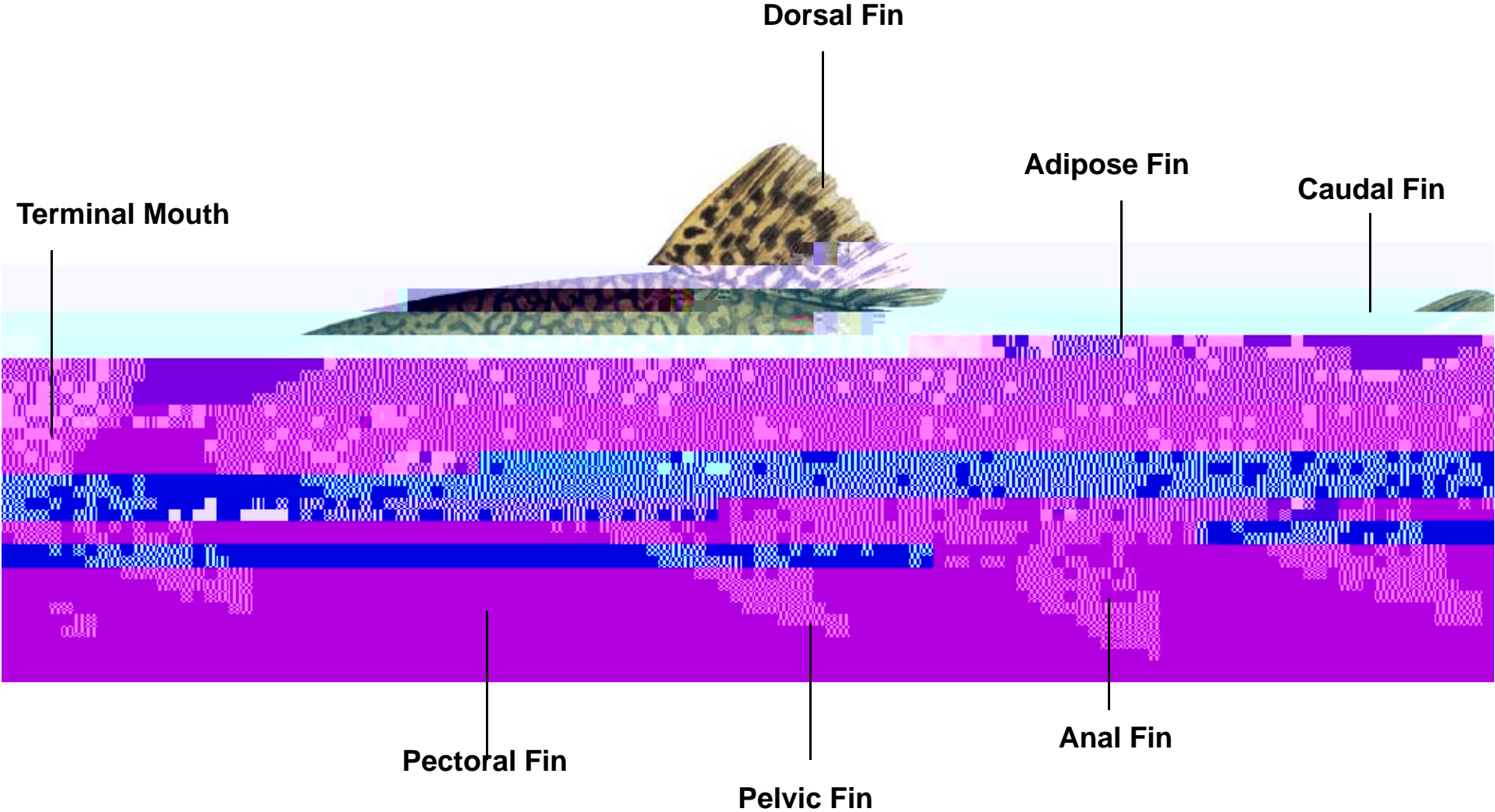
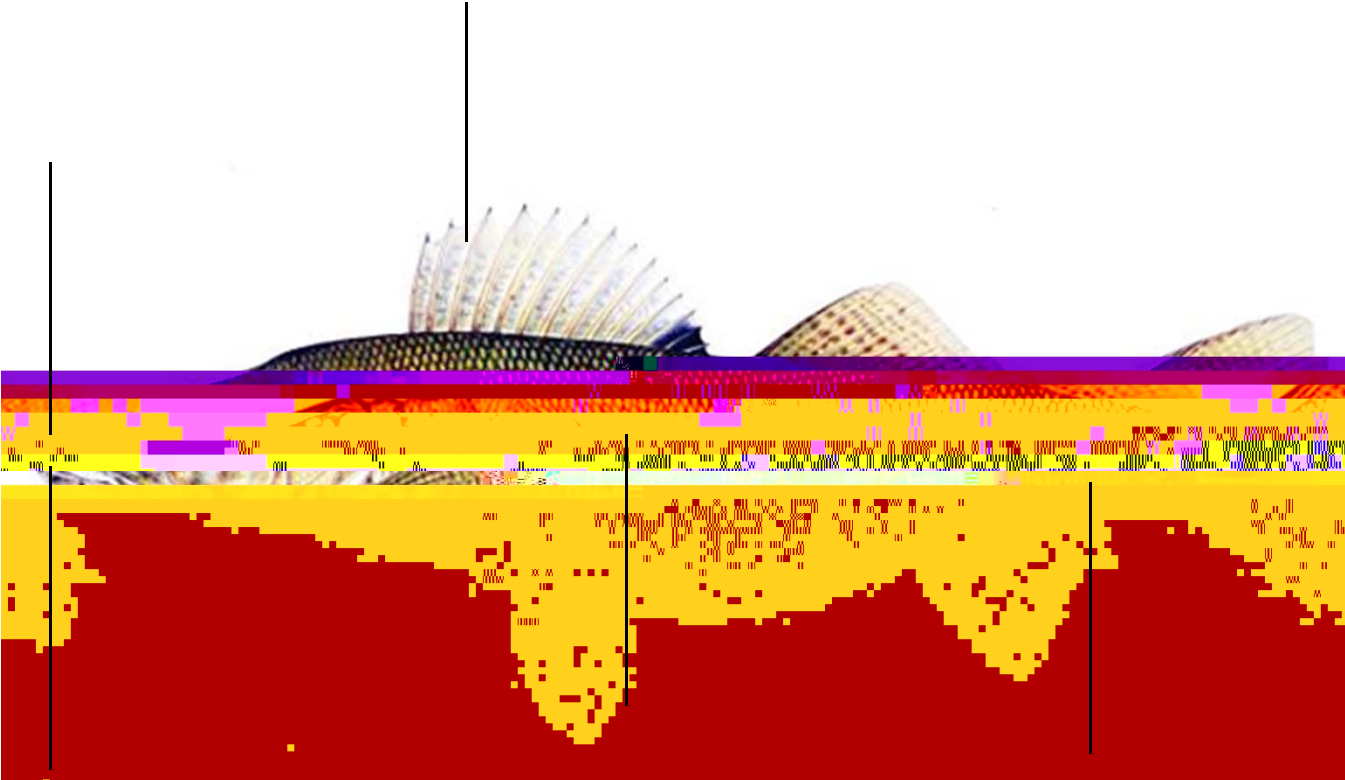


FISH EXTERNAL FEATURES: Brook Trout (*Salvelinus Fontinalis*):



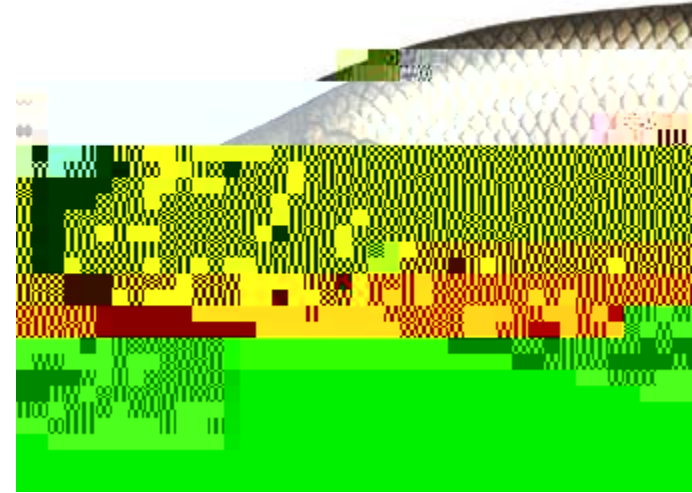
Snout:



EXTERNAL FEATURES: MOUTH TYPES



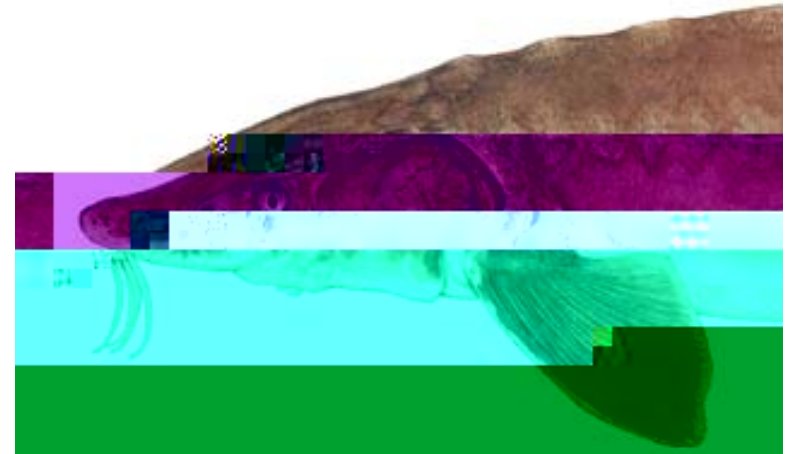
Terminal Mouth: tips of upper and lower jaw forming foremost part of the head; Lake trout, Northern Pike, Cisco



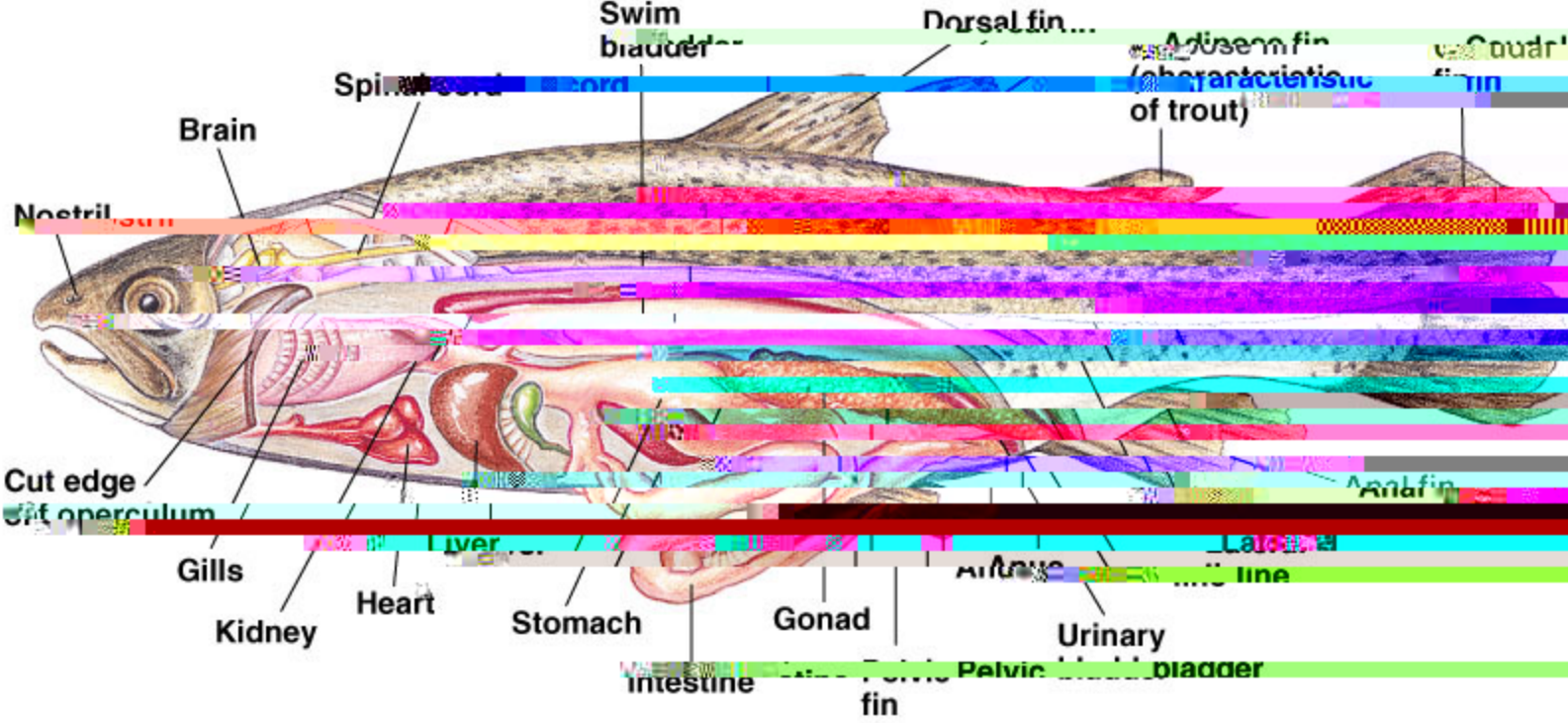
Inferior Mouth: Mouth below snout overhanging by snout, not quite terminal – Lake Whitefish



Ventral Mouth: on ventral surface of head – lake sturgeon, longnose sucker white sucker



INTERNAL FEATURES:

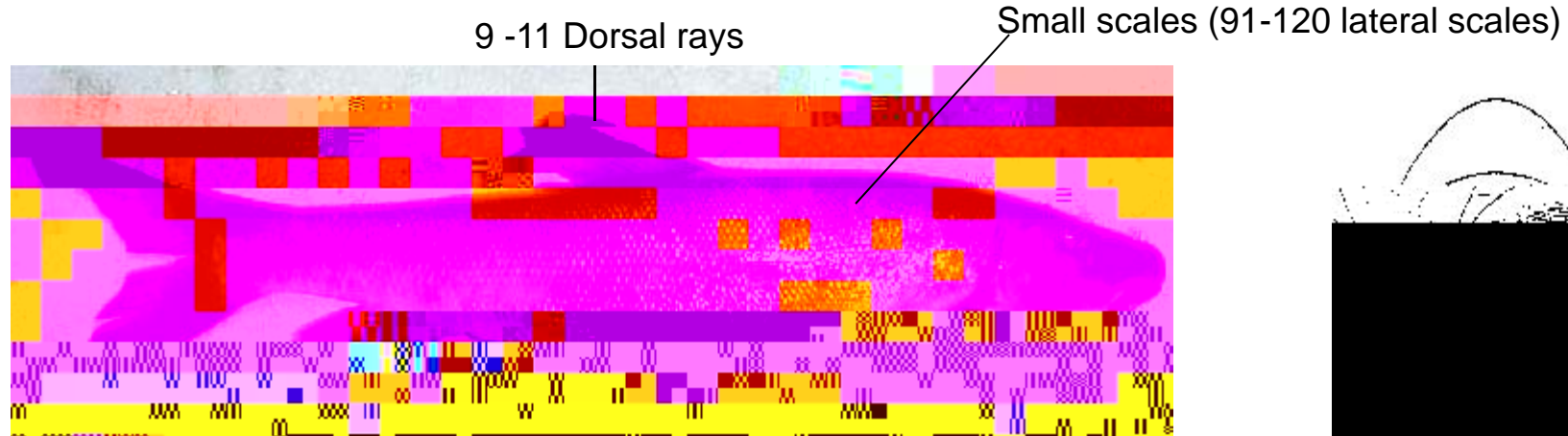


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How to differentiate Common looking Species:

- Some fish within the same family pose some difficulty in determining what species each is.
- External features is one method used to identify these fish to species some features which are used:
 - Mouth and Snout orientation
 - Fin Ray counts (dorsal and anal fins)
 - Scales along the lateral line (size of scales)
 - Fins i.e. adipose fin, forked, square or rounded caudal fin (lake trout vs. brook trout)
 - Markings on the body (vermiculations, spots, bars)
 - Overall shape of fish
 - Colouration

Longnose Sucker (*Catostomus catostomus*)



DESCRIPTION:

Colour

- dark olive or grey to nearly black on back and upper sides, cream to white on lower sides and ventral surface of head and body
- chin and mouth often yellow to orange
- reddish band along the middle of each side of the body of breeding females and, especially, males where it extends onto the snout.

Body

- long and round

Head

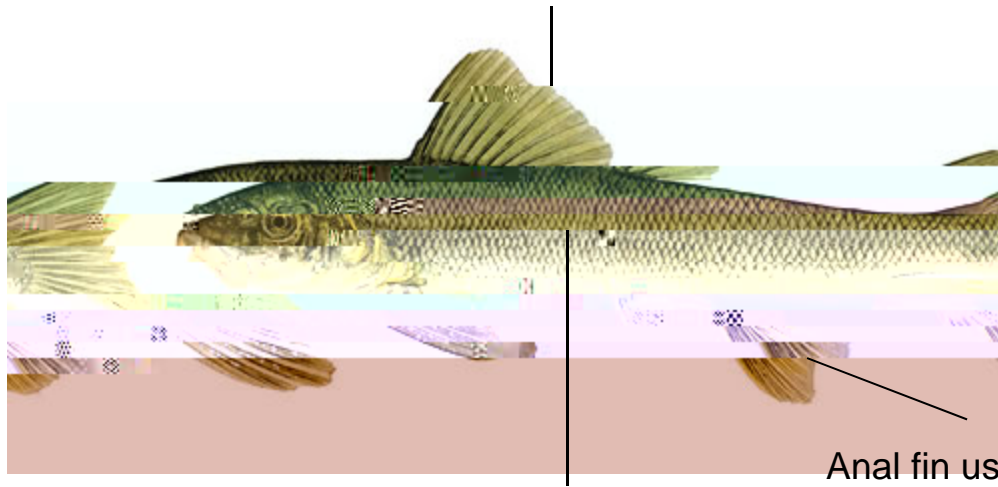
- ventral (underneath), sucker mouth
- long pointed snout.

Identification:

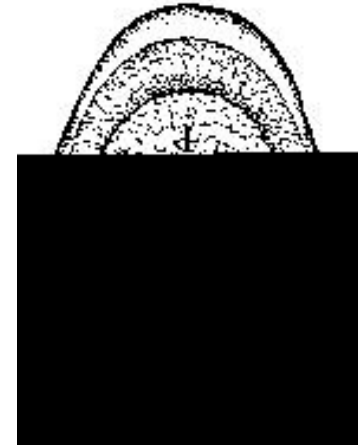
- Distinguished from the closely related and more commonly encountered White Sucker by:
 - generally darker coloration
 - bulbous snout
 - smaller size (12"-14")
 - noticeably longer snout
 - lateral line of 90-117 scales; the White Sucker has less than 85.

Common White Sucker (*Catostomus commersoni*)

Dorsal fin straight to slightly concave
Usually 10 – 13 rays



Anal fin usually 7 rays



Large Visible scales (less than 85 lateral scales)

DESCRIPTION:

- Noticeably larger scales than longnose sucker
- Snout is shorter than that of the longnose sucker – View diagram of lips and snout above

Colour:

- The back and upper sides are grey, brown or black. The lower sides and belly are cream coloured to white

Body

- Deep bodied fish, adult fish can be thick behind the head towards the dorsal fin

Cisco (*Coregonus artedii*)

Pointed head

Adipose fin



Terminal mouth - Protruding lower jaw
(snout does not overhang the mouth)

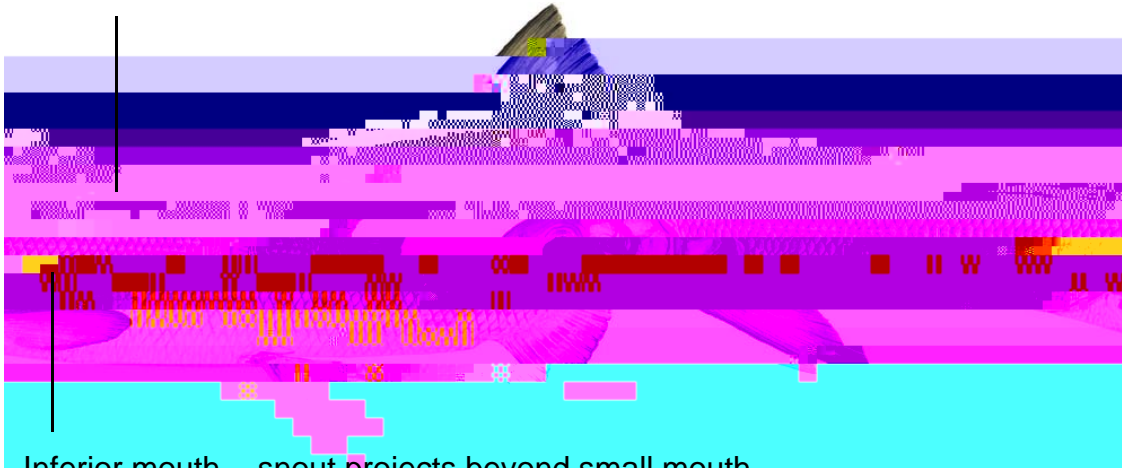
Silvery Fish with blue or black back

Check out the angle of the mouth to the snout.

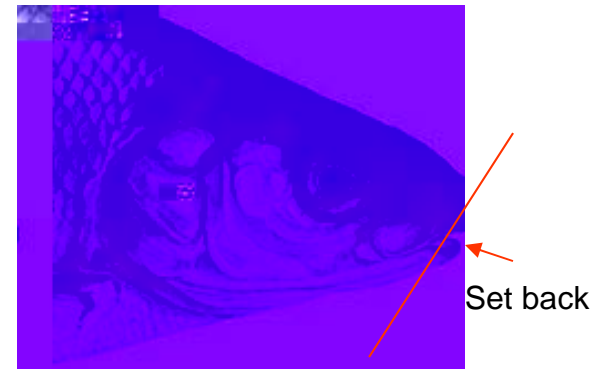


Lake Whitefish (*Coregonus clupeaformis*)

Small Head



Inferior mouth - snout projects beyond small mouth



Fish Sampling Procedures:

Live Release Sampling Steps:

1. Identify Fish to species.
2. Measure fish for Fork Length and Total Length to the nearest millimetre (mm)
3. Weigh fish using a spring scale or digital balance to the nearest gram (g)
4. Identify sex if possible (external identification) – only during spawning periods
5. Collect ageing structures:
 1. Scales from all fish (10+ scales from each fish)
 2. Dorsal fin (2nd and 3rd) rays from spiny rayed fish (walleye)
 3. Pectoral fin rays (1st and 2nd) from soft rayed fish (suckers, trout, whitefish).
6. Release Fish

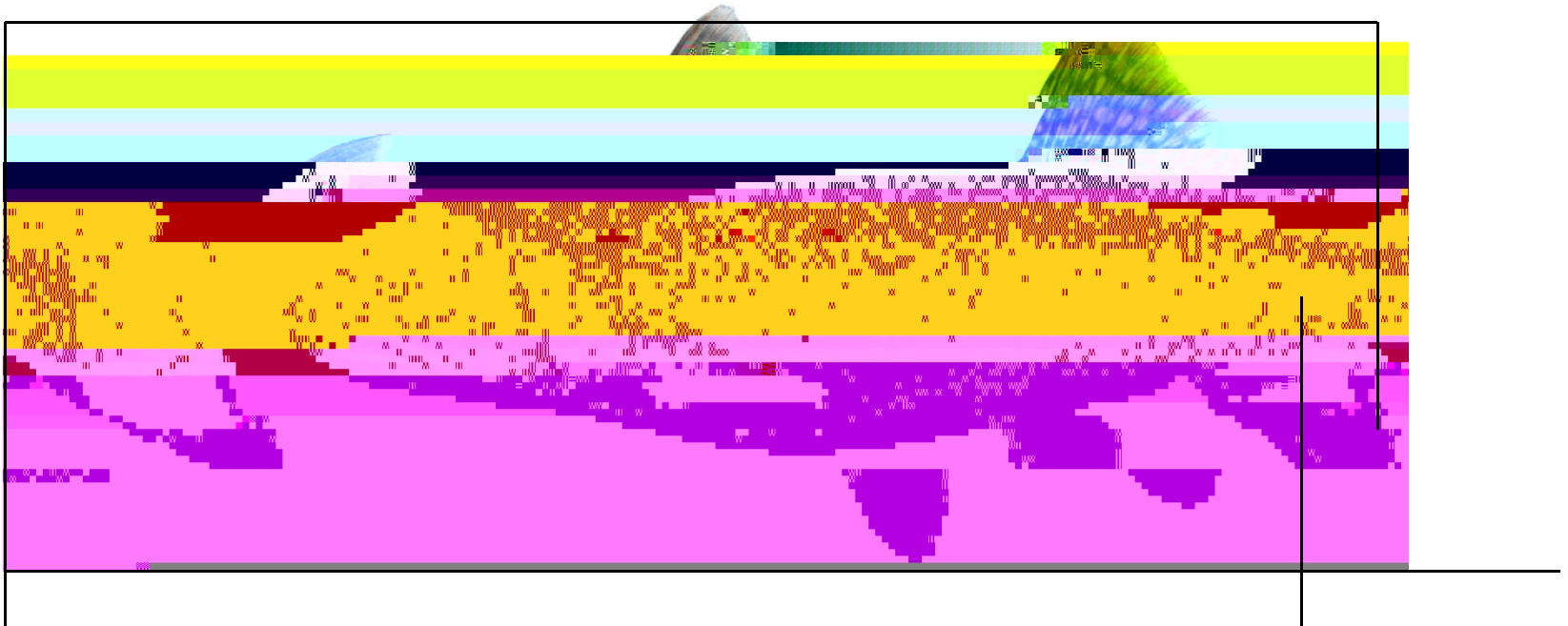
Lethal Fish sampling Steps:

1. Complete steps 1-3,5 from Live Release Sampling steps
2. Cut fish open from the anus to the gills exposing internal organs
3. Identify Sex, and Gonad condition
4. Check Stomach Contents and identify if possible
5. Remove flesh sample for contaminate analysis by the Ministry of the Environment
6. Collect Otoliths for aging structures.

FISH MEASUREMENTS: Total and Fork Lengths (mm)

Total Length (mm)

Pinch caudal fin together and take measurement to nearest millimetre from the tip of the snout to the

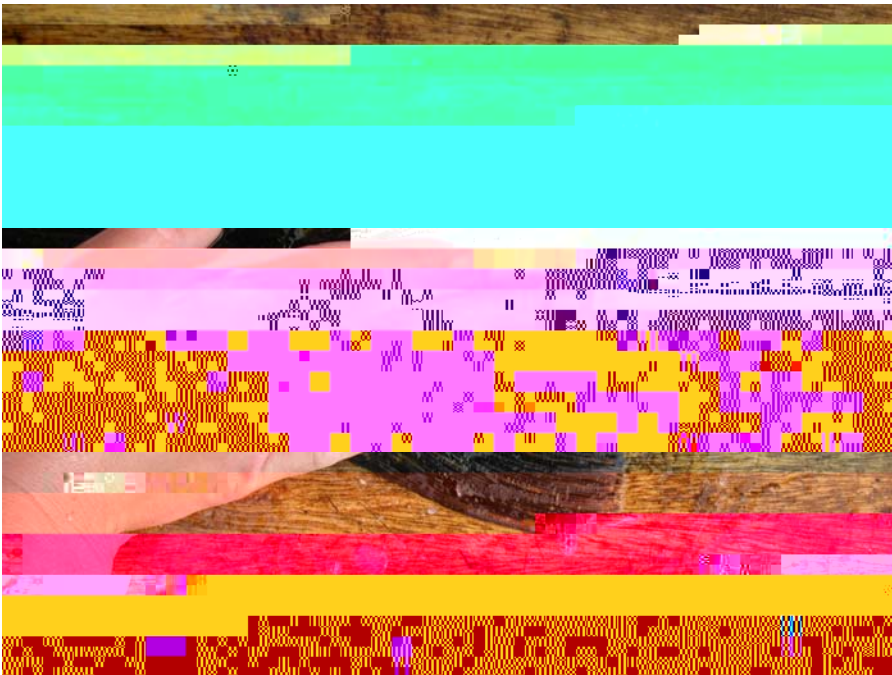


Fork Length (mm)

Take measure to the nearest millimetre from the tip of the snout to the middle of the fork on caudal fin

FISH MEASUREMENTS: Total and Fork Lengths (mm)

Fork Length: Fork length measures from the tip of the longest jaw to the center of the fork in the caudal fin. Measurement is



Fish Weight: Round Weight (RWT)

- Fish are weighed prior to cutting open or removing aging structures
- Fish can be weighed using a spring



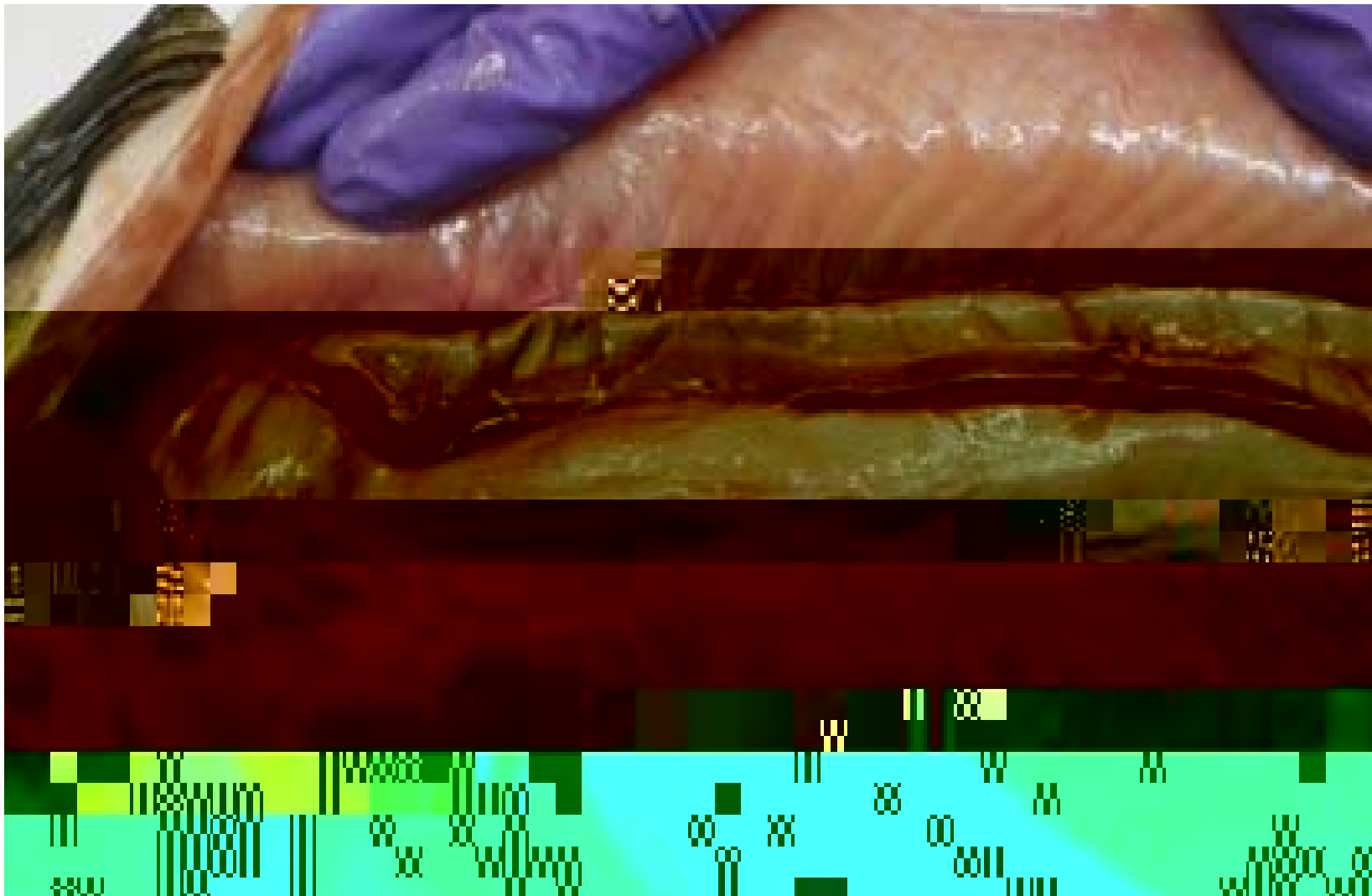


Figure 5. Developing male gonads – gonads are slightly more

GONAD IDENTIFICATION (Con't):

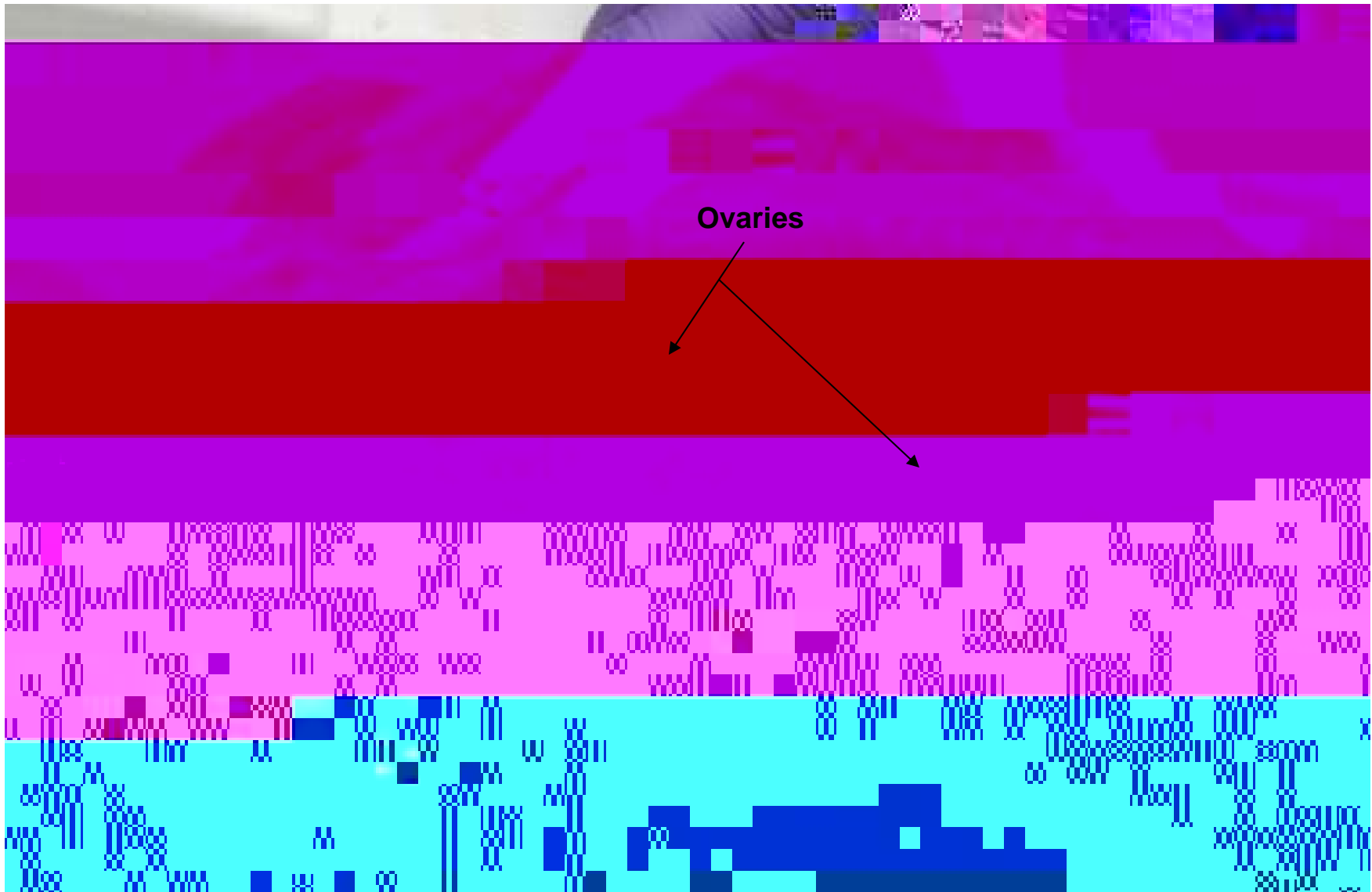


Figure 6. Mature Female with developing gonads the gonads show some eggs and are slightly clear to see the appearance of eggs and egg development.

GONAD IDENTIFICATION:

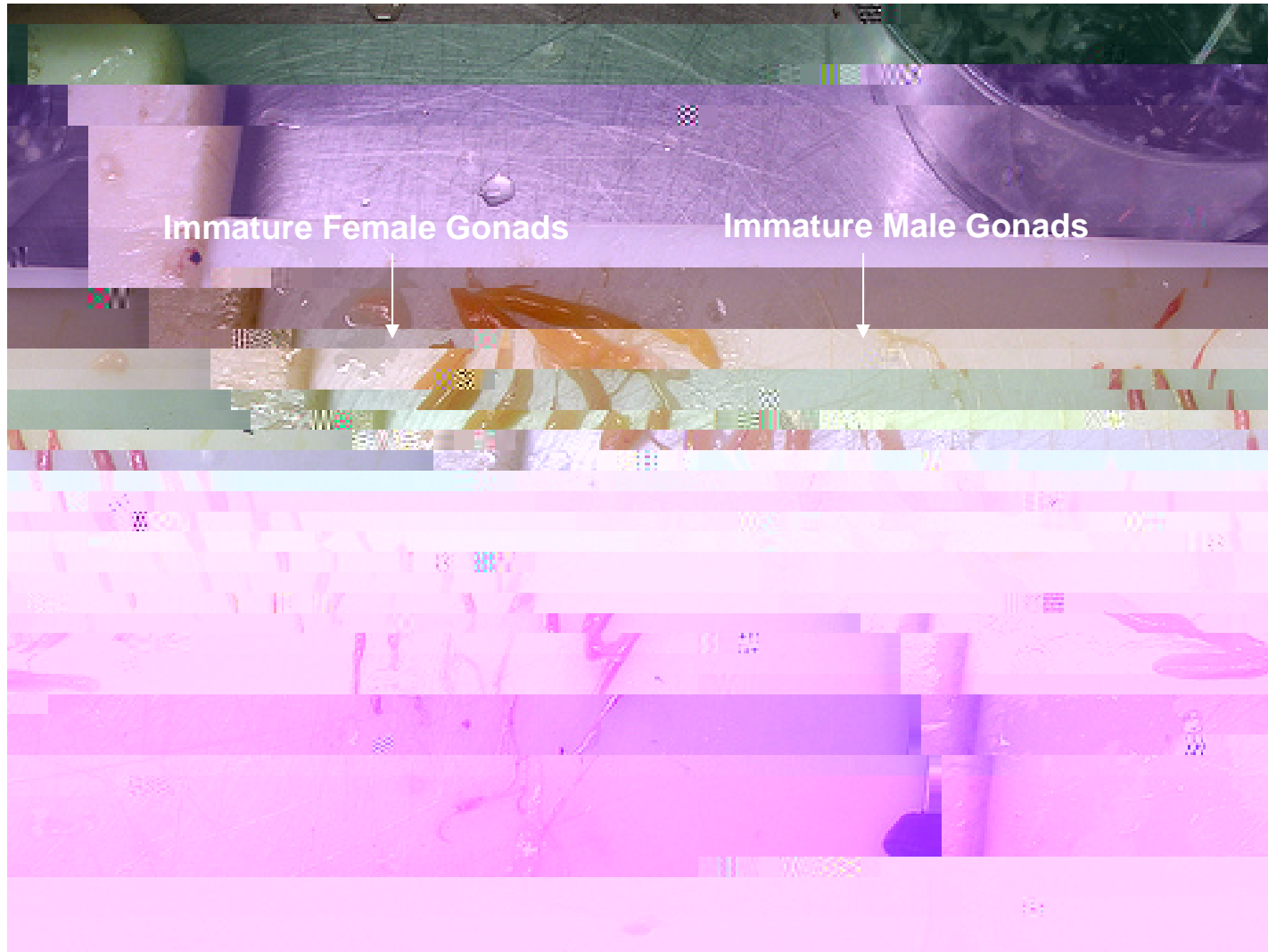
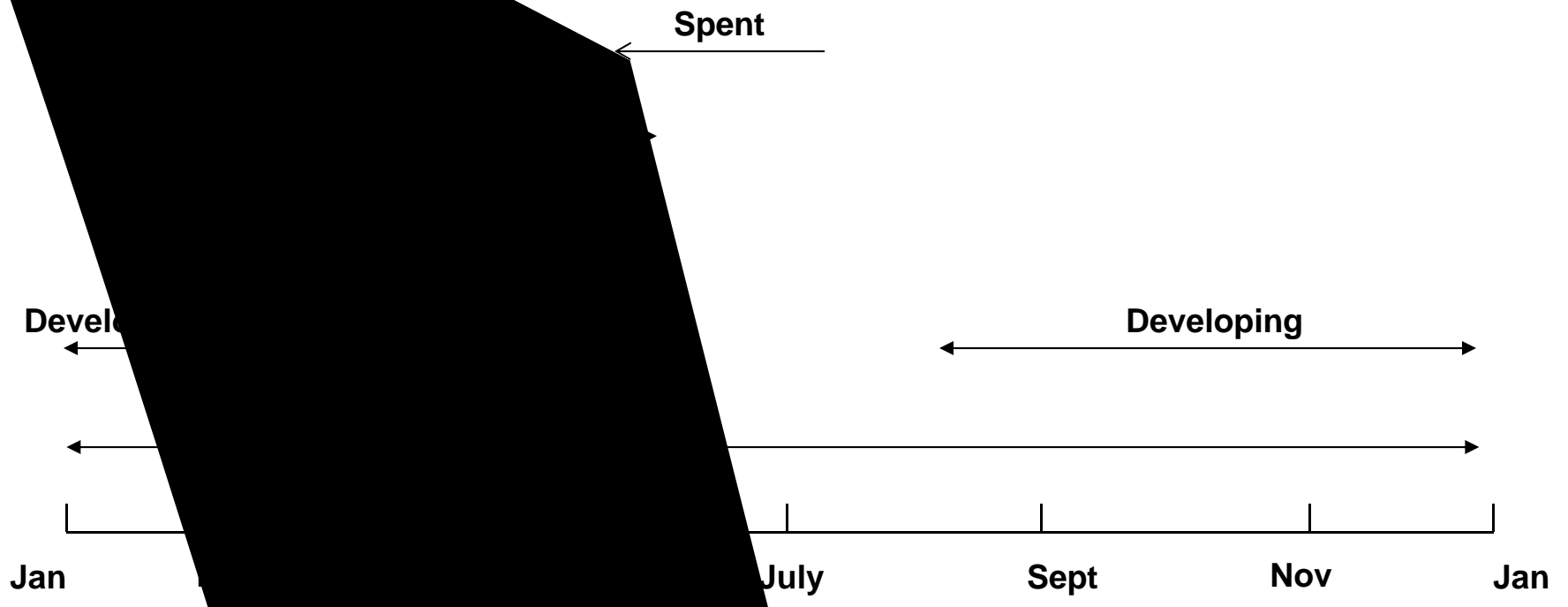


Figure 7. Immature Whitefish gonads from both female (left) and male (right). Note: Gonads from Immature Trout will resemble to these pictures and can be used as a reference. Male gonads are slightly less bulbous and have a single dorsal vein running the length of the testes. Females have a dorsal vein but is usually branched and less thick.

PROJECT SCHEDULE: Walleye



MATURITY SCHEDULE: Whitefish and Cisco

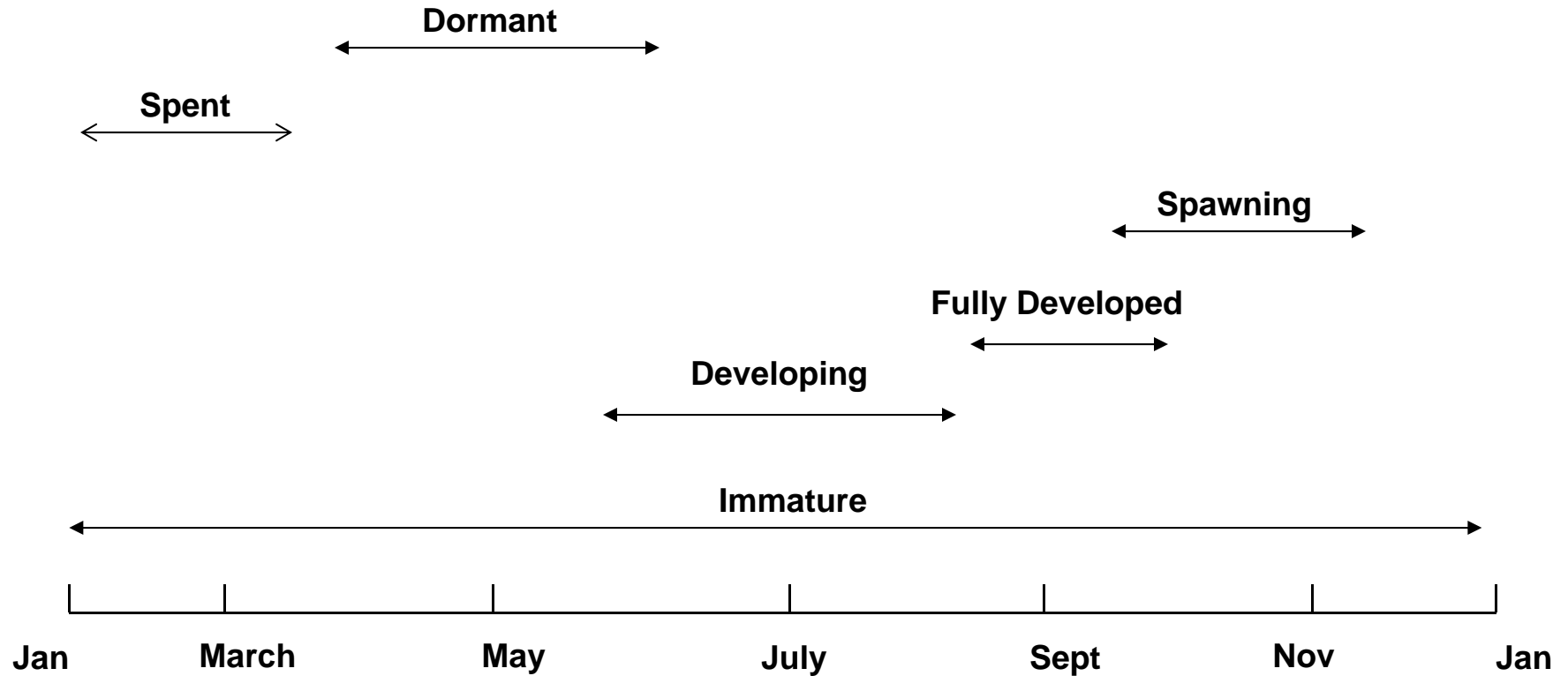


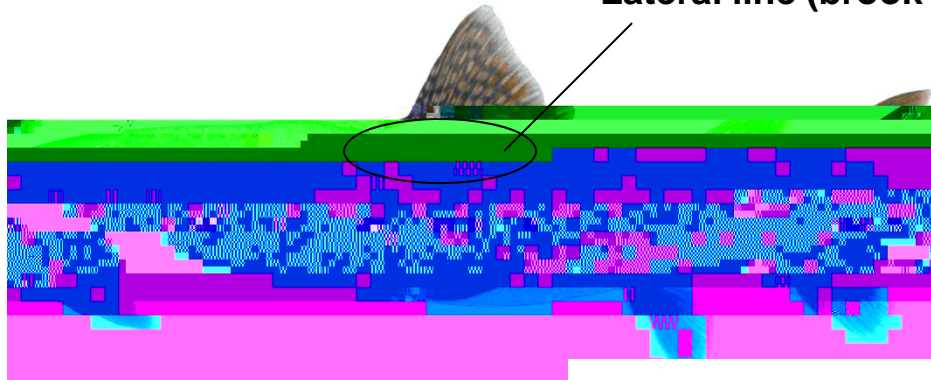
Figure 9. Approximate developmental stages of whitefish and cisco gonads (Duffy, McNulty, Mosindy, 2000)

AGING STRUCTURES:

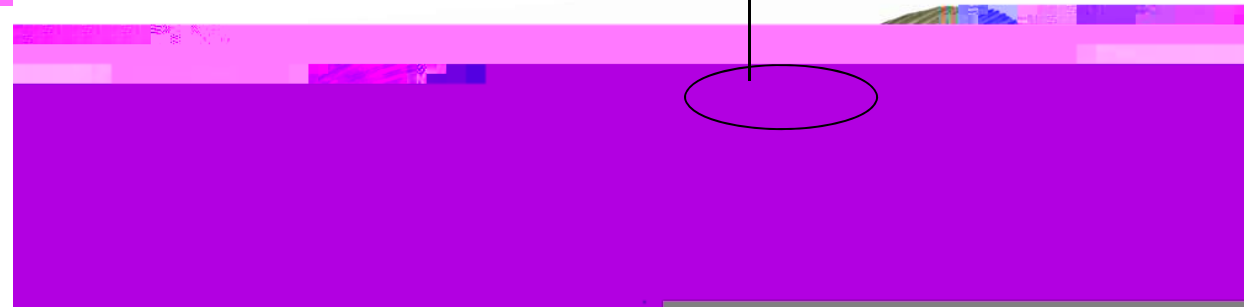
Non Lethal Aging Structures:

AGING STRUCTURES: Scale Sample Location

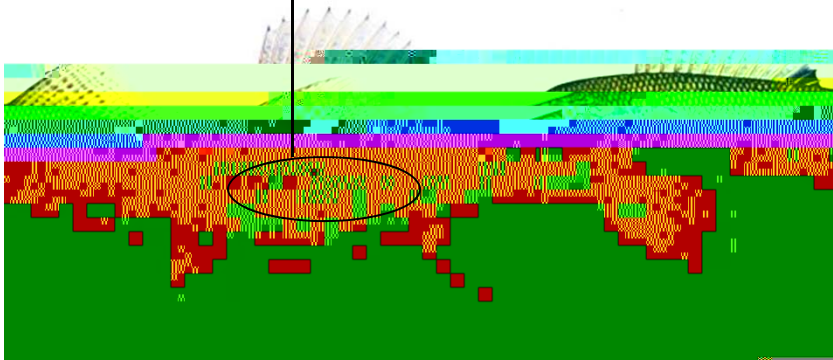
Scale sample area for soft rayed fish below the dorsal fin and above the Lateral line (brook trout, lake trout, whitefish)



Scale sample area for northern pike (soft rayed)



Scale sample area for spiny rayed fish, lift pectoral fin and sample underneath fin (walleye, bass)



AGING STRUCTURES: SCALES (Non Lethal)

1. Using knife remove the slime by scraping the sample area then clean knife with sponge or cloth (clean scales are easier to read).
2. Using tip of the knife remove scales with a flicking motion 10-15 scales are needed for a good sample (Figure 10).
3. Turn the knife parallel to the fish and scoop the scales up (Figure 11). Place in provided scale envelope



Figure 10 (left). removing scales with tip of knife

Figure 11 (right) Scooping up scales with knife ready for envelope

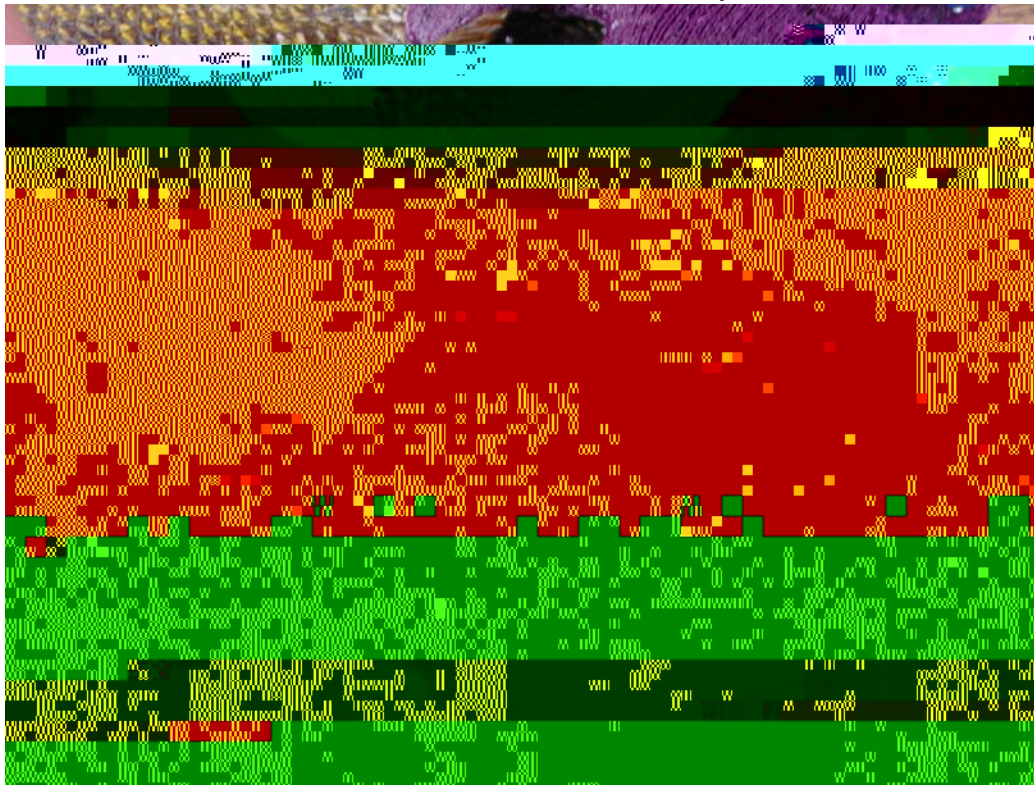
AGING STRUCTURES: Fin Rays (Non Lethal)

Spiny Rayed Fish (Walleye, Bass)

Steps:

1. Use 2nd and 3rd Dorsal fin rays
2. Sever membrane between the 1st and 2nd ray and the 3rd and 4th. Cut all the way down to the dorsal muscle of the fish.
3. Use side cutter and cut the 2nd and 3rd ray as close to the dorsal muscle as possible. Fin rays can be cut Simultaneously.
4. Place fin rays in scale envelope. Fin rays must be dried for 24h period before being stored.

Note: *Fin Rays and Scales can be stored in the same envelope;*



Fip1.0058 TWn.35sTp Syus6o03 Du4n13sm Scales can be stored in 66B48 0s0q0 390.145 -292.62 0 540 1

AGING STRUCTURES: Fin Rays (Non Lethal)

Soft Rayed Fish: (Trout, Whitefish, Suckers)

Steps:

- 1st and 2nd left pectoral fin rays
- Be consistent with sampling the same side – Left pectoral fin rays
- Sever membrane between rays and cut all the way down to the muscle
- Use side cutters and cut the ray as close to the muscle as possible
- Place fin rays in scale envelope. Sample must dry for a period of 24h prior to storage

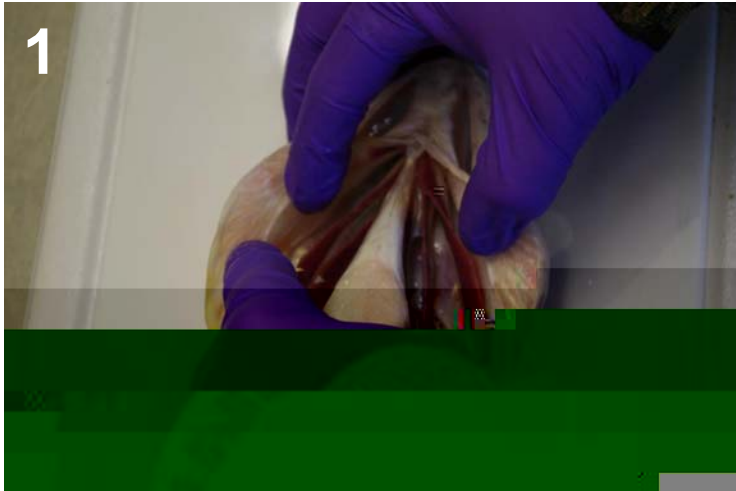


1st and 2nd Pectoral fin rays

Fill Out:

- **Fish #**
- **Species**
- **Date**
- **Location** – Lake or River Name
- **TLEN**

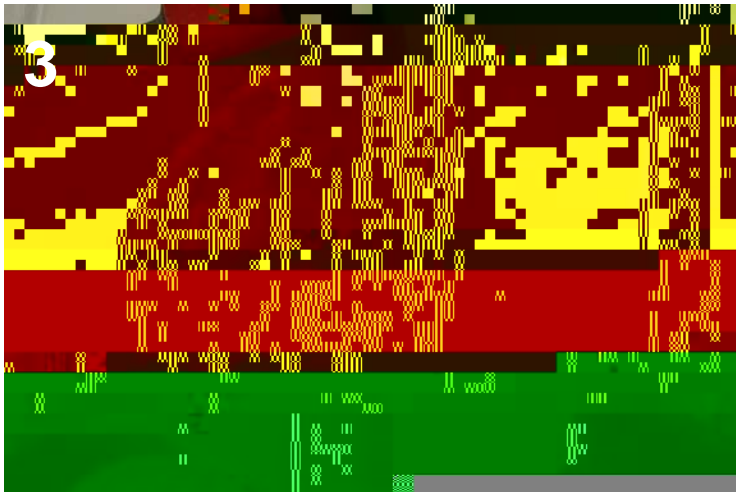
AGING STRUCTURES: Otoliths Removal Steps



Step 1. Turn fish over and expose gills

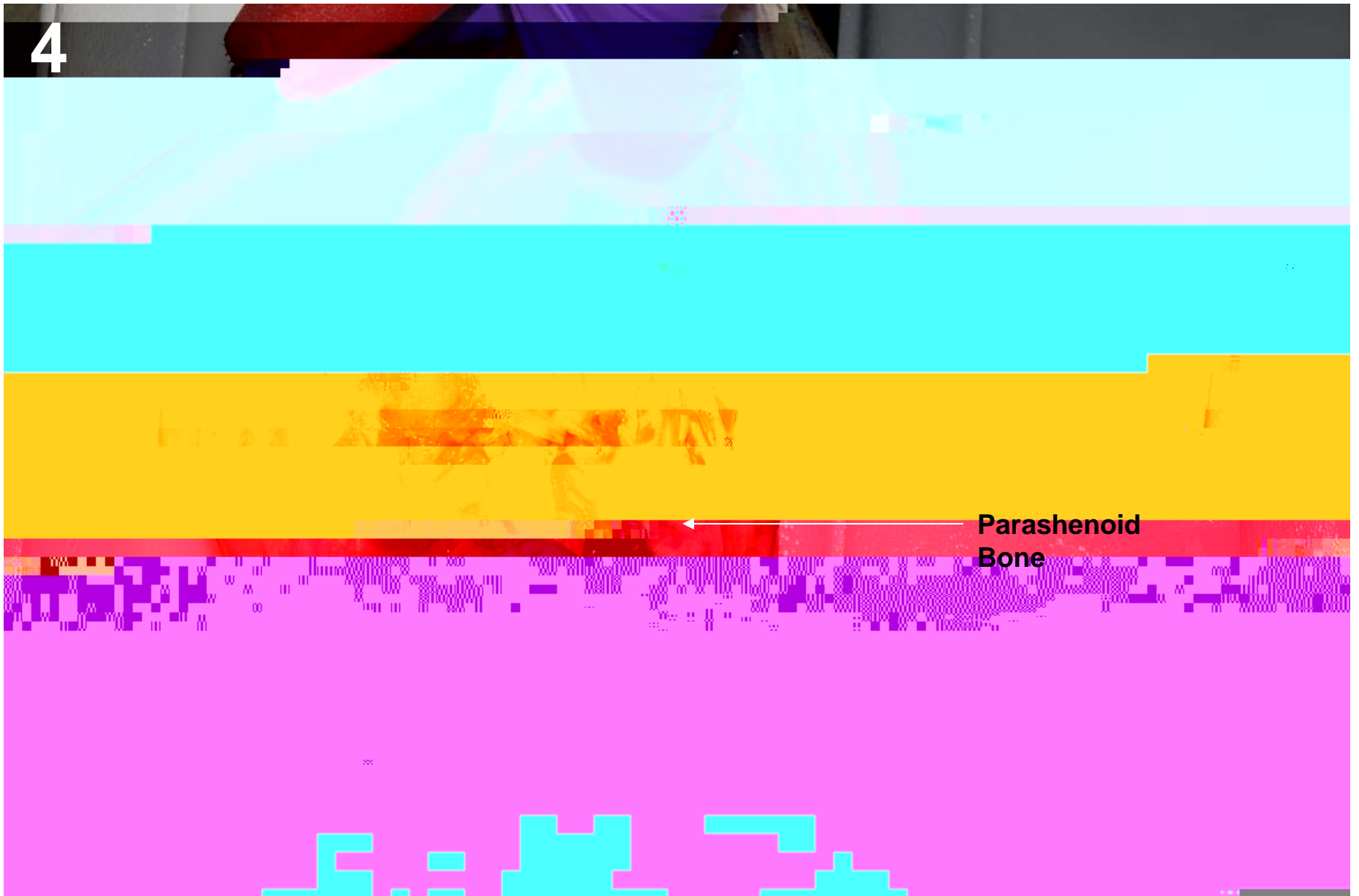


Step 2. Use the knife and cut the isthmus (gill arch connection)



Step 3. Remove the gills to expose the parashenoid bone

4



Parashenoid
Bone

Step 4. Gills removed and parashenoid bone exposed

5

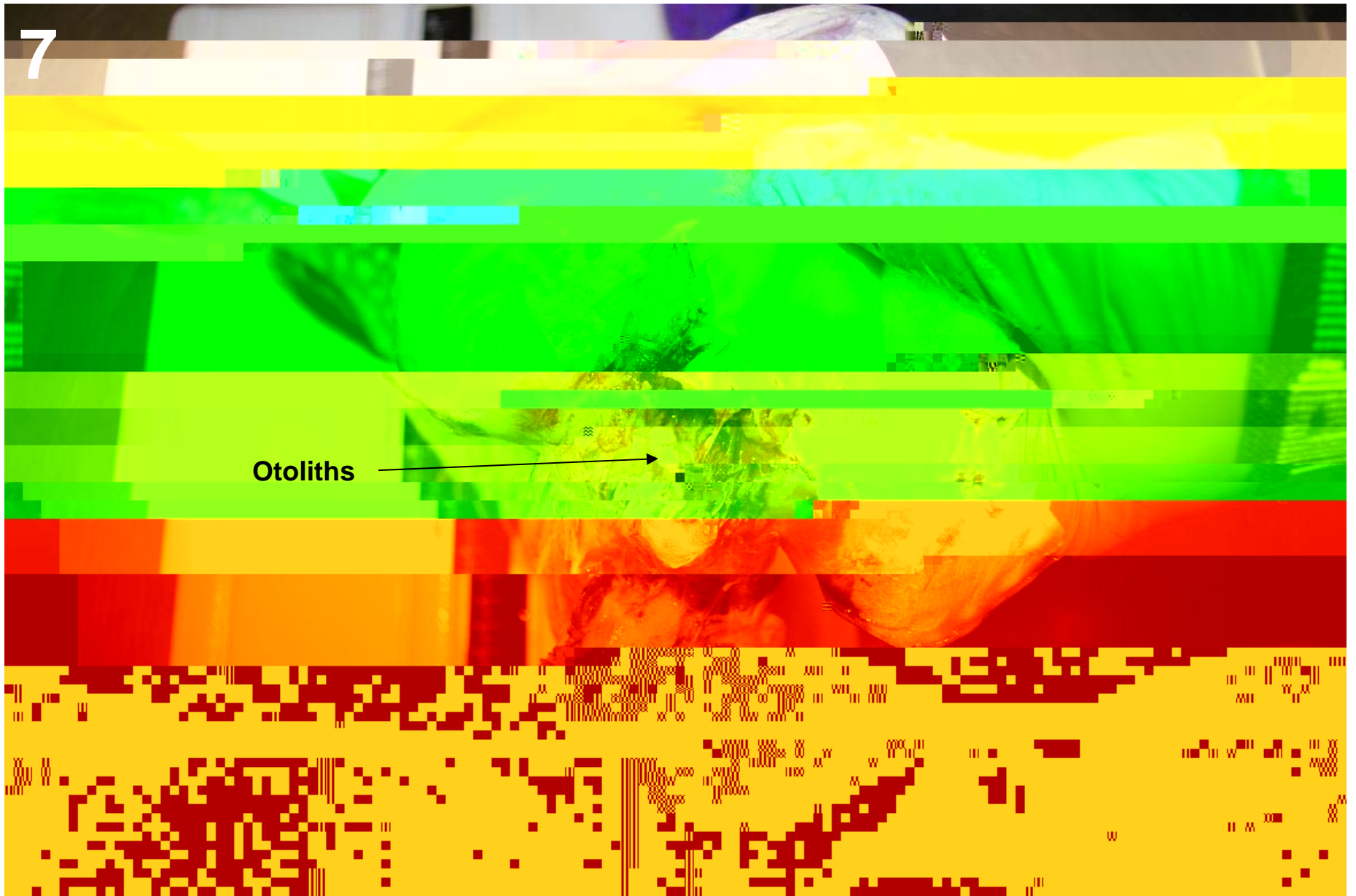


Step 5. Press firmly to cut bone Use one hand on knife handle and the other hand positioned on the blade to add pressure to assist in cutting the bone. Note position of knife on bone. Approximately ½” back from the start. The cut is made between the 1st and 2nd gill arch.



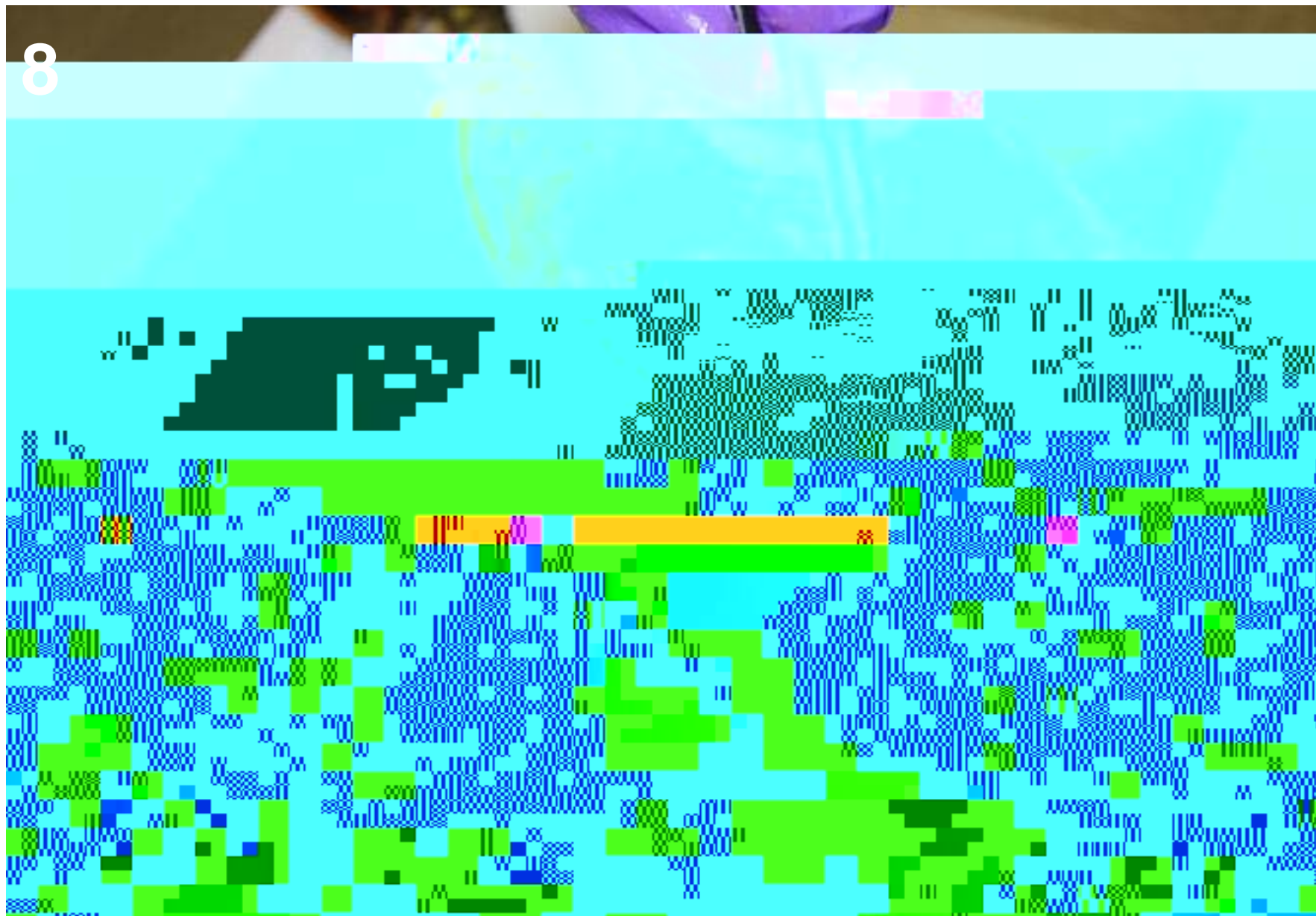
Step 6. After cut is made snap the neck back and expose otoliths notice the placement of hands

7



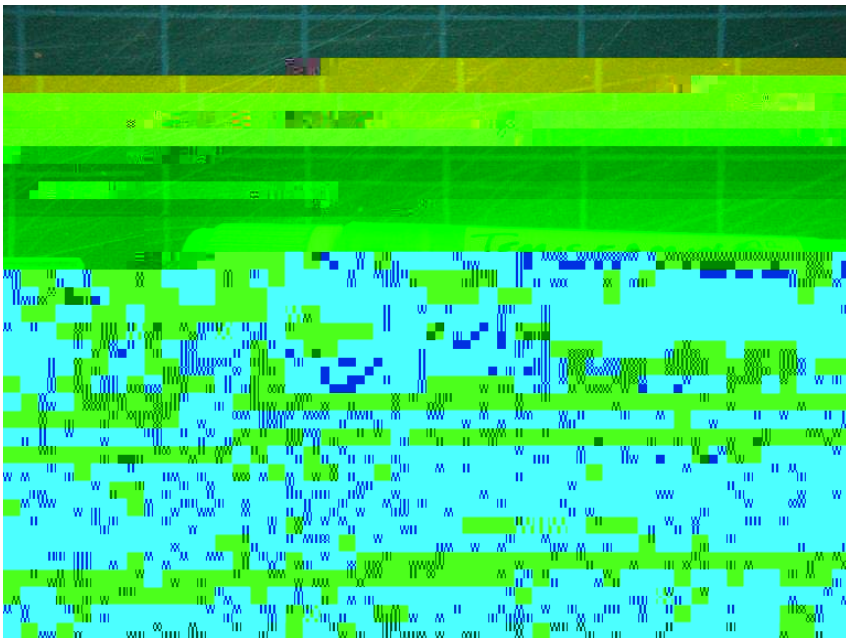
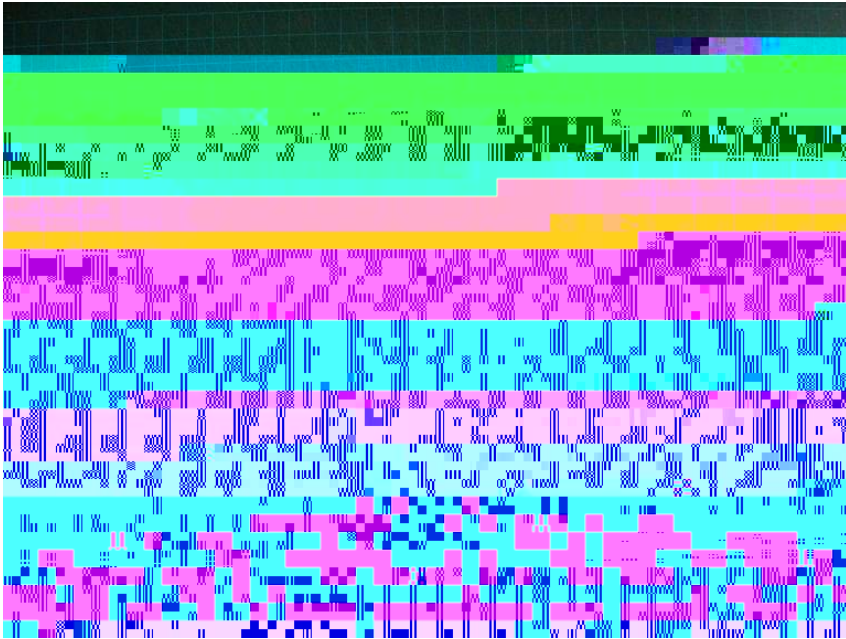
Step 7. Otoliths are visible

8



Step 8. Extract otoliths using forceps and clean slime away and place in storage vial.

Otolith vials and Storage Box:



- Otoliths cleaned and dried (can use sponge, cloth or back of hand. Some otolith from different species are fragile. Handle with care not to drop or break.
- Otolith vial labelled with:
 - Lake Name**
 - Date**
 - Fish Species**
 - Fish #**
- Vials placed in numeric order in the storage box

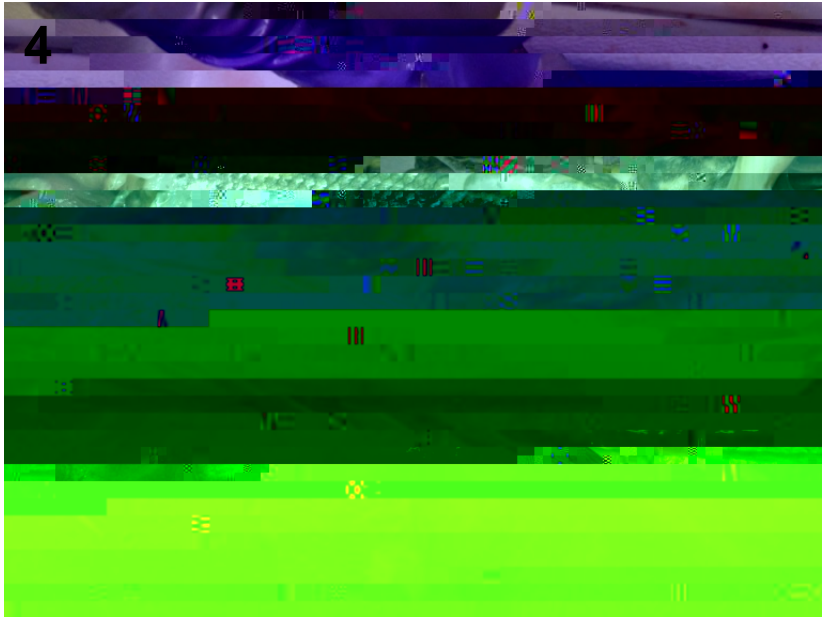
Aging Structures: Cliethrum (Lethal Sampling)

- Cliethrum are the aging structure used in northern pike. They are easily extracted and once cleaned, the age can be interpreted by using a magnifying glass.
- They are a cost effective way of accurately aging northern pike.

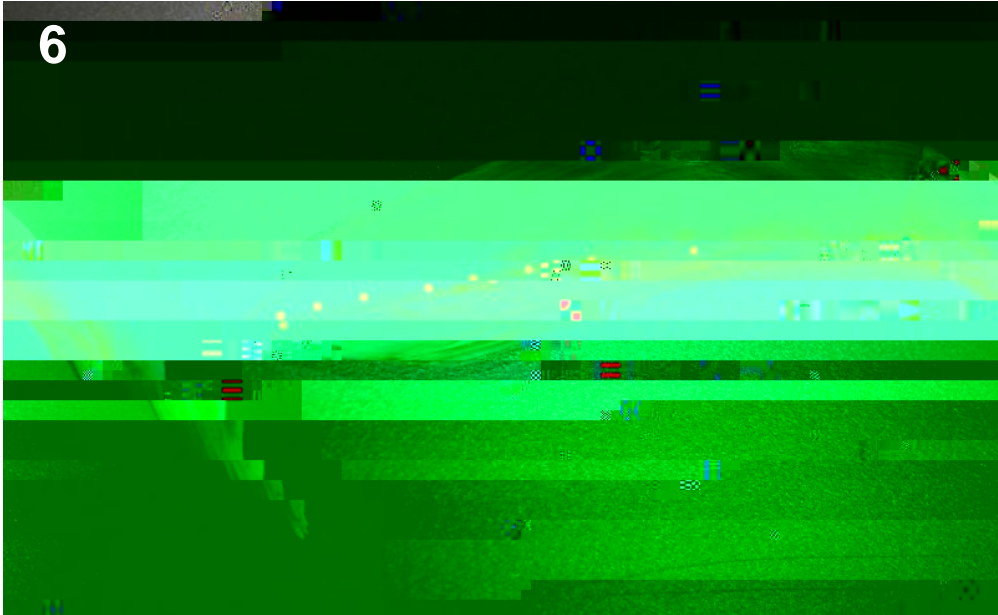
Steps for Cliethrum Removal:

1. Turn fish on its side with left side facing towards you.

Aging Structures: Cliethrum Removal Steps

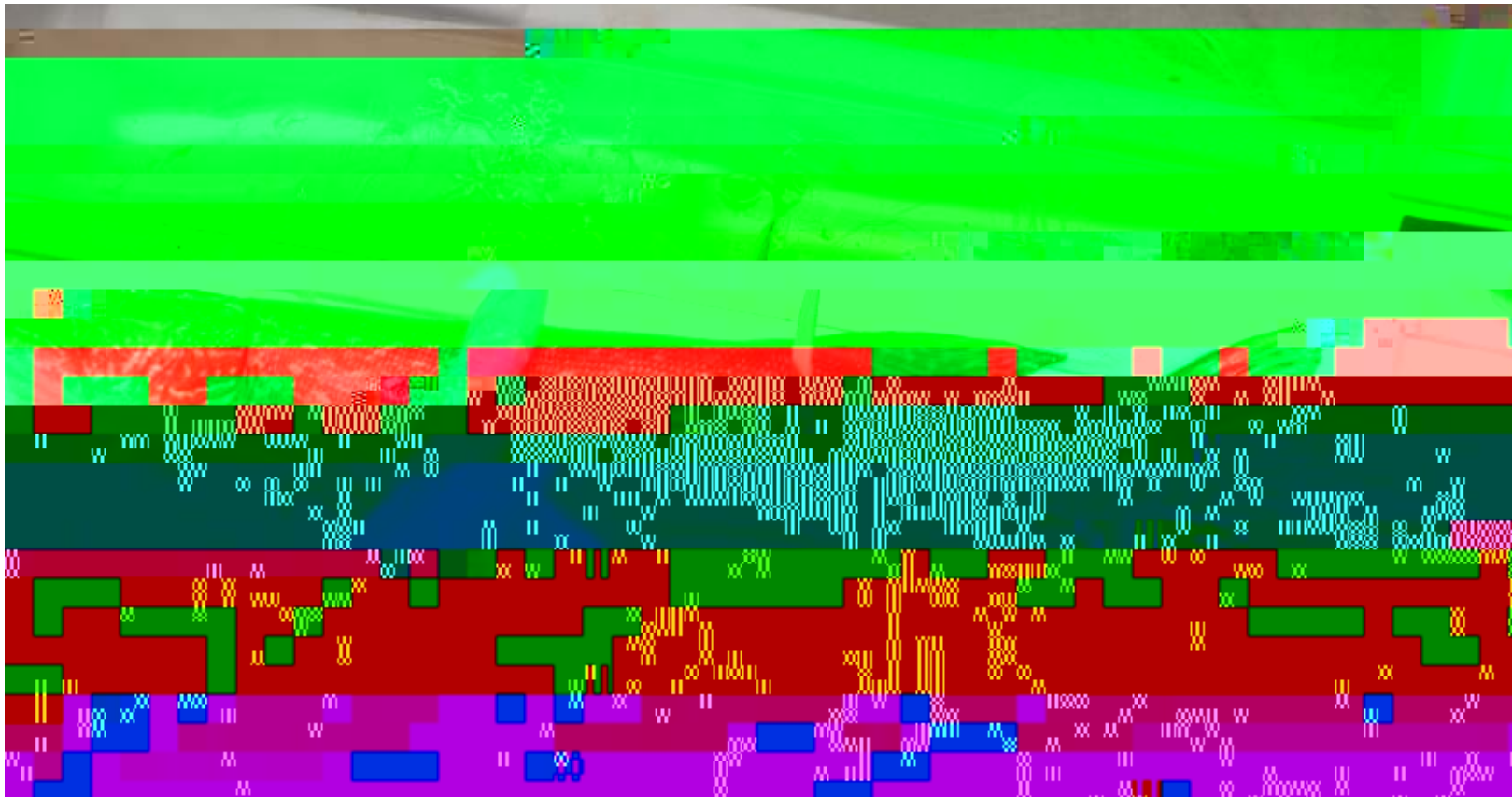


Aging Structures: Cliethrum Removal Steps



Flesh Sample for Contaminants:

- Flesh samples are taken for Mercury (Hg) analysis



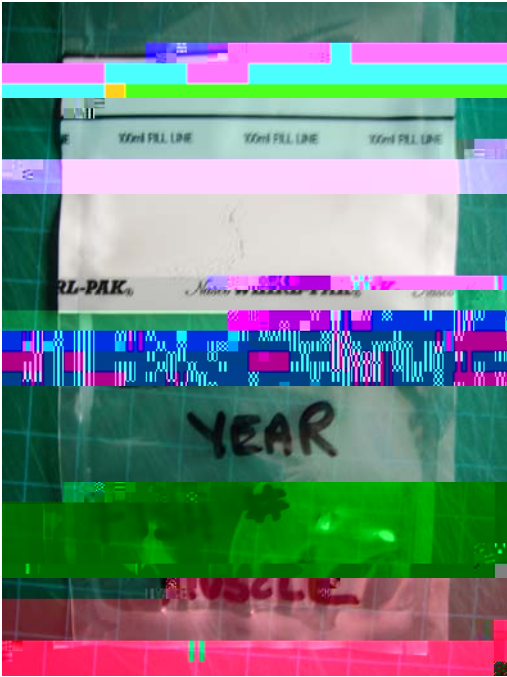
Flesh Sample for Contaminants: Steps



1. Remove a flesh sample from the left side of the fish
2. Cut along the lateral line of the flesh sample.
3. Remove the muscle from the skin.
4. Sample is boneless and skinless.
5. Place sample in **labelled** Whirl Pak.



Whirl Paks:



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References:

Duffy, Mark J., Jim L. McNulty and Tom E. Mosindy 2000. Identification of Sex, Maturity, and Gonad Condition of Walleye (*Stizostedion vitreum vitreum*) NWST Field Guide FG-05