

# Traceability & Chain of Custody Documentation

Gap assessment

What's in Place? What's Needed?

Produced for

Chehalis Indian Band

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**Report Date:** March 2009

## Introduction

The paper entitled “Traceability Tools for an Inland Fishery” defined the term “traceability”, stated why traceability is needed in food chains, described some traceability methodologies for various food sectors including seafood, and made some recommendations for the fishery as follows:

1. DNA Technologies – has applicability for salmon stock management
2. Encourage Fishery Participation
3. Continue to Develop and Improve the Current Traceability System
4. Consider Building in RFID Technology using the Virtual Warehouse as a Backbone
5. Develop Accredited Education & Training
6. Verify that the Quality Management Plan is Working
7. Evaluate the Need for Fishery Accreditation

This report examines points 3 and 4 in more detail as these are directly related to building increased traceability into the fishery through documentation of an intact “chain of custody”<sup>1</sup>. ; the other recommendations will be built into other 2009 projects. Point 4 will be addressed first, the point 3.

This fishery must be able to trace all products within the fishery chain; there are several key methods by which to measure all fish that enter the fishery and to track these fish through to customers of the Virtual Warehouse. At this point, the warehouse customers are responsible for fish traceability. This will change if the fish from this fishery become “branded”; there will need to be more interaction with customer traceability systems to demonstrate that the branded products are truly from the inland fishery.

This report summarizes the improvements to the current system that are needed to set up a fully functional traceability system that demonstrates full chain of custody of the fish and roe through to the Virtual Warehouse customers.

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<sup>1</sup> Chain of Custody – defined by the US Environmental Protection Association as “an unbroken trail of accountability that ensures the physical security of samples, data and records”. The term is also used for food to indicate control of all products within a food supply chain...

## Consider Building in RFID Technology using the Virtual Warehouse as a Backbone

The use of traceability methodologies in the food industry is reviewed by Regattieri (Regattieri, 2006). This paper gives an excellent overview of the current status and challenges associated with various tools for documenting chain of custody. The paper states that the three methods are alphanumeric code, bar code and radio-frequency identification (RFID). Alphanumeric codes are the traditional product coding methods that are placed on paperwork and labels.

The paper goes on to list the pros and cons of each system.

### *Alphanumeric*

The system is relatively simple and economic to design but a significant amount of human resources are needed to manually write and read the codes. There are also no standards for these codes so deciphering the code may not be intuitive. There is also a higher probability of human error leading to data integrity problems due to code misreading and data entry errors.

### *Bar Codes*

Bar codes, as compared to alphanumeric systems, allows for automated reading of the codes at a faster rate. The codes, however, must be positioned to be read by the reader (line of sight positioning requirements) that can lead to errors and inefficiency. The barcodes are also easily damaged leading to mis-reading.

### *RFID*

RFID do not need physical contact or alignment with the reader meaning that reading tags is fast and efficient. A reader can also scan numerous tags at the same time. Its use has also been successful in reducing losses due to “shrinkage” (through theft, fraud and mis-handling) and to more efficient control of the supply chain. Some tags may also have their data rewritten lending more versatility to this system. However, the cost of the tags is quite high meaning that the value chain must be able to support the added cost. There are also many different options available for the design of the system. In addition, the entire value chain is ideally incorporated into the system; otherwise the cost of RFID is not warranted.

### *Realities of the Inland Fishery*

The inland fishery is still in the process of development. While it physically controls some fish and fish products right from the point of landing to retail sale, many products, in particular roe, are sold to and through commercial processors and other buyers. These buyers have their own traceability systems in place, none of which are more sophisticated than an alphanumeric traceability system. This means that neither a barcode nor RFID system would be used past the point of entering the Virtual Warehouse.

**Piloting a barcode or an RFID system is therefore not useful until the rest of the fishery value chain is ready to investigate these technologies.**

## Continue to Develop and Improve the Current Traceability System

Each of these points will be addresses in turn:

1. Sign fish in and out of fishery control – sign the fish from the river into the fishery.

This is happening at three points;

- an independent Monitor counts the fish and their gender and records this information for regulatory purposes at the point of the sets arriving at the beach– this paperwork is not part of this fisheries’ in-use traceability documentation; it is a regulatory document that may be referred to if there is a problem.
- the fish are transported to the Landing Site – a Landing Slip is generated for each landing. The slip states the crew, date, species, fish numbers, the weight is not measured.
- the crews are given a Fish Slip at the end of the day that records the crew, date, species, fish numbers, landing site, the weight is not measured.

### *Improvement Needed*

#### **Weigh the Fish.**

The most accurate way to begin the traceability process is to weigh the fish at this point because the fish are being weighed downstream at the processing plant. Generating a weight at Landing gives a point at which a weight comparison can be made. If there is a discrepancy of between the weights measured here and at the processing plant, there will need to be an investigation and written documentation of the outcome and the final reconciliation of the weights. There are three documents that have written confirmation of the weights at landing, the Landing Slip, the Fish Slip and the Shipping Manifest. It will be necessary to determine how to record the net weight – it is probably easiest to record both the tare weight and the gross weight.

2. Ensure all paperwork is transmitted to the Virtual Warehouse – tote numbers, fish pieces and gender

This transfer of paperwork must happen in a timely fashion to ensure the Virtual Warehouse is up to date and all shipments adequately recorded.

### *Improvement Needed*

#### **Fax the paperwork to the Virtual Warehouse within 24 hours**

A fishery is, by nature, a busy time meaning that it can be difficult to complete paperwork before the next batch is being generated. This means that sometimes the paperwork for each shipment is not being transferred quickly to the Virtual Warehouse. There has been advancement in technology such

that scanned or faxed information can be converted into computer characters. The paperwork can therefore be faxed in to the Virtual Warehouse; it doesn't need to be entered into the computer. This could be done the next morning by office staff.

3. Determine what is required to weigh fish at the landing site

The ability to weigh fish at the Landing Site is a crucial part of an intact traceability system because weights are what is measured by the processing plants. Weights are closely tracked because that is how payments are calculated – this means that close attention is paid to these numbers. Weights are also critical to traceability because this is a quick method by which to track production. Processing plants track how much product is produced to ensure an intact chain of custody for performing recalls and tracking yields. This becomes even more important as the fish is processed into other products. A processing plant will record initial weight, weight of roe, weight of H&G fish and the weight of the waste produced. If the fish are used for value-added products such as Indian candy, the fish weights used will be recorded. The point at which the initial product (the fish) are transformed into other products (roe, dressed fish, Indian candy, and other value-added products) is called a Traceability Decoupling Point (TDP) (Jansenn-Vullers, 2004). At this point the batch and lot identifiers change significantly and it becomes important to maintain an intact system of tracking where the various parts of the fish go – **weights are an important part of keeping track at these TDPs.**

### *Improvements Needed*

#### **Do what is needed to weigh the fish at the Landing Site – buy a scale and facilitate this process for the 2009 season.**

There will need to be some preparation for weighing fish at the Landing Site. The scale must be levelled; either a permanent cement slab must be built into the landing site or a levelled slab built from cement blocks for example. The scale needs to be durable and able to stand a wash-down and exposure to sand and rain. It must also run off rechargeable batteries. Ideally, the scale will internally record activities for downloading into a computer or similar device at a later time. While a print-out sounds ideal, the wet beach environment is not conducive to this feature.

#### **Record the tared weight (with ice) and the gross weight on the Tote Tag**

The totes will need to be prepared for weighing – they must be tared with the ice already in them. This means that the tote label must be started and applied. It may be necessary to devise a system by which the tote label is protected in plastic because more information must be added after the tote is filled. If this is impractical, the totes may need to be somehow coded and that system used to keep track of the tares and final weights.

4. Record the crew on the Shipping Manifest (and Tote Tags)

Ensuring the crew is recorded on the Shipping Manifest adds another layer of traceability to the Landing Site. The lot numbers assigned to product in the Virtual Warehouse will now also indicate a crew; this finer level of detail may be helpful if a recall needs to be run.

*Improvement Needed*

**Record the Crew on the Shipping Manifest and Tote Tag**

Determine what needs to be done to facilitate recording the crew on the Shipping Manifest and Tote Tags.

5. Seal totes during Distribution

The feasibility of this should be considered because there are some logistics involved. There is not as much need for this step if the tote weights are recorded and compared with those recorded at the processing plant.

6. Link roe to original fish through documentation

This is being done through the Virtual Warehouse. The roe remain in the same lot as the fish they were extracted from; there is no mixing of roe. Again, weighing of the fish at the Landing Site will assist this documentation because there is an expected yield of roe (within an expected range). Any discrepancies from this expected range will generate an investigation. As stated earlier, the extraction of roe is a traceability decoupling point (TDP) so weights are extremely important for demonstrating the integrity of the processing chain.

*Improvement Needed*

**Weigh the fish at the Landing Site.**

7. Maintain traditional tracking mechanisms for fish through to final sales

Follow standard record-keeping if there are retail sales– ideally these products will be labelled with the Riverfresh label and marked with a best before date. This label can also have a code that relates the product back to the day of fishing and the crew.

8. Sign fish out of the fishery – at this point, the fish are signed out to customers of the Virtual Warehouse.

This does not appear to be a significant issue at this point, particularly with the Virtual Warehouse in operation. However, if this fishery becomes branded or becomes part of a larger branding program, there will need to be further tracking into the co-packer that is processing the value-added branded products- this is a TDP.

## Summary

The following procedures must be implemented to demonstrate a traceable, intact chain of custody for this fishery:

1. Weigh the fish at the Landing Site and record the tared weights and the gross weight on the Landing Slip, Fish Slip, Shipping Manifest and Bill of Lading.
2. Fax each day's fishery paperwork to the Virtual Warehouse within 24 hours.
3. Record the Crew on the Shipping Manifest and the Tote Tags

The most challenging process is to set up weighing stations at the Landing Sites – weighing is the most important part of demonstrating how much fish has initially entered the system. This allows a direct comparison of the amount of product received at the plant and the Virtual Warehouse. These numbers can also be directly related to other products produced from the fish including roe.

## References

Jansen-Vullers, M.H., Wortmann, J.C., Beulens, A.J. (2004). *Application of labels to trace material flows in multi-echelon supply chains*. Production, Planning & Control 15(3): 303-312.

Regattieri, A., Gamberi, M., Manzini, R. (2007). *Traceability of food products: General framework and experimental evidence*. J. Food Engineering 81: 347-356.