NATIONAL FISHERIES INSTITUTE

in association with

GS1 US

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U.S. Implementation Guide
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Document Summary

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Change Summary

Version	Section	Page	Change
1.1	2.3	10	Update GS1-128 barcode from a GS1 AI (21) - Serial Number to GS1 AI(10) – Batch/Lot Number
1.1	2.3	11	Update GS1 DataBar Expanded Stacked barcode from a GS1 AI (21) - Serial Number to GS1 AI(10) – Batch/Lot Number and change the GTIN-14 data structure to a GTIN-12 data structure.
1.1	5.1	24	Update Figure 11 GS1 DataBar Expanded Stacked barcode from a GTIN-14 data structure to a GTIN-12 data structure.
1.1	5.1	25	Update Figure 12 Captions to change from "GTIN" to "U.P.C. Number System 2"
1.1	5.2	28	Update Figure 15 callout for GS1-128 barcode image from "GTIN Only" to "GTIN, Use-By Date, Net Weight (In Pounds), Variable Count, and Batch/Lot Number"
1.1	6.1	38	Update Figure 21 GS1 DataBar Expanded Stacked barcode from a GTIN-14 data structure to a GTIN-12 data structure.

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1.   Introduction

The Seafood industry continues to evolve to meet consumers' needs. Consumers today are much more knowledgeable and demanding about the foods they purchase. The increased focus on food safety and consumer awareness raises the need to identify and adopt business practices and standards that will aid the Seafood Distribution Channel Participant's ability to track and trace product throughout the supply chain.

1.1.   Purpose and Scope of this Document

Consumers expect safe and nutritious foods. They also expect all participants in the supply chain to have effective practices in place that allow for the rapid identification, location, and withdrawal of food lots when problems are suspected or confirmed. Ensuring that effective practices are in place across a complex and global supply chain is an on-going challenge. For this reason the Traceability for Seafood Implementation Guide has been developed to aid in the adoption of consistent business practices to effectively manage traceability for the seafood industry.

Bioterrorism Act requirements of 2002 for chain of custody are contact information and product data for the company that shipped the product and for the company that the product has been shipped (one step forward, one step back). The Food Safety Modernization Act of 2010 affirms the Bioterrorism Act but details no further traceability requirements. This guide recommends an additional voluntary approach in best practices for identifying and tracking of seafood from farm or vessel to point of sale.

The scope of this guideline establishes minimum requirements and best practices to share information between distribution channel participants. This guide:

- Addresses traceability practices from the processing facility to the point of consumer sale to support Critical Tracking Events (CTEs) such as:

    o   Product Creation/Repackaging

    o   Product Shipping

    o   Product Receipt

    o   Product Consumer Sale

    o   Product Depletion

- Considers traceability practices upstream from the processing facility, including guidance for source tracking for sustainability;

- Applies to all seafood products for human consumption;

- Applies to all levels of the product hierarchy, which may include shipping logistics unit information, lots, pallets, cases, consumer items with data elements, etc.; and

- Includes all U.S. distribution channel participants including, farms, vessels, processors, suppliers, exporters, distributors, retailers, and foodservice operators.

Traceability is a business process that enables distribution channel participants to follow products as they move through the supply chain. Each traceability partner must be able to identify the direct source and direct recipient of product. Traceability as a business process can be utilized for a range of business purposes, including:

- Product Recalls/Market Withdrawals;

- Regulatory Compliance;

- Public Health Trace Backs;

- Safety and Quality Assurance;

- Sustainability; and

- Order Management/Inventory Accuracy.

This document is intended to provide all members of the seafood industry with guidance to develop and adopt business processes which provide traceability to product within the entire distribution channel, regardless of size or technological sophistication.

The guidance recommended is based on GS1 global standards for supply chain management and product identification. These standards were developed by industry participants to optimize business practices across supply chains world-wide.

1.2. How do I Use the Document?

Step 1: If traceability or GS1 standards are new to your company, read the section titled "Key Traceability Standards" in Section **2**.

Step 2: Read Section **3** to understand Traceability Principles.

Step 3: Read Section **4.1** to determine your company's Role(s) in the Supply Chain.

Step 4: Review the entire guideline for all roles to best understand the traceability process for the entire seafood industry distribution channel.

Step 5: Begin implementing, using the reference documents and appendices for assistance. Users should ensure they understand specific government and/or industry requirements for the markets they serve.

1.3. Who can use this Document?

This is a practical guide that is intended for those responsible for implementing traceability in their company's operations and supply chain. The document provides a guide for traceability practices for seafood farmers, vessels, exporters, suppliers, distributors, retailers and foodservice operators.

However, these traceability practices also define, to a degree, interactions with foodservice distributors, distributors, foodservice operators, exporters, and importers. The guide may be useful to these companies as well.

2. Key Traceability Standards

2.1. GS1 Traceability Standard

GS1 standards are the "common language of business" and provide the framework required to support the traceability business process. This industry best practice implementation guideline is based on the GS1 Global Traceability Standard (GTS). Developed by industry, the standard defines the globally-accepted method for uniquely identifying:

- Trading partners (the farms or vessels, your suppliers, your own company, your customers, 3rd party carriers);

- Trading locations (can be any physical location such as a hatchery, a pond, a vessel, a boat dock, warehouse, packing line, storage facility, receiving dock or a store);

- The products your company uses or creates;

- The logistics units your company receives or ships; and

- Inbound and outbound shipments.

The GS1 Global Traceability Standard also defines the essential information that must be collected, recorded and shared to ensure "one step up, one step down" traceability. The standard is applicable to companies of all sizes and geography.

While the GS1 Global Traceability Standard may be implemented independently from any specific technology, best business practices require the adoption of bar coding on packaging hierarchies that may include shipping logistics units, pallets, cases, and consumer items. Businesses are further encouraged to adopt electronic messaging to exchange essential business information. These technologies will be explored in the sections that follow.

GS1 US supports the adoption and implementation of GS1 global standards to provide organizations with real-time, accurate information of internal assets and products in the supply chain. Together with the National Fisheries Institute and other supply chain trade associations, GS1 US will provide important resources to help your company understand the most effective way to implement traceability with your distribution channel participants. GS1 US may also help your company connect with technology providers that serve the seafood industry.

To obtain a copy of the Global Traceability Standard go to http://www.gs1.org/traceability

2.2. Global Trade Item Number

What is a Global Trade Item Number?

A Global Trade Item Number (GTIN) is the standardized and globally unique way to identify items traded in the supply chain. Where there is a requirement to accurately order, invoice, price or receive your product, the GTIN is the basic enabler. The GTIN provides a common language to support multiple business practices, including traceability.

How is a GTIN assigned to the trade items my company produces?

When product is sold under a brand name, the brand owner is responsible for assigning the GTIN. If the company is the brand owner, the first step is to approach your local GS1 Member Organization and apply for a GS1 company prefix. A brand owner typically owns the label for the product that is sold; this may also include non-branded packaging. The company prefix uniquely identifies your organization globally and serves as the basis for each individual product number assigned. Your company then assigns a GTIN, using the GS1 company prefix, to each one of your products and every packaging configuration.
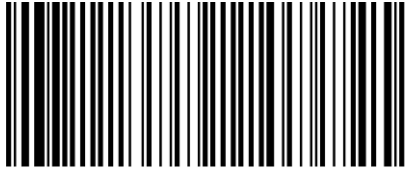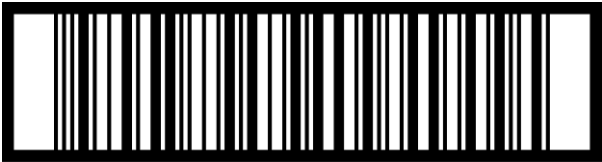
If your company is not the brand owner, then you must use the brand owner's GTIN.

To learn more about GTIN assignment visit
http://www.gs1us.org/barcodes_and_ecom/standards/gs1_identification_numbers.

2.3.   Product Hierarchy and Bar Code Use

There are a number of symbologies or data carriers used today in the seafood industry to support the identification of products. The level of information encoded into the data carrier differs based on the bar code symbology used. All bar code formats with the exception of the U.P.C. Number System 2 bar code, which is used on variable-weight consumer level products, contain a Global Trade Item Number (GTIN). The U.P.C. Number System 2 bar code contains a retailer specific item reference and is not globally unique. For purposes of this document, the U. S. seafood distribution channel suggests the use of the following bar codes at each level of the product hierarchy:

Pallet **(Shipping Logistics Unit)** Fixed-Weight and Variable-Weight	SSCC (Serialized Shipping Container Code) GS1-128 with AI (00)	(00) 0 0614141 0000524136
Case **(Cages, Totes, Bins)** Fixed-Weight and Variable-Weight	GS1-128	(01) 9 0614141 004365 (17) 100629 (3201) 000374 (30) 02 (10) 57432
Case **(Cardboard cartons)** Fixed-Weight	ITF-14	2 06 14141 51695 1
Consumer Item Fixed-Weight	UPC-A	6 14141 54321 2

Consumer Item (Store Item Number) Variable-Weight	U.P.C. Number System 2	2 41314 51225 8
Consumer Item Fixed and Variable-Weight	GS1 DataBar Expanded Stacked	(01) 0 0614141 51695 7 (3202) 002423 (15) 111231 (10) 00235496

Figure 1 - GS1 Identification Standards Table

2.4. General GTIN Allocation Rules

GS1 publishes general guidance on GTIN allocation. The seafood distribution channel has product characteristics that are different from general grocery items, so additional GTIN allocation guidance is necessary. In addition to the general allocation guidelines, seafood suppliers and brand owners should allocate GTINs in accordance with these following rules:

- Assign separate GTINs for each different packaging type such as case-ready, tray-ready, and store-processed product.

- Assign separate GTINs for each primary refrigeration state in which a product is marketed (e.g., if product is normally marketed in more than one state (i.e. shelf stable, chilled and frozen states), assign different GTINs to each refrigeration state).

- Assign separate GTINs to product lots that have different marketing claims or production methods when such characteristics are an important marketing feature to buyers (e.g., wild caught, farm raised, species, organic, etc.).

- Assign separate GTINs for each different product configuration.

To learn more about GTIN allocation rules visit http://www.gs1.org/1/gtinrules

2.5. Use of the GTIN Indicator

Within a GS1-128 bar code, the trade item's GTIN must be in a 14 digit data structure. A product with a GTIN-12 or GTIN-13 will require leading zeroes be included in the GTIN portion of the GS1-128. The first position of the GTIN-14 is used to indicate the packaging hierarchy level. The GTIN indicator value for consumer items is always 0, and

the packaging indicator for a variable-weight case must always be 9. Otherwise, the indicator may be any value between 1 and 8.

2.6.   Use of Batch/Lot Numbers and Case Serial Numbers

All suppliers should assign Batch/Lot Numbers (the terms batch and lot as defined here are interchangeable) or Serial Numbers to products they create. The content, syntax, and format of the batch or lot number itself typically varies from one company to another, depending on company practice and the precision desired. For example, a lot can represent all product produced in a day at one facility or the product produced in one hour from an individual packing line or it could represent a unique recipe run. Industry best practices limit lot codes to no more than one day's production. Additionally, care should be exercised to ensure that other regulatory lot coding requirements, such as those for thermally processed canned foods regulated by FDA are met. In addition to the Batch/Lot Number, some suppliers also assign a unique Serial Number to each case and record the beginning and ending case Serial Numbers for each batch or lot.

It is important to remember that the range of product assigned to a single Batch/Lot Number also defines the minimum amount of product that may need to be removed from the supply chain in the event of a recall. This needs to be considered when defining your company's standard practice for setting the scope of each Batch/Lot Number for each type of product that it produces.

Case Serial Numbers can be assigned to each case at the time of packing by the supplier. Serial Numbers should be generated without any intelligence (e.g., a simple sequential number without any production facility or production date and time reference), however, it is important to link the range of serials numbers assigned to a Batch/Lot Number, production facility, production date and time, etc. for reference with regard to queries about the case.

2.7.   How Does my Company Uniquely Identify Products in the Supply Chain?

Many companies use a stock keeping unit (SKU) to identify a product within their distribution network. The SKU is not a globally-unique product identification, so it is not recommended as a product identification for traceability.

The best practice is to assign a GS1 Global Trade Item Number (GTIN) for each trade item and to generate, at the very least, a unique batch or lot number for each production run of a given product. A serial number would, of course, give the ultimate value of unique identification of any trade item. A GTIN may be assigned at any level of the packaging hierarchy from a pallet, to a case or consumer item, in order to make that level of packaging globally unique.

2.8.   Use of Global Location Numbers

A Global Location Number (GLN) is a unique location identification number for a physical or legal entity. A GLN is a globally unique number that is assigned by the owner of the physical or legal entity using their GS1 company prefix.

The GLN can be used at a very high level to represent an entire corporation but can also be used at a granular level to represent a specific vessel, a pond, a location within a processing plant, etc.. It is recommended that participants in the seafood industry at least assign GLNs (AI 414) to all of their physical locations to provide globally unique location identification for their traceability processes. For participants who choose not to assign GLN or are not required to do so due to market or regulatory requirements, the location identification for the production of the lot must be encoded in the lot code number (AI 10). This will allow participants to maintain confidentiality, while ensuring that the identity of production locations is available in human readable format on individual packages and in both human readable and machine readable format on cases, pallets and shipping documents.

Format of the Element String	
Application Identifier	Batch or Lot Number
1 0	X_1 ———— variable length ————▸ X_{20}

Note, the formatted length of AI 10, Batch or Lot Number is 20 alphanumeric characters. This can be made up of internal codes that identify facility locations, dates, etc., that are used to associate an item with information relevant for traceability of the trade item.

Or

Format of the Element String			
Application Identifier	GS1 Company Prefix ————▸	◂———— Location Reference	Check Digit
4 1 4	N_1 N_2 N_3 N_4 N_5 N_6 N_7 N_8 N_9 N_{10} N_{11} N_{12}		N_{13}

Identification of a Physical Location - Global Location Number: AI (414) GLN length is 13 numeric characters.

To learn more about GLN assignment visit
http://www.gs1us.org/barcodes_and_ecom/standards/gs1_identification_numbers.

3.   Traceability Principles

Implementing a traceability system within a supply chain requires all parties involved to link the physical flow of products with the flow of information about them. Adopting industry standards for traceability processes ensures agreement about identification of the traceable items. This supports the visibility and continuity of information across the supply chain.

Critical Tracking Events along with Key Data Elements for traceability of product movement in the supply chain consists of:
- Product Receipt (Unique Identification of Shipment linked to Unique Product Identification, Date Received, Origin of product)
- Product Ingredient (Unique Identification of ingredient along with Batch/Lot Number or Serial Number)
- Product Creation (Unique Identification of product, Batch/Lot Number or Serial Number)
- Product Shipping (Unique Identification of Shipment linked to Unique Product Identification, Date Shipped, Shipment Destination)
- Pallet Configuration (Unique Shipment ID with Unique Product ID aggregation, Batch/Lot Number or Serial Number, Quantity.
- Consumer Unit Depletion and/or Point of Sale (Unique Product ID, Batch/Lot Number link, Date Purchased, Quantity

Supply chain traceability is the net result of two complementary business processes, referred to as external and internal traceability. External traceability involves the communication of product identity and transport information between trading partners, while internal traceability involves the association of input products with output products when an industry participant creates a new product.

External Traceability - All traceable items must be uniquely identified and this information shared between all affected distribution channel participants. External traceability for the seafood industry is primarily based on the case and consumer item level of the packaging hierarchy. At a minimum, the identification of products for the purpose of traceability requires:

- The assignment of a unique GS1 Global Trade Item Number (GTIN); and

- The assignment of a Batch/Lot Number which includes location information if GLN's are not used.

To maintain external traceability, traceable item identification numbers must be communicated to distribution channel participants on product labels and related paper or electronic business documents. This links the physical products with the information requirements necessary for traceability.

Internal Traceability - Processes that parties maintain within their organization to link the batch identity of raw materials to the batches of the finished goods are those that enable internal traceability.

When a product is combined with others, processed, reconfigured, or re-packed, the new product must have its own unique product identifier (i.e., GTIN). The linkage (auditable function) must be maintained between this new product and its original inputs such as batters, breading, seasonings, marinades, salt, STPP, citric acid, packaging materials and many others to maintain traceability. The label showing the lot identification of the traceable input item should remain on the packaging until that entire traceable item is consumed. This principle applies even when the traceable item is part of a larger packaging hierarchy.

Internal and External Traceability - End-to-end traceability requires that the processes of internal and external traceability be effectively conducted. Each traceability partner should be able to identify the direct source and direct

recipient of traceable items. This is the "one step up, one step down" principle. This requires that distribution channel participants collect, record, store, and share minimum pieces of information for traceability that are described in the sections that follow. To have an effective traceability system across the supply chain:

- Any item that needs to be traced forward or backward should be globally and uniquely identified; and

- All distribution channel participants should implement both internal and external traceability practices.

  Implementation of internal traceability should ensure that the necessary linkages between inputs and outputs are maintained.

3.1.   Implementing Traceability Processes

In order to support best practices for maintaining a traceability process there are five basic business processes that should be put in place among distribution channel participants. They include:

1) Plan and organize how to assign, collect, share, and maintain traceability information.
2) Determine how to align master data required for all products and distribution channel participants and other physical locations.
3) Record traceability information as products are created and shipped and modified in form (critical tracking events).
4) Request a trace using at least one of the four information sources listed:
    a. GTIN or some form of the item identification;
    b. GLN or some form of the traceability partners' name or attribute;
    c. GLN of the physical location for the targeted product;
    d. Dates or time periods for targeted product.
    e. Lot number
5) Use the information provided to take the appropriate action as required.

3.2.   Traceability Data Retention

All companies are expected to maintain records that will facilitate timely and accurate traceability and support any product recalls. It is recommended that your company establish an internal data retention policy based on the following considerations:

1) The 2002 Bioterrorism Act requires that records must be maintained for up to two years based on the type of product.
    For more details go to http://www.fda.gov/RegulatoryInformation/Legislation/ucm155733.htm
2) Length of time product may exist in the distribution channel beyond two years. This is based on the type of product (chilled, frozen, fresh or shelf stable).
3) The needs to promptly retrieve data in the event of an epidemiological event which may, or may not implicate your product.
4) Industry agreements or customer requirements.

4.   The Seafood Industry Distribution Channel

Figure 2 shows an overview of the seafood distribution channel and the key roles played by various distribution participants.
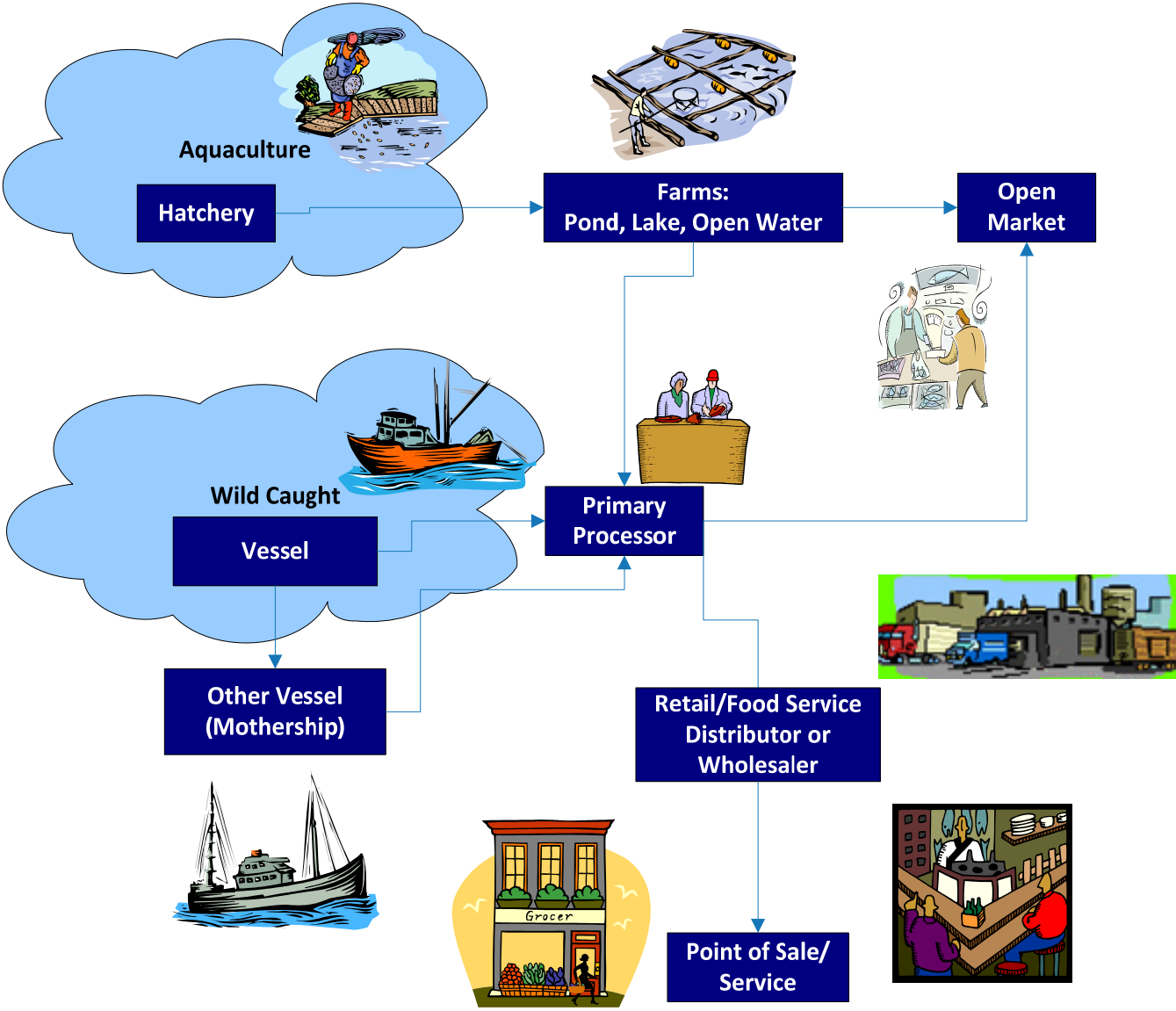
Figure 2 - Seafood Supply Chain

4.1. Roles in the Supply Chain

Figure 3 provides a list of the primary and support roles found in the seafood supply chain and, if covered, where traceability guidance is provided in this document for each role.

Role	Activities	Alias / Examples
Primary Roles		
Hatchery/Farms	Grow and ship	Suppliers of seafood
Wild Caught/Vessels	Catch and ship	Suppliers of seafood
Broker	Manages Relationship Between Supplier and Customer, but Does Not Take Possession of Product	Agent
Processor	Harvest, Process, Repack, Package, Label, Store, Sell, Ship	Seafood packer, supplier
Retail Store	Receive, Store, Process, Package/Label, and Display; Sell to Consumer	Grocery Store, supermarket, grocery chains, open market.
Retail, Foodservice Distributor or Wholesaler	Receive, Store, Sell, Ship	Retail distribution center, Foodservice Distribution Center, Import/Export warehouses
Foodservice Operator	Storage, Prepare, Cook, Sell to Consumer	Restaurants, entertainment venues, institutions.
Support Roles		
Feed Suppliers	Produce and ship	For hatcheries and farms
Packing Material Supplier	Produce and ship	Suppliers of packing material (crates, bags, boxes, labels, bins, clamshells, etc.)
Ingredient Supplier	Produce and ship	Breading,spice manufacturers additives (i.e. citric acid & STP)
Third Party Logistics Service Provider	Transport, Store	Truck / Rail / Ship / Air
Regulatory Organizations	Compliance oversight	Customs, Inspection, and Grading agencies

Figure 3 - Table of Roles

4.2. How is each Supply Chain Facility Uniquely Identified?

A best practice for traceability is to use the GS1 Global Location Number (GLN) for company and location identification. A GLN is based on your company's GS1 Company Prefix number ensuring global uniqueness.

Individual GLN's can be assigned to represent your company as well as any individual trading subsidiaries. GLN's can also be used to identify production, storage, shipping or receiving locations within your company to distinctly identify physical locations associated with traceability processes. For participants who choose not to assign GLN or

are not required to do so due to market or regulatory requirements, the location identification for the production of the lot must be encoded in the lot code number. This will allow participants to maintain confidentiality, while ensuring that the identity of production locations is available in human readable format on individual packages and in both human readable and machine readable format on cases, pallets and shipping documents. See examples in Section 2.8.

To learn more about GLN assignment visit
http://www.gs1us.org/barcodes_and_ecom/standards/gs1_identification_numbers

4.3.   Product and Packaging Scenarios

Within the U.S seafood distribution channel, products are segmented between fixed-weight and variable-weight products. As previously defined, a fixed-weight product is always produced and sold in the same weight. A fixed-weight product is typically priced per selling unit, rather than per weight. A variable-weight product is a specific product for which the weight and price typically varies from unit to unit. A variable-weight product is typically priced on the true weight of the item, rather than per selling unit.

Both retail and foodservice fixed-weight case-level products are encoded with an ITF-14, Interleaved Two of Five, bar code (only allows the use of a GTIN) or a GS1-128 barcode. Variable-Weight case-level retail and foodservice products should be encoded with a GS1-128 bar code. The GS1-128 bar code format is recommended format to adopt to support electronic data encoding within the bar code for traceability for both fixed and variable weight cases as it is the bar code format that enables the encoding of the GTIN and Batch/Lot or Serial Number.

Fixed-Weight products sold at retail use a UPC-A bar code. The U.P.C. Number System 2 bar code is the commonly used format for variable-weight consumer items today, encoded at the retail facility. For products sold at retail, best practice is to use a GS1 DataBar bar code which allows for additional item attributes to be included in the scanning of the product.

Generally, products are delivered by suppliers to retailers, distributors, or foodservice operators in one of the following package types:

Case Package Types	Definition	Product Examples
Fixed-Weight Units, Case or Shelf Ready	Food Service or Consumer level items ready for sale. Product is processed, packaged, and labelled for sale by supplier.	Breaded or un-breaded seafood, canned seafood, bagged frozen seafood, fresh seafood. Retailer and Food Service
Variable-Weight Units, Case or Shelf Ready Pre-priced	Food Service or Consumer level items ready for sale. Product is processed, packaged, and labelled for sale by supplier.	Bulk shrimp, bulk frozen fillets, chilled shrimp and fillets. Retailer and Food Service
Variable-Weight Units Un-priced	Processed, packaged, and partially labeled for consumer sale by supplier. **Final labeling** for consumer sale is done by the **retailer**.	Whole round fish or fillets fresh or frozen, bulk shrimp, crab clusters, bulk oysters or scallops. Retailer only
Tray-Ready	Processed and bulk packed by supplier. Packaged for consumer sale and labeled by retailer.	Bulk shrimp, frozen fillets, chilled shrimp, lobsters and fillets. Retailer only
Store Processed	Bulk packed from supplier and retailer is doing further processing, labeling and packaging.	Whole round fish or fillets fresh or frozen, bulk shrimp, crab clusters, bulk oysters or scallops. Retailer only

Figure 4 – Seafood Package Types

Shelf or case-ready product is identified by information communicated by the supplier to the retailer that can be used by the retailer through their supply system to the point of sale to the consumer.

When retailers, distributors, or operators have suppliers provide them with "Private Label" branded product, the retailer, distributor, or operator is the brand owner and is therefore responsible for identifying that product in the supply chain. The best practice is to identify these private brand items using the GS1 Global Trade Item Number (GTIN). In these cases, the retailers, distributors, or operators will inform the supplier what GTIN to use on the product's packaging.

If a company further processes and packages a product in the supply chain, such as the case with store-processed product, then that company becomes the manufacturer and is responsible for assigning a GTIN or item reference and traceability attributes. This may be achieved using a combination of human readable and scanable product information. This information should also be stored for future retrieval if necessary.

If a company modifies the basic characteristics of a trade item, a new GTIN or item reference is required. Retailers, distributors, and operators should be familiar with and use the same GTIN allocation rules that suppliers use if a GTIN is created. These rules are found in Section 2.4 of this document.

A unique business process at the consumer item level that exists today in the seafood industry is the use of a U.P.C. Number System 2 bar code. As stated earlier in this document, this bar code does not contain a globally unique item number (GTIN). This bar code and its data structure are assigned by the retailer or wholesaler purchasing the product from a supplier(s). It contains a proprietary vendor or supplier reference number, an industry item reference, the extended price, and a price verifier digit. Because this data structure is retailer specific, it is not normally used in traceability processes initiated by the supplier.

When using the Number System 2 bar code, there are a variety of options for the retailer to use to identify store-processed product. The choice is the retailer's to make and is dependent upon his requirements for granularity. But it is the retailer's obligation to always correlate the supplier's GTIN and Batch/Lot Number of the raw material to the product identity assigned by the retailer to the store-processed consumer item created from the supplier's raw material.

U.P.C. Number System 2 Bar										
Prefix	Item Reference Number					Price Verifier Digit	Item Price				Code Check Digit
2	N	N	N	N	N	C	N	N	N	N	C

Figure 5 – U.P.C. Number System 2 Bar Code Format

4.4.   Impact of Batch/Lot and Serial Numbers on Traceability

Each partner in the supply chain shall provide and/or capture certain product information to enable forward and backward (one up/one down) traceability. It is imperative that the supplier establish a case-level product marking protocol that can be used for traceability by supplier, retailer, distributor, and foodservice operator in normal business operations as well as used to locate specific product in the event of a product recall situation.

Of critical importance, should a product traceability or recall situation occur, the supplier should be able to convey to their trading partner(s) the required information to enable a precise search for the identified product. It is incumbent upon the supplier to identify to their trading partners the type of data that will normally be provided for product traceability (i.e., Batch/Lot or Serial Number) as described in
Figure 6**.**

As a minimum, a supplier must assign a Batch/Lot Number for case-level traceability. (Within the GS1 bar code system, a Batch/Lot Number is assigned an Application Identifier of 10). However, use of a serial number would enable traceability to the instance of a product within that Batch/Lot Number. Due to the wide spread use of serial numbering in the Fresh Food industry on variable-weight cases and the limited data carrying capacity of the GS1-128 bar code, a serial number must at times be substituted for the batch/lot number in the bar code.

If a batch number, AI "10" is present in the case bar code, the receiving partner should manage the traceability of the product using that value. However, if an AI "10" batch number is not present, then an AI "21" serial number must be present and that is the number the receiving partner must record to track the product. If both numbers are present, as sometimes happens on fixed-weight product, the AI "10" batch number takes precedence.

Case Bar Code Contents		Number Used For Tracking Case
Batch/Lot AI "10"	Serial AI "21"	
●		Batch/Lot Number
	●	Serial Number
●	●	Batch/Lot Number

Figure 6 – Priority of Batch/Lot and Serial Numbers for Tracing Cases

5. Maintaining Traceability Throughout the Product Hierarchy

The best practice for traceability is to identify traceable products by their GTIN and the associated production Batch/Lot or Serial Number information. This information must be available in human readable format, and best practices are that the information also be available in scanable format.

Products should have a standard identification at all levels of the product hierarchy (shipment, pallet, case, item, etc.).
Figure 7 identifies information that should be used to identify each level. Linking the standard product identification with human readable and potentially scanable attributes for each level of the product hierarchy ensures traceability.

Consumer Item	GTIN or Product Description and Brand Owner, **AND** unique lot identifier such as a Sell-By Date, Best Buy Date, Production Date or Date/Lot Code
Case	GTIN and Batch/Lot Number **OR** Serial Number
Pallet or Shipment	Serial Shipping Container Code (SSCC), Purchase Order Number(s), or Global Shipment Identification Number (GSIN)*

Figure 7 – Table of Hierarchy Levels

*GSIN details at: http://www.gs1.org/barcodes/technical/idkeys/gsin

5.1.   Minimum Requirements for Consumer Item Traceability

The ultimate output of case-ready, tray-ready and store-processed product is consumer-packaged product sold to a final consumer. This section details how retailers, distributors, or foodservice operators manage the minimum required traceability data for these consumer item products.

Consumer item traceability must allow consumers to identify suspect product, so human readable information is essential. Therefore, consumer item traceability requires the use of human readable information on both fixed-weight and variable-weight consumer items.

Fixed-Weight consumer items have a scanable UPC-A bar code that includes a GTIN, but no additional traceability attributes. Variable-Weight consumer items have a scanable U.P.C. Number System 2 bar code that includes an item reference. While the item reference provides the retailer with high-level information about the type of product sold, it fails to provide effective traceability with point of sale scanning. Therefore, retailers as well as consumers are largely dependent on human readable information for consumer item traceability for all items that have a UPC-A or a U.P.C. Number System 2 bar code.

The party responsible for packaging, labelling, bar coding, and setting the shelf life date of the consumer items varies with the packaging type. The following section highlights for each packaging type whether the supplier or the retailer has responsibility:

Packaging Type	Packaging		Label Placement		U.P.C. Number System 2 Item reference		Shelf Life Dating	
	Supplier	Retailer	Supplier	Retailer	Supplier	Retailer	Supplier	Retailer
Fixed-Weight Case Ready	●		●		N/A	N/A	●	
Variable-Weight Case Ready	●		●*	●*		●		●
Tray Ready		●		●		●		●
Store Processed (Full Service and Packaged)		●		●		●		●

* Pre-priced variable-weight case-ready product is labelled by the supplier in accordance with retailer instructions; Non pre-priced variable-weight case-ready product is labelled by the retailer

Figure 8- Responsible Party for Consumer Item Traceability Data

Fixed-Weight consumer items are packaged and labelled by suppliers and the traceability information for this packaging type is always the responsibility of the supplier. Although case-ready consumer items are always packaged by the supplier, they may be pre-priced or un-priced when delivered to retailers. In either case, the retailer always determines the Sell-By Date and item reference number. When labelling is performed by the supplier, the retailer communicates this information to the supplier before the U.P.C. Number System 2 bar code labels are printed. The following table shows those traceability elements required on consumer-item case-ready products that have UPC bar codes:

Data Elements	Scan Length	Case-Ready/Fixed/Variable Weight		Tray Ready/ Store-Processed	
		Human Readable	Scan	Human Readable	Scan
Brand Owner/Company Name	N/A	●		●	
Consumer Item Product Description	N/A	●		●	
Lot Number as defined	2+20	●		●*	
Global Trade Item Number (GTIN) **OR**	12	●	●	●	●*
(Store) Item Identification Number (such as U.P.C. Number System 2)	12	●	●^	●	●^
Best-Before-Date OR Sell-By-Date OR Use-By-Date OR Production-Date Seafood Industry terminology is Lot Code/Date Code.	N/A	●		●	

Human Readable -label text; Scan = Bar coded using the UPC-A;
*Only on fixed-weight items with a UPC-A bar code
^Only on variable-weight items with a U.P.C. Number System 2 bar code

Figure 9 - Consumer Item Traceability Data Elements

For case-ready fixed-weight items, the UPC-A bar code contains the GTIN, which by itself, does not establish unique traceability. Therefore to enable product traceability, human readable data must be used in combination with scanable data.

For case-ready variable-weight packages, the U.P.C. Number System 2 bar code does not contain the product GTIN or any other essential traceability information. For these packages, traceability is achieved entirely through human-readable label information as noted in Figure 12.

Figure 10 shows a consumer label that meets all minimum traceability requirements for a case-ready fixed-weight product: including the use of GS1 Databar
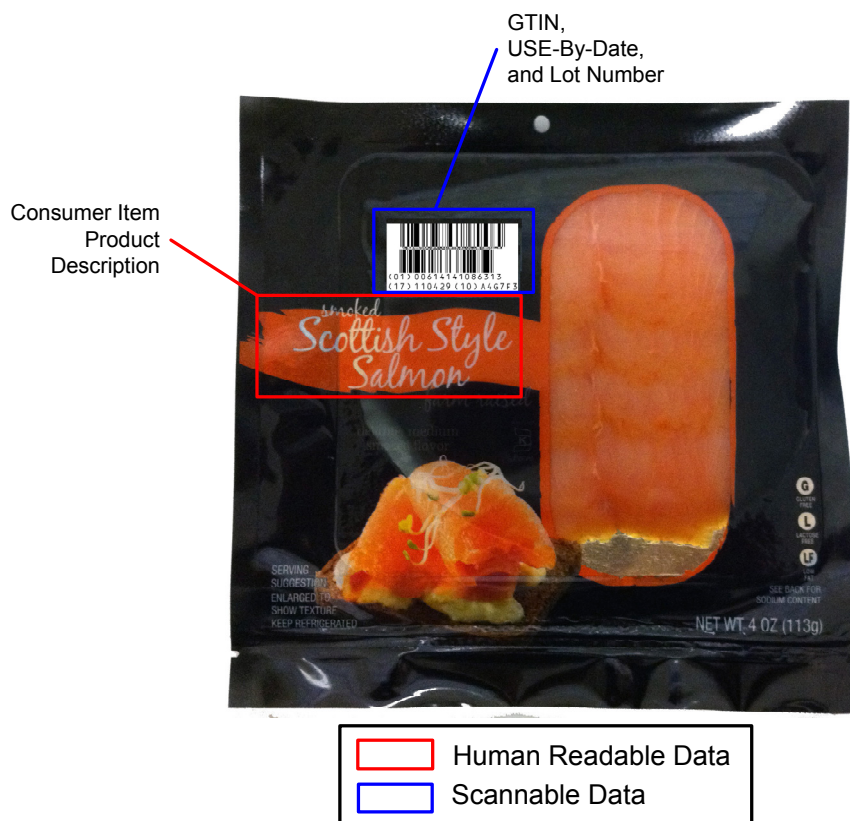
Figure 10 – Case-Ready Fixed-Weight, Consumer Item Label

Figure 11 shows a consumer label that meets all minimum traceability requirements for a case-ready variable-weight product, including use of GS1 DataBar.

GTIN, Use-By-Date, Net Weight, Price, and Lot Number

Consumer Item Product Description

Use-By Date

	Human Readable Data
	Scannable Data

Figure 11 - Case-Ready Consumer Item Label

When retailers, wholesalers, distributors, or operators package and label store-processed and tray-ready consumer items, they must be able to associate the supplier's case GTIN and Batch/Lot Number or case Serial Number with the consumer item product name, item reference, and Sell-By Date that they apply to the consumer package. Maintaining this association makes store-processed and tray-processed product traceability a greater challenge than case-ready consumer items where product is processed only by the original supplier.

Labelling traceability markings on store-processed and tray-ready variable-weight consumer items is always the responsibility of the retailer. The retailer must determine the Sell-By Date and associate it with the supplier's Batch/Lot Number or case Serial Number.

Figure 12 shows a consumer label that meets all the minimum traceability requirements for a store-processed or tray-ready variable-weight consumer item including the use of U.P.C. Number System 2 bar code:
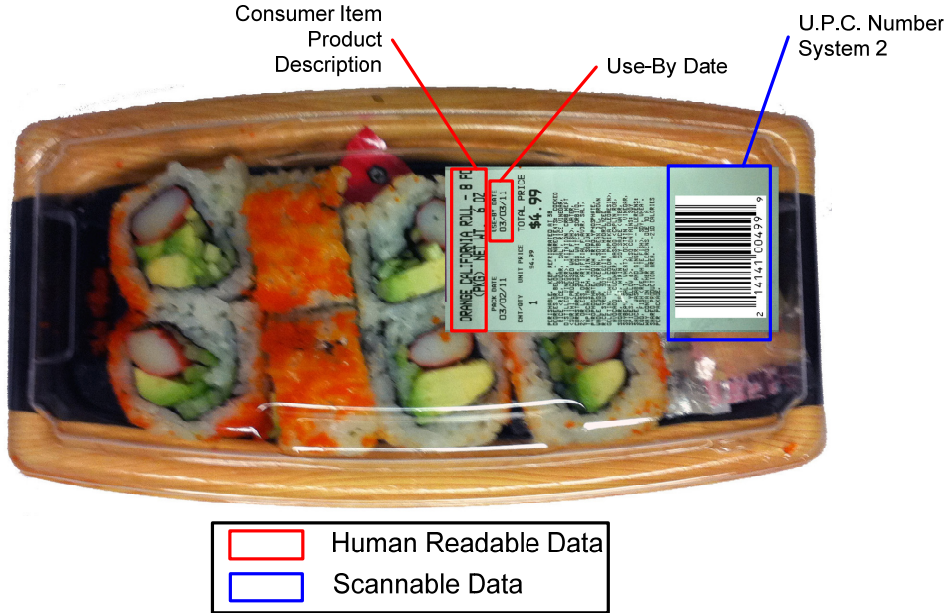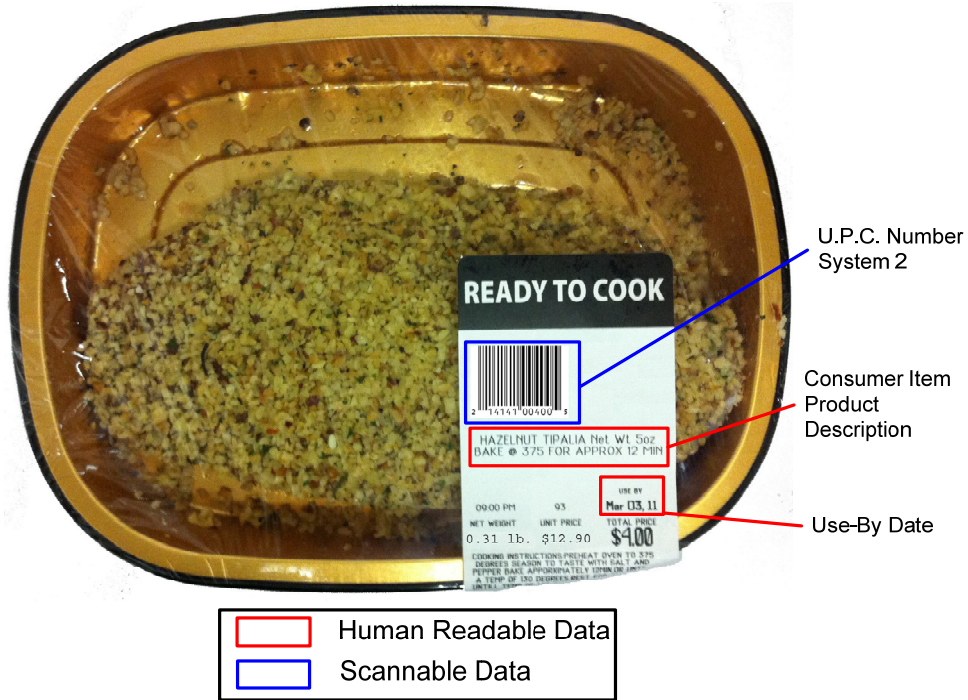
Figure 12 - Store-Processed/Tray-Ready Consumer Item Label

Once product from the manufacturer is removed from cases at the retail store and repacked by the retailer, risk management favors the simplest method of product withdrawal. The Sell-By Date creates a more user-friendly human-readable product identity reference for consumers than the Lot/Batch/Serial Number. Note that the use of GS1 DataBar on these package types would accommodate the inclusion of all of the human readable data, as depicted.

5.2. Minimum Requirements for Case Traceability

The minimum requirements for case level traceability rely upon a combination of the GTIN and Batch/Lot or Serial Number. The figure below provides a summary of scanable and human readable traceability attributes.

Because of differences in production practices and bar code size constraints, traceability labelling practices vary depending on the type of seafood product produced. The primary difference is between variable-weight products and fixed-weight products, and between refrigerated and frozen or shelf-stable. These differences are summarized in **Figure 13** below:

	Scan Length	Case-Ready/Fixed/Variable Weight		Tray Ready/ Store-Processed	
		Human Readable	Scan	Human Readable	Scan
Brand Owner/Company Name	N/A	●		●	
Consumer Item Product Description	N/A	●		●	
Lot Number as defined	2+ Maximum of 20	●	●	●*	
Global Trade Item Number (GTIN)	2+14	●	●	●	●*
Best-Before-Date OR Sell-By-Date OR Use-By-Date OR Production-Date	N/A	●		●	

Human Readable = label text; Scan = Bar coded; ASN = Advance Ship Notice/Ship Notice Manifest; AI = Application Identifier
* = Use Serial Number when present on case and useful for traceability and use Batch/Lot Number if no Serial Number present on case.
^ = Include Serial Number when present on case and useful for traceability

Figure 13 - Case-Level Data Requirements for Traceability

Both variable-weight and fixed-weight product cases must be clearly labelled with the same human readable core traceability information. Human readable numbers should be clearly labelled data elements such as the text "Batch Number" followed by the batch number value. Human readable numbers located below each GS1 bar code are not considered to meet the human readable requirement because they are not clearly labelled data elements. Even though logistics supply chain operators may be able to interpret application identifier code numbers (such as "10" for the Batch/Lot number), the application identifier is not a substitute for a clearly labelled data element.

In addition to the core traceability information in **Figure 13**, case labels will also include:

- FDA or USDA required information including USDA establishment number when required.
- Best-Before-Date, Sell-By Date, Use-By Date, or Production Date, recommended for shelf-life management.

Note that the ITF-14 bar code currently used today by many manufacturers includes only the GTIN and not the Batch/Lot Number in a scanable form.
The GS1-128 bar code format is the preferred format to be used at the case level to communicate both of these critical traceability data elements. It should be adopted, if not currently in use, to best facilitate information sharing for traceability processes.

In addition, the GS1-128 bar code standards allow for the use of Application Identifiers (AI) to define different data elements in a bar code on each case. A fixed-weight product case should always contain a Batch/Lot Number (AI "10") within the case bar code. Optionally, a Serial Number (AI "21") can also be included. If both are available, the Batch/Lot Number should still be used for the traceability of fixed weight products.

Figure 14 is an example of a fixed-weight case label that contains all of the required traceability information using a GS1-128 bar code:

Figure 14 - Fixed-Weight Case Label

Some suppliers assign a serial number to each variable-weight case to ensure that cases are not scanned more than once when loading pallets. When serial numbers are present on variable-weight cases and used for traceability of product, include the case Serial Number (AI "21") in the GS1-128 bar code. If Serial Numbers are not used for traceability, then include the Batch/Lot Number (AI "10"). Ideally, both data elements would be included in the bar code. But because of the limited data carrying capacity of the GS1-128 bar code (48 digits), both a Serial Number and a Batch/Lot Number cannot be included in the bar code along with the GTIN, net weight, and product date that are also required for logistics management of variable-weight cases.

The type of product date used in the bar code depends upon the business segment being served by the product. Most products destined for retail shelves additionally use a Sell-By Date. The use of dates is required by distributors and retailers to know how much shelf life the product has remaining. Foodservice customers generally are interested in the age of the product, so product destined for foodservice uses a production date. However, some foodservice customers prefer other dates and any of four dates (Sell-By, Use-By, Harvest, and Packaging) could be used. For frozen products, some manufacturers use a packaging date (AI "13") instead of a production date (AI "11"), as this is the date the product is stabilized in the frozen or shelf-stable form and the starting point for measuring shelf life.

Figure 15 is an example of a variable-weight case label with a case batch/lot number that contains all of the minimally required traceability information using a GS1-128 bar code:
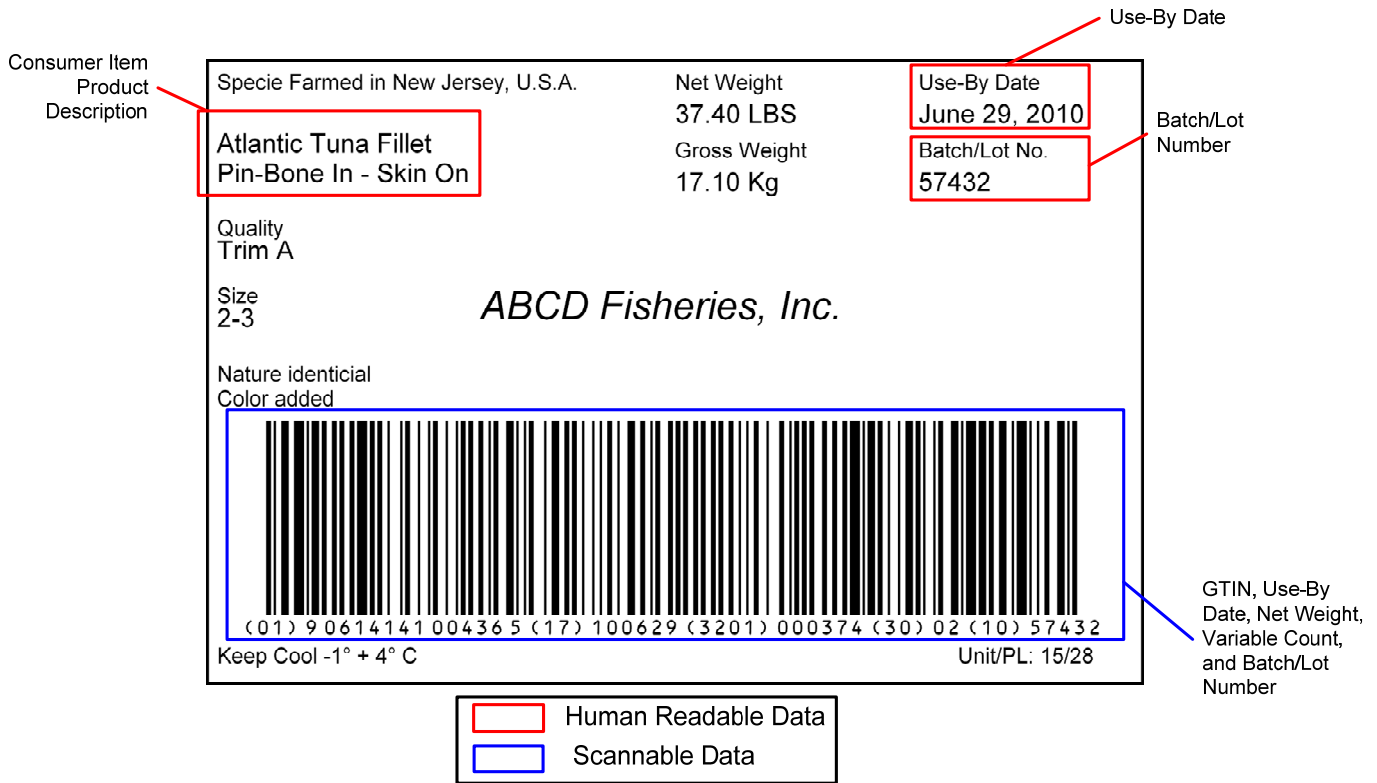
Figure 15 - Variable-Weight Case Label

5.3. Requirements for Pallet Traceability

The standard business practice is to assign a GS1 Serial Shipping Container Code (SSCC) to each pallet once all cases are in place. To manage product traceability at the pallet level, labels must be attached to the loaded pallet to provide a means of identifying that logistics unit to trading partners. The label must show a logistics unit identifier, such as the Serial Shipping Container Code (SSCC), in an easy-to-read human readable form as well as an optional scanable GS-128 bar code.

Typically, when using the SSCC, this shipment identification exists only for the duration of the shipment between trading parties, as shipments are broken down upon arrival it is not intended to be considered a primary identifier for product traceability. However, it can provide some links when contents are related to the larger shipment identifier. Unique shipment identification information may be used as a reference, along with other document identification like Bill of Lading, Manifests, Shipping Notice, etc.

Each SSCC number that is assigned is unique to the individual logistics unit and is based on your company's GS1 Company Prefix number. This ensures unique SSCC numbers world-wide.

The SSCC is typically part of a larger label affixed to the pallet. Additional information may be shown on the label, depending on the requirements of the trading partner. Most often the additional human readable information includes the shipper name and address, the carrier, and the delivery information.
Over time, your company will exhaust its pool of available SSCC numbers. For this reason, it is important that your company manage the re-use of SSCC numbers so as not to conflict with logistics units already in the supply chain. The best practice is to not re-issue an SSCC number for a period of at least one year.

Figure 16 is an example of a pallet label with just the SSCC in a GS1-128 bar code.

FROM: ABCD Fisheries 1234 Tuna Drive Salt Lake, NJ 06245 USA	CARRIER: Fish Transport USA PRO#: BOL#: 0614141018253933

TO:
ZYXW Food Service, Inc.
54321 Food Lane
Riverland, FL 33241 USA

Ship-To Postal Code

(420) 33241

PO#: 13840176
DEPT#: 025
CTL#: 8006937711

CARTON: 1 of 1

Serial Shipping Container Code (SSCC)

(00) 0 0614141 018253933 1

Figure 16 - Pallet Label

To fully utilize the SSCC in a GS1-128 bar code, the bar code should be used in conjunction with an EDI 856 Advance Ship Notice (ASN). The SSCC can then be used as a reference key to additional logistical information provided in the ASN.

Additional information about SSCC assignment may be found at
http://www.gs1us.org/barcodes_and_ecom/standards/gs1_identification_numbers

5.4. Requirements for Shipment Traceability

Bills of Lading (BOL) and Manifests are paper-based documents created by a supplier or shipper and sent with a shipment or order to the product recipient. The Bill of Lading is the legal document summarizing information about the goods being transported. The Manifest document describes individual order details such as product GTINs, individual case weights, etc. Advance Shipping Notices (ASNs) are electronic messages created by a supplier/shipper and sent to a product recipient using Electronic Data Interchange (EDI) and is used to communicate similar shipment information as the Bill of Lading and Manifest.

The traceability data elements required are the same for all seafood products, both variable-weight and fixed-weight, and refrigerated, frozen, and shelf-stable. Best Practices are that the following data elements are included in the paper-based Manifest and the electronic ASN:

- Global Trade Item Number

- Batch/Lot or Serial Numbers

- Quantity shipped

- Shipping and Receiving Dates

- Ship From and Destination Locations

In addition, other useful information such as the following may be included as appropriate for your records:

- Stock Keeping Unit (SKU) or other supplier product identification reference

- Production Date **IF** Product is for retail store-processing or foodservice use

- Sell-By Date OR Best-By Date **IF** applicable

- USDA Establishment Number **OR** FDA Facility Registration Number, USDA Country of Origin Labelling Statement **OR** ISO Country Number(s), if applicable

- USDA Labelling for wild caught or farm raised

The shipment information includes the capability to define relationships between the shipment, purchase orders, pallets, and cases present in the order and the traceability and logistical management data for each. These relationships should be clearly defined at the shipment level in each electronic message.

The data model for traceability information and the relationship of this information to each level of the traceable item hierarchy is shown below. Note that the data described in Figure 18, below, meets the requirements of Critical Tracking Events data described throughout this document.

SHIPPING DATA MODEL FOR SEAFOOD TRACEABILITY
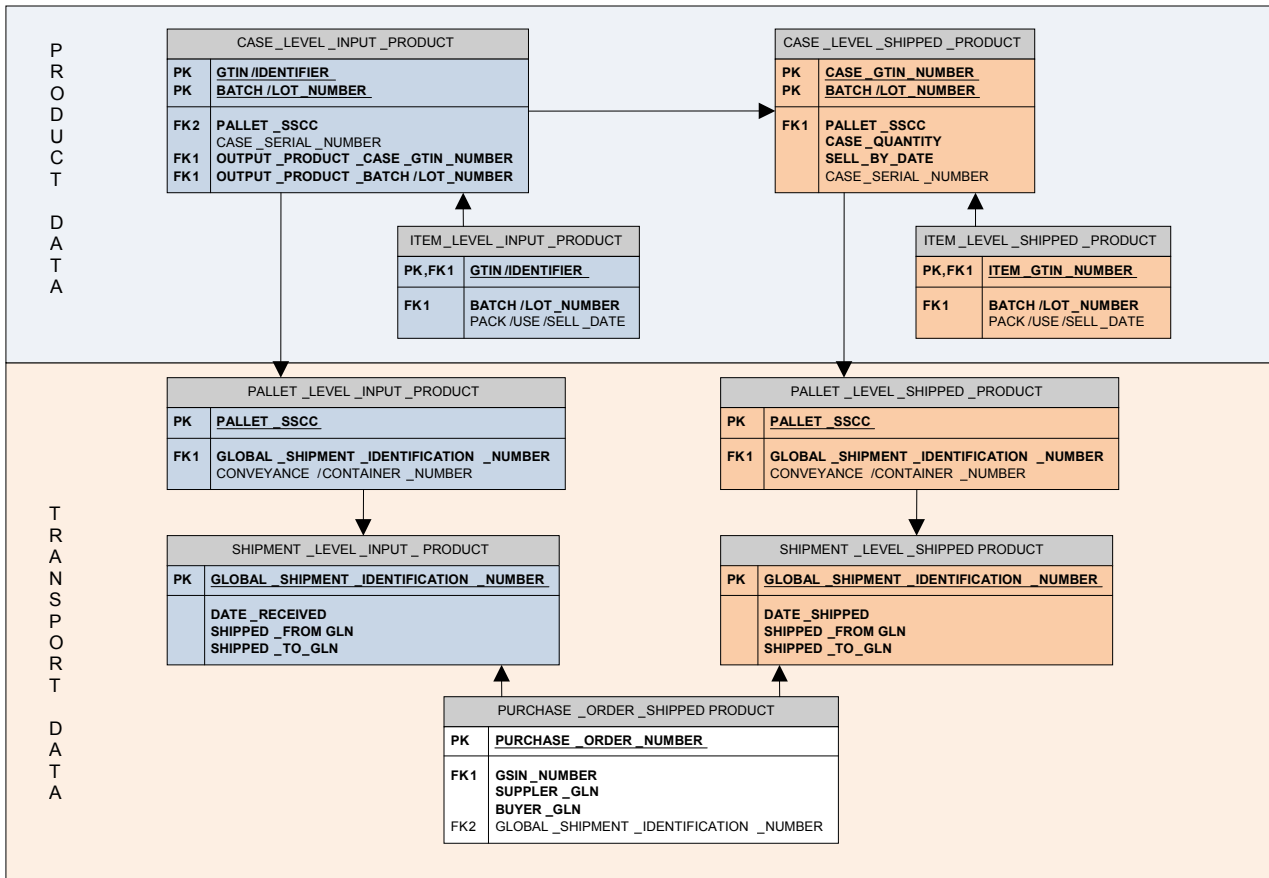
Figure 17 – Shipping Data Model for Seafood Traceability

5.5.   Maintaining Traceability for Product from Live Seafood Providers

Live Seafood providers deliver product in various logistic units. Each logistics unit should be individually traceable. Information used to insure traceability includes:

- Provider Identity
- Accurate farm/vessel information depending on species of the seafood received
- Purchase Order Number or Live Receiving Ticket of received seafood
- Date of Shipment and Receipt
- Carrier Name and Trailer Number
- NSSP Tag for Live Shell stock
- Count of seafood.

Live animal/seafood product lots must be traceable. This is accomplished by associating each seafood lot identification number with the GTIN and Batch/Lot Number of the output product it is used to produce. Note that the data described is focused on key data elements that support the sharing of Critical Tracking Events.

5.6.   Maintaining Traceability for Other Product Ingredients

Batters, breadings,, seasonings, marinades, salt, STPP, citric acid, packaging materials and many other product inputs are used in the production process by suppliers. These product lots must be traceable. This is accomplished by associating each product lot identification number with the GTIN and Batch/Lot Number of the output product it is used to produce.

Product sourced from other suppliers should be identified by the GS1 Global Trade Item Number (GTIN) and Batch/Lot Numbers provided by the supplier. The assignment of GTINs for each product traded (i.e., all product configurations) is the responsibility of the brand owner and must be recorded in the supplier's internal systems prior to being processed or traded.

GTIN and Batch/Lot or Serial Number information is shown on individual case labels. The GTIN and Batch/Lot or Serial Number of each input product must be associated with the GTIN and Batch/Lot Number of the output product.

5.7.   Maintaining Traceability in Sustainability Assurance

The traceability guide has been designed for the purposes of complying with traceability requirements for food safety. The processes and information that are collected and maintained under a food safety traceability program will also be utilized to provide sustainability information to stakeholders who desire it. This implementation guide will enable tracing of product, both in machine and human readable form, from its source to the end user, covering all levels of the supply chain needed for seafood product tracing for sustainability. In light of this, and in order to avoid unnecessary duplication or conflicting requirements that would add substantial costs to seafood traceability, a system created by these guidelines will be utilized to satisfy stakeholders stated needs.

The seafood industry's best practice for organizing sustainability-related information is to associate that information with the input lot at the point of first receipt, where it can be tracked through the supply chain. This information by input lot then is associated with the GTIN and Batch/Lot Number of the output product for which it is used and can be retrieved upon request.

The sustainability data that needs to be collected and made available up the value chain will vary depending upon the type of seafood, the manner in which it is produced and processed, the market, and legal or customer requirements. Fisheries or aquaculture facilities/operations that have achieved certification as sustainable or compliant with established best practices may obviate the need for detailed information related to the harvest or production of seafood products produced by that fishery or aquaculture operation to be included in a detailed trace. Simply put, the best practices established for lot traceability will be capable of including sustainability information, if it is decided by stakeholders that it is desired and the individual production sector finds that it is feasible to provide it, subject to specific legal, customer and market needs for that seafood and fishery/aquaculture sector. The guidelines will assist each segment of the supply chain as it works with their suppliers and customers to develop the specific list of needed information, the method of documenting the information within their internal systems and the method for sharing the information with their trading partners.

5.8.   Industry Practice for Product Dating

Although the product date is not used at the case level for traceability, it is related to the product Batch/Lot number and because the product date is critical for inventory management, it typically appears on the case and consumer item label. You should select the date type used by the type of product you are packaging. Industry practices for product dating encoding are:

- By Product Type:

  - **Minimally Processed, Refrigerated or Frozen Seafood** – Use the Production Date, AI "11".

  - **Further Processed Foods** – If the process that you use alters the life of the product such as cooking or freezing a refrigerated product, the appropriate date is the packaging date, AI "13".

  - **Cutup and Repacked Seafood** – Neither of these changes the useful life of the product.   The original Production Date should be on the case label as described above. The process step of Cutup or Repack, however, should be traceable by the Batch/Lot Number, AI "10".

  - **Otherwise Blended Seafood** – These blends, intended for use in other processes, should be identified by a Use-By date, AI "17". By using a Use-By date, the items can be produced to satisfy volume needs without regard for final use. The Use-By date should be calculated based on the seafood used to produce the product.

- By Date Type:

  - **Production Dating** – To represent the actual production date you should use the production date, AI "11". For uses that require you to know the age of refrigerated seafood, this is an appropriate entry.

  - **Packaging Dating** – This type of dating should be used if the process that you use alters the life of the product such as cooking or freezing a refrigerated product. With this type of situation the appropriate date is the packaging date, AI "13".

  - **Sell-By Dating** – This date, AI "15", should be used on product destined for and that will be viewed by end customers.   Examples of this would be fresh tray pack items or frozen retail items.

    - **Use-By Dating/Best-By Dating** – This type of date, AI "17", should be used where product is going to be used in another process. Its advantage is that it shows the user the last date a product can be used. In most cases a harvest date is best for refrigerated seafood, but there are times when a use-by date may be a useful date for consumers in addition to the Sell-By Date.

The application identifiers (AIs) described above are meant for use in GS1 bar codes to describe the meaning, structure, and function of the GS1 System element string that is encoded.

6. Best Practices for Maintaining Traceability

Traceability processes are only as good as the weakest link. Therefore it is important for suppliers, retailers, processors, distributors, wholesalers, and foodservice operators to understand the value of collecting and maintaining product information that supports, at the very least, "one up/one down" traceability. More detail on specific logistics information needed is found in Section 7.6.

Best practices for maintaining traceability for the suppliers, retailers, processors, wholesalers, distributors, and foodservice operators is to capture all agreed to traceable information and store it within their systems by scanning the information directly from the case and/or consumer item bar codes. Scanning enables data to be captured, stored, and retrieved without the need to visually review the human readable information and manually key that information into systems.

While the process of scanning cases outbound from distribution center to a store or operator is the exception today, more and more retailers, processors, distributors and wholesalers are putting processes in place to collect and store at least the minimum product information required to support traceability. Product can be scanned as it enters a distribution center, as it is shipped out of the distribution center, as it is received at a retailer store or foodservice operator, or as it is opened for processing or consumer display; all Critical Tracking Events as defined by the IFT Report.

Best practices would be for a retailer, processor, wholesaler, or distributor to mimic the product information data requirements recommended for the supplier traceability best practices. The more holistic the view of the product flowing within the supply chain, the more accurate the information used in a traceability process.

Critical tracking events identify those core business processes where traceability data capture is vital to a successful traceability process. The following figure illustrates those key events for the seafood supply chain.

CRITICAL TRACKING EVENTS FOR SEAFOOD TRACEABILITY

Hatchery/Farms

WildCaught/ Vessels

Grow or Catch Seafood; receipt of value added ingredients or packaging

Product Preparation for Shipping

Shipping

PROCESSOR

Receipt

Receipt of raw materials or ingredients; Creation or Repackaging of Finished Goods; Build shipping configuration

Shipping

Receipt

DISTRIBUTION CENTER

Product Repackaging; Build shipping configuration

Retailers or Operators with their own DCs may choose to scan and store data at either point of DC shipping or point of store receipt

Shipping

RETAILER or FOODSERVICE OPERATOR

Receipt

FOODSERVICE OPERATOR STORE Or RETAIL STORE

Consumer Packaging/ Product Depletion (Use in customer product; Shrink; Point-of-Sale)

EVENT DATA

Event ID
Event Owner GLN
Event Date
Event Location GLN

PRODUCT DATA

Product Creation/ Preparation and Packaging

Input GTIN*
Input Batch/Lot #
Input # of Cases
Output GTIN
Output Batch/Lot #
Output # of Cases

*All Product inputs such as raw material ingredients and food contact packaging must be traceable

Product Depletion

GTIN
Batch/Lot #
Number of Cases/ Units

TRANSPORT DATA

Product Shipping

Shipment Number
Destination GLN
GTIN
Batch/Lot #
Lot Control Date
Number of Cases

Product Receipt

Shipment Number
Origin GLN
GTIN
Batch/Lot #
Lot Control Date
Number of Cases

Figure 18 - Critical Tracking Events for Seafood Traceability

The following diagram is an example of the traceability and logistical data that is typically collected and reported by the supplier to each customer for those critical tracking events noted above (in Figure 19):

Trading Partner ASN Interchange Example

Supplier
- Product Information established for Data Synchronization
- Supplier Produces Product
- Supplier Palletizes Cased Product on Pallets and Identifies each unit
- Supplier Scans Pallets to Shipment & Ships Product to Customer

Customer
- Customer Database Populated with Data Synchronization Information
- Customer Receives Truck @ Door and Matches Bill of Lading to Order
- Customer Receives Pallets and records identification of delivery
- Customer Places Product in Inventory

Information Data Sharing
- Data Synchronization Data Storage and Delivery
- EDI Providor Receives and Delivers ASN

Supplier Information

Case
- GTIN
- Batch/Lot/Serial #
- Harvest Date or
- Product Date or
- Sell-By Date or
- Use-By Date
- Variable or Fixed Weight
- COOL
- USDA #
- Trade Item Qty
- Trade Item UOM

Pallet
- SSCC
- GTIN
- Batch/Lot/Serial #
- Trade Item Qty
- Trade Item Unit of Measure

Load
- Order Number
- SSCC
- Carrier
- Seal Numbers
- Date of Shipment
- Appointment Date/Time
- Ship To Location

Customer Information

Data Synchronization Information
- GTIN
- MFG Product Identifier
- Product Description
- Shelf Life
- Variable or Fixed Weight
- Ingredient

Load
- Order Number
- SSCC
- Carrier
- Seal Numbers
- Date of Receipt
- Receiving Location

Pallet
- SSCC
- GTIN
- Batch/Lot/Serial #
- Trade Item Qty
- Trade Item Unit of Measure

Case
- GTIN
- Batch/Lot/Serial #
- Harvest Date or
- Product Date or
- Sell-By Date or
- Use-By Date
- Variable or Fixed Weight
- COOL
- USDA #
- Trade Item Qty
- Trade Item UOM

Figure 19 - Trading Partner Data Requirements Example

6.1. Best Practices for Consumer Item Traceability

January 2010 was the sunrise date for the adoption of the GS1 DataBar. This new bar code symbology standard allows up to 74 numeric characters or 41 alpha/numeric characters of information to be included on a consumer item bar code. Once this symbology is adopted, all product information required for traceability can be encoded into the bar code. The need to combine human readable information to the scanable information will no longer be necessary. Using the GS1 DataBar, the required traceability data can be included on each package.

Adoption timelines will occur between 2010 and 2014, depending on the product category.   Perishables, pharmaceuticals, and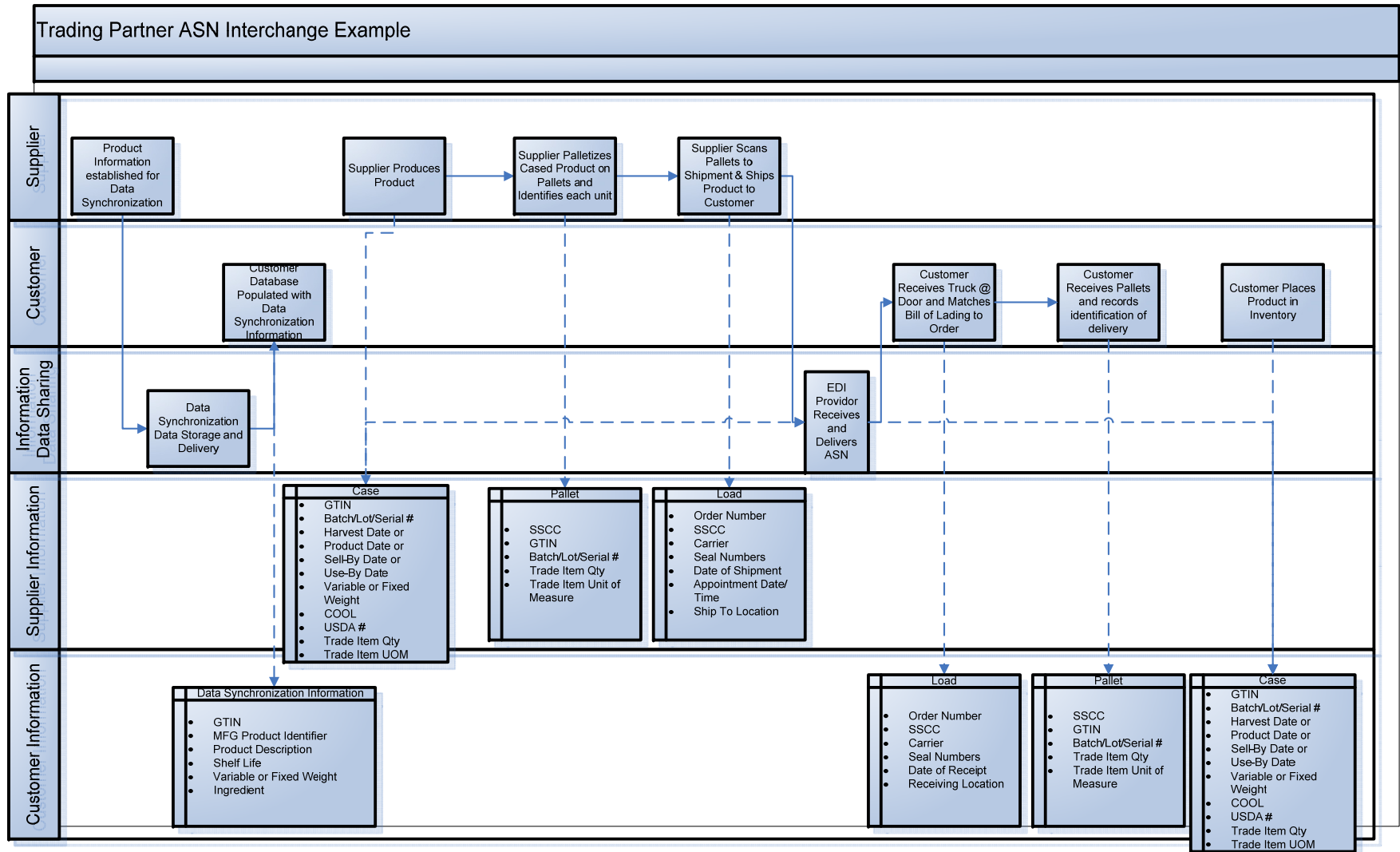 coupons are being implemented first as work has been underway for a few years to develop their requirements.   As GS1 standards have been finalized for seafood, adoption will begin.

The GS1 DataBar symbology will enable the seafood industry to move away from the retailer specific U.P.C. Number System 2 bar code on variable weight, variable price and store processed items, which does not support the encoding of a GTIN. Implementing the GS1 DataBar at the consumer item level will greatly aid in the ability to capture traceability information electronically as product flows from a retailer to the consumer. Critical traceability data elements that should be encoded into a GS1 DataBar include:

- Global Trade Item Number (AI "01"); and
- Sell-By Date (AI "15") OR Use-By Date (AI "17")

The table below summarizes the information that must be present to enable traceability in human-readable form, in scanable consumer item GS1 DataBar, and in the electronic commerce Advance Shipping Notice:

● = Mandatory	Scan Length	Scan	ASN
Global Trade Item Number (GTIN) (AI "01")	2+14	●	●
Sell-By-Date (YYMMDD) (AI "15") OR Use-By-Date or a reference to Date Code (YYMMDD) (AI "17")	2+6	●	●

Scan = Bar coded using the GS1 DataBar;
ASN = Advance Ship Notice/Ship Notice Manifest;
AI = Application Identifier

Figure 20 - Consumer Item Data Requirements

The GS1 DataBar may contain other application identifiers such as the Batch/Lot Number, weight, and extended price. The Sell-By Date, however, is required for use in the GS1 DataBar, as it meets aggressive withdrawal objectives and provides the greatest assurance to suppliers and retailers that recalled product which reaches the point-of-sale register will not be sold to consumers.

Figure 21 below shows a consumer item label with a GS1 DataBar that enhances traceability by allowing the product GTIN (AI "01") and Use-By Date (AI "17") or similar date to be scanned at the point of sale.

Figure 21 - Best Practice Consumer Item Label with GS1 DataBar

For implementation information about the GS1 DataBar, go to
http://www.gs1us.org/standards/barcodes/gs1_databar

6.2.   Best Practices for Case Level Traceability

The minimum requirements for case level traceability rely upon a combination of the GTIN and Batch/Lot or Serial Number.

Best practices for case traceability for the retailer are achieved by electronically capturing the traceability information of the case and associating that information with all movements of that product across the supply chain. The case level traceability attributes that should be captured through the bar codes or ASNs, electronically stored, and retrieved upon demand are:

DATA ELEMENT	Scan Length	VARIABLE-WEIGHT		FIXED-WEIGHT	
		Scan	ASN	Scan	ASN
GlobalTrade Item Number (AI " 01")	2+14	●	●	●	●
Batch /Lot Number (AI "10")	2+12 max	●*	●	●	●
Serialized Case Code (AI "21")*	2+12 max		●^	●^	●^

Scan = Bar coded; ASN = Advance Ship Notice/Ship Notice Manifest; AI = Application Identifier
* = Use Serial Number when present on case and useful for traceability and use Batch/Lot Number if no Serial Number present on case.
^ = Include Serial Number when present on case and useful for traceability

Figure 22 - Best Practice Case Level Traceability Requirements

Figure 23 shows the best practice flow of traceability information for seafood:

Read inbound case GTIN and Batch/Lot or Serial Numbers in system

Fixed Weight Case Ready Consumer Item

Consumer item contains the GS1 DataBar encoded with a GTIN and Use-By Date.

Display Case

Point-of-Sale

Point-of-Sale systems should be GS1 DataBar compliant and the system should read and store GTIN and Use-By Date.

Variable Weight, Case Ready Consumer Item

Consumer item contains the GS1 DataBar encoded with a GTIN, Use-By Date, Weight, and Estimated Price.

Variable Weight, Store Processed Consumer Item

Store processed consumer item must be packaged and labeled with a GS1 DataBar encoded with a GTIN, Use-By Date, Weight, and Estimated Price.
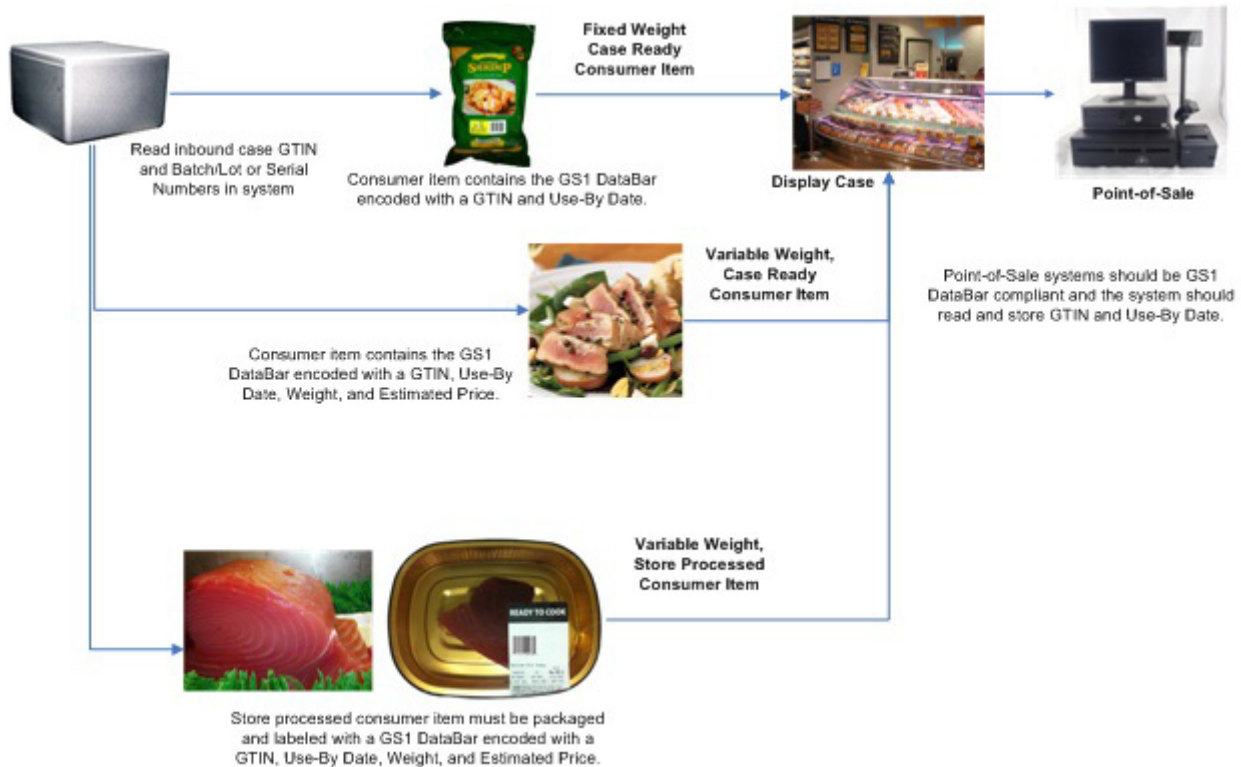
Figure 23 - Traceability Best Practices

6.3.   Capturing Supplier Product Data

Best practices are for retailers, processors, wholesalers, and distributors to capture logistics unit and product information electronically from their suppliers to maintain traceability and manage product inventory. The use of GS1 international standards for marking products (GTINs) and pallets (SSCCs) in the supply chain is a primary enabler for maintaining product visibility throughout the supply chain. The SSCC uniquely identifies each shipping unit. The electronic Advance Ship Notice (ASN) information, available from many suppliers, can be used to access information for all aggregated product on that shipping unit.

When full shipment quantities are shipped from the warehouse to the retail store or foodservice operator, scanning the SSCC from the shipping unit and using the information from the ASN provides traceability information for the processor, wholesaler or distributor. If that shipping unit has not been re-configured since it was received from the original information collected during the receiving process (i.e., the scan of the SSCC tied to the ASN information), it may be used to support traceability. It is the "owner" of the shipping unit configuration that is responsible for the accuracy and the attributes that are associated with the product configured on the shipping unit.
In the seafood industry the use of human readable information captured is used in conjunction with electronic scanning. As a result traceability processes are dependent on both electronic and human readable traceability information.

The best practice is to scan the case when breaking the product down to a consumer item in order to link the case to the consumer item.

6.4.   Outgoing Product to Stores or Foodservice Operators

Retailers, processors, wholesalers and distributors should capture information about outbound product going from a warehouse to a store or foodservice operator. This information may be captured at any point in the product movement such as from the warehouse outbound to the store, at arrival at the store, or when the product is being broken down to a new consumer item or is placed into self-service display cases; all examples of critical tracking events. To enable traceability, retailers, processors, wholesalers and distributors should identify the GTIN, Batch/Lot or Serial Number and quantity of cases in each order sent to a store or foodservice operator. This supports the "one up/one down" principle of tracing a product's movement through the supply chain. More detail on specific logistics information needed is found in Section 7.6.

6.5.   Advance Shipping Notice

The Advance Shipping Notice (ASN), an electronic data file sent from suppliers to receivers, can be used as an efficient alternate to case scanning. Retailers can process the ASN to capture for each shipping unit identified by a Serial Shipping Container Code (SSCC) the GTIN, case Serial Number, if used, and/or Batch/Lot Number of each case on the shipping unit. When a shipment is received, retailers that use ASNs only need to scan the SSCC of each high level logistics unit in the shipment rather than each case in the shipment individually.

Similarly, distributors or retailers that break down shipping units and restack cases onto outbound shipping units should scan case bar codes and create a new ASN to be sent to the subsequent receiver of the product. In this way, the flow of traceability information for that product is always efficiently available to all partners in the supply chain.

Figure 24 below shows the best practice flow of traceability information at the case level for retailers using the ASN:
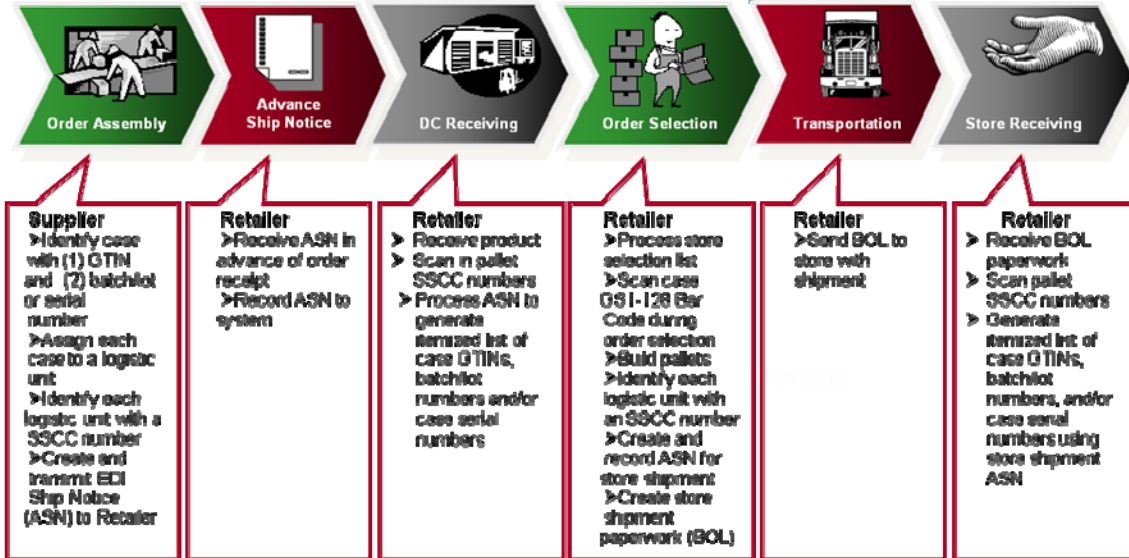
Figure 24 - Best Practices for Case Level Traceability

6.6. Potential Contributions of Future and Existing Technologies

While none of the technologies listed below are currently required for the Seafood Industry Traceability Guideline, they do enable a standardized way to capture and maintain data for the purposes of traceability. Unique identification (the GTIN) is the key and the link to making use of these technologies and solutions.

EPC-enabled RFID (Electronic Product Code Radio Frequency Identification) has made some inroads in the logistics area of the supply chain and at the item level for some categories of products. While not a requirement of the seafood traceability guideline, RFID technology, when applied to the some levels of the product hierarchy, has shown potential to be a contributing technology for enabling traceability. EPC tags can contain a number of different types of data including a serialized version of a GTIN (SGTIN).

Global Data Synchronization (GDS) facilitates product description information at all levels of the packaging hierarchy. With a standard, choreographed method for exchanging product attributes, trading partners can achieve quality master data for use not only in their traceability processes, but also in every day business processes from order to cash and in labelling activities.

Electronic Data Exchange (EDI) is used in most organizations as a means to exchange transactional data about business processes among trading partners like a purchase order, an invoice, a receipt of product, etc.

EPC Information Services (EPCIS) is a standardized means of exchanging data about the physical events of a product throughout its life; these physical events describe the Critical Tracking Events (CTEs) identified by the Institute of Food Technologists (IFT) to permit traceability.

Rapid Recall Exchange™ is an online service that applies industry expertise and best practices to standardize product recall and withdrawal notifications between retailers/wholesalers and suppliers, making value chains more visible, secure, and sustainable. The service enables prompt and accurate information exchange to protect customers and save trading partners time and money. Rapid Recall Exchange takes advantage of global GS1 Standards to ensure accuracy and enhance speed of recalls. See Section 7.10 for more detail.

7. Seafood Industry Recalls

7.1. Recall Goals

The primary objective of traceability is prompt and accurate product recall. The overriding goal of any recall is to ensure that targeted product is quickly and easily removed from the supply chain and not consumed by consumers. A secondary goal is to minimize the amount of non-targeted product that is also removed from the supply chain as part of a recall. Efficient trace or recall requests require that the target items are identified using their unique identifier numbers.

Note that regulatory bodies define a product recall and a market withdrawal as two distinct situations as described in **Section 7.2**. This section of the document will incorporate guidance for both situations under the term "Recall".

7.2. Recall Definitions

Case is a printed label affixed to a case of product that denotes lot-specific information about the product placed in the case.

Case label panel is the side of a case to which the case end label is affixed, which is typically the shortest vertical surface of the case. The case end panel may also contain printed, non-lot specific information such as the supplier's name and address.

Case product is product that has not been removed from the supplier's shipping container, which is typically a case.

Human readable information is print on the case label or case label panel of a size sufficient to be readily noticeable, legible, and understandable without special training or knowledge of code values or syntax.

Market Withdrawal is a firm's removal or correction of product that involves minor infraction that does not cause product to be adulterated or misbranded.

Recall is a firm's removal of distributed seafood products from commerce when there is reason to believe that such products are adulterated or misbranded under provisions of various food safety regulations.

Recall notice is a notification from a supplier to a participant in the supply chain that provides sufficient product identification information to allow the participant to effectively identify and remove target product from the supply chain.

Scanable information is information that is encoded in a bar code.

Scope is the range of the product being recalled.

7.3. Recall Principles

In general, suppliers should provide to processors, wholesalers, distributors, retailers or foodservice operators the information needed to quickly and effectively remove the targeted product from the supply chain regardless of the technological level of the participant in the supply chain. The information must be specific enough to

accurately delineate the scope of the recall, meaning what product and/or what Batch/Lot of product, or what location the product was delivered to and when.

To ensure preparedness in the event of an incident, every company should have a traceability team in place and simulate recall events regularly to test the effectiveness and timeliness of their traceability processes and systems.

7.4. General Recall Steps

Supply chain participants who wish to initiate a recall request must communicate at least the product identification and as much of the additional information listed below when available to aid in the retrieval of the target products:

- Product identification or an attribute of the product
- Lot or batch codes
- Trading partners affected
- Location of the product
- Delivery date/time period
- Quantity

Notification to supply chain participants should include all the necessary information to help the partner identify where product is in their distribution system. In turn, participants should identify to the supplier how far into the supply chain the product has gone, and specifically if any of the targeted product has reached consumers.

If targeted product has reached consumers, public notification of a recall should be initiated. It is assumed that if targeted product has reached store shelves or the foodservice operator, it has reached the consumer. If possible, supply chain partners should directly contact purchasing consumers.

Guidance for disposition of any target product remaining in the supply is determined by the supplier. It generally involves destruction of the product or return to a supplier facility.

7.5. Scope of Recall

The scope of a recall notice can be as specific as a single product produced at a single facility on a specific date and time or as broad as all products produced by a supplier. As an example, a recall could include:

- All products of a given facility, regardless of GTIN or production date

- All products of a given GTIN, regardless of production date

- Products of a given GTIN, produced within a specific date range

- Products of a given GTIN, produced within a specific date range at a specific facility

- Products of a given GTIN, produced within a specific date range at a specific line at a facility

- Products of a given GTIN of a given Batch/Lot Number or range of Serial Numbers

A combination of product and organization identification data, such as the product GTIN and the participants' GLNs, along with transactional data about the physical flow of the products will best enable the successful retrieval of the target product.

The granularity of the product information required is dependent upon the scope of the recall request. It is recommended that at minimum the information include the GTIN and Batch/Lot Number(s) or Serial Number(s).

For retailers, processors, wholesalers, distributors, and foodservice operators usually two methods may be used to identify targeted product:

1. Human readable identification, in which an employee is responsible for visually identifying which cases or retail packages need to be removed typically from a store, cooler, service case, or freezer.

2. Electronic identification, in which the information captured from case bar codes or from a supplier electronic message is used to identify which cases or consumer packages need to be removed typically from a warehouse or distribution center (DC) or store.

Typically a combination of human readable and electronic identification is used to find all products in the supply chain. As an example, for a recall of a given Batch/Lot or Serial Number of a given GTIN, employees of the retailer, wholesaler, distributor, or foodservice operator may visually review product cases in a cooler or warehouse to locate targeted product; or a warehouse manager will use the warehouse inventory management system to locate targeted product in storage.

Retailers will typically use a combination of human readable and electronic identification to find all products in the supply chain. As an example, for a recall of a given Batch/Lot or Serial Number of a given GTIN, employees of the retailer may visually review product cases in a store cooler to locate targeted product; and a warehouse manager will use the warehouse inventory management system to locate targeted product in storage.

Electronic identification can, in theory, be implemented as part of a regular inventory management process, depending on the extent of scanning within the retailer's operations. If the retailer scans cases leaving the retailer's distribution center, scans cases before product is further processed and packaged at the retailer's store, and also scans a GS1 DataBar on consumer items at the point of sale, the retailer would have high visibility to the presence and location of targeted product throughout the retailer's distribution system.

A more likely scenario is a combination of human readable and electronic identification, or even human identification only. Identification will be fully human readable if a retailer lacks scanning ability within facility. Further, if retailers have not implemented the use of the GS1 DataBar at the point of sale then removal of product from service cases must be accomplished through human identification.

It is the responsibility of the supplier initiating the recall to provide all trading partners with both human readable and scanable product identification information (when it exists) to support the use of both human readable and electronic identification of recalled product.

7.6. Logistics Information

For all product recalls regardless of scope, the supplier/shipper must record and provide to the processor, wholesaler, retailer, distributor, or foodservice operator logistics information on product deliveries. Suppliers must provide the following logistics information for all recalls:

- Name, address and telephone number (fax and e-mail if available) of the shipper;

- Name, address and telephone number (fax and e-mail if available) of transporting company;

- Delivery location, on a facility by facility basis;

- GTIN's, brand & item description, carton/case configuration and lot number(s) of each product;

- Total logistics units delivered to each location; and

- Delivery date, and if available delivery time and dock door.

Each recipient must also record this information, as well as the date and quantity received.

7.7. Scanable Data

For all product recalls regardless of scope, the supplier must provide the processor, wholesaler, distributor, retailer, and foodservice operator the information for the recalled product that is contained on the applicable bar code, for all product hierarchy levels.

HIEARCHY LEVEL	BAR CODE TYPE	BAR CODE DATA
Case	GS1-128	GTIN and Batch/Lot Number or Serial Number
Fixed-Weight Consumer Item	UPC-A	GTIN
Variable-Weight Consumer Item	U.P.C. Number System 2	Item Reference Number
Fixed-Weight and Variable-Weight Consumer Item*	GS1 DataBar	GTIN and Sell-By Date

*Available after GS1 DataBar adoption

Figure 43 - Scanable Recall Data

7.8. Batch/Lot and Serial Number Ranges

In a recall situation a supplier will provide either Batch/Lot or Serial Numbers to the processor, wholesaler, distributor, retailer, or foodservice operator. A supplier should ideally provide the starting and ending Batch/Lot or Serial Numbers when the suspect values are part of a range of numbers.

The effectiveness of any recall is in part dependent upon the ease with which recalled product can be identified. Providing non-sequential Batch/Lot or case Serial Numbers instead of sequences of Batch/Lot or Serial Numbers will significantly increase the complexity of a visual recall of product. It also increases the likelihood of all recalled product not being removed from the supply chain.

If a supplier is unable to provide a single or a limited number of numeric sequences to the distributor, retailer, or foodservice operator, other traceability information such as production date, Sell-By Date, or establishment number should be provided. While this will increase the likelihood of removing unrecalled product, retailers, distributors, wholesalers and foodservice operators need manageable product information that ensures the recall of all target products and the safety of all consumers.

7.9. Human Readable Information

The human-readable information a supplier will need to provide in a recall varies depending on the scope of the recall. Suppliers must provide to supply chain participants the consumer item information, in addition to case information, that is needed to quickly and effectively identify and remove targeted product from store coolers and consumer display cases. Supplier-provided information must be specific enough to accurately delineate the scope of the recall while respecting the staffing challenges that retailers face in recall situations. The following shows the human readable information that would typically be provided for each type of product recall at the case or consumer item level:

- Supplier Company Name

- Supplier Product Number or Item Code

- Case-Level Product Description

- USDA Establishment Number and/or FDA Facility Registration Number, when required

- Date Information

7.10.   Rapid Recall Exchange

Industry supply chain participants are encouraged to use the Rapid Recall Exchange to initiate, target, deliver and receive comprehensive product recall and withdrawal information. Rapid Recall Exchange™ is an online service that provides a method for suppliers to communicate to retailers 24/7, alerting them that there is a product recall or withdrawal event.

Rapid Recall Exchange was commissioned by the Food Marketing Institute (FMI) Associate Member Advisory Board and developed by GS1 US™ (creators of the U.P.C. barcode system) in collaboration with FMI, the Grocery Manufacturers Association (GMA) as part of their commitment to enhanced food and product safety, brand protection and consumer confidence. It is also endorsed by the National Grocers Association (N.G.A.).

It was developed with input from a variety of industry sectors to provide a product recall or withdrawal notification process that can be used by food and fast moving consumer goods companies. Its capabilities and functionality are designed for all retailers, wholesalers, manufacturers and suppliers regardless of size and breadth of product line. Rapid Recall Exchange is available to all types of industry associations as a way for their members to enhance their recall capabilities.

A growing number of retailers, wholesalers and suppliers of all sizes and types subscribe to the Rapid Recall Exchange. The service is available through an annual individual subscription. The annual subscription fee provides receipt of product recall notifications and withdrawals and associated communications and information.

To learn more about the Rapid Recall Exchange go to http://www.rapidrecallexchange.org

8.   Summary

Bioterrorism Act requirements of 2002 for chain of custody are contact information and product data for the company that shipped the product and for the company that the product has been shipped to (one step forward, one step back). The Food Safety Modernization Act of 2010 affirms the Bioterrorism Act but details no further traceability requirements. This guide recommends an additional voluntary approach in best practices for identifying and tracking of seafood from farm or vessel to point of sale.

Traceability in the seafood industry can be implemented at a fundamental level across the supply chain when each trading partner can identify its product by GTIN and Batch/Lot or Serial Number and location numbers by either GLN or Batch/Lot Code. GS1 standards facilitate the ease of managing this traceability information electronically, and the adoption of case scanning, the use of Advanced Shipping Notice electronic messages, and the use and scanning of the GS1 DataBar on consumer packages at point of sale will dramatically enhance the effectiveness of supply chain to trace and recall seafood products.

Adoption of the GS1 DataBar for item label applied at the retail level and the GS1-128 bar code formats encoding both the GTIN and Batch/Lot or Serial Number for case traceability processes provide the foundation for a successful traceability system. Additionally, capturing, storing, and sharing that information with your trading partners promotes timely and accurate traceability processes.

To be successful in this process a trading partner that processes, packages, and/or labels product should ensure that all inbound product batches are linked to outbound product batches so that there is no breakdown in the ability to trace product flow through the supply chain. Minimum requirements for traceability may always depend to a certain extent on human readable information, but the best practice for all supply chain partners is to build a traceability process that allows for electronic data capture, storage, and retrieval of critical product traceability information for all product hierarchy levels throughout the supply chain, from the farm to the ultimate consumer.

9. Appendix and Reference Documents

9.1. Global Traceability Standard

http://www.gs1.org/docs/gsmp/traceability/GS1_Global_Traceability_Standard_i1.pdf

9.2. Produce Traceability Guideline

http://www.producetraceability.org/pdfs/CPMA_PMA_Traceability_Guide.pdf

9.3. Building the Fresh Foods Supply Chain of the Future

http://www.fmi.org/forms/uploadFiles/28DBC00000008.toc.RoadmapFinal_exec.pdf

9.4. GS1 DataBar

http://www.gs1.org/barcodes/databar

9.5. Traceability for Meat and Poultry

http://www.mpxml.org/I_Traceability.html

9.6. Guidelines for Voluntary Open Dating of Foods

The following is taken from Guidelines for Voluntary Open Dating of Foods, Open Date Labeling Task Force, National Food Processors Association, Washington, D.C., May 1999.

SHELF STABLE FOODS

Definitions

- **Best Before/Best Before End/Better If Use By. . .**

The date on the label or package signifies the end of the period under which the product will retain specific quality attributes or claims, even though the product may continue to retain positive quality attributes after this date. Safety of the shelf stable product is not in question beyond the specified date.

- **Sell by Date/Pull Date**

These terms generally are used when the open date labeling is directed primarily to the retailer. This is the last date of offer for sale to the consumer. The product should not be marketed after this date. Safety of the shelf stable product is not in question beyond the specified date.

- **Use By (Expiration Date)**

These terms generally are used when the open date is directed primarily to consumers. This date signifies the last date in which the quality attributes (i.e., nutrient content, color, flavor, texture) expected by the consumer are guaranteed. The product should not be marketed after this date. Safety of the shelf stable product is not in question beyond the specified date.

REFRIGERATED AND FROZEN FOODS

Definitions

- **Best Before/Best Before End/Better If Used By. . .**

The date on the label or package signified the end of the period under which the product will retain specific quality attributes or claims, even though the product may continue to retain positive quality attributes after this date.

- **Sell By Date/Pull Date**

These terms generally are used when the open date labeling is directed primarily to the retailer. This is the last date of offer for sale to the consumer. The product should not be marketed after this date.

- **Use By (Expiration Date)**

These terms generally are used when the open date labeling is directed primarily to consumers. This date signifies the last date in which the quality attributes (i.e., nutrient content, color, flavor, texture) expected by the consumer are guaranteed. The product should not be marketed after this date.

9.7.   GS1 Application Identifiers

Application Identifiers Relevant for the Seafood Supply Chain

Notes: (*):   The first position indicates the length (number of digits) of the GS1 Application Identifier. The   following value refers to the format of the data content.

(**):   If only year and month are available, DD must be filled with two zeroes.

(***):   The fourth digit of this GS1 Application Identifier indicates the implied decimal point position.

Example:

- 3100 Net weight in kg without a decimal point

- 3102 Net weight in kg with two decimal points

(FNC1):   All GS1 Application Identifiers indicated with (FNC1) are defined as of variable length and must be limited by a Function 1 Symbol Character unless this Element String is the last one to be encoded in the symbol.

AI	Data Content	Format*	FNC1 Required
00	SSCC (Serial Shipping Container Code)	n2+n18	
01	Global Trade Item Number (GTIN)	n2+n14	
10	Batch or Lot Number	n2+X..20	(FNC1)
11 (**)	Production Date (YYMMDD)	n2+n6	
13 (**)	Packaging Date (YYMMDD)	n2+n6	
15 (**)	Best Before Date (YYMMDD)	n2+n6	
17 (**)	Expiration Date (YYMMDD)	n2+n6	
254	GLN Extension Component	n3+X..20	(FNC1)
30	Count of Items (Variable Measure Trade Item)	n2+n..8	(FNC1)
310 (***)	Net weight, kilograms (Variable Measure Trade Item)	n4+n6	
320 (***)	Net weight, pounds (Variable Measure Trade Item)	n4+n6	
330 (***)	Logistic weight, kilograms	n4+n6	

390 (***)	Applicable Amount Payable, local currency	n4+n..15	(FNC1)
391 (***)	Applicable Amount Payable with ISO Currency Code	n4+n..15	(FNC1)
392 (***)	Applicable Amount Payable, single monetary area (Variable Measure Trade Item)	n4+n..15	(FNC1)
393 (***)	Applicable Amount Payable with ISO Currency Code (Variable Measure Trade Item)	n4+n3+n..15	(FNC1)
410	Ship to - Deliver to Global Location Number	n3+n13	
411	Bill to - Invoice to Global Location Number	n3+n13	
412	Purchased from Global Location Number	n3+n13	
413	Ship for - Deliver for - Forward to Global Location Number	n3+n13	
414	Identification of a Physical Location - Global Location Number	n3+n13	
415	Global Location Number of the Invoicing Party	n3+n13	
422	Country of Origin of a Trade Item	n3+n3	(FNC1)
423	Country of Initial Processing	n3+n3+n..12	(FNC1)
424	Country of Processing	n3+n3	(FNC1)
426	Country Covering full Process Chain	n3+n3	(FNC1)

9.8. For more details go to www.aboutseafood.com and www.GS1US.org

9.9. Glossary

Term	Description
Actor	An actor is a role that a user plays with respect to a system.
Application Identifier (AI)	The field of two or more characters at the beginning of an Element String that uniquely defines its format and meaning.
Asset	An entity that is part of the inventory of a given company that has financial value (e.g., a product or a pallet).
Batch/Lot Number	A batch unites products/items that have undergone the same transformation processes. Batch and Lot are considered synonyms. GS1 Global definition: Reference number assigned by manufacturer to a series of similar goods or seafood under similar conditions.
Consumer item	The trade item intended to be sold to the end customer.
Event	Is an occurrence of a process in a specific time or a period of time?
External Traceability	External traceability takes place when instances of a traceable item are physically handed over from one trading partner (traceable item source to another (traceable item recipient).
Fixed-Weight	A term used to denote that a product's weight is constant from case to case or from item to item. It is sometimes known as set weight or fixed measure. A fixed-weight product is typically priced per selling unit rather than per weight.
GLN (Global Location Number)	The GS1 Identification Key comprising a GS1 Company Prefix, Location Reference, and Check Digit used to identify physical locations or legal entities. GS1 Global definition: Unique location number mandatory within the Global Data synchronization process to identify data owners/info providers, etc., such as Distributors, Brokers, and Manufacturers.
GSIN (Global Shipment Identification Number)	The GS1 Identification Key comprising a GS1 Company Prefix, Shipment Reference, and Check Digit used to identify unique shipments.
GTIN (Global Trade Item Number)	The format in which Global Trade Item Numbers (GTIN's) must be represented in a 14 digit reference field (key) in computer files to ensure uniqueness of the identification numbers. GS1 Global definition: A particular Global Trade Item Number, a numerical value used to uniquely identify a trade item. A trade item is any trade item (trade item or service) upon which there is a need to retrieve pre-defined information that may be planned, priced, ordered, delivered and/or invoiced at any point in any supply chain.
GRAI	Global Returnable Asset Identifier.
GS1 System	The specifications, standards, and guidelines administered by GS1.
Identification	The identity assigned to an item or party that is needed to access other relevant information about the item or party.
Identification Carrier	Mark/tag/label/accompanying document sometimes called "passport" or "identity card" in some industry sectors.
Internal Process	A series of actions, changes or function(s) within a company or organization that brings about a result.
Internal Traceability	Internal traceability takes place when a trading partner receives one or several instances of traceable items as inputs that are subjected to internal processes,

	before one or several instances of traceable items are output.
Label/Case Markings	A tag, sticker, or printing on product packaging that provides information about the product inside.
Link	Recording the information necessary to establish the relationship to other relevant information.
Location	A place where a traceable item is or could be located [ISO/CD 22519]. A place of production, handling, storage and/or sale.
Logistic Unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain.
Master Data	Master Data describes each item and party involved in supply chain processes. Master data is defined as data having the following characteristics: • Permanent or lasting nature • Relatively static, not being subject to frequent change • Accessed/used by multiple business processes and system applications Can either be neutral or relationship dependant.
Party	A party (or) location is any legal, functional or physical entity involved at any point in any supply chain and upon which there is a need to retrieve pre-defined information. A party is uniquely identified by a GS1 Global Location Number.
Process	A series of actions or steps towards achieving a particular end. Examples of common processes include Production, Transformation, Quality Control, Storage, Transportation, Movement, Recycle, Return, Packing, Receiving, Traceability . . .
Product Description	GS1 Global definition: A piece of information reflecting a characteristic related to an identification number [e.g., an expiration date or a product description related to a GTIN®].
Quantity	A precise number of articles, pieces or units. Used in conjunction with Unit of Measure.
Receipt Date	GS1 Global definition: Date/time upon which the goods were received by a given party.
Record	Act of creating a permanent piece of information constituting an account of something that has occurred.
SSCC (Serial Shipping Container Code)	The 18-digit GS1 System Identification Key comprising an extension digit, GS1 Company Prefix, Serial Reference, and Check Digit used to identify a logistic unit.
Serial Number	A code, numeric or alphanumeric, assigned to an item for its lifetime. A unique individual item may be identified with the combined Global Trade Item Number and Serial Number.
SGTIN (Serialized Global Trade Identification Number)	SGTIN is a method of identifying unique items at the unit or retail level as well as at the case and carton levels. It is composed of a GS1 assigned Company Prefix and Item Reference (GTIN), combined with a Serial Number. Where UCC/EAN bar codes have traditionally been used, the SGTIN specification combined with an RFID tag can give visibility beyond the Item Reference right down to the exact Serial Number of the item.
Share	Act of exchanging information about an entity or traceable item with another Trading Partner.
Ship Date	GS1 Global definition: Date on which goods should be shipped or despatched by the Supplier.
Ship from Location	GS1 Global definition: Identification of the party from where goods will be or have been shipped.
Ship to Location	GS1 Global definition: Identification of the party to where goods will be or have been shipped.
Shipment	An item or group of items delivered to one party's location at one moment in time

	that have undergone the same despatch and receipt processes.
Shipment Reference Number	GS1 Global definition: The reference number assigned to a shipment.
Traceability	Traceability is the ability to track forward the movement through specified stage(s) of the extended supply chain and trace backward the history, application or location of that which is under consideration.(GS1 Global Traceability Standard, issue 2) [ISO 9001:2000] Traceability is the ability to trace the history, application or location of that which is under consideration.
Traceability Data	Any information about the history, application or location of a traceable item. This may be either Master Data or Transactional Data.
Traceable Item	A physical object where there may be a need to retrieve information about its history, application or location. The level at which the traceable item is defined within a product packaging or logistical hierarchy is dependent on the industry and degree of control required. Could be tracked, traced, recalled or withdrawn. Could exist in multiple locations at the same time (for example, if identified at the trade item and batch level). A traceable item may be related to another traceable item. See also definition for process.
Trace Request	A formal inquiry about the history, application or location of a traceable item. A request can trigger subsequent trace requests up or down the supply chain in order to fulfil the original request. The requesting party requires a response from the data source.
Tracing (Tracing Back)	The ability to identify the origin attributes, or history of a particular traceable item located within the supply chain by reference to records held. "Tracking back" and "tracking forward" are the preferred terms used in this document.
Tracking (Tracking Forward)	The ability to follow the path of a traceable item through the supply chain as it moves between parties.
Trade Item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain.
Trading Partner	Amy Supply Chain Partner that has a direct impact on the flow of goods through the supply chain. Examples include Third Party Logistics Provider, Manufacturer, Retailers, wholesalers, distributors, or operators, and Grower.
Transformation	A change to the nature of a traceable item that changes the identity and/or the characteristics of the traceable item. The act of changing the item such as combining ingredients to make a finished product or case picking to create a new pallet. Transformation can be production, aggregation, grouping, splitting, mixing, packing and repacking traceable items.
Transporter	The party that handles and or stores the traceable item from one point to another without transforming the item. Receives, carries, and delivers on or more traceable items. The Transporter may only have "possession, custody, control" of a traceable item, as distinct from ownership.
Unit of Measure	The unit of measure relating to a specific quantity.
Variable-Weight	A term used to denote that a product's weight varies from case to case or from item to item. It is sometimes known as random weight, catch weight, or variable measure. A variable-weight product is typically priced on the true weight of the item rather than per selling unit.