



METHODOLOGY

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1. INTRODUCTION

One of the main thrusts of the Bureau of Fisheries and Aquatic Resources (BFAR) is to ensure sustainable management of aquatic resources in the country to achieve food security, a situation that needs for a countrywide detailed assessment as basis to formulate management options. Based on this demand, the National Stock Assessment Program (NSAP) was conceptualized and implemented by BFAR to provide standardized and continuous information on fishery resources, i.e. fish catch statistics and biological information, which are fundamental for fisheries management. This also aims to develop the institutional capability of the regional field units of BFAR to conduct resource assessment studies in their respective areas of jurisdiction.

To ensure accurate data collection and recording, a standard NSAP method should be followed. This manual of methods was prepared to guide the program implementers particularly the data enumerators in the implementation of the project in the regions.

2. DATA COLLECTION

2.1. SAMPLING STRATEGY

Fisheries data are collected through “sampling method” in which a small part of something or a small number of items from a group are selected for examination or analysis to estimate the quality of nature of the whole. In this method only a small number of units are sampled to minimize time and cost without reducing the accuracy. Data collection by sampling method can be done through random

sampling whereby samples are acquired in a random manner. In such sampling operation, all observations in the fish population are given the same probability of being sampled. In the case of a very big landing area that the assigned enumerators cannot possibly record all the fishing boats that are landing, a stratified random sampling maybe applied. In this method, the whole population/area is first subdivided into strata then a stratum is selected to be the sampling area wherein a random sampling method is applied. The opportunity for inclusion of each observation in the sample is constant for each stratum or segment of the population.

2.2. REQUIRED DATA TO BE COLLECTED
(in priority sequence):

- a. **Catch & effort.** This is the overall landings and fishing activities within the sampling area. This can be done through direct interview with the fisherman or fishing operator. The three main points of conversation are: *total landed catch* (by boat, by gear); *type of fishing gear used* (e.g. ringnet, purse seine, surface gillnet, Handline, etc.); and *fishing effort* (e.g. number of hauls, number of hours fishing, etc.) (Refer to 3.2.2 for the list of fishing efforts). All catch and effort information are recorded in Form 2.
- b. **Total sub-sample weight and weight of each species group.** This can be done by borrowing sub-samples from the catch by gear. Know the total sub-sample weight then sort to species group (identify to species level and use Scientific Name e.g. *Nemipterus japonicus*, *Decapterus macrosoma*) and get the *weight of each species group*. The weight measurements are entered in Form 2a.

- c. **Length measurements by species by gear.** All the species in the sub-sample can be measured immediately or only selected commercially or dominant species, depending on the instruction of the Project Leader. The length measurements are recorded in Form 2b.

2.2.1. Source of catch & effort data:

- 1. **Survey at landing center** – The data are collected by the enumerators at the landing site through direct interview with the fishermen to obtain information on when, where, how much of the fish were caught by what fishing gear and how much effort was used, etc. This method is usually effective only for coastal fisheries, which operates near shore and take a trip for a day or few days only since it depends mostly on the fishermen’s memory.
- 2. **Survey by logbooks** – This method is effective for large-scale fisheries (i.e. commercial boats), particularly for boats that stay in the fishing ground for a considerable length period (e.g. Purse Seiners). Data on catch & effort are recorded thru logbook system. Generally, commercial boats keep their own navigation and fishing logs.

2.3. FREQUENCY OF SAMPLING AND SCHEDULES

There is a standard sampling schedule for NSAP. Sampling day is every after two-days in each landing site regardless of Saturdays, Sundays and Holidays or a total of 10 to 11 surveys each month per fish landing site for

Standard Monthly Sampling Schedule

Days

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

- Landing Site 1 – Major or Commercial Landing Site
- Landing Site 2 – Minor or Municipal Landing Site
- Data Checking and Form Completion (non-sampling day)

30 and 31 days in a month, respectively. Classification of major and minor fish landing sites depends on the bulk of boat landings. Major fish landing sites have more number of boat landings than minor fish landing sites and a combination of commercial and municipal boats maybe landing in the area. In the case of commercial and municipal landing sites, only commercial boats (with more than 3 GT) are being monitored in the commercial landing site and municipal boats (weighing 3 GT or less) in municipal landing site. Each Data Enumerator or pair of Data Enumerators are usually assigned in two fish landing sites where they move from Landing Site 1 to Landing Site 2, by following the NSAP schedule. For example, if the first day of the month is scheduled for major landing site (Landing Site 1) the second day is scheduled for minor landing site (Landing Site 2). Or if the first day is for commercial landing site (Landing Site 1), the second day is scheduled for municipal landing site (Landing Site 2). Every third day following the 2 sampling days is a non-sampling day. This day is allotted for data checking and form completion. The same sampling pattern is followed for the succeeding days until the end of the month. In case of months with 31 days, the last day is scheduled for Landing Site 1. On the first day of the following month, the assigned Data Enumerator(s) will still go back to Landing Site 1 as a start of the month. This is so since every month is treated separately and a standard monthly sampling schedule is strictly followed. Below is the standard monthly sampling schedule for strict compliance by the NSAP team.

2.4. SAMPLING ACTIVITY

Reminders when collecting catch and effort information:

- Before recording the catch, ascertain whether it is a complete catch, incomplete catch (determine how much were eaten from the catch, set aside to be divided among the crew or given out to other people), partly sold (determine how much were sold), or mixed catch coming from different fishing gears (single fishing boat that use multiple fishing gears).

- To determine the weight of the container, check if it is full of fish or with water and ice (by pushing down the fish). Estimate the weight of the container with fish minus ice and water.
- Record boats that land even with “no catch” provided an “effort” was used. Know the reason for having no catch (e.g. due to “engine trouble”, “entangled net”, etc.).
- Include and monitor “night landings” during sampling day.
- Do not mix samples coming from various gears since each gear type is selective for different sizes of individuals from the stock
- Do not include fish of floating buyers (buyers that buy the fish directly at the fishing ground) especially if coming from different sources and cannot be segregated.
- Remember the priority sequence. The catch and effort information of all the boats that land during sampling day should be recorded. If the fisherman is not in a hurry to dispose his catch, go to the second priority and immediately to the third priority if it is still okay with him.

2.5. SUB-SAMPLING THE CATCH

Sub-sampling should be done by gear. This is important to determine the distribution of the species composition and likewise to collect data on length frequency.

A reminder on how to obtain a representative sub-samples:

- Get fish samples at random and from top and bottom of container. Exercise caution during sub-sampling because sometimes large fish are selectively placed at the bottom or on top of the container. In most cases, the small fish are the one placed at the bottom of the container.

- For pre-sorted catch (by species, by size) upon landing, borrow sub-samples from each pre-sorted group. First determine the weight of each pre-sorted group then proceed with the sorting and the usual sub-sampling method.
- Data coverage should be reasonably good but not always necessary to attain 100% for the catch of un-sampled boats can still be raised or segregated. It is important to take a sub-sample of the catch by gear but not necessarily from all the boats. If possible, at least 10% of the landed boats should be sampled.

3. DATA FORMS

In order to facilitate the encoding, collection and processing of data, all essential data elements are collected and recorded in standard forms. The data will be encoded and processed using the developed NSAP database. The length frequency data can be analyzed using FISAT Program (see Reference & User's Manual, Gayanilo, et. al., 1997) or by using other assessment programs. The basic design of the NSAP forms was adopted from the Food and Agriculture Organization (FAO) and was also used by the other assessment projects of BFAR i.e. Tuna Project, and Small Pelagics Management Program. The survey method is carried out using the following NSAP Forms (See Appendix 1 for the Sample Forms).

NSAP Form 1	: Monthly Report (Landing by Gear & Length Frequency)
NSAP Form 2	: Fish Landing Survey Form (Catch & Effort)
NSAP Form 2a	: Landed Catch & Effort Monitoring (Weight Measurement)
NSAP Form 2b	: Landed Catch & Effort Monitoring (Length Measurement)
NSAP Form 3	: Length Frequency Tally Sheet
NSAP Form 4	: Boat Particulars
NSAP Form 5	: Gear Particulars

3.1. NSAP FORM 1 - Monthly Report (Landing by Gear & Length Frequency)

NSAP Form 1 is a monthly summary report of the boat landings by gear, the sampled boats and the length measurements. All information in this form are derived from forms 2, 2a & 2b. This form is usually accomplished every sampling day after completing forms 2, 2a, 2b, and 3.

3.2. NSAP FORM 2 - Fish Landing Survey Form (Catch & Effort)

NSAP Form 2 is for catch & effort statistics. This is the most essential part of the NSAP reporting forms for this contains all fishing boats landing for the day with particular catch information. With this survey form, the total catch, fishing gear and corresponding effort, and the catch composition with weight are recorded.

3.2.1. Coverage Catch

Catch data should cover all fishing boats that will land in the designated fish landing site during sampling day, regardless of gear type, and are recorded by fishing ground. The time schedule of boat landings varies by landing center. It is important that all boats that land during sampling day, including early morning and night landings, and all fishing operations that do not require the use of fishing boat i.e. beach seine, manual push net, fish corral etc. should be recorded. Also, all fishing boats that will land with "no catch" provided the gear was used in the fishing operation even just for a short time, it has already a corresponding effort and should be recorded. Any reasons and observations made should be written in the remarks. Be observant for fishing boats using multiple fishing gears (sometimes 2 to 3 types) for these should be recorded however, it is essential that catches from one gear be separated from catches taken from other gears. Do not mix catches from various gears, since each type of gear is selective for different sizes of individuals from the stock. In case it is not possible to separate the catch by gear, list all the gears used and write in the remarks the estimate of the proportion of catches (%) made by each gear type by asking the fisherman. Fish of floating buyers coming from different sources are not included if it is impossible to separate them by fishing gear or by fishing boat. Some fishermen dispose their catch to floating buyers right at the fishing ground and usually big or first class fish are being sold to them. Be observant and always

ask the fishermen if their catch is still complete. Also, ask for the quantity of catch (kilogram) they set aside as share by the other fishermen on board, those given to friends, and for personal food consumption (“ulam”). These should all be added to the total catch of the boat.

DATE	Refers to the date of sampling
LANDING CENTER	The assigned landing site during sampling schedule. It can either be commercial, municipal, major, or minor landing center.
FISHING GROUND	The water where the fishing boat operated or where the fishes are caught.
ENUMERATORS	The name of the data collectors assigned in the designated landing area.
NO. OF SAMPLES	The total number of boats sampled for length & weight measurements.
SAMPLE SERIAL NUMBER	Refers to the serial number of the fishing boats monitored.
BOAT NAME	The name of the boat that operates in fishing. If the boat has no name, as in the case of some non-motorized boats, the name of the fishing operator or fisherman may be used provided it is constantly used for that particular boat. The boat will be classified according to gear type.
FISHING GEAR	The type of fishing gear used in catching fish.
FISHING EFFORT	The fishing power exerted to capture/harvest the fish in a given fishing area.

3.2.2. Commonly Used Fishing Gears and Measures of Effort

The following are the most commonly used fishing gears with codes and the recommended measures of effort for each gear type. Other fishing efforts may be added when necessary.

Fishing Gears

- Trawl (T)
- Purse Seine (PS), Ringnet (RN), Bagnet (BN); Beach Seine (BS)
- Danish Seine (DS)
- Bottom Gill Net (BGN), Drift Gill Net (DGN), Surface Gill Net (SGN)
- Lift Net (LN)
- Multiple Hook & Line (MHL), Hook & Line (H&L), Longline (LL)
- Handline (H)
- Troll Line (TL)
- Jigger (J)
- Spear Gun (SG) (with or without compressor)
- Fish Pot (FP), Fish Corral (FC), & other fixed gears

Fishing Effort

- Number of hauls, Dragging hours
- Number of hauls, Fishing hours
- Number of hauls
- Length of net in meters (Number of “banata”), Number of hours setting
- Number of hauls, Soaking time
- Number of hooks, Number of sets, Soaking time
- Number of hours fishing, Number of lines, Number of days fishing
- Number of lines, Number of hours fishing
- Number of jigs, Number of hours jiggig
- Number of spear used, Diving hours
- Number of hours during which the gear was in the waters, Number of hauls per day, Number of unit

Know if the fishing operation was done in “payao” (Fish Aggregating Device/FAD) or “free school” (F), especially for ringnet, purse seine, and handline.

For gillnet, always check the number of “banata/panyo” (sheet netting) used during fishing operation and know the length per sheet to compute for the total length of the gear (Length of Banata x Number of sheets). The detailed fishing gear information should be recorded in form 5 (Gear Particulars).

UNIT OF CATCH (Weight) : Record total catch in kilograms or metric tons while the sub-sample weights in grams

TOTAL BOAT CATCH : The quantity (actual estimation) of fish catch by a particular fishing boat per fishing gear. The weights of the species in the catch composition (Market Categories) are summed up to get the total catch.

No. of Boxes : Refers to the number of fish containers used. The containers can be in the form of boxes, bañeras, foams, etc.

Weight in Kg. : Actual estimated weight of catch per boat, per gear. If fish catches are in containers, the standard weight of each container can be determined by asking the fishing operators, fishermen or fish buyers. However, the actual weight of each container with fish, varies depending on the amount of fish and the proportion of water and ice present. In this case, the estimated weight of the catch in each container can be determined by carefully pushing down the fish with the palm. Then, estimate the weight of the fish in the container minus the water and ice.

TOTAL SAMPLE : The quantity of fish sub-sampled for species composition in weight, and for length measurements by fishing boat & by fishing gear.

No. of Boxes : Refers to the number of containers where fish sub-samples were taken for length & weight measurements.

Weight in Kg. : The total weight of the sub-samples taken.

CATCH COMPOSITION Market Categories (Boxes/Kg.) : Refers to the species composition in the catch of the boat by gear with corresponding (Boxes/Kg.) weight by species. If possible, scientific name is used. The estimated catch (under the catch composition) should tally with the number of boxes and weight found in the column of the total boat catch.

from commercial (C) and municipal (M) fishing boats by fishing gear are totaled separately.

3.2.3. Steps in Raising Individual Group in the Sub-sample to Total Catch.

- Determine the **total boat catch** (weight) or count the number of containers filled with fish and record for this can be used in raising to the total catch later. In the first place have an estimated weight of the container filled with fish minus ice & water.
- Determine the state of the catch if pre-sorted (by species, genus, family, or size), unsorted (mixed), or a combination of sorted & mixed. Record accordingly.
- Raise samples to the total catch of the boat (by following the simplified formulas below).

RAISING METHOD:

A. Unsorted or mixed catch:

1. Randomly select containers, get sub-samples and weigh to get the Total Sub-Sample Weight. One or more containers can be sampled by species.
2. Sort by species/genus group.

If possible sort fish to species level and identify them using Scientific Name. Avoid the use of spp., if possible.

3. Weigh each sorted species group to determine the **weight of each group** and record in form 2a.
4. Raise each species group to the total catch by following the formula below (RF1). This will be recorded in form 2 (Catch Composition - Market Categories).

$\text{Raising Factor 1 (RF1)} = \frac{\text{Wt. of each species group}}{\text{Total sub-sample weight}} \times \text{Total Catch of the boat (weight)}$
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5. Add all raised weights to get the total boat catch by species.

At the end of each sampling day, the number of boats that landed and their catch equivalent by species for the day should be raised and totaled. Catches coming

B. Pre-sorted Catch (either by family, genus or species):

1. Determine how many classes are there and if only sorted by genus or family.
2. Determine the number of containers of each class or group.
3. If the catch is pre-sorted by species, estimate the total weight of each species group by following the formula below (RF2).

$\text{Raising Factor 2} = \text{Wt. of container of Species A} \times \text{Number of Containers}$ <p>(RF2)</p>
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4. Add all raised weights to get the total catch of the boat by species.

If the fish are only pre-sorted by genus or family, sort further by species. Follow A2-5.

C. Pre-sorted Catch (by size):

1. Determine the number of containers of species having the same size (e.g. large, medium & small) to get the **total catch by size**.
2. Randomly select containers by size, get sub-samples and weigh to get the Total Weight of Sub-Sample by Size. Get sub-samples from different sizes and have a separate record of the total sub-sample weight & species weight by size.
3. Raise individual weight of each species group by size to total catch by size.

$\text{Raising Factor 3} = \frac{\text{Wt. of species group by size}}{\text{Total weight of sub-sample by size}} \times \text{Total Catch of the boat}$ <p>(RF3)</p>
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4. Add all raised weights of the same species regardless of size
5. Add all sub-totals by species to get the total catch of the boat.

D. Combination of Mixed & Sorted Catches:

1. Determine the number of containers with sorted catches and mixed catches then record separately.

2. Raise sorted & mixed catches separately. In raising the sorted catch, follow B1-4. For mixed catch, follow A1-5.
3. Add all raised weights of the same species from the sorted & mixed catches.
4. Total all weights by species to get the total catch of the boat.

Record in Form 2 (under Catch Composition – Market Categories) the raised weights by species. Raisings of catch is usually done at the end of sampling when no more boats are expected to land on that day.

The space for “**Remarks**” is provided for any unusual observations/comments during sampling day (e.g. weather condition, barangay or town fiesta, etc.).

The Data Enumerator/s who accomplished the forms should sign at the space provided, noted by the Project Leader or the Assistant Project Leader.

3.3. NSAP FORM 2A - Landed Catch & Effort Monitoring (Weight Measurement)

This form is used when conducting sub-sampling activity together with NSAP Form 2b (Length Measurement). The actual weights of species group from sub-samples are first entered in this form. These are the weights that are raised to total catch of the boat.

3.3.1. Steps in Sub-Sampling for Weight Measurement:

- Determine the total catch (weight) of the boat (by gear) to be sampled.
- Borrow sub-samples at random by gear, weigh then record.

Exercise caution during sub-sampling because sometimes, large fish are selectively placed at the bottom of the container or vice-versa. If only the fish at the top of the pile are measured the sample is biased.

- Sort sub-samples to species groups.

Sub-samples are sorted to species group and properly identified to species level, if possible, using Scientific Name. Species should be identified correctly because any small errors in species identification will become magnified to huge errors when raised.

- Weigh each species group.

Each species group is weighed (in grams) & recorded in NSAP Form 2a.

3.4. NSAP FORM 2B - Landed Catch & Effort Monitoring (Length Measurement)

Species are collected for length measurements by fishing gear. Taking the length measurement is important to assess their growth and mortality within the fishery.

3.4.1. Collection of Length Data

1. Determine if all the species in the sub-sample are to be measured or only selected species.
2. Get individual length measurement of species

After weighing the samples, individual length measurement is taken. For fish that grow >15 cm, use centimeter. For fish that does not grow >15 cm (e.g. anchovies and all invertebrates), the actual reading is in millimeter.

If possible measure at least 30-50 pcs per species per gear, per sampling day. In case not all species are measured, weigh total fish measured per species and write at the upper right side of the space provided for (wt: ____). Weigh remaining fish not measured and write at the left side below the Box no.

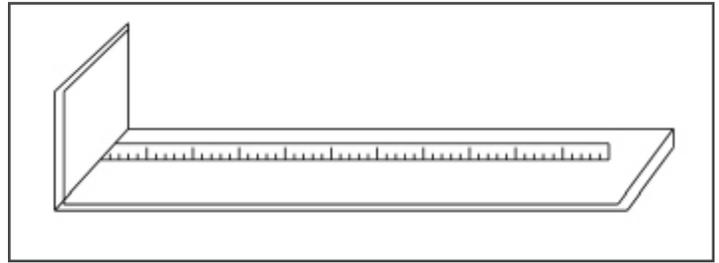
Box number refers to the number of boxes sampled. One or more boxes maybe sampled from a particular fishing boat depending on the quantity and type of catch.

After measuring, count the number of pieces measured per species and entered in the appropriate boxes provided. This is copied to form 1.

3.4.2. Measuring Instruments:

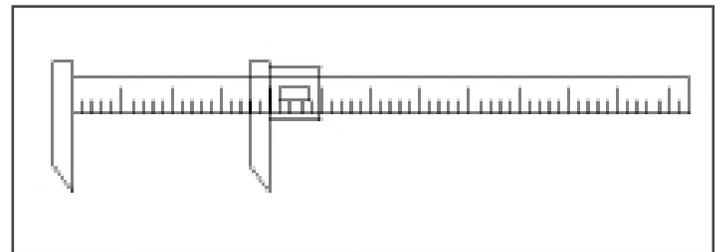
i) Measuring board

Measuring board is a suitable tool for measuring particularly, smaller fish.



ii) Caliper

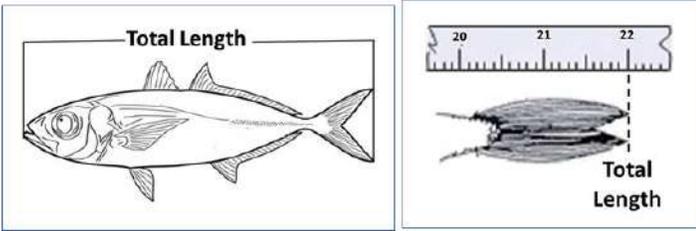
Caliper is usually used for measuring invertebrates. In the case of big tunas & billfishes, an improvised caliper made of wood can be used.



3.4.3. Types of Length Measurements:

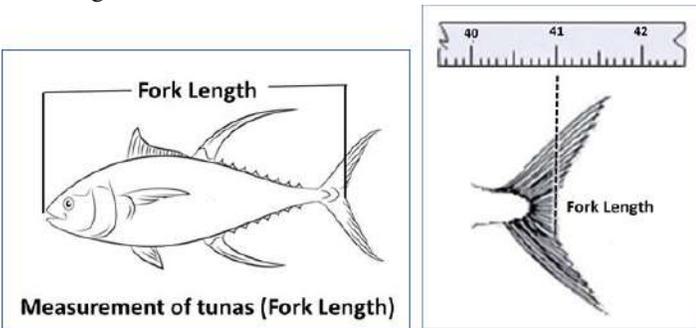
The fish is placed on a in a measuring board on a flat surface in a horizontal position while being measured. Fish with a broken snout or tail, or frozen fish not in a straight position should be rejected.

- a. **Total Length** - The distance from the tip of the snout to the tip of the caudal fin. Used for fish with soft caudal fin.

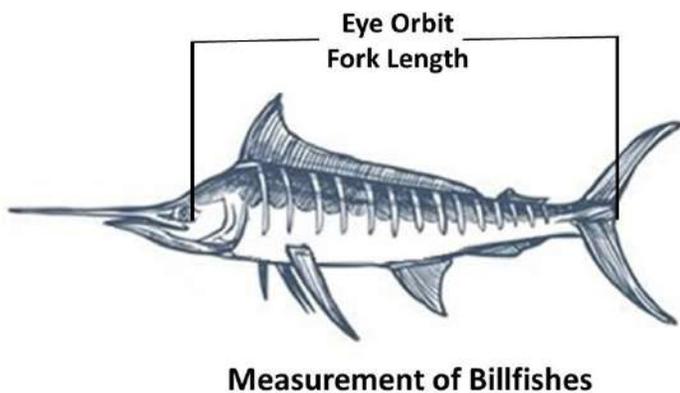


For fish with **prolonged upper or lower jaw**, measure from shorter jaw to tail; for **fish with extending filament in caudal fin**, exclude extending filament; for **fish with unequal tail length**, measure from the jaw to shortest caudal fin.

- b. **Fork Length** - the distance from the tip of the upper jaw to the cartilaginous median part of the caudal fork. Used for fish with hard caudal fin, (e.g. tunas).



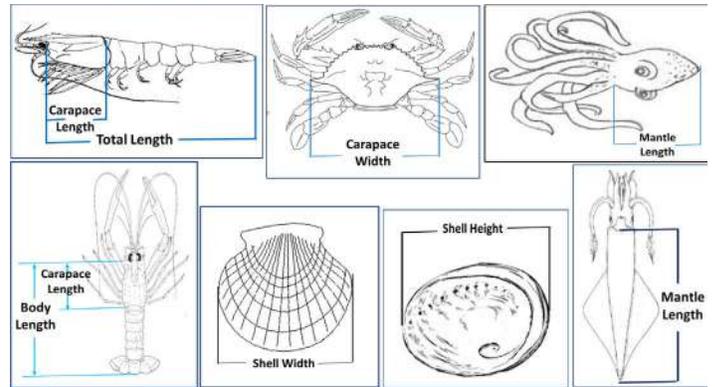
- c. **Eye Orbit Fork Length** – the distance from the posterior edge of the eye orbit to the posterior tip of the shortest caudal ray (for billfishes).



Measurement of Billfishes

- d. Measurements for invertebrate species (in millimeter):
- shrimp/lobster = carapace length
 - crab = carapace width

- squid/octopus = mantle length
- shells (bivalve or univalve) = total length
 - those that grow vertically – dorso ventral measurement (**shell height**)
 - those that grow horizontally – antero-posterior measurement (**shell width**)
 - In bivalves with almost the same size in length & width, measure both and get the biggest measurement.



3.5. NSAP FORM 3 – Actual Length Frequency Tally sheet (Monthly)

This form is accomplished after every sampling day. This is the grouping together of all length measurements of the same species and gear for the month. The length-frequency data should be grouped into midlength/ midpoint. The class interval to be used for species growing less than or equal to 30 cm is 0.5 cm and the midpoints will be 0.25 and 0.75 values. Those fish that attain a length of more than 30 cm, the class interval will be 1.0 cm and the midpoint value will be 0.5.

3.5.1. For class interval of 0.5 cm

(Example: *Sardinella fimbriata*)

Length interval	Midlength	Frequency
3.0 - 3.499	3.25	
3.5 - 3.999	3.75	
4.0 - 4.499	4.25	1
4.5 - 4.999	4.75	

5.0 - 5.499	5.25	1
5.5 - 5.999	5.75	3
6.0 - 6.499	6.25	14
6.5 - 6.999	6.75	22
7.0 - 7.499	7.25	11
7.5 - 7.999	7.75	18
8.0 - 8.499	8.25	10
8.5 - 8.999	8.75	10
9.0 - 9.499	9.25	15
9.5 - 9.999	9.75	8
10.0 - 10.499	10.25	5
Total =		118

This means that fish lengths which fall between 3.0 – 3.499 cm are grouped in 3.25 cm midlength and those that fall between 3.5 – 3.999 cm in 3.75 cm midlength, and so on.

3.5.2. For class interval of 1.0 cm

(Example: *Thunnus albacares*)

Length interval	Midlength	Frequency
15.0 - 15.999	15.5	
16.0 - 16.999	16.5	
17.0 - 17.999	17.5	1
18.0 - 18.999	18.5	
19.0 - 19.999	19.5	1
20.0 - 20.999	20.5	2
21.0 - 21.999	21.5	5
22.0 - 22.999	22.5	10
23.0 - 23.999	23.5	3
24.0 - 24.999	24.5	5
25.0 - 25.999	25.5	10
26.0 - 26.999	26.5	8
27.0 - 27.999	27.5	15
28.0 - 28.999	28.5	2
29.0 - 29.999	29.5	5
Total =		67

This means that fish lengths which fall between 15.0 – 15.999 cm are grouped in 15.5 cm midlength.

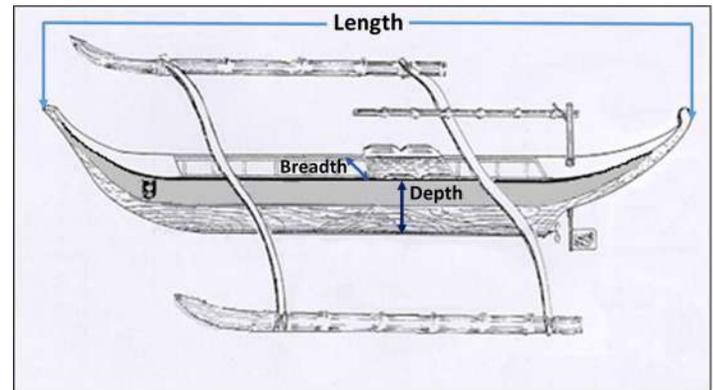
3.6. NSAP Form 4 – Boat Particulars

A record information of the fishing boats that regularly land in the designated landing sites is important. This form can be accomplished once but updated every now and then to know for boats that are no longer operating in the area, already dilapidated, or has been modified, etc.

3.6.1. Inventory of total fishing boats by size:

1. **Boat's name** - refers to the name given to identify the fishing boat.
2. **Length** - refers to the “length over all” or the horizontal distance between the extreme ends of the boat.
3. **Breadth/width** – refers to the horizontal distance of the width in the broadest part of the boat.
4. **Depth** – refers to the vertical distance from the baseline to the free board deck

Boat Measurement:



5. **Gross tonnage** – the total volume of space in cubic meters. It includes the under deck tonnage, permanently enclosed spaces above the tonnage deck, except for certain exemptions. In broad terms, all the vessel’s “closed-in” spaces expressed in volume terms on the bases of one hundred cubic feet (that equals one gross ton).

Computing the Gross Tonnage (GT):

In meter

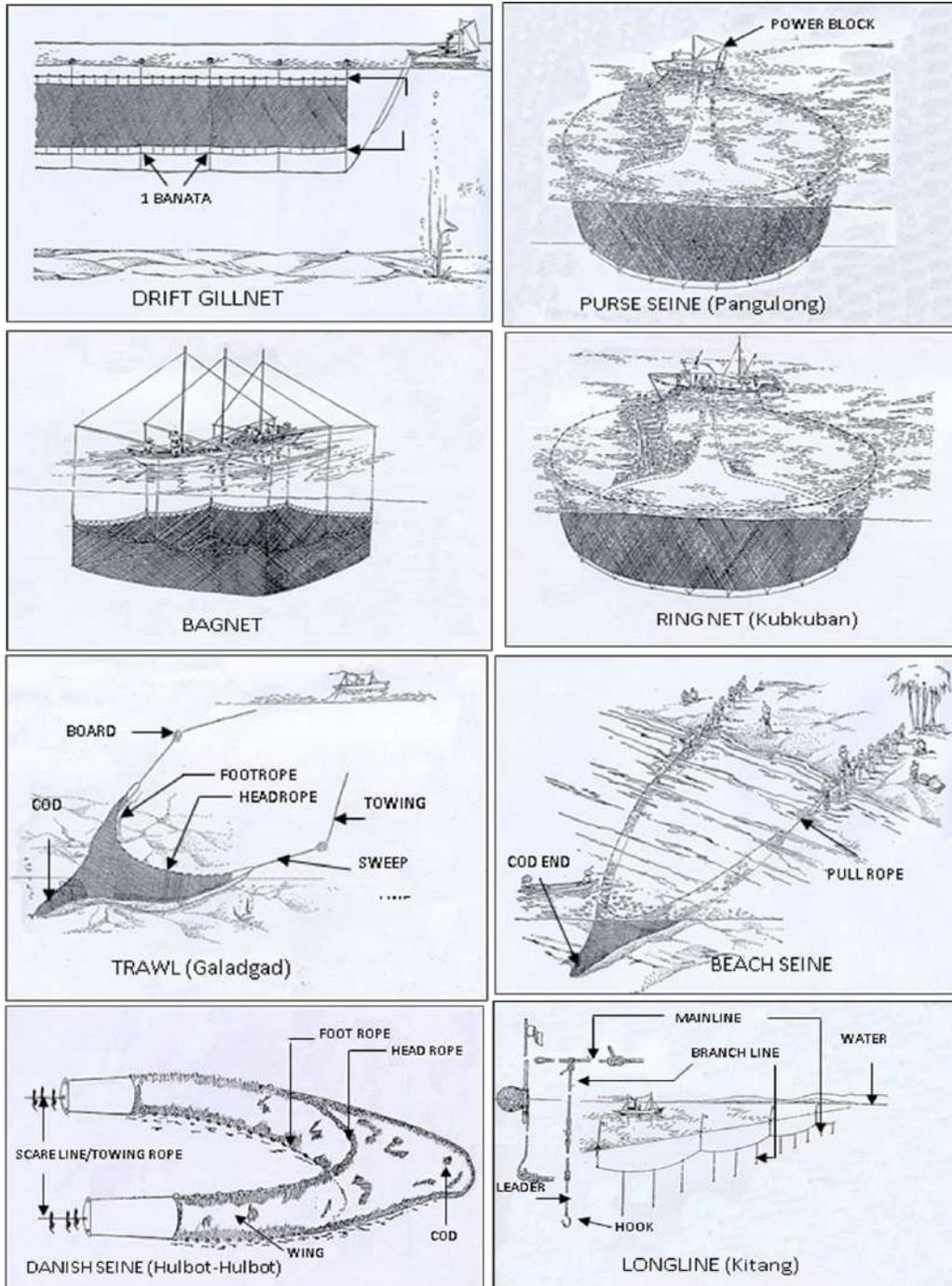
$$\text{G.T.} = \frac{L \times W \times D \times 0.70}{2.83}$$

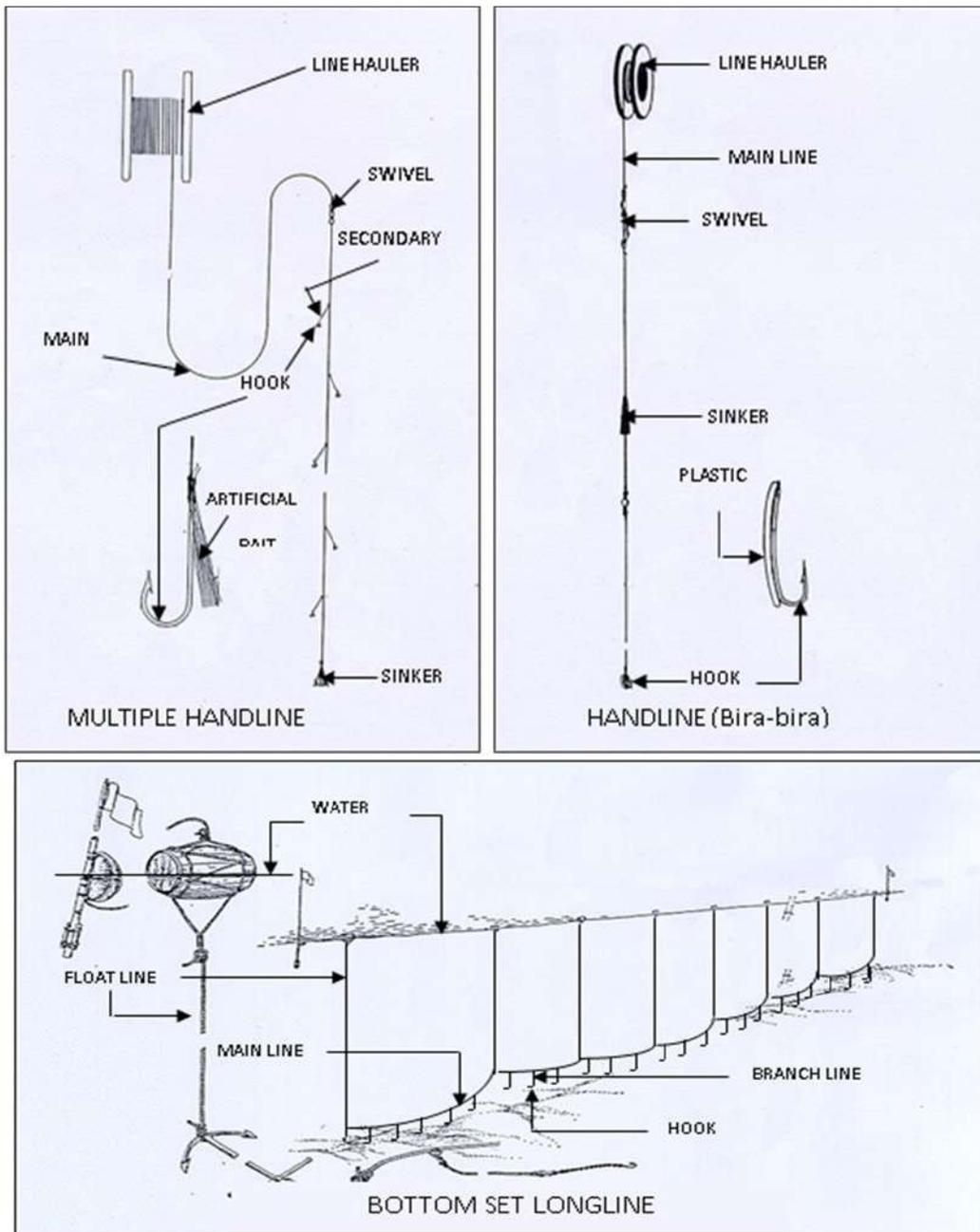
6. **Horsepower** – the power given out by the main engine.
7. **Engine type** – refers both to the brand of the main engine which is used during fishing operation and the fuel being used.
8. **No. of fishermen on board** – the number of crew on board who are involve in the fishing operation.

3.7. FORM 5 – Gear Particulars

This form is also accomplished once, just like form 4 (Boat Particulars). This should also be updated every now and then to know if there are new gears being operated in the area and to know what gears are no longer being used.

3.7.1. Common types of fishing gears being operated in the country:





Equipment and materials needed by the Data Enumerators during sampling:

1. Weighing scale (10-20 kgs & 1-2 kgs)
2. Data forms/record book/notebook
3. Measuring board/caliper
4. Container for fish samples
5. Plastic mat/mantel (for sorting fish)
6. Calculator

Optional:

7. Raincoat
8. Boots
9. Flashlight

National Stock Assessment Program
Region _____
Monthly Report

Fishing Ground _____
 Landing Center _____

Month _____
 Enumerator(s) _____

Sample Dates 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
 19 20 21 22 23 24 25 26 27 28 29 30 31

1. Landing by gear

Gear	Date																			Total
	Boats																			
	Catch																			
	Boats																			
	Catch																			
	Boats																			
	Catch																			

2. Length Frequency

	Date																			Total
S A M P L E	Boats																			
	Boxes																			
	Kg.																			
N O. O F F I S H M E A S U R E D																				

Comments : _____

Enumerator(s) _____
 Noted : Project Leader _____

National Stock Assessment Program Region _____

LANDED CATCH AND EFFORT MONITORING (Length frequency)

DATE	SAMPLE SERIAL NO.

Landing Center _____
 Boat _____
 Fishing Ground _____
 Fishing Gear _____

Enumerator(s) _____

No. of Boxes Sampled _____
 Total Weight of Sample _____

B O X #	SPECIES :	WT :				B O X #	SPECIES :	WT :			
B O X #	SPECIES :	WT :				B O X #	SPECIES :	WT :			
B O X #	SPECIES :	WT :				B O X #	SPECIES :	WT :			

For RN and PS Indicate if set made on payao or free school

NO. OF FISH MEASURED
BY SPECIES

National Stock Assessment Program BOAT PARTICULARS

Region _____

Landing Center: _____
Fishing Ground: _____

Date: _____
Sheet No.: _____

BOAT SPECIFICATION	B O A T ' S N A M E				
	F/B	F/B	F/B	F/B	F/B
Length(m)					
Width (m)					
Depth (m)					
Gross Tonnage					
Horse Power					
Engine Type					
No. of Fishermen on board					

BOAT SPECIFICATION	B O A T ' S N A M E				
	F/B	F/B	F/B	F/B	F/B
Length(m)					
Width (m)					
Depth (m)					
Gross Tonnage					
Horse Power					
Engine Type					
No. of Fishermen on board					

BOAT SPECIFICATION	B O A T ' S N A M E				
	F/B	F/B	F/B	F/B	F/B
Length(m)					
Width (m)					
Depth (m)					
Gross Tonnage					
Horse Power					
Engine Type					
No. of Fishermen on board					

National Stock Assessment Program GEAR PARTICULARS

Region _____

Landing Center: _____
Fishing Ground: _____

Date: _____
Sheet No.: _____

GEAR SPECIFICATION	B O A T ' S N A M E				
	F/B	F/B	F/B	F/B	F/B
Trawl/Danish Seine					
Length of headrope (m)					
Length of footrope (m)					
Length of towing warp (T) or headrope(DS) (m)					
Mesh size (cod end or bunt) (cm)					
Net material					
Board dimension (T) (m)					
Gillnet					
Length of "banata" (m)					
No. of "banata"					
Depth of Net (m)					
Mesh size (cm)					
Hook and Line/Jigger					
Type: (e.g. H&L, MHL, LL, HL, Jigger, etc.)					
Length of mainline (m)					
Length of branch line (m)					
No. of hook/jigger					
Size of hook/jigger					
Bait					
Purse Seine/Ringnet					
Length of net (m)					
Depth of Net (m)					
Mesh size (cm)					
Net material					
Others					