lloyds and Inmarsat numbers, VMS unit, vessel type, fishing license. ACDS: location of catch, product code, fishing license,	OurFish system is currently being trailed by several suppliers. This system is more of a business tracking tool to analysis operations in terms of fuel, fisher and supplier payments, ice usage, bait usage, total catch, price/kg, and grade. Currently it does not have the capability to capture the required KDEs, however, given that the program is being trialed and under development, there may be an opportunity to redesign it to ensure it does capture such information in the future.

[32] http://thisfish.info/

							flag State, IMO/Lloyds and Inmarsat numbers, fishing license.	
M-Fish[33]	Vessel	Collection of traceability data from the vessel (i.e., origin based traceability).	X	X	X	X	all KDE's with the exception of location of catch and species.	This system does not capture majority of the required KDEs of international traceability standards. It does however, offer a simple form of traceability by capturing the basics regarding the fisher, location of catch, size of fish and also the species being harvested. But omits critical traceability data that proves whether catch is IUU or not. Given that the system is a web-based platform and continuously being improved and updated, it is assumed that the system would be able to be developed further to ensure the capture of such important traceability information from the vessel.
Provenance[34]	Full chain	Provide an open full chain traceability platform from vessel through to consumer.	**n/a**	**n/a**	**n/a**	**n/a**	**n/a**	Provenance has only been recently trailed in Indonesia. The system effectively captures data from other sources and other systems and holds it. Therefore, it is currently unknown what KDEs the Provenance system captured whilst trialing in Indonesia. However, one could assume that since the system relies on other data systems and formats to provide information, then if those other systems are capturing the required KDEs, then the Provenance system would automatically capture those KDE's and make available to the supply chain.
Tally-O	Second stage processor	Data collection from supplier and from processing procedures to export.	X	X	X	X	WWF: name of vessel, vessel number, fishing license. US: scientific name, name of vessel, vessel number, fishing license, dolphin safe statement. EU: scientific name,	While the Tally-O system didn't satisfy all of the required KDEs completely, the system is still a very robust and effective traceability tool and has demonstrated its ability to provide the required data needed to have traceability throughout the supply chain. This systems major omission is not capturing the individual vessel and its operational fishing data, instead it only captures the data back to the supplier. However, this allows the ability for product to be traced back through the supplier to an individual vessel. While the system is effective and robust and provides

[33] http://www.tonehome.com/mfish/
[34] https://www.provenance.org/tracking_tuna_on_the_blockchain

	name of vessel, vessel number, name of captain/master, vessel owner/address, VMS unit, fishing license, IMO/Lloyds number, Inmarsat number. ACDS: name of vessel, vessel number, name of captain/master, fishing license, IMO/Lloyds number, Inmarsat number.	traceability data back to supplier which is considered appropriate and satisfying the MSC CoC requirements, it currently does not capture all of the KDEs required by the four international traceability standards within the one system. However, it does provide the strong link back to that data which meets all majority of the required KDEs.

8. RECOMMENDATIONS

Following conducted research and audits, a range of recommendations have been made, most of which are specific to either the Indonesian government, the management systems of supply chain actors, product segregation procedures and/or product identification processes. There are also several general recommendations regarding KDEs.

Throughout all audited supply chains, high-risk areas, or Critical Control Points (CCP)[35], were identified. These occur when raw material either changes hands or enters a new process along the supply chain. While such CCPs present themselves at different stages within a specific supply chain, they are generic potential issues that need to be considered by all when product/raw material enters certain stages. Appendix 6 highlights the most common CCPs observed in the audited supply chains and provides a useful guide on what information and data needs to be collected, when and by whom.

Table 4 presents a high-level summary of the identified issues and recommendations for each actor across the four identified supply chain categories. It should be noted that this project only covers the "first mile," i.e., from the point where fish were first offloaded by the vessel and first received on the dock through to export.

Table 4: High level summary and reference of the identified issues and recommendations for each actor across the four identified supply chain categories

Supply Chain Category	Actor	Gear type	Issues	Recommendation #
Vertically Integrated	Supplier	Pole & Line Purse Seine	• Labelling • Raw material identification • SOP • Cold storage/air blast freezer storage plans • Segregation	1, 3, 10, 14, 16, 17, 18, 19, 21, 22, 23, 24, 27, 28.
Semi vertically Integrated	Processor	Pole & Line Purse Seine	• Labelling • Raw material identification • Segregation • SOP material available to staff on floor • Package coding	1, 2, 3, 10, 11, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28.
Non-contractual	Supplier	Handline	• Lack of physical tag/identification of whole fish	1, 3, 11, 12, 18, 19, 21, 22, 23, 24, 27, 28.
	Processor	Handline	• Raw material identification throughout processing stages • List of approved vessels • Labelling • SOP • SOP material available to staff on floor • Recording forms	1, 2, 3, 10, 11, 12, 13, 14, 15, 18, 20, 21, 22, 23, 24, 27, 28.

[35] CCP: for the purposes of this audit, a CCP is defined as a point, step or procedure within the processes of a supply chain at which there is a high risk of potential issues to occur (namely identification, labelling, recording) but controls can be applied and an issue can be prevented, eliminated or reduced to acceptable (critical) levels.

Disaggregated independent nodes	Processor	Pole & Line Purse Seine	• Segregation • Labelling • Raw material identification • SOP material available to staff on floor • Package coding	1, 2, 3, 10, 11, 14, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28.
Government		Pole & Line Purse Seine Handline	• VMS Units • Inmarsat # • IMO/Lloyds # • Dolphin safe Captains statement • Electronic data capture • Purpose built traceability system • Small scale vessel requirements • Catch Certificates • Consistency between national, regional and district government regulations	4, 5, 6, 7, 8, 9

8.1 General Recommendations

1. Given that KDEs are critical to a traceability system's ability to trace product to its initial source and ensure that supply chains are free from IUU products, identification records (including labels and tags) must capture (at a bare minimum) those KDEs that facilitate traceability back to a specific vessel. Depending on what stage in the supply chain an actor is present, each actor must record KDEs that allow at least a one-down and one-up track and trace to occur. Ideally, KDEs from the start of the supply chain (from the vessel) would be passed up the chain to all other actors, allowing for efficient and effective traceability to occur at any stage within the supply chain. However, irrespective of this, the final processed product ready for export, must contain the relevant KDEs that address the requirements of the import market.
2. If lots or batches of raw material are developed during the processing stages, then KDEs need to be captured at this critical tracking event to identify all initial sources of raw material that went into making that lot or batch of product. The lot or batch must use a unique identifier that can be used at a later point in time to relate and trace back to each initial source of raw material using its KDEs through processing logbooks. For example; each lot or batch must have a unique code or numbering system for identification, and each source of raw material that made up the lot/batch must also be recorded with the same unique code or numbering system at time of processing and be clearly recorded. Table 5 illustrates a hypothetical example of a Daily Processing Record Logbook that captures certain KDEs to enable traceability back to raw material from lot/batch numbers.
3. Companies to appoint an existing staff member to be the responsible officer for the development, implementation and adoption of traceability systems within its supply chain.

Table 5: Mock example of Daily Processing Record Logbook

Daily processing record logbook						
Supplier/vessel UI	Date (received)	Gear type	species	Weight (kg)	Lot/batch No.	Production Date (processed into lot/batch)
209	30/12/2016	PL	SKJ	100	06116SPL	6/01/2016
398	25/12/2016	PL	SKJ	400	06116SPL	6/01/2016
409	28/12/2016	PL	SKJ	650	06116SPL	6/01/2016
293	2/1/2016	PS	SKJ	297	06116SPS	6/01/2016

Lot/batch No. 06116SPL = 06116 (production date), S (species - Skipjack), PL (Gear type). This code can be used in conjunction with the Daily Processing Record Logbook to see which supplier/vessel raw material went into making that lot/batch on that production date.

8.2 Government Recommendations

Indonesia's tuna fisheries would benefit greatly from the development and implementation of a basic, purpose-built traceability system that allowed the consistent capture and recording of KDEs that addressed, at a bare minimum, the current requirements of international traceability standards (Appendix 7). This would be best lead and supported by the Indonesian government in close cooperation and collaboration with industry. The following recommendations are recommended for the Government of Indonesia, based upon audit results and research.

1. Make IMO numbers mandatory for all vessels over a certain size class. The government should investigate what the appropriate minimum vessel size class is for mandatory IMO numbers, and should consider the costs and barriers, specifically on small-scale vessels (<5 GT). At a bare minimum, it is recommended that IMO numbers be made mandatory for vessels >30 GT, similar to those provisions regarding VMS units. The Government of Indonesia, after determining the appropriate minimum size class of vessels, should investigate other innovative means of identifying those vessels that fall under the minimum size class, with a unique identifier. This should involve industry and other external parties who are well positioned to provide innovative and contemporary solutions.
2. Implement a series of training workshops for vessel Captains regarding Endangered, Threatened, Protected species, mitigation techniques and specific education and training on dolphin safe requirements of the US and how to make a statement/declaration for the purposes of meeting the traceability requirements of international standards.
3. Make compulsory the recording of date/time/location of all transshipments for all gear types, and ensure that this is clearly stated on all catch certificates issued.
4. Improve traceability processes and systems, including:
    - Vessel requirements – The national government must ensure that all legal requirements, regulations, processes, systems and procedures are applied and implemented consistently for all vessels across all regions irrespective of which authority is present in a region (regional, provincial, national). These requirements must be clear, concise and be able to be issued by the various governments such as regional, provincial and National.
    - Catch Certificates require improvement in several ways, enabling provision and transfer of information more efficiently to the industry and external parties whilst increasing the credibility and robustness of this important document. The recommended improvements include:
        - Gear Type needs to be clearly stated on the actual Catch Certificate;
        - Enhance consistency of issuance - Currently this can take anywhere from a few weeks up to several months, contrary to the stipulated regulations. The government must improve its Catch Certification system, processes and procedures to ensure robustness, credibility and a consistent timeframe for issuing to industry. An e-system platform is recommended.
5. Support and fund information/education sessions and training workshops for industry and government officials regarding international traceability requirements and standards, potential opportunities, benefits and barriers to export market access, and understanding the regulations and compliance needs from all parties. These should also address the requirements to invest in registration of vessels, moving towards electronic data, and development of an e-system platform.

8.3 Management Systems

It is recommended all companies document their current systems, processes and procedures through Standard Operating Procedures (SOP). SOPs should be simple text, clear and concise, and available to all staff and auditors. This, at a bare minimum, should outline the steps and procedures for delivery trucks, when offloading multiple vessels at same time, correct labeling procedures, and identify the staff member with responsibility for the documentation and staff training of such matters. This should also document the required records and information that must be captured for each record within the various stages of the supply chain. The SOP should capture exactly what each different activity consists of within the different parts of the supply chain that the company has control over. The SOP should contain diagrams or pictures as examples of what the final product should look like if performed correctly, such as labelling/tagging, etc. There are numerous SOP templates available from the internet ranging from simple through to complex. For most parts, only a simple SOP will be required. The box below contains a broad outline of a basic SOP.

SOPs will consist of three elements apart from the procedure/activity itself:

1. Title page: This includes 1) the title of the procedure/activity, 2) an SOP identification number, 3) date of issue or revision, 4) the name of the agency/division/branch the SOP applies to, and 5) the signatures of those who prepared and approved of the SOP. Formatting can be determined by the developer, as long as the information is clear.
2. Table of Contents: This is only necessary if your SOP is quite long, allowing for ease of reference.
3. Quality Assurance/Quality Control: A procedure is not a good procedure if it cannot be checked. Have the necessary materials and details provided so the reader can make sure they've obtained the desired results. This may or may not include other documents, like samples of report forms, labels, tags, etc.

For the procedure itself, the SOP needs to cover the following:

1. Scope and applicability: Describe the purpose of the process/activity, its limits, and how it's used. Include standards, regulatory requirements, roles and responsibilities, and inputs and outputs.
2. Methodology and procedures: List all the steps with necessary details, including any required equipment. Cover sequential procedures and decision factors. Address the "what ifs" and the possible interferences or safety considerations. Provide clear examples, such as labelling/tagging information, what it should look like once completed, what needs to be included, what a recording form looks like when filled in, where labels/tags should be placed, and clear identification on what data needs to be collected, maintained and passed onto next stage of the chain.
3. Clarification of terminology: Identify acronyms, abbreviations, and all phrases that are not common.
4. Equipment and supplies: Complete list of what is needed and when, where to find equipment, standards of equipment, etc.
5. Cautions and interferences: Troubleshooting section. Cover what could go wrong, what to look out for, and what may interfere with the final product.

Each of the topics above should have their own section (usually denoted by numbers or letters) to keep your SOP from being wordy and confusing and to allow for easy reference. This is by no means an exhaustive list.

In addition, it is recommended that:

1. SOPs are placed on the wall in factory, in clear sight of all staff operating on the floor, an example of a correctly labeled products.
2. Develop and document processes and procedures for collection vessels when in use and collecting from multiple vessels, regarding segregation, labelling, vessel identification, etc.
3. Each supplier (including cold storage actor if different) and processor within a supply chain develop and implement an up-to-date database (preferably electronic i.e., Excel, or for remote regional suppliers paper based lists) of vessels and suppliers that they currently source from. This database should identify those vessels and suppliers that are legal. Furthermore, the database should be kept simple and record vessel name, captain, license details, registration, supplier name, address, company, IMO No., etc. (Figure 1).

Figure 1: Example of excel database spreadsheet for approved source vessel/supplier

	A	B	C	D	E	F	G	H	I
1	No.	Supplier/vessel name	Unique identifier (code)	Name of captain	address of supplier	License expiry date	Registration expiry date	Registration No.	IMO No.
2	1	PT SOSK	101	n/a	1564 Oneway Lane	n/a	n/a	n/a	n/a
3	2	FV Ella	203	John Smith	n/a	30 October 2017	29 December 2018	2374CHDI8	IMO1234567
4	3	FV Tuna II	205	Larry Home	n/a	28 November 2017	30 August 2018	9484JSNC9	IMO0987654
5	4	PT Kye	105	n/a	3984 Process Street	n/a	n/a	n/a	n/a
6	5	FV SKJYFT	310	Mary Jane	n/a	30 October 2017	30 August 2018	1324DBNH6	IMO5364782

4. All companies that are operating under an effective paper based recording system should periodically review the need for implementation of a simple basic e-traceability system that would improve accuracy, efficiency and effectiveness of the business.

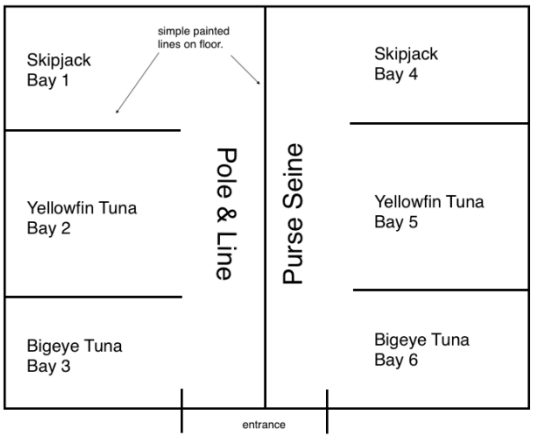
5. That separate recording forms are used to capture data and information for each of the key specific stages and activities carried out within a supply chain and that the same form is not used for multiple stages in the facility.

8.4 Product Segregation

1. Develop clear and concise storage plans that are available and accessible to all staff for air blast freezer and cold storage units (Figure 2). These should be regularly updated and provided on the doors to each unit front and center. Storage plans should provide information on where fish are, or should be, stored inside the unit. Fish should ideally be stored in bins/cages that are individually labelled (describing the species, vessel/supplier unique identifier, weight, offload date and vessel trip date). But if not applicable then in some cases fish could be stored in loose piles but maintain batches and identification which would require a more complex storage plan that is regularly updated with each new load of fish (Figure 3). If more than one gear type being sourced then would also require specification of gear type. Furthermore, if collection vessels are used for either Pole & Line or Handline products, then these vessels should develop and implement vessel stowage plans.

2. There are clear segregation processes and procedures in place for product throughout the supply chains various stages between gear types that prevent mixing. This can consist of simple yet effective processes, some examples of which include (this list is not exhaustive):
    - Raw material from one individual vessel is maintained in fish cages/bins within cold storage and labelled (label to include: vessel unique identifier, gear type, date of trip, date of offload, species, weight).
    - Cold storage unit is clearly divided into sections/bays for each gear type (e.g., Pole & Line and Purse Seine) by painting a think line (e.g., bright yellow, etc.) on floor that separates the different bays from one another.
    - Second stage processors use labelled trolleys and trays for each individual supplier's batch of raw material.
    - Only one batch of raw material from the same supplier and gear type to be processed at one time, there should be a clear space between the next batch of raw material before processing.

Figure 2: Example of a simple cold storage unit storage plan when fish is maintained in labelled fish cages/bins.

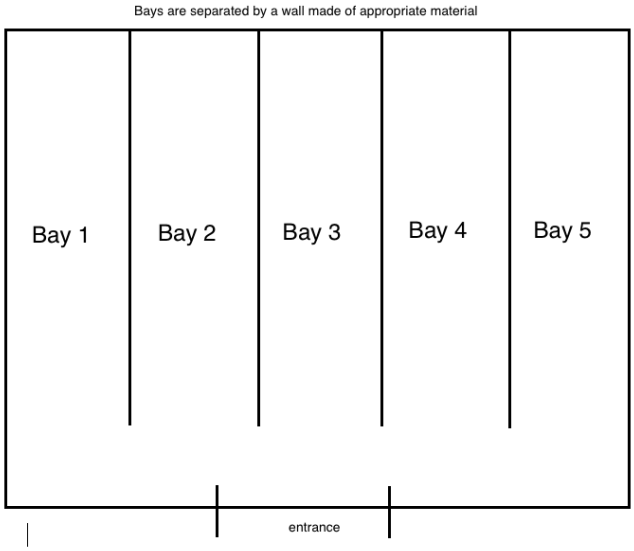


- Different color tags/markers can be used on trays/processing lines to distinguish gear type and supplier raw material.

8.5 Product Identification

1. Adoption of low cost and low technology labelling solutions that are durable within the active work environment that would be suitable for the supply chain. Develop and implement robust labeling systems and materials from point of first delivery to stock piling in cold storage and shipping in export freezer containers. For example, several options could include metal tags, water-proof paper or even color stickers or plastic need to be utilized to identify different vessels and different dates of offloading that can be coded throughout the entire supply chain stages until packed into freezer containers. This system should be clearly visible to all staff working on the floor. The labeling system will be aided by the development of a storage plan for the blast freezers and cold storage units as illustrated above. Unique identifiers must be created and all label information captured on all records throughout the various stages of the chain. These must be applied consistently and staff trained on an annual basis of the systems, processes and procedures.
2. All species must be clearly identified and separated from one another throughout all stages of the supply chain. For example, skipjack, yellowfin and bigeye tunas must all be separated from one another, ideally during the catching activity, but especially from point of offloading and going into cold storage units forward throughout the chain.
3. Clearly state and identify product on all sales invoices including gear type.

Figure 3: Example of a more complex cold storage unit storage plan when fish are loosely stored in piles within bays.



BAY #	Species	Supplier/Vessel Unique Identifier	Gear type	Date of Trip	Date of Offload	Date stored
1	Skipjack	AKB001	PL	3-6 Sep	7 Sep	8 Sep
2	Yellowfin	Tuna Chaser	PL	4-10 Sep	12 Sep	13 Sep
3	Bigeye	Tassie	PS	10-12 Oct	12 Oct	13 Sep
4	skipjack	AKB003	PL	3-6 Sep	8 Sep	10 Sep
1	skipjack	BAK002	PL	8-11 Sep	12 Sep	14 Sep
1	skipjack	KAB005	PL	8-11 Sep	12 Sep	14 Sep
2	yellowfin	IJB900	PL	15-20 Sep	22 Sep	24 Sep

It should be noted that only one gear type and species should be stored in each individual bay but can contain multiple sources of raw material (i.e., different vessel/supplier/trip) as long as they are separated within the bay by appropriate material that does not allow mixing, such as a thick small mesh cargo net that is also identified in some way. This could be through a use of a colour tag or other identifier, but would need to be recorded against the product line in above table.

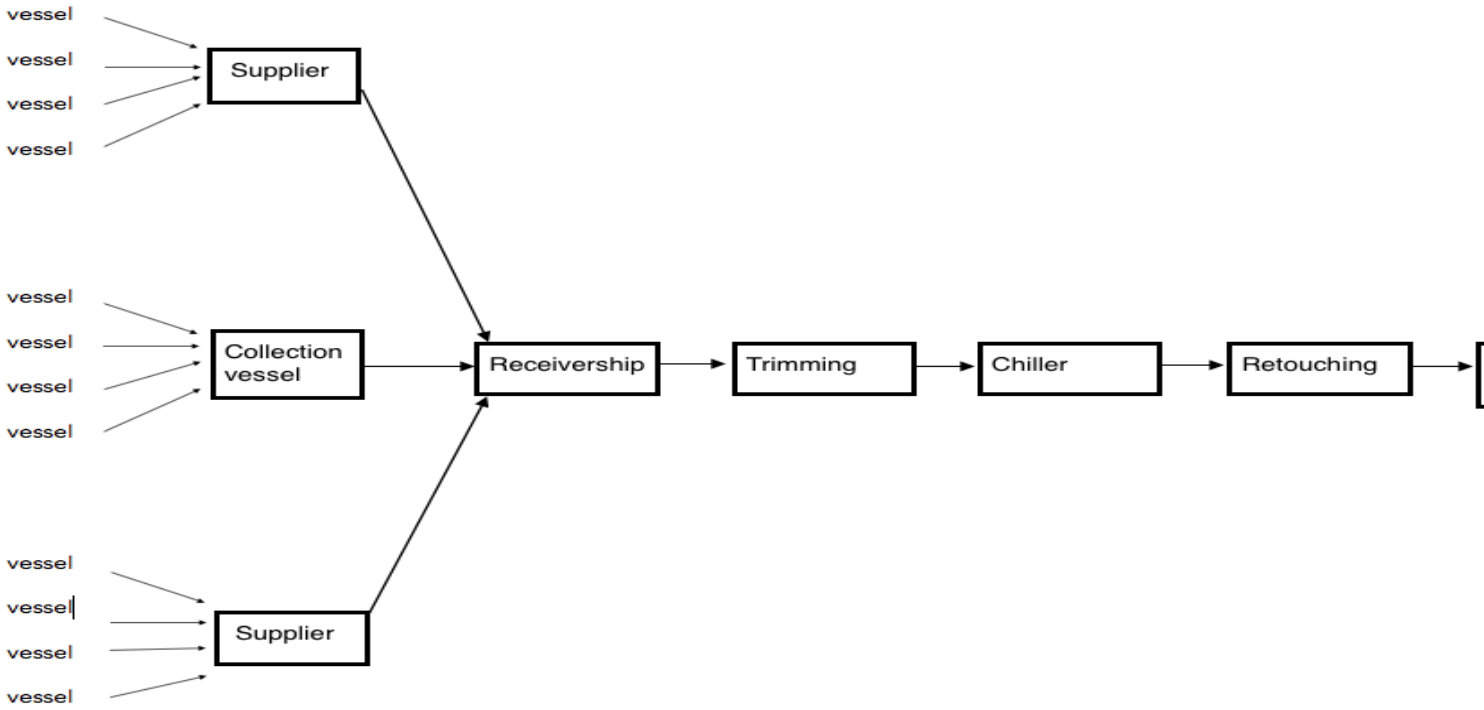
4. All materials/equipment that is used to hold or store products must be Labeled. For example all poly bags, trays or trolleys, even whilst being transported, etc. should be labelled with vessel identification, species, weight, offload date, and trip date as bare minimum.
5. All areas, materials or equipment that is used to store or hold fish must be labelled immediately when fish are placed in or on these.
6. All areas, materials or equipment that is used to hold or store fish and is labelled for product, must be inspected and all old labelling removed before being reused for other batches of product.
7. The use of more appropriate materials (plastic/metal with permanent marker pen) for labels in adverse environments where water and wind could compromise the current paper label.
8. If codes are used for final export products such as on canned tuna or packaged plastic bags for further processing, the code should contain an identifier that any product can be distinguished from another product (for example the inclusion of a unique identifier for gear type i.e., "PL" for Pole & Line, "PS" for Purse Seine). Furthermore, the codes used should ensure that it relates and links back to an actual batch of fish and not just day of production.
9. That all packaging materials used for certified product are labelled consistently and at the appropriate time during the process within the supply chains. For example some packaging material (plastic bags, etc.) can be labelled before product is packed, however, cans on the other hand, may be better stamped with code

immediately after packaging and seamed. This will depend on each company and its operations and risk of potential mixing.

10. Add unique identifiers for gear type (PL = pole & line, PS = purse seine) to labels throughout the supply chain.
11. Ensure a unique identifier is issued and clearly visible with all documentation between supplier, fisher and processor. Such implementation would make trace back and verification easier, more efficient and remove any doubt between the varies records currently used.

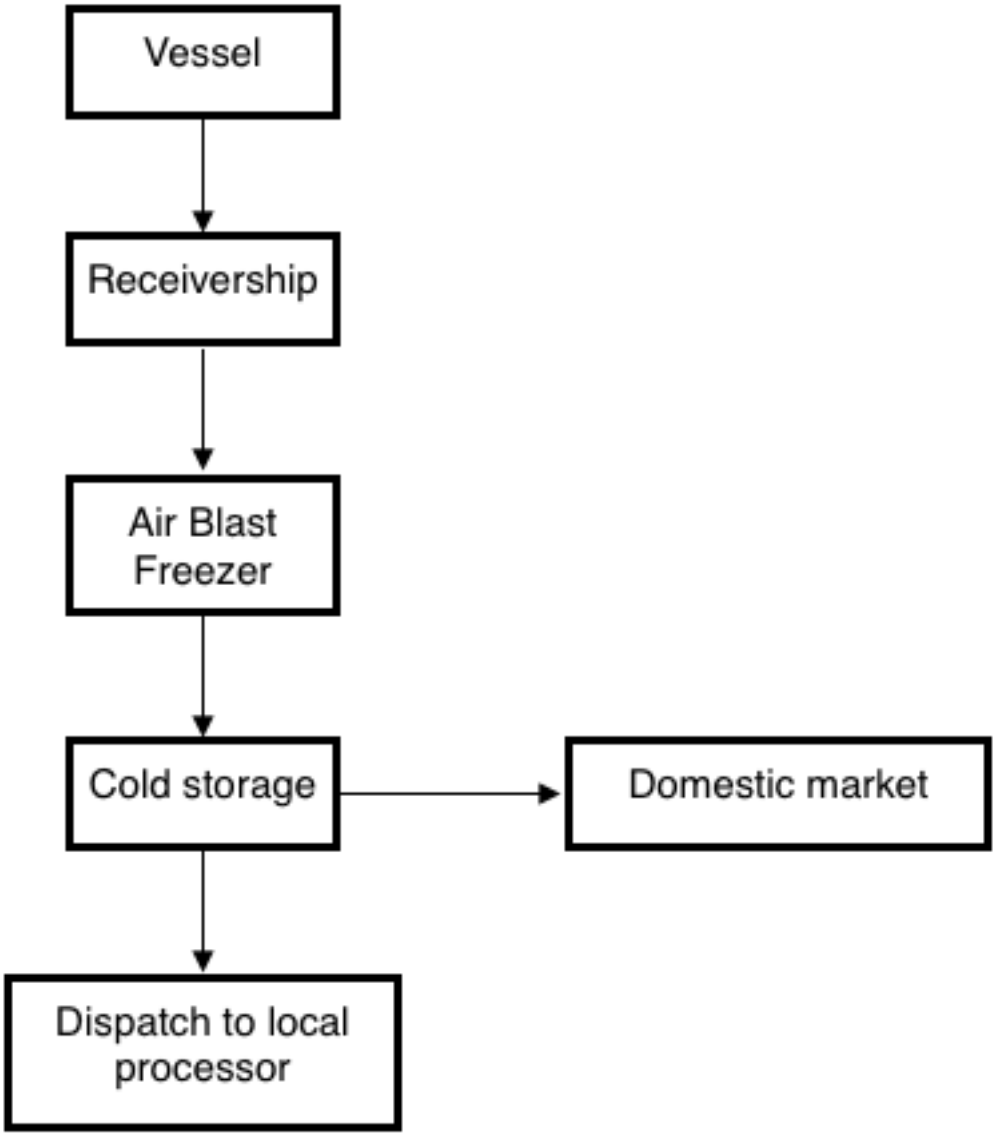
APPENDIX 1: GENERIC PRODUCT FLOWS

Handline supply chain



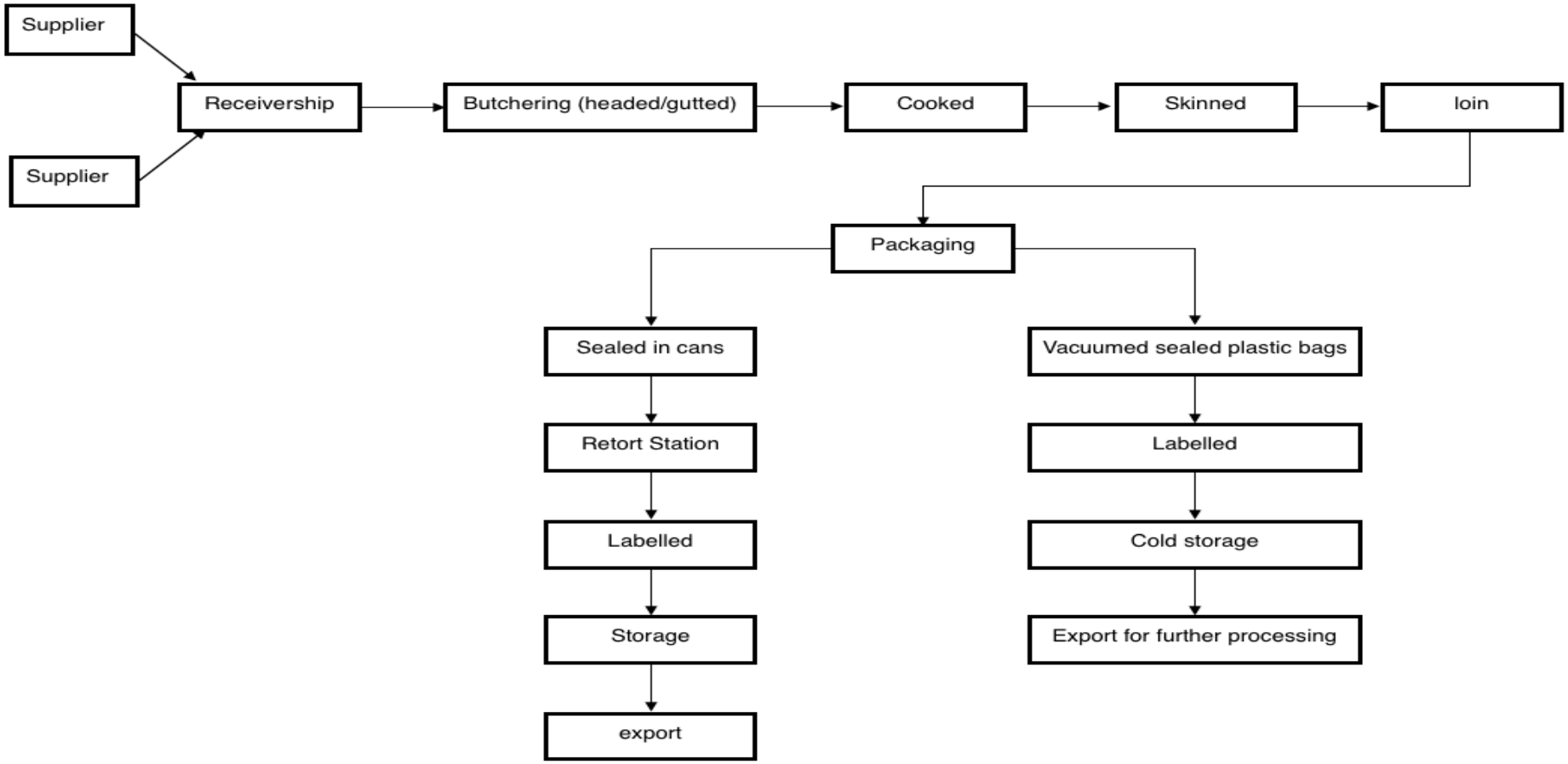
Note: In the above diagram, vessels can either be owned directly by the supplier, operating under a contract with the supplier or even independent. The collection vessel is owned by the company that first receives the raw material. The vessels feeding into the collection vessels are part of the collection vessels operation. Vessel must be meeting all government requirements, regulations to be deemed legal. All suppliers/collection vessels must ensure they collect data from vessel (vessel name/registration/captain, etc., date of trip, date of offload, species, weight, fishing area, gear type). Company receiving raw product must ensure they collect data from supplier (supplier is a legal entity, supplier name, address, species, weight, date of receiving, gear type). The company receiving raw material must then ensure that this data follows the material throughout all processing stages within the supply chain until it is placed in either a tamper proof container (i.e., canned or in vacuum sealed plastic bag) and labelled/coded, or sold to a consumer.

Cold storage supply chain



Note: The above supply chain also closely resembles that of a vertically integrated supply chain. The only real difference is that the vessels are owned by the cold storage supplier/company instead of being owned by individuals. Vessel must be meeting all government requirements, regulations to be deemed legal. The first receiver of raw material must ensure they collect data from vessel (vessel name/registration/captain, etc., date of trip, date of offload, species, weight, fishing area, gear type ("certified")). This data must follow each batch of raw material throughout the cold storage supply chain. Ideally, this information would also be made available for the company that purchases the raw material for further processing.

Second stage processor supply chain



Note: The suppliers illustrated in this diagram can be either owned or operated as part of the same company as the processor, providing raw material on contractual basis or acting as an independent and selling raw material on the daily basis to which ever processor the supplier deems to sell to. In this diagram, under all the different supplier scenarios mentioned, the first receiver of raw material, must ensure they collect data from the suppliers (supplier is a legal entity, supplier name, address, species, weight, date of receiving, gear type). The company receiving raw material must then ensure that this data follows the material throughout all processing stages within the supply chain until it is placed in either a tamper proof container (i.e., canned or in vacuum sealed plastic bag) and labelled/coded, or sold to a consumer.

APPENDIX 2: NOAA FORM 370

NOAA Form 370
OMB#: 0648-0335
APPROVAL EXPIRES: July 31, 2018

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL MARINE FISHERIES SERVICE (NMFS)

Fisheries Certificate of Origin

1. Customs Entry Identification

Customs Entry Number (11 digits)

Date of Entry

2. Exporter (Name and Address)

Telephone Number:

3. Importer (Name and Address)

Telephone Number:

4. DESCRIPTION OF FISH

U.S. Tariff Schedule Number, Species Description, and Product Form	Weight (kg.)	Ocean Area	Fishing Gear	Vessel Flag	Trip Dates Begin-End	Vessel Name

5. DOLPHIN SAFE STATUS - check the statement that applies.

A. The tuna or tuna products described herein are not certified to be dolphin safe and contain no marks or labels that indicate otherwise.

B. The tuna or tuna products described herein are certified to be dolphin safe:

(1) Tuna not harvested with a purse seine net, and not harvested in any fishery that has been identified by the Assistant Administrator as causing a regular and significant mortality or serious injury of dolphins and/or a regular and significant association between dolphins and tuna, with valid documentation by: (1) the captain of the vessel and, where applicable, by either a qualified and authorized observer or by an authorized representative of a nation participating in the observer program, certifying that no purse seine net or other fishing gear was intentionally deployed on or used to encircle dolphins during the fishing trip and that no dolphins were killed or seriously injured in the sets or other gear deployments in which the tuna were caught and; (2) by the captain of the vessel certifying completion of the NMFS dolphin-safe captain's training course. See instructions. **Certification(s) attached.**

(2) Tuna harvested using a purse seine net outside the Eastern Tropical Pacific Ocean (ETP), in any fishery for which the Assistant Administrator has not determined that there is a regular and significant mortality or serious injury to dolphins and/or a regular and significant association occurring between dolphins and tuna, with valid documentation by: (1) the captain of the vessel, and where applicable, documentation by either a qualified and authorized observer or by an authorized representative of a nation participating in the observer program, certifying that no purse seine net or other fishing gear was intentionally deployed on or used to encircle dolphins during the fishing trip and that no dolphins were killed or seriously injured in the sets in which the tuna were caught and; (2) the captain of the vessel certifying completion of the NMFS dolphin-safe captain's training course. See instructions. **Certification(s) attached.**

(3) Tuna harvested in a fishery in which the Assistant Administrator has determined there is a regular and significant mortality or serious injury to dolphins and/or a regular and significant association occurring between dolphins and tuna, with valid documentation by: (1) the captain of the vessel, and where applicable, by an authorized observer certifying that no purse seine net or other fishing gear was intentionally deployed on or used to encircle dolphins during the fishing trip and that no dolphins were killed or seriously injured in the sets or other gear deployments in which the tuna were caught and; (2) the captain of the vessel certifying completion of the NMFS dolphin-safe captain's training course. See instructions. **Certification(s) attached.**

(4) Tuna harvested in the ETP by a purse seine vessel having a carrying capacity of 400 short tons (362.8 mt) or less, with valid documentation by: (1) the captain of the vessel and, where applicable, by either a qualified and authorized observer or by an authorized representative of a nation participating in the observer program, certifying that no purse seine net or other fishing gear was intentionally deployed on or used to encircle dolphins during the fishing trip and that no dolphins were killed or seriously injured in the sets in which the tuna were caught and; (2) the captain of the vessel certifying completion of the NMFS dolphin-safe captain's training course. See instructions. **Certification(s) attached.**

(5) Tuna harvested in the ETP by a purse seine vessel of more than 400 short tons (362.8 mt) carrying capacity, with valid documentation signed by a representative of the appropriate IDCP-member nation certifying that: (1) there was an IDCP-approved observer on board the vessel during the entire trip; (2) no purse seine net was intentionally deployed on or to encircle dolphins during the fishing trip and no dolphins were killed or seriously injured in the sets in which the tuna were caught; and (3) listing the numbers for the associated Tuna Tracking Forms which contain the captain's and observer's certifications. **IDCP Member Nation Certification attached.**

6. EXPORTER CERTIFICATION - I certify that the above information is complete, true, and correct to the best of my knowledge and belief.

Exporter Name (Print or Type) Signature and Date:

7. IMPORTER/PROCESSOR ENDORSEMENT

(Name and Address) Signature and Date

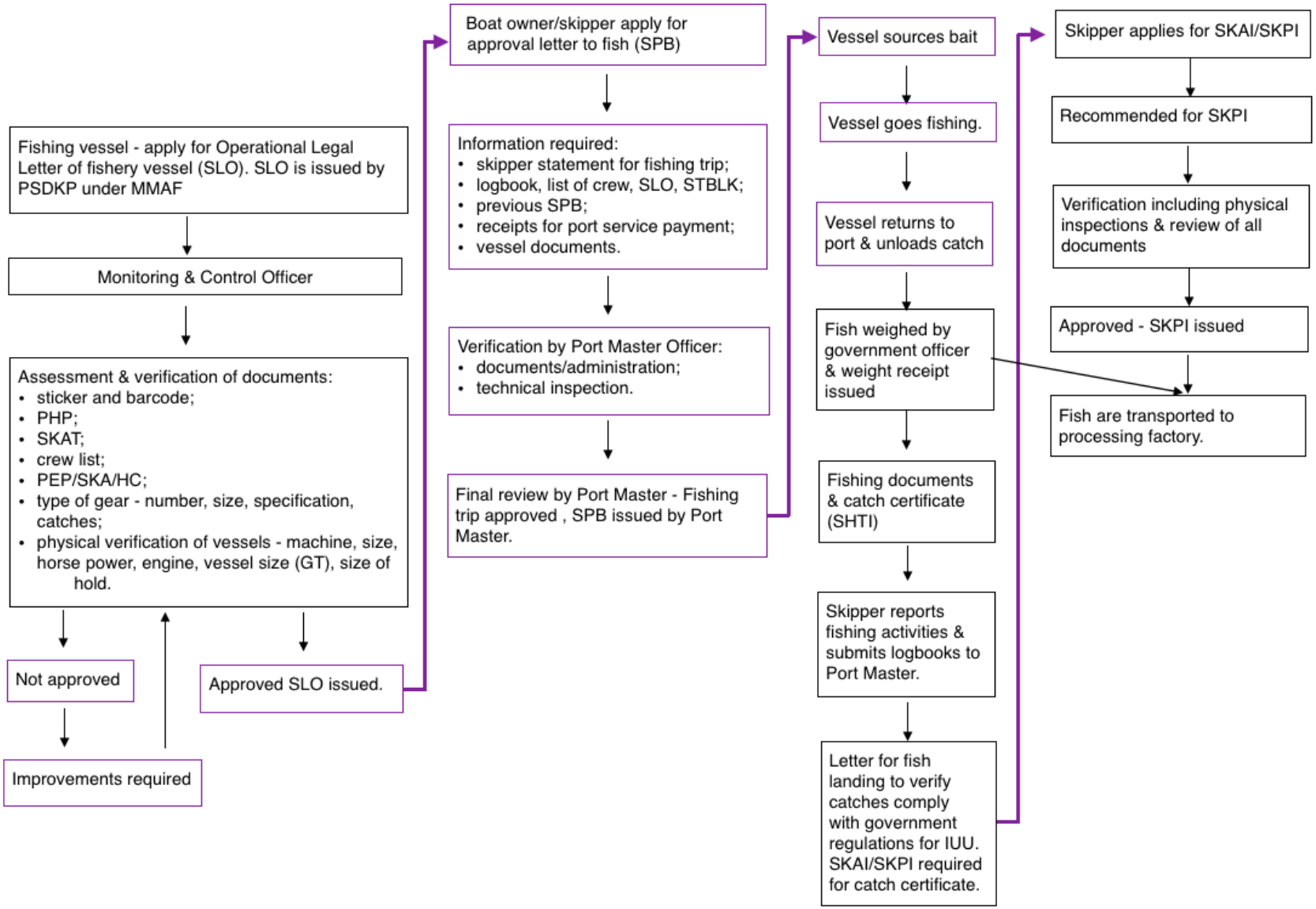
(Name and Address) Signature and Date

APPENDIX 3: WWF TRACEABILITY PRINCIPLES

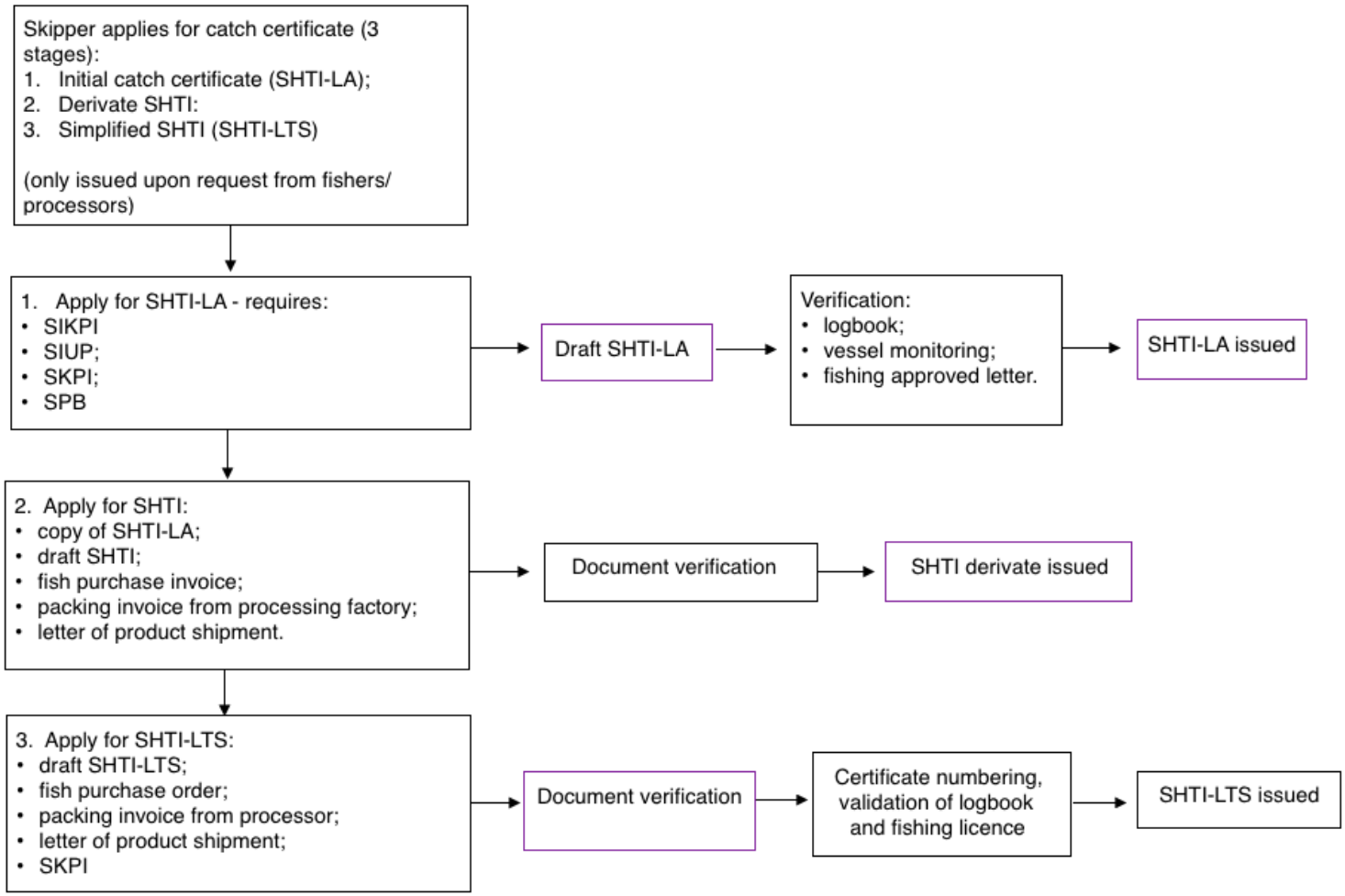
Principle 1: Essential information All wild-caught fish product traceability systems should provide rapid access to reliable information that is sufficient to assess the compliance of the fish product under consideration with all applicable legal requirements.	
Key points	• Key objective is to avoid IUU fish entering the supply chain. • What information is 'essential' depends on the fishery, risk of IUU and robustness of management / governance / MCS systems. • 'Basic' information, that should be collected in all cases, includes: vessel ID and registration; location of catch; authorisation to fish (permit, licence etc.); fishing method; date and time of fishing; quantities of all species landed and discarded; habitat impacts if relevant; details of any transshipment; details of any at-sea transformation; location, time, date, volumes and species landed; person / enterprise with custody after offloading; any other data required by law to be recorded. • Level of detail depends on requirements to distinguish fisheries (e.g. the level of detail of fishing location required to distinguish different stocks). • Not all this information has to be transmitted up the supply chain, as long as there is traceability back to it if required.
Principle 2: Full chain traceability All wild-caught fish product traceability systems should be able to provide "full chain" traceability from the point of catch to the point of final sale, and should be able to establish a verifiable and complete chain of custody/ownership of the product as it moves through the supply chain.	
Key points	• Ensure that the information required to prove that the product is non-IUU is recorded. • Information required and the level of detail will vary by fishery – fisheries with weak governance may need to record more information. • Give generalised list of required information (see Box 1 below) • Information need not be passed up the supply chain intact, but must be available such that legality of the product can be checked at any point in the supply chain.
Principle 3: Effective tracking of product transformations All wild-caught fish product traceability systems should record tracking of product transformations and information on the location of product sufficiently to ensure that the legal origin of products can be readily established at the final point of sale, and that claims related to sustainability or fishing methods are readily verifiable.	
Key points	• Traceability must be sufficient to verify sustainability and legality. • Where an end product originates from multiple fisheries or fishing activities, traceability should be possible back to a limited set of these activities, sufficient to allow verification of compliance and verification of any claims relating to sustainability and fishing methods. • Unique product identifiers need to be present on each level of packaging, and must be traceability through and between suppliers and buyers. New products (after transformation) should have new identifiers but be traceable back to the original products.
Principle 4: Digital information and standardised data forms Wild-caught fish product traceability systems should employ electronic recording of data, labelling, and tracking in standard data formats from point of capture to point of final sale.	
Key points	• Except for very localised and short supply chains, paper-based systems are only considered adequate in the short term, and a move to electronic systems (or electronic + paper) should be a high priority. • Industry should take the lead in ensuring that electronic systems are harmonised and inter-operable. As industry standards emerge, companies should comply with them. • Companies should use a standardised list of species names, including the scientific name, for commercial sales including retail packaging (as is already required in the EU). • WWF recognises the need for technology transfer to developing countries to implement electronic systems.
Principle 5: Verification All wild-caught fish product traceability systems, and all claims based on them, must be subject to credible and transparent external verification mechanisms and regular independent audits, including effective governmental oversight and enforcement as well as, where applicable, credible third-party verification.	

Key points	• Companies should have transparency and traceability policies and regular compliance audits, and make polices and audit results public wherever possible. • Companies should carry out regular internal 'trace-back' audits, and if legal regulatory systems are not in place, have regular third-party audits of traceability and legality of wild-caught fish. • Traceability systems should be subject to regulatory oversight and enforcement.
Principle 6: Transparency and public access to information All wild-caught fish product traceability systems should be as transparent as possible and should provide consumers and other stakeholders the information needed to inform responsible choices.	
Key points	• Traceability systems should be transparent, such that supply chain actors and consumers can make informed choices about sustainability when purchasing fish products. • Information collected by traceability systems should be public as far as possible. Retailers should be able to give the public information on the species, location of catch, fishing dates and method, confirmation of legal compliance and compliance with any specific commitments on responsible or sustainable sourcing made by the retailer. • Information which cannot be disclosed to the public should still be available to regulators and/or auditors. • Information can be made publically available by a variety of methods, but making information available at point of sale should be considered the best method (e.g. via comprehensive labelling, QR codes etc.).

APPENDIX 4: FISHING VESSEL (>5 GT) REQUIREMENTS

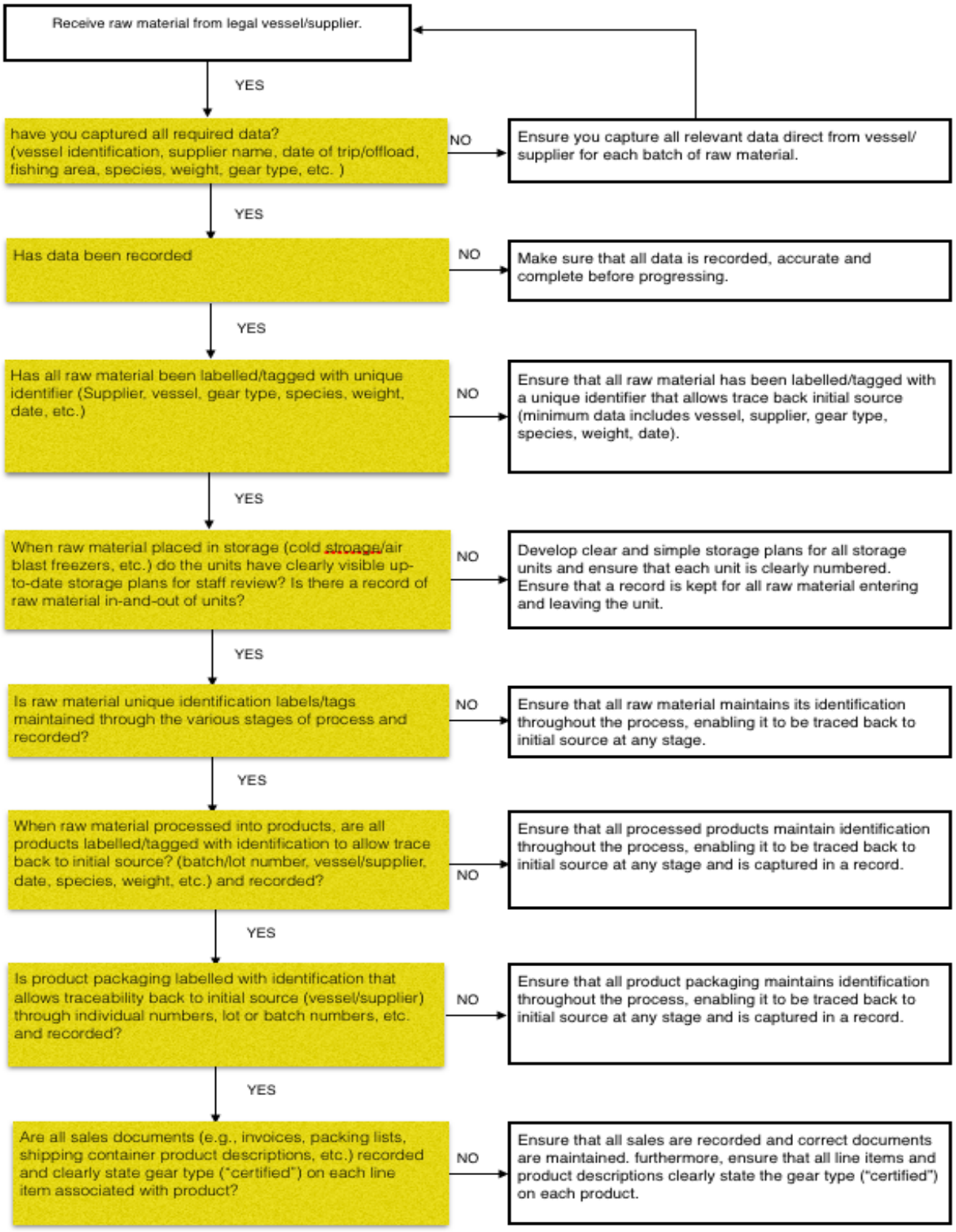


APPENDIX 5: CATCH CERTIFICATE (VESSELS >20 GT)



APPENDIX 6: STEP THROUGH TRACEABILITY REQUIREMENTS

Note: Orange denotes a Critical Control Point for information, identification and record keeping.



APPENDIX 7: KDE MATRIX IDENTIFIED AND PROVIDED BY THE ICTSA

KDE	WWF	Required US Wild Harvest	Required EU	ACDS
Point of Catch				
Scientific name (species)	X	X	X	
Common market name		X		
ASFIS # or product code		X		X
Estimated weight				X
Verified weight/volume (quantity)	X	X	X	X
Location of catch	X	X		X
Catch description			X	
Date of departure				
Date & time of catch	X	Date only		Date only
Date of landing				
Type of gear/method	X	X	X	
Name of fisher(s)				
Name of captain/master			X	X
Nationality(ies) of fishers/crew				
Company name		X		
Fishing vessel owner name			X	
Address & contacts		X	X	
Name of vessel	X	X	X	X
Unique vessel id/registr #	X	X	X	X
VMS unit #			X	
Vessel type/ tonnage			X	
Fishing license #	X	X	X	X
Flag state of vessel	X	X	X	X
Date, time, location of trans-shipment	X	X		Declaration
Trip #		X (if applicable)		
Electronic data	X	X		
Dolphin Safe statement		X		
IMO/Lloyd's #			X	X
Inmarsat #			X	X