

PROJECT CROOS

Collaborative Research on Oregon Ocean Salmon



CROOS COLLABORATIVE RESEARCH FIELD SAMPLING PROTOCOL

(draft June 8th, 2007)

Project Funded by:
Oregon Watershed Enhancement Board & NOAA National Marine Fisheries Service
To the Oregon Salmon Commission



GENERAL CROOS PROCEDURE

Attach one metal barcode tag to each of the first 20 fish harvested per day on days you are instructed to collect data. Use the GPS only on days you are collecting data.

- Turn GPS **on** when lines are in water and **off** when lines are pulled up (see GPS Units Procedure, page 6)
- Use the GPS to make one waypoint for each fish

For each fish sampled

- 1) When a fish is landed, press the **MARK** button to record a waypoint. If you land more than one fish, make a waypoint for each fish.
- 2) Check this waypoint number and time (to remember it), and press the **ENTR** button to store the waypoint number on your GPS
- 3) **Remove a barcode from an envelope.** You will use this envelope to record data for this fish.
- 4) Use a zip-tie to **attach metal barcode tag on the fish** (page 7)

Record data on Envelope. The barcode placed on the fish needs to match the number on the envelope. See Instructions: Filling out Envelope Data Procedure (page 8).

- 5) Write the GPS waypoint number on the envelope
- 6) Write the time the waypoint was recorded for time and the day's date
- 7) Write the depth the fish was caught at (in fathoms)
- 8) Measure Fork Length in Inches (page 9).
- 9) Check fish for hatchery markings (page 8)
- 10) Remove 8 - 10 scales from the "Key Area" and place in middle of paper (p. 10-11)
- 11) Fold paper once over the scales (pages 10 - 11)
- 12) Take genetic sample (page 12)
- 13) Fold last paper flap over tissue sample and place paper in envelope
- 14) Write your Vessel's name on the envelope

Use clean scissors and tweezers when taking samples!

Sample Storage at End of Day

Samples need to dry out as fast as possible. The longer they stay wet, the more the tissue breaks down. Place samples in the wheelhouse or somewhere dry after you have taken them. The envelopes need to be kept clean and dry. If fish blood soaks through, the samples will be contaminated.

Within 24 hours return from sea (see Fleet Communication Protocol, page 5)

- Take samples, your protocol and the CROOS Toolkit (with all supplies, including the GPS) to the Port Liaison at the port you landed your fish (Liaison list on page 2)
- Contact your home-port Liaison so they know that your samples were received
- Port Liaison will fill out your invoice and submit it to the Oregon Salmon Commission for payment
- Port Liaison will download your GPS data, check your samples in, and either restock the CROOS kit and give it back to you, or will keep it to re-issue it if you are not going to be sampling again that week. The Port Liaison will give you any protocol updates.

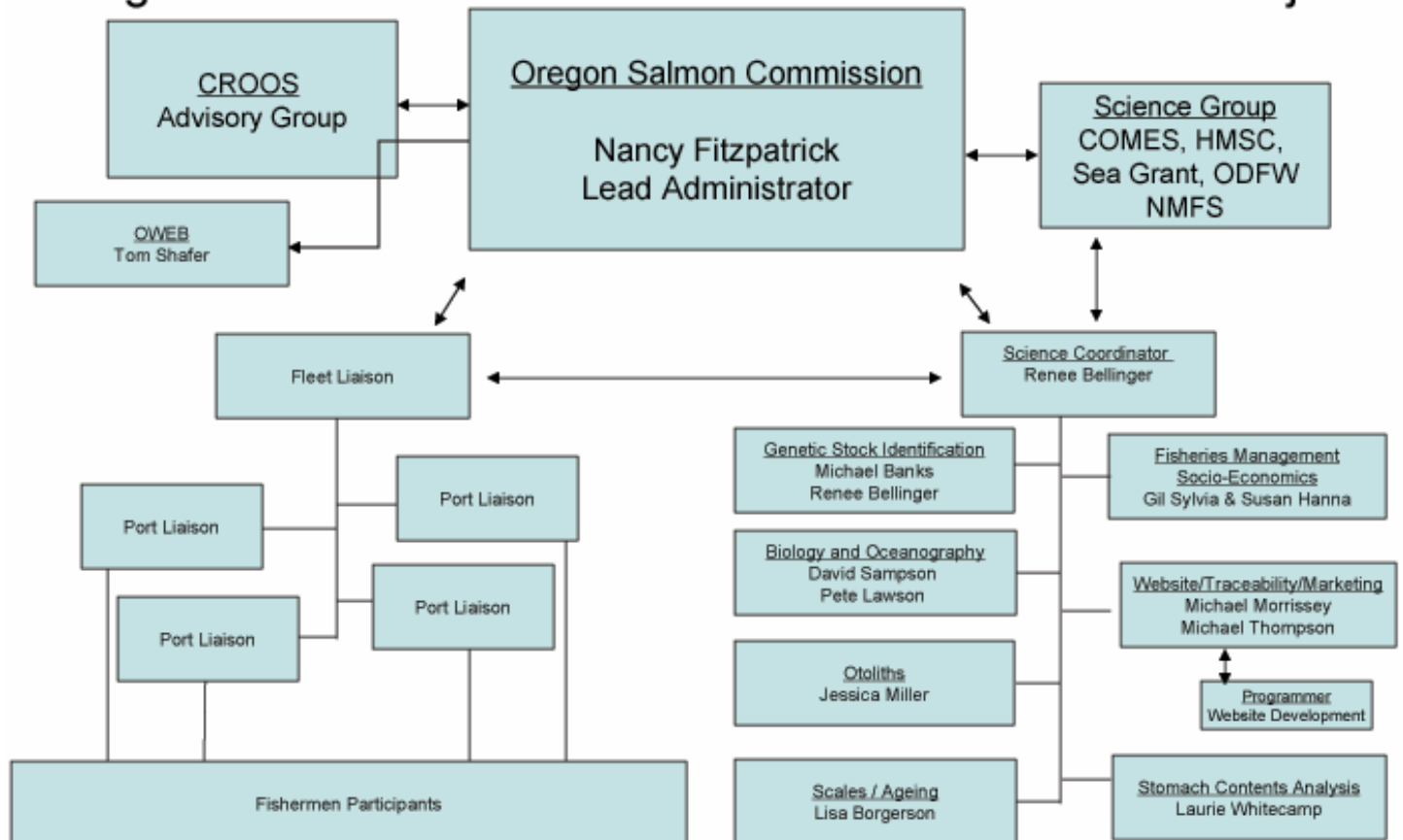
Port Liaison Contact Information

Port	Port Liaison Contact Information	Hours
Garibaldi		
Newport		
Winchester Bay		
Coos Bay / Charleston		
Port Orford		
Brookings		

Other Contact Information for Project CROOS

Role	Name	
Fleet Liaison		
OSC Administrator		
OSC / Oregon Sea Grant		

Organizational Chart for OWEB Collaborative Science Project



Fleet Communication Protocol

Overview

All communications with the fleet will happen through liaisons. Each fisherman will have an assigned liaison and must contact their liaison within 24 hours of returning from each sampling trip. If a boat comes in to a port other than their homeport it is their responsibility to contact their assigned liaison (to let them know where they are ported) AND the liaison in their port of call to turn in their data. Each liaison has an individual contact plan (see Liaison Contact and Instruction Sheet.)

Fishing Days Assignments

There are limits to how many boats can go out per week and how many samples may be taken. Fleet managers will assign fishing days and adjust assignments as needed. When assignments become available your liaison will let you know. It is your responsibility to confirm with your liaison whether or not you will be fishing those days.

Samples and Data

It is your responsibility to contact your liaison (if landing in a port other than your home, you must ALSO contact the liaison in that port) within 24 hours of returning from a sampling trip.

When You Come in to Port

You must **bring your kit and all data and samples and your protocol to the Liaison at that port**. You will wait while the liaison checks your samples and GPS data for completeness and consistency. Your kit may or may not be returned, depending on upcoming sampling day assignments. If your kit is returned to you, you and your liaison will restock your supplies (batteries, envelopes etc...) at that time.

Protocol Changes

Your liaison will inform you of changes in protocol as needed.

Invoicing

Invoices will be completed and turned in by your liaison. No payment will be allowed until samples are properly received.

GPS Units Procedure


- Check GPS units throughout day to make sure the batteries haven't run out of power. You can change the batteries and will not lose the data stored in the GPS unit.
- When using GPS, keep it outside where it can get satellite reception (typically there is no reception in the wheelhouse)

Turn GPS **ON** when your gear is in water

Turn GPS **OFF** when your gear is not in water

Make one waypoint PER FISH. For example, if you land 3 fish, make 3 waypoints.

To record a waypoint when you land a fish

1. Press "**MARK**" button to record a waypoint 
2. Read the waypoint number on the screen and remember the waypoint's time
3. Hit "**ENTR**" button to store the waypoint on the GPS unit
4. Write the **Waypoint number** on the envelope
5. Write the **Time and Date** of the waypoint on the envelope.

To check waypoints that you have already made

1. Press "Find" button
2. Use the arrow to highlight the "Waypoints" icon
3. Press "Enter"
4. You will see a list of waypoints, with the last one made as the last one on the list.
5. Use the arrow keypad to select the waypoint that you want to check, and press "Enter"
6. Press "Quit" to exit the screen

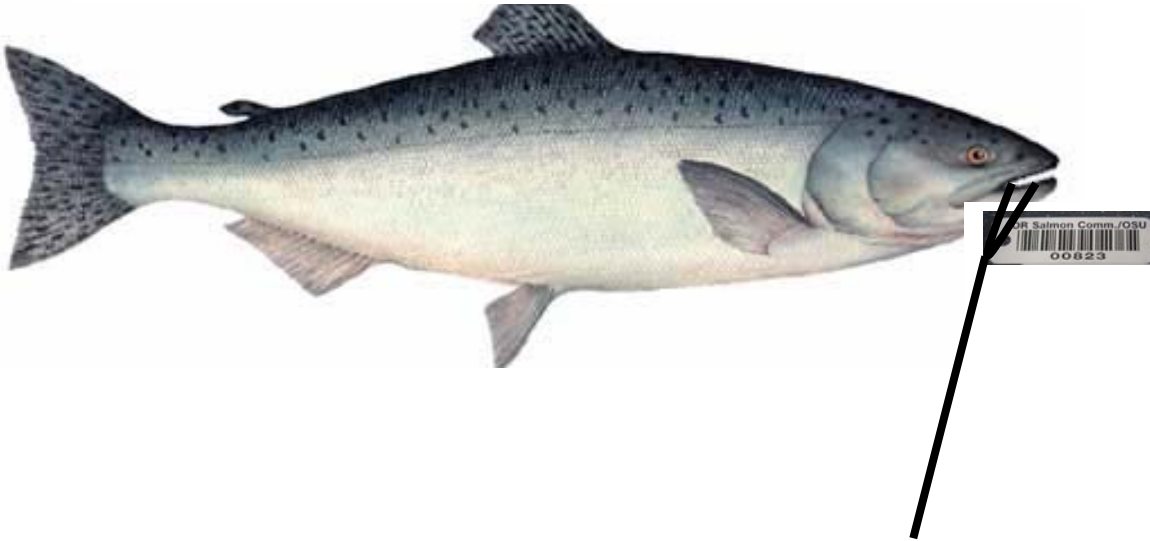
* If you want to see a different waypoint, press the "Quit" button, and it will take you to the previous screen with the list of numbers.

The GPS unit automatically saves your track in five minute intervals when it is on. You won't see anything indicating that it is recording, but as long as the GPS is on, it is recording.

Placing Metal Bar Code Tag on Fish Procedure

Make incision through jaw, thread zip-tie through tag and jaw and pull the zip-tie shut

The metal tag's barcode number matches the number on the envelope



Filling out Envelope Data Procedure:

Use the envelope that you removed the barcode from to record data for that fish

We use date and time to match capture location to GPS data (we use this to double-check that the waypoint matches the fish).

There are three different versions of envelopes because we have been modifying them as we develop protocols. This is the newest version.

Vessel Name _____

Date _____

Time _____

Depth of capture _____ fthms

Fork Length _____ inches (to 1/4)

No Mark ____ Ad Clip ____

Vent Clip ____ Dye mark ____

Scale ____ DNA ____ Stomach ____

GPS Waypoint

notes:

Place any pit-tags in envelope
USE CLEAN SCISSORS/FORCEPS

WRITE YOUR VESSEL NAME

Date Month, Day, Year

Time Time you landed fish, same as
Waypoint number time

Depth of capture – in fathoms

Fork Length - Round to 1/4 inch

Hatchery markings – check for clips to
adipose, vent, or for dye-markings. If no
marks, check “No Mark”

Check to indicate that scale & tissue samples
were taken. We are not collecting stomachs
this year.

Waypoint number * (one per fish)

Additional notes (white salmon, etc)

If you find a pit-tag, place in envelope.

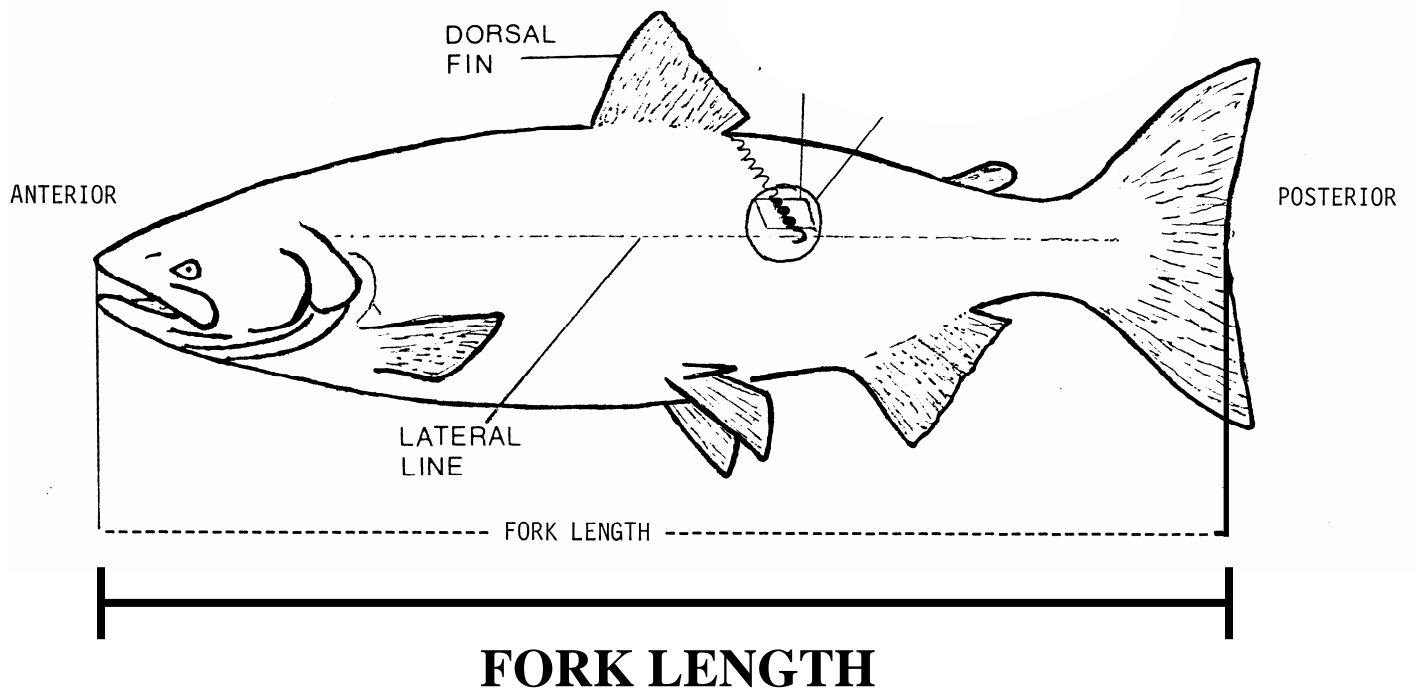
**** **USE CLEAN SCISSORS** ****

* Older envelopes have “Notes or lat/long (optional) written on the bottom of the envelope.

Write the waypoint number in this area regardless of what the envelope instructs.

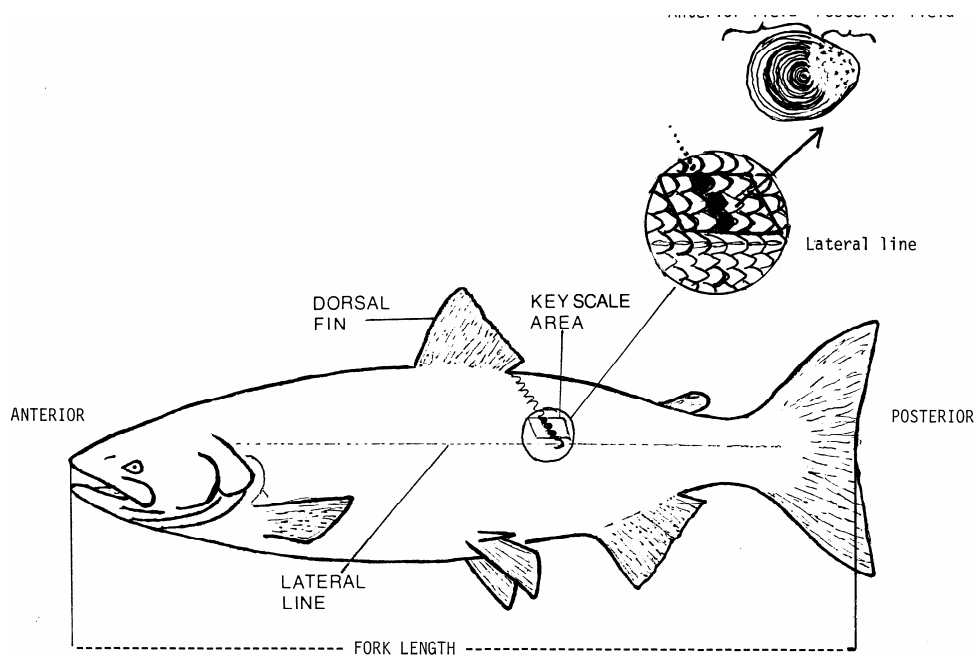
Fork Length Measurement Procedure

Write length in inches on envelope, and round to 1/4 inch.



Scale Sampling Procedure

1. Locate key area by following the diagonal row of scales down and back from the posterior insertion of the dorsal fin to the first 3 scales above, but not including the lateral line. One to two scales in front of (anterior) and behind (posterior) these three scales are within the key area.
2. Scrape the key area with a knife to remove any slime. With forceps, pluck **8-10** scales from this area and place them neatly between the paper insert in the envelope. Be very careful that the scales come from the key area. Fold paper one time.
3. If scales are absent from the key area on one side of the fish, sample from the key area on the other side of the fish. **If fish has visible damage or scarring in key scale area use other side of fish for scale collection.** If both sides are damaged or scared do not take scale samples and make note on envelope in area provided (or see #4).
4. If scales are absent from key areas on both sides of fish, scales may be taken from under the dorsal fin but only from 1-4 scale rows above or below the lateral line. "Non-key" must be recorded on the envelope on the comments line.

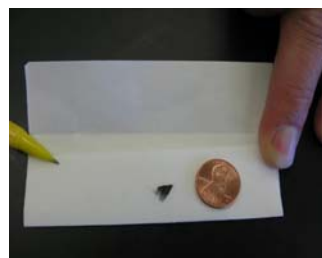


Take 8 - 10 scales before tissue sample

Place in middle of paper

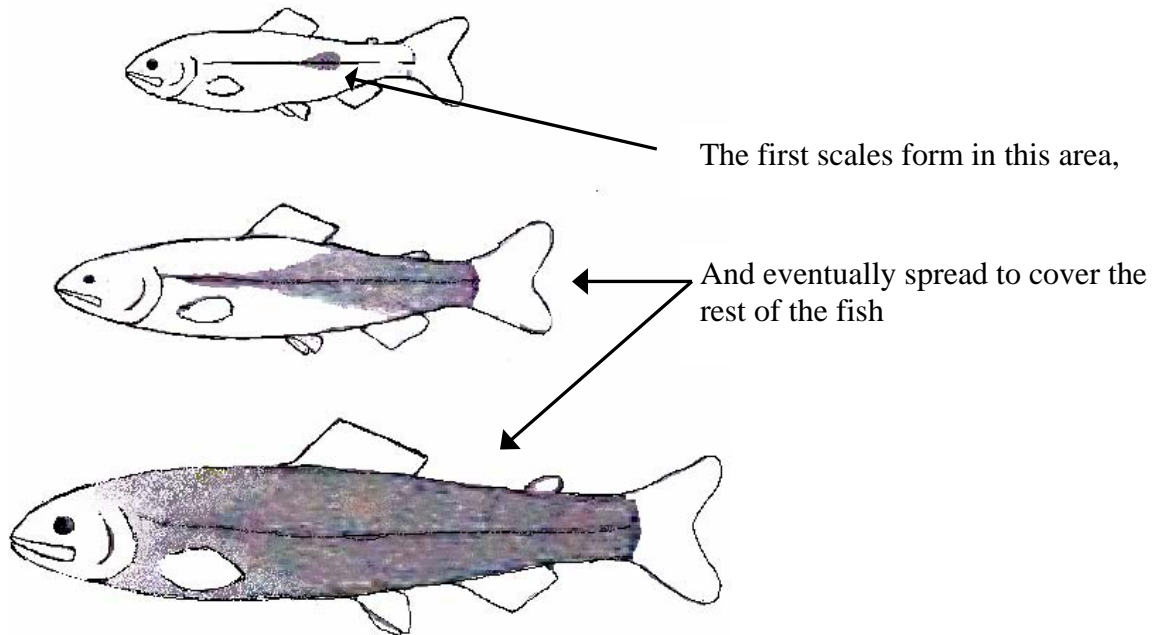
Fold paper once over scales

**DNA tissue sample will go on next fold
(pictured to right)**



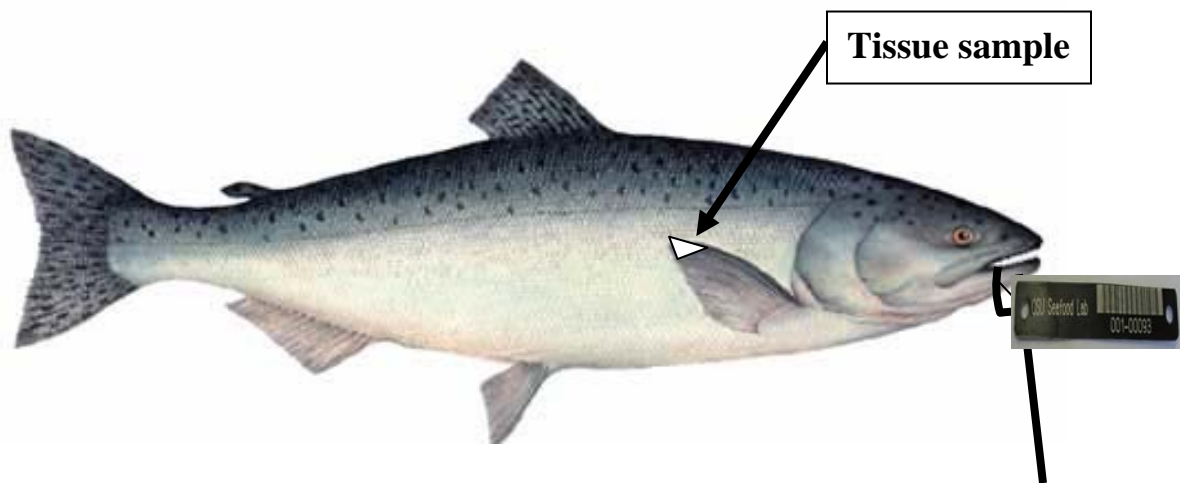
Note on Key Area:

When a juvenile salmon hatches and emerges from the gravel, it does not yet have scales. When it is about 3.5 cm long (1.3 inches), scales start to form in the area we designate as the Key Area. Therefore, key area scales are the biggest and more life history information has been “recorded” on them compared to scales from elsewhere on the fish. We can still age scales taken from near the key area but as these scales will be smaller, we would be unable to use these scales for analyses that required measuring features such as the ocean entrance mark. We may be unable to age scales taken further from the key area, especially from the back or belly.

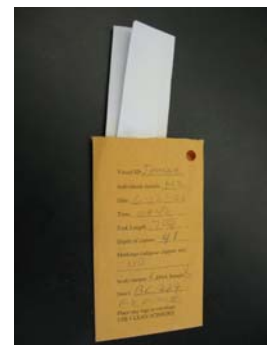
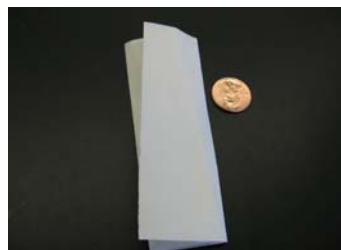
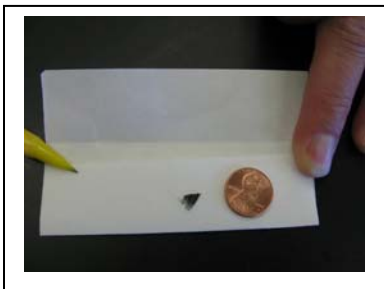


Genetic Sampling Procedure

- 1) Use **ONLY CLEAN** scissors and forceps
- 2) Remove small portion from pectoral fin (not larger than a dime)
- 3) Place fin snip flat on second fold of paper (scales should be separate from tissue sample)
- 4) Place tissue flat on paper
- 5) Fold paper over
- 6) Slide paper in envelope
- 7) Close envelope
- 8) Place envelope somewhere safe and dry. The faster the tissue dries, the better the DNA is preserved.
- 9) Keep the envelopes clean. Blood from other fish will contaminate samples.
- 10) Rinse scissors & forceps well in salt water - using the deck-hose to rinse is fine



Place small piece of tissue on paper, fold and place paper inside envelope



CROOS collection of salmon heads for otolith collection

For information only

- Heads with CROOS tags will be collected by some processors / buyers.
- Collection of heads from buyers will be coordinated by Jeff Feldner and Jessica Miller.
- Fish with coded-wire tags detected by ODFW will have tags removed and returned to OSU

Contact:

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541-867-0381 (office) 503-939-9812 (mobile)
Jessica.Miller@oregonstate

CROOS Otolith Collection

The heads of Chinook salmon tagged with Project CROOS barcodes will be saved by some processors and buyers and returned to researchers at Oregon State University. Data from otoliths will be used in conjunction with Genetic Stock Identification to study migration and schooling patterns of Chinook.

Briefly, otoliths are crystalline structures, comprised primarily of calcium carbonate, located in the inner ear and function as balance organs. Otoliths begin to grow during the egg stage and grow continuously throughout the life of a fish. Daily and annual rings, similar to a tree ring, are deposited in salmon. As an otolith grows, certain elements, such as magnesium, barium, and strontium, are incorporated into the crystal structure in relation to the amount of those elements in the water. Some variation occurs with water temperature as well. Therefore, an otolith can be used as a natural tag to provide information on past periods in the life of a fish. If fish reside in water masses with different chemical compositions and/or temperatures, those properties will be reflected in otolith composition. We will examine otoliths of fish from three to five selected stocks identified with genetic analyses and examine the chemical composition of the otoliths throughout the life history. This will allow us to examine fish of known origin and capture location and examine aspects of their past migration history. We can then compare aspects of the migration histories of fish from different stocks, as inferred from chemical composition, of the otolith rings. This will provide a first look at whether fish of similar age and origin appear to be following similar migration pathways and/or residing in similar water masses while in the ocean.

