Virtual Meeting 1 of HSBI WG

4 March 2025 10:00 – 13:00 (Pohnpei time)

Standard Operating Procedure: DNA Sampling

WCPFC-HSBIWG01-2025-DP01

4 March 2025

Paper submitted by Australia

Standard Operating Procedure: DNA Sampling

1 Purpose

The purpose of this SOP is to provide guidance to AFMA Fisheries Officers conducting DNA Sampling as part of in-port or at-sea inspections.

Officers conducting HSBIs should familiarise themselves with any applicable procedures relating to the collection of DNA as per the CMMs of the respective RFMO for that area. Those procedures/guidelines will take precedence in that scenario.

2 Background

DNA or deoxyribonucleic acid is a molecule that contains the genetic code that is unique to every individual living being. DNA sequencing is when a genetic marker with a known location on a chromosome is used to identify individuals or species.

As a regulatory agency, AFMA uses DNA Sampling as a MCS tool for international and domestic compliance purposes.

The primary use of DNA Sampling by AFMA is to ensure compliance with reporting, including:

- To confirm species identification
- To verify if Endangered, Threatened and Protected (ETP) species have been retained.
- To verify that only licensed species are being retained and declared.
- To verify catch reporting/catch log data

3 Biopsy DNA Sampling

DNA Biopsy sampling involves taking a tissue sample from a single fish, to provide confirmation of species or family of that fish.

AFMA Fisheries Officers use DNA Biopsy sampling to identity or verify a fish species as accurately as possible. The DNA sampling can be used to corroborate other forms of evidence, such as photographs and catch records. When conducting an inspection, the results of the DNA analysis are used to validate if any ETPs, or species that should not be kept under the licence conditions of the vessel, are in fact being retained onboard. This is commonly seen when species of tuna or shark have been misreported or not reported in the catch logs of a fishing vessel.

Biopsy
• Direct sample of one fish or product. • Used to identify species that look similar when processed and frozen. • Also known as a punch test. • Used to confirm the identification of a specific carcass or single fish. • Results can take a while to return depending on lab.

4 Process – Biopsy DNA Sampling

4.1 Preparing a DNA Biopsy kit

Before starting an inspection, Officers can pre-fill the preservation vial with preservation solution (undenatured ethanol).

Each DNA Biopsy kit is to be used on an individual vessel

4.2 Taking a Biopsy DNA Sample

- Officers are to take reasonable care to avoid any action that would adversely affect the quality of the catch.
- Officers must allow and encourage the master of the vessel, or a senior crew member, to observe the taking of the sample.
- Officers should take a photo of the specific fish the sample is taken from.
- Officers should attempt to record the taking of the sample via video.

1. Wear single-use disposable gloves to prevent cross-contamination of the sample (Tip: rubber gloves are less likely to tear if you put them on before entering the freezer).
2. Find a fish to sample and place the fish on flat surface.
3. Chose a part of the fish that has been semi-processed, if possible (flesh already exposed, tail cut off, pectoral fin removed). Alternatively, Officers can use a single-use razor blade to expose flesh to minimise the risk of sample contamination from other catch.
4. Splash a small amount of fresh water (from a sealed water bottle) on the exposed flesh if it is frozen, this will help to defrost it slightly.
5. Immediately use the biopsy tool to extract a small amount of flesh from the fish.
6. Use a slight twisting motion to bury the metal tip.
7. Heavy pressure may be required for frozen samples. Do not press the ejector trigger while taking the sample.
8. Remove the biopsy tool from the fish using a slight tilting and scooping motion to lever the tissue at the end of the biopsy tool while leaving the sample intact.
9. Open the preservation vial.
10. Slowly press the pink ejector trigger to expel the sample into the sample vial containing undenatured ethanol. Ensure sample is submerged fully in ethanol.
11. Tightly screw lid back on the vial, ensure proper seal.
12. Safely dispose of the biopsy tool and razor blade.
13. Write key details on the label of the vial (date, time, sample number, fishing vessel name and IRCS). Use a pen or permanent marker to label the vial
14. Return and store the vial in the DNA Biopsy Kit.

4.3 Post DNA Sampling

- Officers should ensure that a record of any DNA samples taken during an inspection are recorded in their notebooks, and on the relevant inspection forms.
- Keep the samples in a secure, cool and dark area until you return to port.
- Avoid leaving sample vials or DNA Biopsy Kits in direct sunlight.
- Maintain the continuity of the DNA evidence as per AFMA Evidence Handling Procedures.

Australian Government
Australian Fisheries Management Authority

FISH BIOPSY SAMPLING INSTRUCTIONS

Follow these instructions to take a biopsy sample from a fish for DNA verification purposes.

Caution! To avoid contamination of fish samples:

- ✓ keep fish samples separated in the work area
- ✓ Use new equipment for every fish: gloves, biopsy tool and preservation vial

Fish DNA biopsy kit contents:

5 x Biopsy tool
6 x Pair of gloves
5 x Sample jars
2 x Pen

EQUIPMENT

GLOVES

BIOPSY TOOL

SAMPLE JAR

1

WEAR GLOVES.

TIP ✓: PLACE GLOVES ON PRIOR TO ENTERING FREEZER AREA, THEY ARE LESS LIKELY TO TEAR

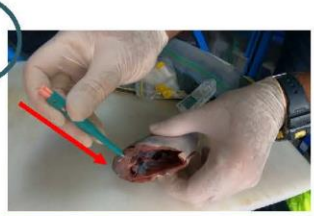
2

PLACE FISH ON FLAT SURFACE

CHOOSE PART OF THE FISH THAT HAS BEEN SEMI-PROCESSED (if possible):

- FLESH ALREADY EXPOSED;
- TAIL CUT OFF;
- PECTORAL FIN REMOVED

3



INSERT BIOPSY TOOL INTO THE FISH. USE A SLIGHT TWISTING MOTION TO BURY THE METAL TIP

TIP✓: HEAVY PRESSURE MAY BE REQUIRED FOR FROZEN SAMPLES

CAUTION! DO NOT PRESS THE EJECTOR TRIGGER

Australian Government
Australian Fisheries Management Authority

4

REMOVE THE BIOPSY TOOL FROM THE FISH

USE A SLIGHT TILTING AND SCOOPING MOTION TO LEVER THE TISSUE AT THE END OF THE BIOPSY TOOL WHILE LEAVING THE SAMPLE INTACT

5

OPEN THE SAMPLE JAR AND POSITION THE BIOPSY TOOL OVER THE OPENING

SLOWLY PRESS THE EJECTOR TRIGGER TO RELEASE THE FISH SAMPLE FROM THE BIOPSY TOOL INTO THE SAMPLE JAR

6

SECURE LID ON THE SAMPLE JAR

CAUTION! DISPOSE OF GLOVES AND BIOPSY TOOL

7

WRITE DETAILS ON THE LABEL OF THE SAMPLE JAR.

CAUTION! USE PEN OR MARKER TO WRITE ON SAMPLE JAR. DO NOT USE PENCIL

EXAMPLE

5ml

STERILE TUBE

Name: SAMPLE 1 / VESSEL NAME

Sender: AGENCY NAME

Date: DAY / MONTH / YEAR

Time: 1400 / 2pm

8

RETURN AND STORE THE SAMPLE JAR IN DNA BIOPSY KIT

CAUTION! AVOID LEAVING SAMPLE JARS IN DIRECT SUNLIGHT