6.0 OVERVIEW OF BRITISH COLUMBIA FISHERIES TRACEABILITY PRACTICES

6.1 DATA SOURCES

A number of data programs are in place in the BC fishing industry to collect catch, landing and sales data. Most of the information is collected to support fisheries management, enforcement and stock assessment and is mandated by Fisheries and Oceans Canada (DFO). Additional programs collect information for food health and safety, business transactions, invoicing and traceability purposes. These programs have been implemented over time in a cumulative fashion, with new systems added to old systems to address issues or management initiatives within specific fisheries. The initial information systems were harvest logs and sales slips. More recent additions have been validation records and transit slips as part of dockside monitoring programs for individual quota fisheries. A brief explanation of these programs is provided in the following inset box.

Other data programs, such as delivery records, processing records, storage records and sales records may also be used by buyers or processors depending on the type of operation and product(s) produced. Examples of some of these non-DFO programs are provided in the following inset box.

DFO Fisheries Data Programs

Hail - Hail reporting may be required prior to fishing and/or after fishing. "Start fishing" hails are used to keep track of which vessels are fishing where, when and for what species. "End fishing" hails may be used for notification that the vessel has left the fishing grounds, for reporting catch totals and/or notifying when and where catches will be offloaded. The harvester is responsible for hail reporting and, with the exception of roe herring packers (where certified scales are required on board), catch amounts are estimates.

Harvest Log - Harvest logs are a record of fishing events that document what was caught, where and when. Species and amounts reported are estimates made by the harvester. The location of catch is usually documented as latitude and longitude coordinates.

Validation Record - Validation records are completed by dockside observers, who independently record and report how much of each species (or species aggregate) was offloaded from each vessel and from each area fished. Weights are obtained from certified weigh scales at the offload site and are used for business transactions. Validations are used to maintain an official accounting of vessel and area quotas. Validation information is regarded as the most accurate and reliable fish landing information.

Transit Slip - A transit slip is completed by a dockside observer for halibut and sablefish offloads and may sometimes be used for rockfish hook and line, Schedule II species, and groundfish trawl offloads. The transit slip is similar to a bill of lading, documenting the transport company, when and where product was picked up, what the product is, the number of containers, the total weight, and where and when the product was delivered.

DFO Fisheries Data Programs (cont'd)

Sales Slip (Fish Slip) - A sales slip is a record of sale between the fisher and the buyer of his product. Typically, sales slips are completed and submitted to DFO by commercial buyers. Weights reported in fisheries with dockside validation are usually validated weights. Amounts reported on sales slips in fisheries without dockside validation are taken either before or after the product is processed (e.g. shrimp harvesters are generally paid on processed or peeled weight). Sales slips may also document fishing area and harvest date, but this information is generally considered to be unreliable. Sales slips are used for estimating the economic value of the fisheries.

At-Sea Observer Catch Estimation - An at-sea observer independently records the catch (species kept as well as discarded), time and area of fishing. Other information such as gear specifications, weather and biological sampling information may also be recorded. Catch weights are usually estimated based on standard catch estimation methodologies. At sea observer catch estimates are not carried out in all fishing sectors and, with the exception of groundfish trawl where observer coverage occurs on 100% of the fishing trips, observer catch estimates are only carried out on a portion of fishing trips.

Groundfish Hook and Line Electronic Monitoring Program – In BC's commercial groundfish hook and line fishery harvest log data are use for the management of the fishery. Harvest log data are measured against validation record data and a percentage of the catch and spatio-temporal data from vessel-based electronic monitoring (EM) systems. EM data are collected for 100% of all fishing trips in this fishery with the exception of trips where an at sea observer is present and responsible for collecting catch and effort data. If the data match within certain standards, the Harvest Log is used for quota management and represents the at sea catch reporting for the trip.If the Harvest Log does not meet the required standards, the trip is sent to a review board which may chose to use the Harvest Log Data as is, require further testing, or require further processing of data. In some cases, the data from the EM System supplants those from the Harvest Log.

Other Data Programs

Offload Tally

Offload tally sheets are used by custom offloading companies to record the catch landed by a vessel. If a dockside monitoring program is in place, observers will have a separate tally sheet for the validation record, and the weights on the offloader's tally sheets will be verified by the dockside validation observer. The information on the offloader's tally sheet may be organized differently from a validation record because the tally sheet functions as a business transaction record possibly based on grade or quality categories rather than species and area categories used for fisheries management purposes. Typical information recorded on an offload tally includes offload company, vessel and buyer, product description, container weights, number of containers, and transport company.

Bill of Lading

A bill of lading is a business record kept by transporters documenting what packages they picked up, who they picked them up from and to whom, where and when the packages were delivered. The information contained on the bill of lading is used for invoicing purposes by the transport company.

6.2 DATA REVIEW

Fisheries and Oceans Canada currently requires large amounts of information to be collected and reported through one or more of the data systems outlined in the previous section. The responsibility for this information is placed at the harvester level, as other agencies have jurisdiction over other business partners in the supply chain. DFO data requirements for each commercial fishery in BC were reviewed in 2005 and updated in 2010. An updated inventory of these requirements is provided in Appendix Table D. Sources examined for these requirements included commercial fishing management plans and conditions of licence, third party validation records and data forms, harvest logs, sales slips, and personal communications with fishery managers and harvest association representatives.

The emphasis of the review was placed on fisheries with the significant volume or value relative to total seafood production in BC. Table 6.1 provides DFO landings statistics for 2009 summarizing the number of active licences, volume landed and value for each fishery included in the review. Intertidal clam wild harvest is also of significant volume and value but has not been included in the review because the data reporting requirements are essentially the same as shellfish aquaculture under the Canadian Shellfish Sanitation Program (Appendix Table C).

Appendix Table D provides the comprehensive data requirements applying to all sector participants, all the time. Partial requirements were not documented because such programs do not provide the comprehensive data set required for traceability purposes. For example, BC's shrimp trawl fishery does have a small at sea observer program to monitor bycatch in this fishery but the effort observed by this program is small (<5%) and would not support traceability. The party (skipper, observer, electronic monitoring system, buyer) that collects or verifies the information is also indicated in Appendix Table D. This table has been updated to reflect the 2010 management and data reporting requirements of the integrated groundfish hook and line/trap fishery in BC. This fishery includes participants in directed hook and line fisheries for halibut, sablefish, rockfish and schedule II (lingcod, dogfish and skate) which were managed independently prior to integration in 2006. A requirement of the integration of these fisheries was the implementation of 100% at sea catch monitoring in 2006 using either at sea Observers or electronic monitoring systems to audit fisher reported harvest logs.

Table 6.1. Summary of 2009 landed weight and value of BC fisheries included in the traceability data review[25]

Fisheries Sector	No. Licences	Landed Wt. (tonnes)	Landed Value ($ millions)
Halibut	429	4,065	24
Sablefish	48	2,400	16
Rockfish	259	1,209	2.8
Schedule II	473	4,582	2.7
Groundfish Trawl	141	86,227	49
Herring Roe	1515	11,621	11
Herring SOK (2008)	39	140	3.8
Tuna	179	4,188	11.4
Salmon (Gillnet, Seine, Troll)	2128	18,198	19.8
Geoduck	55	1,286	24.5
Prawn Trap	245	2,530	31
Red Sea Urchin	109	1,321	2.1
Green Sea Urchin	49	97	0.3
Sea Cucumber	85	1,109	2
Crab	218	4,452	29
Shrimp Trawl	239	541	2
Total		143,966	231

6.3 TRACEABILITY ISSUES – HARVEST LEVEL

The gap analysis (Appendix Table E) between regulatory traceability requirements (Appendix Table A) and data collected for fisheries management requirements (Appendix Table D) was updated for 2010. The purpose of this analysis is to identify whether the information being collected in specific fisheries also meets current traceability regulations. Identified data gaps for specific fisheries are provided in Appendix Table E and in the Traceability Readiness report cards. Appendix Tables A, D and E have been updated in 2010 to reflect the current international traceability requirements and British Columbia fisheries data requirements.

The 2005 analysis and interviews with processors identified a number of general data issues at the harvest level of the supply chain which are summarized below. Interviews with the wild harvest processing sector were not conducted in 2010, and only minor updates to the section below have been made based on the personal knowledge of the project team.

A. Most of the required data at the harvest level is collected but product identifiers are lacking

Product description information – Generally this information is complete and well documented. Usually this is the same information used for fisheries management purposes.

Business identification information – Harvester and buyer identity information is documented but transportation details such as who the transporter is, when and where products were picked up, by which vehicle, and when and where they were delivered is not well documented within existing fisheries data programs. Better transportation documentation exists in validated fisheries than non-validated fisheries. Bill of ladings and buyer delivery records are not included in

[27] Source: DFO Licence Reports and 2009 DFO Catch Statistics. Herring SOK data are for 2008.

Appendix Table D, and are likely a better source of transportation information than fisheries management sources, therefore the integration of this information is required.

Product identification – The identification of products by batch numbers, trade unit ID's and logistic unit ID's are virtually non-existent at the harvester to processor stages of the supply chain in most fisheries except for spawn-on-kelp where there are shipment numbers and tote numbers to identify products. Other industry sectors are investing in product labelling and value added initiatives that may facilitate more robust product identification. Validation numbers used in dockside monitoring programs could serve as batch numbers. Product identification is one of the most important elements for traceability and the lack of product identification from harvester to processor is a major constraint to meeting traceability for this level of the supply chain.

B. Data systems vary greatly and data transfer is often ineffective

The required traceability data elements are recorded by a variety of data systems and data parties. If this information is not stored and readily accessible with a data responsible party at a single location for each step in the supply chain, the traceback of a product will be slow and inefficient.

Creation and maintenance of records – All the data systems investigated were paper based with most information subsequently entered into either spreadsheets or databases. Using paper based systems requires data to be recorded in a timely manner; however, the timeliness of subsequent data entry into electronic data systems is quite variable. For example, some harvest logs may not be entered into an electronic system for over a month after the fishing event. Although there is no *requirement* to have data in an electronic format, it is more efficient to search for data electronically in the event of a trace back.

Accessibility of records – The accessibility of fisheries data is variable. Some harvest information is sent directly from the fisher to DFO. This information would not be considered accessible, nor would likely be accessible in a timely manner. The accessibility of information is dependant to some degree on the nature of third party catch monitoring contracts. Some contracts are through DFO while others are through industry associations. The information collected under fisheries monitoring programs is protected under the Privacy Act. Information from these programs can be used publicly provided it is not specific to an individual. For traceability purposes, it is important to know the identity of the business (or harvester) as well as the product information, suggesting a problem may exist in using fisheries information for traceability purposes. However, personal identity information is already being provided by harvesters to transporters and buyers for business transaction and invoicing purposes, which suggests harvesters should be able to give consent to allow their information to be used for purposes other than fisheries management.

Compatibility and redundancy of data systems – The level of data system compatibility that exists through the supply chain is limited to paper records passed from one business to the next. There is virtually no communication of data electronically through the supply chain and there are duplicate systems in place recording similar information for different purposes. Processors do not generally use validation records as part of their internal data records (dive fisheries may be an exception). Two tally sheets are often created for an offload, one completed by an observer for fisheries management purposes and one created by the offloading company for business and invoicing purposes. Offload tallies and validation records are reconciled at the offload but the

validation record is generally not used by the processor, leading to duplicate entry of offload information into separate data systems. The integration of these data systems would generate efficiencies for both processors and catch monitors.

Although the scope of this project does not cover the entire supply chain, it should be noted that traceability must extend throughout the supply chain (i.e. record keeping must be seamlessly linked throughout the chain to allow for effective and efficient communication). The traceability system eventually implemented at the harvester/buyer level should be compatible with the systems of all downstream players in the chain (all the way to the retail level). Since this need for compatibility extends to players in export markets, the use of globally recognized standards (e.g. the EAN numbering system) would improve compatibility with global partners.

C. Data systems are only partially verifiable.

At certain points in the supply chain, some data systems are verifiable. Dockside monitoring programs would be considered verifiable as they are carried out by a third party, but these programs are currently focussed on collecting data for fisheries management purposes. QMP systems are audited by federally authorities to ensure food is processed in a safe manner. Hails or fish slips are not be considered verifiable since there is no way to prove the information is accurate.

D. Data responsible parties are not clearly defined.

Much of the required information for traceability is collected through a variety of systems and parties in the supply chain including harvesters, monitoring service providers, transporters and buyers/processors. Although the traceability data required for any one party may be collected, that data is typically being collected, and held by two or three different parties. This situation is clearly not efficient in the event of a trace back nor is it acceptable according to verification requirements of the US Bioterrorism Act and COOL. It is important that a data responsible party be specified for each partner in the supply chain.

6.4 TRACEABILITY ISSUES – PROCESSING LEVEL

Since much of the response to changing export regulations lies with the processing sector, a series of interviews were conducted in 2005 with processors to determine current traceability practices at the processing level in order to identify issues of concern to the BC seafood industry in meeting new traceability requirements. Processors were selected for interviews based on the species, product and export markets focus of their business. A total of seven processors were interviewed (Table 6.2). Interviews with the wild harvest processing sector were not conducted in 2010, and only minor updates to the section below have been made based on the personal knowledge of the project team.

Table 6.2. List of processing companies interviewed in 2005 regarding traceability practices.

Processing Company	Interview Contact	Products Sold	Primary Export Markets
Seaworld Fisheries	Tony Wong	Geoduck, crab, prawns	China, US, Asia
Aero Trading	Yuki Hamakawa	Roe herring, spawn on kelp, sablefish, tuna, prawns, halibut, salmon, crab	Japan, US, EU
Canadian Fishing Company	Ralph Drew and Kate Abraham	Salmon, herring	US, Canada, EU, Japan
Ocean's Fisheries	Doug Safarik	Salmon, herring, groundfish	US, Canada, EU, Japan
Finest At Sea Ocean Products	Paul Chaddock	Salmon, sablefish, groundfish, tuna	Canada, US
Lions Gate Fisheries and S&S Seafoods	Carl Caunce, Ty Dewar,	Groundfish, halibut, shrimp, salmon	Canada, US
North Sea Products	Thomas Okuma	Roe herring, sablefish, tuna, prawns, halibut, salmon	Japan, US

Issues and themes related to opportunities and barriers to implementing traceability in the BC seafood industry identified as a result of the interviews are summarized below.

A. Product pooling may occur at various stages of the supply chain

The moment that product is pooled, traceability to a specific boat is lost. In some fisheries such as salmon and roe herring, pooling of product is common as a result of the way those fisheries are conducted and managed. None of the regulations reviewed *require* traceability to a single vessel/harvester (except CSSP/QMP for bivalves). For example, the EU General Law requires the traceability of food at all stages (you must be able to say where it came from) however, this does not preclude mixing or pooling of product from multiple sources.

One exception is the requirement to segregate product by country of origin under COOL legislation. Currently, some Canadian packers and processors mix product caught in US and Canadian waters. According to representatives of the Agri-Food Trade Service, this mixing would not be acceptable under COOL; rather, all product will be required to remain segregated by country. The same condition applies under the EU IUU regulation (see below).

Due to space constraints and the associated costs of transporting and storing seafood products, totes may be topped up (product pooled) to gain cost efficiencies. With the implementation of traceability, this practice may be more difficult or undesirable. For fisheries where production volumes are low and catch is commonly separated into species or grades, consideration should be given to using smaller containers for transportation and storage rather than the standard large sized, insulated fish totes.

If the mixing of product units occurs, it is essential that the ID of each unit contributing to the mixed consignment be recorded. This would ensure that even if the physical traceability of the *individual* product units were lost, their presence within the mixed consignment would be known

(in case a trace back was initiated). The Canadian Catch Certificate System (FCS) developed to meet the EU IUU Regulation permits processors and exporters to trace product to a registered group of harvest vessels rather than a single vessel.

Although traceability systems do not preclude pooling, risk is increased each time product is pooled. For example, if a food safety problem arises in pooled product sourced from a number of vessels, all of the vessels and all areas fished within the pool would be implicated in the problem. If product had not been pooled, the problem could be traced to a specific vessel or area, and the vessels fishing other areas would be unaffected.

B. Traceability can facilitate improvements to product quality

For fisheries where harvesters are paid a differential price based on quality, Harvester to processer traceability systems have to be established. This is generally the case for groundfish trawl, but not the salmon fishery. In general, processors do not pay harvesters based on product quality for salmon because much of the product is pooled on packers and traceability to individual vessels is lost. Under this system there is no incentive for a harvester to deliver a product of higher quality. A good traceability system can help buyers with quality control, as it provides a tool to determine which harvesters are meeting quality standards and which harvesters need to improve the quality of landed product.

Several smaller processors are using traceability information from harvesters (vessel, date of catch, method of harvest) to access higher valued niche markets (i.e. the restaurant trade). Some processors are appealing to the consumers' appetite for knowledge by marketing information such as where and when the fish were caught and how they were stored on board the vessel. In addition, sector wide initiatives (product labelling on frozen-at-sea prawns) are seen as a definite advantage in markets like Japan.

C. Traceability is often implemented on an "as required" basis

Processors react to regulatory changes or consumer demand. Concern about cost means that only minimum requirements are met. Proactive, non-regulatory business case advantages are often not recognized. Marine Stewardship Council (MSC) chain of custody certification is an emerging traceability requirement for BC processors due to amount of MSC certified product (Alaskan Salmon, BC Halibut, BC hake) moving through their plants.

D. Most processors do trace product through the plant

In general, processors have traceability systems in place within the processing facility by use of batch numbers, lot numbers or sales order numbers. Current data systems in processing plants consist of paper and spreadsheets. Bar code systems were not used by any of the processors interviewed. Most of the required traceability information from water to buyer is being collected, but effective one-up, one-down traceability is lacking.

E. Market driven fisheries have a traceability advantage over opportunity driven fisheries

The fisheries management regime can be a barrier to addressing quality and traceability issues due to the "rush" to move large amounts of product to the processor in a short period of time. In general, IQ managed fisheries are slower paced with fishing activity more closely linked with market demand. Some IQ fisheries focus on product quality through better product handling.

One of the best examples of market based fishing is the geoduck fishing. Each day, an order is placed by buyers to harvesters for how many geoducks to harvest. Fisheries such as salmon are not as fortunate. The current salmon management regime forces fast paced fishing and product pooling in order to transport the high volumes of fish caught in short periods of time. The latter scenario is clearly more challenging for implementing an effective traceability system.

F. In 2005 consumer driven demand for product information/history was not a major driver in many BC fisheries

Globally, there is an increasing demand from consumers to know more about food products and their production history. At present, consumer demand for BC seafood seems to be driven more by quality issues rather than by product knowledge or history. This may change with increased recognition of MSC certification and the demand for product information by retailers and distributors. For example, sablefish aquaculture product exported to Japan requires full traceability including documentation of hatchery and feed sources as well as therapeutant use to meet buyer demand.

G. Cold storage facilities are a "weak link" in the traceability chain

In 2005 processors remarked that inventory information systems vary considerably among cold storage facilities, and that frozen product (especially whole dressed salmon) is often stored by processor, species, grade and year, with no further identification to facilitate trace back to processor batch numbers or the harvester. Addressing this weak link will be a major challenge to meeting full supply chain traceability for unpackaged frozen product. Cold storage facilities were also identified as one of the biggest problems for Fisheries Officers attempting to determine origin or ownership and legitimacy of stored seafood products, as it is very easy to mix legal and illegal product with current record keeping practices (S. Roxburgh, Speyside Environmental Consultant, pers. comm.).

H. Live product is often not segregated by harvester or fishing area and batching may be poorly documented

It is more difficult to segregate live product during transportation (live rockfish) and at the processing plant (Dungeness crab). In many facilities it is not routine practice to document batching for live holding tanks (except possibly by harvest area). Although this "gap" can be addressed at the transportation/processing level by improved batching records, the pooling of live product through distribution chains will prove to be a major obstacle to full traceability (R. Bulmer, Ron Bulmer Consulting Inc., pers. comm.)

J. The health and safety rationale for increased traceability requirements is considered questionable by many seafood processors.

In 2005, processors commented that existing QMP programs based on HCCAP adequately deal with the health and safety risks associated with seafood processing and distribution (i.e. existing batch traceability for canned products, QMP programs for bivalves and cooked shellfish). Several processors commented on the ability of the BC salmon canning industry to track every can of salmon back to a specific plant, date and retort batch from the can label. From a health risk management perspective many processors do not consider it necessary to incorporate traceability to the harvest level into QMP programs. This adds a "resistance factor" for implementing these traceability measures.

K. There is a need to integrate information technology with fish processing operations.

The cost of implementing traceability is a concern to processors. Processors are cautious to adopt new technologies (i.e. bar codes and software solutions) due to concerns over how they integrate with the existing processing line operations (including the dynamics of supplying fresh market demand). Those processors who had investigated technological solutions (e.g.. bar codes) were not confident that they were presented with a workable system. This is in part due to poor understanding of technology on the part of processors and poor understanding of fish processing operations by technology suppliers.