Virtual Meeting 1 of HSBI WG

26 June 2025 10:00 – 13:00 (Pohnpei time)

HSBI DNA Sampling Guide

Voluntary HSBI Regional Guides
TOOLS FOR HIGH SEAS BOARDING AND INSPECTIONS

WCPFC-HSBIWG02-2025-WP02

6 June 2025

Paper submitted by

Australia

Western and Central Pacific Fisheries Commission

Voluntary HSBI Regional Guides

TOOLS FOR HIGH SEAS BOARDING AND INSPECTIONS

- Use of DNA sampling during HSBI
- Procedures for DNA sampling and processing to an evidentiary standard[1]

HSBI DNA Sampling Guide

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by

Contents

PURPOSE STATEMENT

1. The purpose of this Guide is to provide guidance to Authorised inspectors conducting DNA Sampling as part of WCPFC High Seas Boarding and Inspections (HSBI[2]). For CCMs wishing to use DNA testing for HSBIs, the development of this Guide also intends to:

[1] Adopted Intersessional process to develop voluntary regional guides for the use of tools in conducting high seas boarding and inspections

[2] HSBI, refers to boarding and inspection and related activities conducted pursuant to CMM 2006-08 Western and Central Pacific Fisheries Commission Boarding and Inspection Procedures or any successor CMM.

- Support the establishment of a robust DNA testing process by CCMs at the national level to verify species identification of individual specimens in support of HSBIs.
- Assist CCMs in ensuring that DNA data are credible and admissible using appropriate methods and procedures throughout the entire DNA testing process;
- Support the establishment of minimum practices at the national level which are necessary to ensure that DNA sampling produce accurate, precise analytical findings, and findings are conveyed in an unbiased, objective manner; and
- Provide guidance to CCMs on tools that can be used for gathering and preserving DNA evidence during HSBIs and the minimum standards for DNA sampling and analysis.

2. This guide refers to general considerations/minimum standards in the application of Genetic Analysis (DNA sampling) during a High Seas Boarding and Inspection (HSBI) and the post analysis process, which includes:
    - DNA sampling
    - DNA sample handling, preservation and storage
    - DNA sample transfer/shipping
    - DNA testing and analysis
    - transmission of DNA results.

3. The application of this Guide will be voluntary and apply to HSBI activities within the WCPFC area of competence.

4. This guide can be modified in response to new information, technical innovations, and perspectives. It is expected that this guide will continue to evolve as the field develops.

Application of DNA sampling in WCPFC HSBI activities.

5. The aim of HSBIs is to check a vessel is operating in compliance with the WCPFC Convention and all applicable WCPFC CMM obligations.

6. Inspectors conducting HSBI activities can detect and confirm species on board at the time of inspection. A visual inspection of morphological characteristics may be all that is needed to obtain a species identification.

7. Genetics offers a powerful tool to complement the work of Inspectors conducting HSBI activities as it allows conclusive species identification.

8. Genetic analysis is the method of choice for species identification when identity cannot be determined on a purely morphological basis. Such as, the morphological characteristics are unfamiliar, similar, are absent, or are partial or compromised due to their processed state.

9. Genetic analysis through DNA sampling of fish for identification can support investigations to verify a vessel's reported catch, through providing additional proof and the ability to confirm the identify the species in question.

10. DNA sampling results can be used to corroborate other forms of evidence such as vessel logbooks and photographs taken by the inspecting officer. This can be used to support risk assessments to prioritise the vessel for further investigation and prosecution as determined by the flag CCM.

11. The use of DNA sampling during HSBI activities can assist with assessing compliance with vessel *licensing and reporting* obligations, including to:
    - confirm species identification
    - verify that only species which a vessel is authorised to catch are being retained and declared
    - verify catch reporting/ catch log data
    - verify if protected species are being retained.

HSBI DNA SAMPLING Standards

Methods of DNA sampling

Biopsy	Fin clip	*Other*
DNA Biopsy sampling[3] involves taking a tissue sample from a single fish.	Tissue sample is collected from a single fish through cutting off a section of the fin.	*Rapid DNA test*

EVIDENTIARY PROCEDURES for DNA Sampling

The general principles and procedures for DNA sampling collection in fisheries investigations:

a) Witnesses and Photographing DNA sampling

- The DNA sampling should be documented using a recording device, including photographs and videos.
- DNA sampling is conducted with witnesses' present (Authorised inspectors, master, crew, boarding party). Authorised inspectors should ideally work in pairs.
- The master of the vessel signs the HSBI report which includes details of any DNA collection.

b) Documentation and records of DNA sampling

- The HSBI report should record DNA sampling information.
- The inspector should observe, inspect and record as much as possible, including but not limited to the following information:
    - Date of the inspection
    - Vessel name
    - Location
- Suggested HSBI report table, minimum information required:

DNA Samples			
Sample number (corresponding number on sample jar)	Location of fish (blast freezer, hold # location,	Description (Processed state of fish)	Comments (photos taken, surrounding area, stored?)

c) Collecting and preserving DNA samples

- DNA samples should be gathered, labelled, preserved and sealed at the sampling site.

[3] An example of a biopsy sample procedure is provided at appendix A.

- Each sample should be collected and marked separately with reference to a sample number, photographed and recorded by the Authorised inspector.
- Example sample label details:
    - Date
    - Sample reference number
    - Vessel name
    - Collector's details
- Samples to be kept in a cool, dark environment, preferably a freezer when available.

d) Preventing cross-contamination of DNA samples

Protective measures are necessary to prevent cross-contamination of samples. The following should be considered for each individual sample:

- *Using new, washed or unopened sampling tools*
- *Wear single-use disposable gloves,*

e) Secure transfer, storage, chain of custody of DNA samples to the testing laboratory

From the beginning to the end of the DNA sampling process, it is crucial to be able to demonstrate every single step undertaken to ensure traceability and continuity of the sample. The integrity of DNA evidence must be preserved as it passes from one person to another. It is a continuous record of the life of the DNA evidence from the moment it was sampled to the moment it is analysed. Every step must be recorded to ensure it is not tampered with, changed or lost.

- The DNA samples should be stored in a sealed bag or envelope.
- Chain of custody record maintained.
- It is the Authorised inspector's responsibility to ensure chain of custody of the DNA evidence.
- DNA samples should be tested at a laboratory that complies with internationally recognised standards.

f) Transmission of DNA sampling results to the flag CCM

Timing of DNA analysis and results will vary depending on circumstances, such as:

- return to port
- arrange postage
- postage
- analysis.

Once the DNA sample results are received by the relevant authority of the inspection vessel, they should be provided to the flag CCM within [5 business days].

NATIONAL DNA sampling and analysis procedures

CCMs wishing to use DNA testing for HSBI should share their National DNA Sampling Procedures with the Secretariat for posting on the HSBI website.

The National DNA Sampling Procedures should include:

- DNA sampling method for HSBI activities
- DNA sampling procedures for HSBI activities
- Details of testing Laboratory and credentials and recognised standards, e.g:
    - ISO 17025 / 9001 – *this accreditation supports laboratories in maintaining complex processes of testing and calibration to the highest standards and demonstrates to external clients that the laboratory outputs are valid and reliable.*
    - Quality Management Systems (QMS)
    - Society for Wildlife Forensic Science (SWFS) Standards and Guidelines for Wildlife Forensic Analysis – *the minimum standards and additional guidelines for wildlife forensic analysts in the sub discipline of DNA*
    - Genetic reference database – *used for species assignment for WCPFC catch and compliance*

Accessibility of DNA Sampling and Multi-language information

To assist the DNA sampling process during HSBI activities, it would be beneficial for the National DNA sampling procedures to be translated into languages that are in use on fishing vessels and/or as pictographs to bridge any language barriers.

The following supporting documentation should be considered for translation by CCMs:

- HSBI Multi-language cards
- DNA sampling procedures translated into flag CCM languages, provided online.
- DNA sampling procedures given/shown to master of vessel prior to DNA sampling by HSBI Authorised inspectors.

In addition, flag CCMs should also consider providing information about DNA sampling procedures that may be used during HSBI Inspections to their fishing vessels in a language(s) used by their vessels.

Appendix A: *example fish biopsy sampling insructions*

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

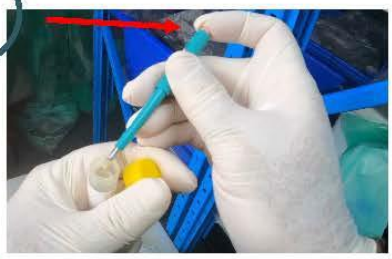
CAUTION! DO NOT PRESS THE EJECTOR TRIGGER

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