



Virtual Meeting 3 of HSBI WG

7 August 2025 10:00 – 13:00 (Pohnpei time)

HSBI Catch Quantification Guide

Voluntary HSBI Regional Guides

TOOLS FOR HIGH SEAS BOARDING AND INSPECTIONS

WCPFC-HSBIWG03-2025-03_rev1¹

8 August 2025

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¹ This is revision 1 of WCPFC-HSBIWG03-2025-WP03 *DRAFT Voluntary Guide on use of volumetrics method for estimating the fish quantity* issued on 5th August 2025. This revision considers the discussions during HSBI WG3 meeting.

Voluntary HSBI Regional Guides

TOOLS FOR HIGH SEAS BOARDING AND INSPECTIONS

- Estimation of catch on board by HSBI officers
 - Hold inspection
 - Estimation of how much fish in a hold using the volumetric method
- Logbook interrogation and comparison to catch estimation
 - Electronic and written

HSBI Catch Quantification Guide

Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by

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PURPOSE STATEMENT

1. This document provides guidance to Authorised inspectors conducting WCPFC High Seas Boarding and Inspections (HSBI¹) on:
 - catch quantification, an estimation on the quantities of fish on board, when direct weighing or weighing by sampling is not possible

¹ HSBI, refers to boarding, inspection, and related activities on the high seas within the Convention Area conducted pursuant to CMM 2006-08 Western and Central Pacific Fisheries Commission Boarding and Inspection Procedures or any successor CMM.

- tools and methods for catch quantifications
 - the minimum standards for analysis.
2. The development of this Guide also aims to:
 - support the establishment of robust catch estimation methods to quantify and estimate the catch on board
 - ensure that catch estimates are credible and are consistently using appropriate methods and procedures.
 3. This guide refers to general considerations in the application of quantifying the catch² on board during a HSBI and the estimation and analysis process, which includes:
 - catch document³ analysis
 - freezer and Fish Hold inspections
 - verifying Catch
 - quantifying catch
 - weight estimations
 - analysis
 - reporting.
 4. The application of this Guide will be voluntary and apply to HSBI activities within the WCPFC area of competence.
 5. 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.

Quantify and estimate catch weights in WCPFC HSBI activities.

6. The aim of HSBI is to ensure compliance of a vessel with the WCPFC Convention and all applicable WCPFC CMM obligations.
7. A key function of an authorised inspectors during a HSBI is to identify potential misreporting, unreported transshipment, under reporting or record keeping errors.
8. Inspectors conducting HSBI activities can detect and confirm species on board at the time of inspection. They can do this by comparing the information in catch documents with a visual check, count or estimation of catch on board.
9. The purpose of quantifying catch is to verify what is declared on the log sheets is what is on board the fishing vessel. It is an important tool for Inspectors to assess if the catch is being recorded accurately, and in line with the relevant WCPFC CMMs.
10. The use of catch quantification during HSBI activities can assist with assessing compliance with vessel licensing and reporting obligations, including to:
 - verify catch reporting/ catch log data
 - estimate total catch held on the vessel

² Catch refers to the target, bycatch or non-bycatch species.

³ Catch documents can include logbooks, log sheets, observer reports, transshipment declarations, captain's notes, engineers' reports - both electronic or written.

- assist a risk assessment for a more extensive sampling i.e. Port inspection.

11. The general aim of catch quantification is to:

- measure the hold as accurately as possible to calculate the total hold space
- estimate the area of the hold filled with fish to estimate tonnage of fish
- compare estimated tonnage with the amount of fish recorded in the fishing logbook
- determine if non-compliances can be linked to tonnage inconsistency.

12. This is an initial estimate so you can check it against the logbook to identify any discrepancies.

If discrepancies are found:

- this may inform or call for a more accurate approach, such as a port inspection or unload/offload, within the framework provided by WCPFC CMMs
- inform the flag State and request an enquiry into the vessel.

HSBI Catch quantification estimation

Table 1. Methods of estimating catch quantity

Volumetrics	Subsample	Processed unit counts
Estimate fish in the hold where the volume of the hold is known, or can be calculated	weighing a subsample of a species then calculating average fish weight	counting the total number of individual (processed or whole), multiplied by the average weight (or an estimated weight) to find the total weight of the species

13. The most appropriate quantification method will depend on the type of vessel and the amount of catch on board. It may be useful to use two methods in combination. Consider what fish are onboard, how they are stored and what information you have available to help decide what method(s) could assist.

14. The general principles and procedures for catch quantification in fisheries inspections:

- documentation and records
- information gathering
- hold measurements: density and conversion factors
- compare catch information to catch estimates.

a) Documentation and records

15. Authorised inspectors should:

- document the catch quantification process including analysis, using photographs and videos
- conduct the catch quantification process with witnesses' present (Authorised inspectors, master, crew, boarding party) and prioritise that witnesses from the fishing vessel are present
- ideally work in pairs or as a trio, to cover the tasks:
 - reviewing the logbooks and interviews the master for species, product types, and estimated catch
 - performing the physical measurements of each fish hold.

16. The HSBI report should record any catch quantification estimation and analysis. The authorised inspector should record as much as possible, including but not limited to the following information:

- date of the inspection
- vessel name
- vessel coordinates
- catch quantification methods, measurements (including unit of measurement), estimations and analysis.

17. The master of the vessel must be provided with an interim copy of the report which includes details of any catch quantification analysis. The master must also be given to opportunity to include any objection or comment to be included in the final report.

b) Procedural steps

18. Authorised inspectors should calculate the total cubic capacity of each cargo hold, measured in cubic metres. Information on the vessel cargo holds, freezer or storage areas can be found in:

- Vessel Plans
- Hull Survey Certificates
- General Arrangements
- Stability Book.

19. Authorised inspectors should check ships beam (width) for verification of vessels principal dimensions. This will confirm information on the plans belongs to that vessel.

c) Measuring the hold – volumetrics

- Obtain the hold volume by measuring interior dimensions
- Measure the volume occupied by the fish in the hold, or
- Measure the free air space in the hold and deduct it from the total volume of the hold.
- Obtain fish volume estimation by species
- Converting fish volume into fish weight. The factors below are examples for the inspector's reference. For the transparency of the process, it is important for the inspectors to record the factor used in the estimation process:

- Apply density factors⁴. An estimate for the average density of whole fish in bulk is 1080kg/m³. Some examples:

- Marlin (MLS): 1080 kg/m³
- Bigeye tuna (BET): 1065 kg/m³
- Pacific bluefin tuna (PBF): 1070 kg/m³
- Albacore tuna (ALB): 1050 kg/m³
- Skipjack tuna (SKJ): 1030 kg/m³
- Swordfish (SWO): 1075 kg/m³

⁴ [Insert source for density factors]

- Apply processing conversion factor⁵ is fish is processed, species by species.

Species (FAO code)	Whole	Gutted	Gutted + Head off
Marlin (MLS)	1.00	1.10	1.30
Bigeye tuna (BET)	1.00	1.13	1.33
Pacific bluefin tuna (PBF)	1.00	1.14	1.34
Albacore tuna (ALB)	1.00	1.12	1.31
Skipjack tuna (SKJ)	1.00	1.10	1.28
Swordfish (SWO)	1.00	1.10	1.30
Sharks (CWZ)	1.00	1.10	2.00
Yellowfin tuna (YFT)	1.00	1.16	1.36

- Apply stacking factors⁶, taking into account if stacking is loose (factor 0.45), medium (factor 0.51, mean value for frozen tuna), or tight (factor 0.54).

Example Calculation

Hold: $8 \times 8 \times 2.5 \text{ m} = 160 \text{ m}^3$

Fill rate: 70%

Species: Bigeye tuna (BET), gutted

Density: 1065 kg/m^3

Stacking factor: 0.51

Processing factor: 1.13

Usable volume: $160 \times 0.7 = 112 \text{ m}^3$

Gross weight = $112 \times 1065 = 119,280 \text{ kg}$

Stacked weight = $119,280 \times 0.51 = 60,832.8 \text{ kg}$

Catch weight = $60,832.8 \times 1.13 = 68,741 \text{ kg} \approx 68.7 \text{ tonnes}$

d) Analysis of Results

- Compare the result with the fishing logbook, captain's declarations, and any landing or transshipment data. Calculate the data and assess whether there are significant differences between the figures.
- If fishing logbook figure > catches onboard:
 - look for concealed space where fish could be stored

⁵ [Insert source for conversion factors]

⁶ Note that stacking factors vary depending on the type of fishing vessel (e.g. purse seine, longline, trawler). Specific the source of these stacking factors and where they could be used.

- look for evidence that an undeclared transshipment occurred during the fishing vessel trip, where the fishing vessel gave fish.
- If fishing logbook figure < catches onboard:
 - look for evidence that an undeclared transshipment occurred during the fishing vessel trip, where the fishing vessel received fish
 - look for species that might be underreported.

Accessibility of Catch quantification method information

20. To assist the catch quantification process during HSBI activities, it would be beneficial for the catch quantification procedures to be translated into languages that are in use on fishing vessels and/or as pictographs to bridge any language barriers.
21. Information accessibility of the HSBI Catch quantification process for the vessel master crew and for the HSBI Authorised inspectors could be supported via:
- HSBI Multi-language cards
 - the catch quantification procedures given/shown to master of vessel by HSBI Authorised inspectors
 - the voluntary guide translated by CCMs.