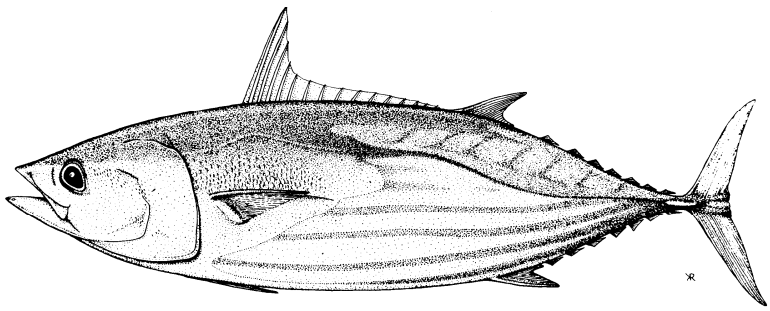
FIRST WPEA – NSAP TUNA DATA REVIEW WORKSHOP

13-14 May 2010
NFRDI/BFAR offices, Manila, Philippines



Western and Central Pacific Fisheries Commission
Pohnpei, Federated States of Micronesia
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Contents

1. INTRODUCTION

The Western and Central Pacific Fisheries Commission (WCPFC) has been involved in Philippines tuna fishery data collection through the Indonesia and Philippines Data Collection Project (IPDCP), which was developed at the Preparatory Conference for the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific (Anon. 2003) and adopted by the WCPFC in December 2005. The objectives of the IPDCP were

1) to collect and compile data that can be used to reduce the uncertainty of the assessments of tuna stocks in the Western and Central Pacific Ocean, and
2) to improve the monitoring of tuna fisheries in the Philippines and Indonesia so that both countries will be able to fulfill their future obligations in regard to the provision of fisheries data to the Commission.

The funding available under the IPDCP project was fully-utilized by 2009, but continuation of this important work in the Philippines (and Indonesia and Vietnam) has been subsequently included in a new project offered by the Global Environment Facility (GEF) - ***West Pacific East Asia Oceanic Fisheries Management (WPEA OFM)*** project, which began in 2010 (see http://www.wcpfc.int/doc/2009/wpea-ofm-project-document). The activities to be carried out under this project contribute towards the following objective:

"*To strengthen national capacities and international cooperation on priority transboundary concerns relating to the conservation and management of highly migratory fish stocks in the west Pacific Ocean and east Asia (Indonesia, Philippines and Vietnam)*"

The WPEA OFM project will cover, *inter alia*, the following key areas

(i) strengthen national capacities in fishery monitoring and assessment,
(ii) improve knowledge of oceanic fish stocks and reduce uncertainties in stock assessments,
(iii) strengthen national capacities in oceanic fishery management, with participant countries contributing to the management of shared migratory fish stocks,
(iv) strengthen national laws, policies and institutions, to implement applicable global and regional instruments.

The Philippines domestic fisheries are widespread, diverse and numerous, and the logistics for undertaking data collection to obtain representative indications presents a challenging task. Review of the catch, effort and size data collected at landing centers collected in the Philippines through the BFAR National Stock Assessment Project (NSAP) was the focus of this workshop. These data provide fundamental information for tuna stock assessments and ensuring the appropriate quality and coverage of these data is a key review activity of the WPEA OFP project.

It is also acknowledged that the breakdown of species catch estimates by gear type for the Philippines domestic fisheries is one of the most significant gaps in the provision of data to the WCPFC, and this review workshop covered areas where NSAP data could resolve the problems associated with this data gap.

The opening addresses noted that the Workshop would cover, *inter alia*, the following areas :

- Provide an opportunity for the WCPFC to review the NSAP data used for regional tuna stock assessments;
- Provide an opportunity to compile important species composition and catch estimates at the Philippines region level as input into the Annual catch estimates workshop;

- Provide an opportunity to review any problems with NSAP data collection, and thereby improve quality of data collected;
- Provide an opportunity to train participants in using the NSAP database system and understanding the NSAP database reports;
- Provide an opportunity to get feedback on NSAP database system and suggest enhancements to the system and reports produced.

2. NSAP PORT SAMPLING DATA REVIEW

This main focus of the workshop was the agenda item reviewing the NSAP port sampling data collected in each region and what information the BFAR regional offices had compiled that could be used in the annual catch estimates review workshop to be conducted in the following week. The following sections briefly cover the key points from each presentation and subsequent discussion, noting that more detailed information is available in each presentation (see APPENDIX 7 for a list of presentations).

2.1 WCPFC Requirements for data

The WCPFC representative provided an introductory presentation on the WCPFC requirements for scientific data, covering the following areas:

- Brief overview of WCPO fisheries by gear type
- Why we collect data from tuna fisheries including reasons why data collection, research and management must be conducted at the regional level
- The WCPFC member country data-reporting obligations (refer to http://www.wcpfc.int/doc/data-01/scientific-data-be-provided-commission-revised-wcpfc4-wcpfc6)
- A description of Annual catch estimates and why they are fundamental to the work of the WCPFC and member countries
- Why NSAP data are so important to the WCPFC
- The current issues with Philippines domestic tuna data that are of concern to the WCPFC

The purpose of this introductory session was to inform participants of their role and the importance in providing (the NSAP) data to the WCPFC. It was noted that the importance of the aggregated NSAP data to the WCPFC covers the following main areas:

- NSAP data provides essential tuna and billfish species composition data for determining annual catch estimates by GEAR,
- NSAP data provides essential TUNA SIZE DATA for the regional stock assessments,
- NSAP data provides essential TUNA CPUE trend data for regional stock assessments (in the absence of logsheet data).

In the coming years, it was noted that the WPEA-OFM would serve to assist improvements in the coverage and quality of NSAP tuna data collection. The discussion after the presentation revolved around further explanation and clarification of how NSAP data are used by the WCPFC and where future WPEA funding might be directed.

2.2 Tuna Catch Estimates by Species and Gear Type in each NSAP Region

Recent (2009) data collected from the NSAP in each region data were presented, commencing with a comprehensive description of data compiled by the central NFRDI/BFA office in Manila. Presentations from each region were structured in a similar manner and covered the following key areas :

- Main tuna fishing grounds and landing centers
- Seasonality in fishery
- Estimated number of vessels
- Estimated catch by species
- Disposal of tuna catch (% breakdown)
- Problems in estimates or collecting data

A list of presentations is contained in APPENDIX 7 and a list of the tuna catch estimates for each Gear/Region was compiled from the presentations and further discussion (see Section 2.3 and APPENDIX 8). The following are some of the interesting points noted in these presentations:

- The purse seine fishery in the Philippines includes those vessels that target small pelagics (with smaller mesh size) and those vessels that target tuna. There may be a further division in those vessels targeting tuna between those that are small and restricted to the EEZ and those larger vessels that fish beyond Philippine waters (in the high seas and in PNG waters under access agreements). It was noted that some purse-seine vessels in the Philippines change their target species from small pelagics to tunas (skipjack in December – March) on a seasonal basis.
- A large % of bigeye tuna (9%) was reported in Region 3 for 2009 in the ringnet fishery according to the NSAP data. Further information is required.
- In region 6, the main fishing port is the only landing site covered by NSAP but it is acknowledged that there are many ringnet vessels landing elsewhere.
- There were relatively high catches of Albacore tuna from the handline fishery in Lagonoy Gulf (Region 5) in Sept-November 2009. Seasonal catches of Albacore tuna have been taken in this area and season in other years, but not to the extent as experienced in 2009. Possible explanations for this were proposed – the first El Nino in a number of years and/or a series of typhoons at that time causing abnormal oceanographic conditions (upwellings). Small albacore landings from the handline and longline fisheries were also reported in Regions 11 and 12.
- There was relatively high bigeye species composition (28%) reported from the Hook-and-line fishery in Region 8 during the period Sep-Dec 2009. Further information is required.
- Reports of Pacific bluefin caught in Region 1 but have yet to be sampled by NSAP enumerators.
- There is increasing interest in the export of Handline-caught tunas to the European market. Region 8 is one such area and also Region 4a (Mindoro), which is not currently covered by NSAP. HACCP has changed accordingly in the Philippines in the past few years and Catch Documentation has been implemented. (more details required ??).

The WCPFC representative acknowledged the usefulness of the information presented and suggested some minor enhancements to the template for reporting tuna catch estimates in each region for the future; the new template for preparing region reports for the next workshop is included in Appendix 4.

2.3 Discussion on tuna catch estimates for non-NSAP sites in each region

After review of NSAP data in each region (through the presentations), the workshop participants then spent some time considering the estimates of tuna catch by gear for landing centers in each region that were not covered by NSAP. This process was the first time it was attempted, and since participants had not been informed to prepare this information prior to the workshop, it was acknowledged that the estimates proposed "off the cuff" could only be expected to be very approximate. Nonetheless, it was acknowledged to be a useful process and participants from each region were therefore asked to consider research into obtaining estimates from the non-NSAP landing centers for future workshops.

Participants noted that better estimates could be obtained by increasing the coverage of NSAP monitoring, or consideration for monitoring new key landing sites for tuna. In order to better plan where to direct resources for NSAP monitoring in the future, it was suggested that each region complete the template table listed in Appendix 5 before September 2010 so that consideration for extending or redirecting resources for NSAP sampling could be undertaken for the 2011 WPEA Annual Work Plan.

Tuna catch estimates for each region and gear for the non-NSAP sites were compiled from discussions and are contained in APPENDIX 8, which also contain the estimates for the NSAP-monitored landing sites.

2.4 Review of NSAP Tuna size data

A presentation providing a review of the NSAP size data by region was provided and covered the following areas :

- Species composition data by REGION and GEAR
- Size data collected in recent years for the main fisheries
    - Large-fish Handline
    - Small-fish Hook-and-line
    - Purse seine
    - Ringnet

An excerpt of the review is contained in Appendix 9.

The review noted some specific issues in certain regions to resolve in the future and these areas were included in one of the recommendations from the workshop (see APPENDIX 3). One important issue was the need to have a clear distinction between the small-fish hook-and-line and large-fish handline gears in NSAP Data Collection and subsequently, the encoding into the NSAP database; a recommendation was formulated and draft text describing the distinguishing characteristics of hook-and-line and handline gears has been included in Appendix 6.

2.5 Review of NSAP data management

As a part of discussions on NSAP data management, workshop participants were introduced to the concepts of data auditing. A presentation covered the following areas:

- The general definition of "AUDITING"
- Why is there a need to "audit" systems

- "Systematic" vs "non-systematic" audits
- How will audits on fisheries data could be conducted in the future
- The components of an Audit
    - Data collection systems
    - Data management systems
- An introduction to the Port Sampling Audit Workbook (draft)
- An introduction to the Logsheet Systems Workbook (draft)

Workshop participants acknowledged the potential usefulness of the Port Sampling Audit workshop but noted that it was not specifically designed to work with the NSAP data collection system, so a recommendation was formulated to work towards the production of a more appropriate workbook for the NSAP data collection system in the future (see Appendix 3).

3. NSAP DATABASE REVIEW

This agenda item covered two main topics, (i) a demonstration of the current NSAP database System, and in particular, the reports available from this system and an example of the output from each report, and (ii) discussion of what enhancements to the database system are required by regional offices. Discussion of the enhancements to the NSAP database system were compiled and included as a recommendation from the Workshop (see Appendix 3).

4. RECOMMENDATIONS AND WORKSHOP CLOSE

The workshop participants reviewed and agreed on a list of six recommendations based on discussions made during the two days (see **APPENDIX 3**). All participants agreed to action the recommendations relevant to their organisation/region over the coming year.

A table containing a list of potential NSAP landing centers was provided in the month after the workshop and will be considered in the period before the next workshop to be held in 2011 (see APPENDIX 10).

The WCPFC/WPEA are committed to holding this type of workshop on an annual basis in the short term to review the data collected by the NSAP and identify priority areas for improved coverage and data quality. It was acknowledged that the NSAP data do not produce annual catch estimates. However, NSAP data provide key information for determining the annual catch estimates for the Philippines-domestic fleets by gear, which was the subject of another workshop scheduled to be conducted in the following week. The importance of the NSAP data to producing annual catch estimates meant that a workshop to review NSAP data will be required on an annual basis over the short term, so the next workshop should therefore be scheduled for May 2011.

The representatives from NFRDI/BFAR and the WCPFC provided brief closing remarks, thanking the regional participants for their attendance, highlighting the importance of the NSAP data to the WCPFC and the productive discussions made during the workshop. The meeting was closed with a round of applause and numerous photos.

APPENDIX 1 – AGENDA

FIRST WPEA – NSAP Tuna Data Review Workshop

NFRDI/BFAR Meeting Room, Quezon City
13 - 14 May 2010
9AM – 5 PM

1. Registration

2. Welcome Message

3. Introduction of Participants

4. Rationale for the Workshop

5. NSAP Port Sampling Data Review

5.1. WCPFC Requirements for data
5.2. Tuna Catch Estimates by Species and Gear Type for each NSAP region
5.3. Review of NSAP Tuna Size Data
5.4. Review of NSAP Data Management

6. NSAP Database Review

6.1. Status of the current NSAP Database System
6.2. Review of the NSAP Database System and future requirements

7. Recommendations and Workshop Close

APPENDIX 2 – LIST OF PARTICIPANTS

1.	*Francis Buccat*	*- Region 1*
2.	*Ronald Bathan*	*- Region 3*
3.	*Annielyn Capadosa*	*- Region 4*
4.	*Alma Santos*	*- Region 4*
5.	*Maribeth Ramos*	*- Region 4*
6.	*Esmeralda Mendoza*	*- Region 4*
7.	*Virgiña Olaño*	*- Region 5*
8.	*Mayet Calacal*	*- Region 5*
9.	*May Guanco*	*- Region 6*
10.	*Sheryll Mesa*	*- Region 6*
11.	*Elmer Baustista*	*- Region 8*
12.	*Leah Tumibiene*	*- Region 8*
13.	*Jose Villanueva*	*- Region 11*
14.	*Laila Emperua*	*- Region 12*
15.	*Miyong Bianca*	*- Region 12*
16.	*Macmod Mmalangkap*	*- ARMM*
17.	*Noel Barut*	*- BFAR/NFRDI*
18.	*Elaine Garvilles*	*- BFAR/NFRDI*
19.	*Desiderio Ayanan*	*- BFAR/NFRDI*
20.	*Peter Williams*	*- WCPFC/SPCh*

APPENDIX 3 – WPEA – NSAP Tuna Data Review Workshop

RECOMMENDATIONS

1. Regional BFAR offices provide important information on tuna fisheries in their regional reports which are fundamental input to the annual catch estimation process and the WCPFC review of NSAP data. **Regional BFAR offices** were encouraged to produce a regional tuna fishery report (as a document and/or powerpoint presentation) for future review workshops, based on the template provided in APPENDIX 4.

2. The Workshop identified important tuna landing centers not currently covered by NSAP that should be considered for establishing NSAP sampling in the future, depending on available funding. The list of landing centers by region is provided in APPENDIX 5. **Regional BFAR offices** will obtain estimated total tuna (SKJ/YFT/BET) landings for those non-NSAP sites to use as justification for expanded sampling to these landing centers. **BFAR/NFRDI** will review the list of potential new NSAP sites (based on priority as tuna landing centers), in conjunction with available funding, to determine where sampling should be established.

3. **WCPFC/SPC, BFAR/NFRDI and respective BFAR Regional offices** will investigate potential issues identified in the NSAP data for 2009.

4. **BFAR/NFRDI and Regional BFAR offices** will train enumerators and encoders to clearly differentiate between the HANDLINE and HOOK-AND-LINE gears in NSAP data collection and management (NSAP database) systems to ensure the data made available to scientists are consistently assigned to these two different methods of fishing. The definitions of each GEAR to be used in the training are contained in APPENDIX 6.

5. The Workshop acknowledged the usefulness of the fishery data audit process (e.g. workbooks) as a tool for improving the quality of fishery data. The Workshop recommended that the **WCPFC/SPC** revise the current version of the Port Sampling Audit Workbook to cover the Philippines NSAP situation and for **BFAR/NFRDI** to subsequently test the revised workbook and further revise as required. The status of the revised NSAP Port Sampling Audit Workbook would be reviewed at the 2011 NSAP data review workshop.

6. **WCPFC/SPC** will endeavour to update the NSAP database system to cater for the following requests from BFAR/NFRDI and Regional BFAR offices:
    a. Implement the data entry of weight data and produce relevant reports summarising weight data
    b. Enhance the FISAT reports to cater for the extraction of length frequency data for more than one GEAR
    c. Enhance the FISAT reports to allow length frequency data to be in raised or unraised formats
    d. **WCPFC/SPC and BFAR/NFRDI** to provide instructions to Regional BFAR offices to show how to use the EXCEL Pivottable function to manipulate report data extracted from the NSAP Database system
    e. Implement a system in the Species database table to allow regions to filter the list of species by GEAR, so that a reduced but relevant list of species for that REGION/GEAR only appears at data entry and when producing reports.
    f. Provide instructions of how to use the NSAP database system in multi-user data entry mode.
    g. Produce a new report in the National NSAP Database system which aggregates all regional data by FISHING GROUND.

APPENDIX 4 – Regional NSAP Tuna Catch Report Template

Suggested format of the report on fisheries catching oceanic tuna species (skipjack, yellowfin and bigeye) in each region

REGION's TUNA FISHERY REPORT

- *Main tuna fishing grounds and landing centers for vessels catching tuna (BY GEAR)*

- *Seasonality in fishery for vessels catching tuna (BY GEAR)*
    a. Provide details of when and why the peak/low fishery seasons occur

- *Estimated number of vessels catching tuna (BY GEAR)*

- *Estimated catch by species for vessels catching tuna (BY GEAR)*
    a. From NSAP-monitored landing centers
    b. From other landing centers <u>not</u> monitored by NSAP
    (A rough total tuna estimate by GEAR, not broken down by species, is acceptable)
    c. What is the reliability of the estimates for non-NSAP landing centers and how can these estimates be improved

- *Disposal of tuna catch (% breakdown) for vessels catching tuna (BY GEAR)*
    a. Cannery
    b. Export
    c. Family/Community (subsistence), barter or gifts
    d. Sold at point of landing
    e. Sold at market
    f. Sold to other commercial outlets (e.g., supermarkets, restaurants)

- *Problems in estimates or collecting data*

Notes

- Use tables and graphs/charts to show catch estimates by gear and species in your region
- The information should be presented for the previous calendar year, but you are also encouraged to compare with information from previous years.

APPENDIX 5 – Template for listing the potential new NSAP tuna landing centers

List of potential tuna landing centers where NSAP sampling should be established in the future

Region	Landing center	Total tuna catch estimate (by Gear)	Comments

APPENDIX 6 – Differentiation of HANDLINE and HOOK-AND-LINE fisheries

Standardised Naming Convention and distinguishing characteristics for HANDLINE and HOOK-AND-LINE gear

HANDLINE

- Targets large yellowfin tuna
- Description of GEAR
    - Use single hook
    - Large Hook size (Tuna Circle Hook … confirm typical hook type used here)
    - Heavy monofilament (include typical line strength here)
    - "Heavy monofilament handlines are tied to a single tuna circle hook that is baited and set at approximately 30 – 50 fathoms at night. One set of handline gear was examined in Narra, consisting of a 170 kg monofilament mainline wrapped around a hand reel and attached to a 140 kg monofilament leader with a stainless steel swivel (Figure 5). The rig terminated in a hand twisted, two strand stainless steel leader attached to an 11/0 stainless steel circle hook."
    - Some minor modifications to gear description mentioned above are experienced elsewhere (e.g. no stainless steel leader)
- TARGETING DETAILS
    - Exclusively fish on Payaos (e.g. within one nautical mile of anchored payaos that are generally set in at least 1000 m of water)
    - Mostly target depths > 100m
    - Mostly fish at Night but day fishing at different depths also occurs
    - May use bait attraction lights
    - Common bait used is dead scads and squid
- May be seasonal (e.g. Puerto Princessa fishery)
- Trip length at least 3 days and can be more than 20 days for large GCS pump boats
- Includes Pump boats; Generally more than 4 crew; may have many "auxilliary" vessels with outboard
- Many single-hook handlines can be used from one vessel

SINGLE, and Multiple, HOOK-AND-LINE

- Targets small tunas (skipjack and yellowfin)
- Generally fish in the day
- Fish shallower than "HANDLINE"
- The gear reflects the small-fish targeting …
    - "Handlines consist of artificial lures attached one per line or to dropper loops attached to a common mainline (The lures are usually colored fabric and bright twine tied to single "J" hooks."
    - Variations of the above exist …
    - Also this gear used to catch bait (small pelagics) which are then used to catch tunas
    - Light-Medium monofilament (include typical line strength here)
    - Hook size is clearly smaller than HANDLINE
- Smaller vessels with smaller crews than HANDLINE
- Trip length is generally ONE DAY only (where fishing grounds are not far away)
- Skipjack may be taken from free schools ??
- Vessels may change from large-fish HANDLINE to small-fish HOOK-AND-LINE seasonally (e.g. Puerto Princessa) or sometimes within the same trip (rare?)

APPENDIX 7 – LIST OF PRESENTATIONS

1. WCPFC data requirements and current issues with the Philippines catch data	WCPFC/SPC
2. NFRDI – Overview of NSAP data collected in 2009	BFAR/NFRDI (Elaine Garvilles)
3. Region 1 – Luzon	*REGION 1 (Francis Buccat)*
4. Region 3 – Zambales	*REGION 3 (Ronald Bathan)*
5. Region 5 – Bicol	*REGION 5 (Virgiña Olaño)*
6. Region 6 – Visayas	*REGION 6 (xxxxxxxxx)*
7. Region 8 – Samar	*REGION 8 (xxxxxxxxx)*
8. Region 11 – Davao	*REGION 11 (Jose Villanueva)*
9. Region 12 – General Santos City	*REGION 12 (xxxxxxxxxx)*
10. Region ARMM	*REGION ARMM (Macmod Mmalangkap)*
11. Preliminary review of NSAP data by Region and Gear	WCPFC/SPC
12. Auditing Data Collection and Management Systems	WCPFC/SPC
13. Demonstration of the NSAP Database System	WCPFC/SPC

APPENDIX 8 – Estimates of tuna catch by Gear, Region and Species from NSAP sites and non-NSAP sites

PURSE SEINE						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	*non-NSAP landing sites estimate*	*0.000*	*0.000*	*0.000*	*0.000*	
3	NSAP	839.104	596.577	152.944	1,588.625	
	non-NSAP landing sites estimate	*239.000*	*156.000*	*0.000*	*395.000*	raised based on actual catches in 2001 for Santa Cruz, Zambal
4	*non-NSAP landing sites estimate*				*0.000*	No purse seine
5	*non-NSAP landing sites estimate*	*0.690*	*0.250*	*0.000*	*0.940*	
6	NSAP	25.089	1.703	0.000	26.792	
	non-NSAP landing sites estimate				*0.000*	No purse seine landings elsewhere
8	*non-NSAP landing sites estimate*				*0.000*	No purse seine
11	*non-NSAP landing sites estimate*				*0.000*	No purse seine
12	NSAP	20,887.996	3,549.125	445.490	24,882.612	
	Private landing wharfs				*1,093.500*	estimated for 27 sites
	non-NSAP landing sites estimate					
ARMM	NSAP	65.968	6.276	1.416	73.660	Includes 75% ringnet
	non-NSAP landing sites estimate				*1,000.000*	Rough estimate of total tuna catch for PS and RN
		22,057.847	*4,309.932*	*599.850*	*28,061.129*	
	NSAP	84%	14%	2%		
		23,556.240	4,002.492	502.397	28,061.129	

RINGNET						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	112.244	0.000	0.000	112.244	
	non-NSAP landing sites estimate					No ringnet vessels in other sites
3	NSAP				*50.000*	Subic - rough estimate
4	*non-NSAP landing sites estimate*					No ringnet vessels
5	*non-NSAP landing sites estimate*	*303.350*	*16.430*	*0.840*	*320.620*	
6	*non-NSAP landing sites estimate*				*0.000*	No oceanic tuna catch from ringnet vessels in this region
8	*non-NSAP landing sites estimate*	*216.816*	*25.213*	*20.290*	*262.319*	determined from expected proportion by gear type; Eastern Samar only
11	*non-NSAP landing sites estimate*				*1,000.000*	Time series in Davao Gulf raised based on 5 NSAP landing sites covering RN; but more realistic estimate is 1,000 t.
12	NSAP	8,696.553	2,139.753	84.652	10,920.958	
	Private landing wharfs				*10,000.000*	Significant catches landed in private wharves ...
	....					
ARMM	NSAP	117.564	9.309	3.475	130.348	
		9,446.527	*2,190.705*	*109.257*	*22,796.489*	
	NSAP	80%	20%	1%		
		18,153.250	4,466.536	176.702	22,796.489	

HOOK-AND-LINE

NSAP + estimates for areas not covered by NSAP

Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	68	158	0	226	
	non-NSAP landing sites estimate	*27*	*53*	*0*	*80*	based on vessel inventory - raised
3	NSAP	3	3	0	6	
	non-NSAP landing sites estimate				*2*	
4	NSAP					Attributed to HANDLINE
	non-NSAP landing sites estimate				*1,000*	rough estimate
5	NSAP	87	198	2	286	
	non-NSAP landing sites estimate				*500*	rough estimate since H&L is the major gear used throughout
6	NSAP	191	664	68	923	
	non-NSAP landing sites estimate				*150*	rough estimate but no base information available - probably hi
8	NSAP	127	24	2	153	
	non-NSAP landing sites estimate	*108*	*4*	*3*	*116*	Eastern Samar only
10	NSAP					
	non-NSAP landing sites estimate					
11	NSAP				*1,000*	Dominant gear; estimate based on NSAP
	non-NSAP landing sites estimate					
12	*non-NSAP landing sites estimate*				*0*	Municipal
	non-NSAP landing sites estimate					
	....					
ARMM	NSAP				7	no breakdown by species
	non-NSAP landing sites estimate				*1*	
		611.240	*1,104.150*	*74.900*	*4,449.290*	
		34%	62%	4%		
		1,519.075	2,744.071	186.144	4,449.290	

DRIFT GILLNET

NSAP + estimates for areas not covered by NSAP

Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	22.000	7.000	0.000	29.000	
	non-NSAP landing sites estimate	*45.900*	*25.873*	*0.000*	*71.773*	based on boat inventory - raised
3	NSAP				*3.000*	Subic
4	*non-NSAP landing sites estimate*					No drift gillnet
5	*non-NSAP landing sites estimate*	*0.230*	*0.820*	*0.030*	*1.080*	
6	*non-NSAP landing sites estimate*				*150.000*	Estimated production - all species (50 units) incl non oceanic tuna s
8	*non-NSAP landing sites estimate*				*0.000*	None
11	*non-NSAP landing sites estimate*				*100.000*	Not covered by NSAP - estimated catch
12	*non-NSAP landing sites estimate*				*0.000*	Not likely to catch oceanic species
ARMM	NSAP	30.000	5.000	3.475	1.000	
	non-NSAP landing sites estimate				*4.000*	Estimate
		98.130	*38.693*	*3.505*	*355.853*	
		70%	28%	2%		
		248.844	98.120	8.889	355.853	

MULTIPLE HOOK-AND-LINE

NSAP + estimates for areas not covered by NSAP

Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	1.000	0.000	0.000	1.000	
	non-NSAP landing sites estimate	*14.992*	*11.395*	*0.000*	*26.387*	based on vessel inventory; raised
3	NSAP				*500.000*	Subic is only landing site for MHL
4	NSAP	29.000	11.000	0.000	40.000	
	non-NSAP landing sites estimate				*50.000*	rough estimate
5	NSAP	1.560	0.780	0.000	2.340	
	non-NSAP landing sites estimate				*10.000*	
6	NSAP	94.000	174.000	0.000	268.000	
	non-NSAP landing sites estimate				*500.000*	
8	NSAP	6.000	2.000	0.000	8.000	
	non-NSAP landing sites estimate				*0.000*	no
11	*non-NSAP landing sites estimate*				*100.000*	Estimate based on NSAP data
12	*non-NSAP landing sites estimate*				*200.000*	rough estimate
ARMM	*non-NSAP landing sites estimate*				*10.000*	
		146.552	*199.175*	*0.000*	*1,715.727*	
		42%	58%	0%		
		727.288	988.439	0.000	1,715.727	

HANDLINE (large-fish)

NSAP + estimates for areas not covered by NSAP

Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	2.000	2.000	0.000	4.000	
	non-NSAP landing sites estimate					(included in hook-and-line)
3	NSAP	13.000	29.000	1.000	43.000	
	non-NSAP landing sites estimate	*13.000*	*6.000*	*0.000*	*19.000*	based on 2001 data
4	NSAP	11.000	579.000	25.000	615.000	Counted as Hook-and-line
	non-NSAP landing sites estimate				*600.000*	rough estimate to include potential other sites (e.g. Mindoro)
5	NSAP	16.000	54.000	0.000	70.000	
	non-NSAP landing sites estimate					(included in hook-and-line)
6	*non-NSAP landing sites estimate*				*0.000*	no large-fish target HANDLINE
8	NSAP	3.000	1.000	2.000	6.000	
	non-NSAP landing sites estimate	*0.000*	*0.000*	*0.000*	*0.000*	
11	NSAP					
	non-NSAP landing sites estimate				*1,000.000*	based on NSAP sampling sites and those sites not samp
12	NSAP		3,736.000	159.000	3,895.000	8 months
	Private landing wharfs				*1,947.500*	Additional 4 months
	....					
ARMM	*non-NSAP landing sites estimate*					
		58.000	*4,407.000*	*187.000*	*8,199.500*	
		1%	95%	4%		
		102.229	7,767.669	329.602	8,199.500	

TROLL						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	62.000	23.576	0.000	85.576	
	non-NSAP landing sites estimate	*3.022*	*4.160*	*0.000*	*7.182*	Raised - based on vessel inventory
3	*non-NSAP landing sites estimate*				0.000	No known troll activity
4	*non-NSAP landing sites estimate*				*50.000*	
5	NSAP	10.580	0.073	0.000	10.653	
	non-NSAP landing sites estimate					No known troll activity
6	*non-NSAP landing sites estimate*				*0.000*	No known troll activity
8	NSAP	46.122	24.399	3.100	73.621	
	non-NSAP landing sites estimate					No known troll activity
11	*non-NSAP landing sites estimate*				*100.000*	Estimate based on NSAP sites and considering other s
12	*non-NSAP landing sites estimate*				*0.000*	No known troll activity
	Private landing wharfs				*0.000*	
	....					
ARMM	*non-NSAP landing sites estimate*					No known troll activity
		121724	*52.208*	*3.100*	*327.032*	
		69%	29%	2%		
		224.861	96.445	5.726	327.032	

TUNA DRIFT LONGLINE

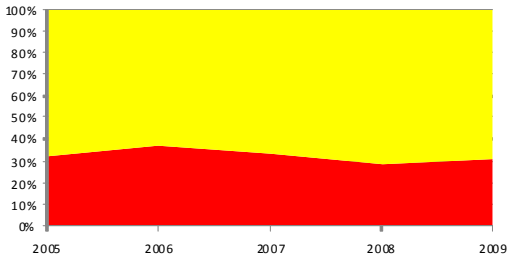
NSAP + estimates for areas not covered by NSAP

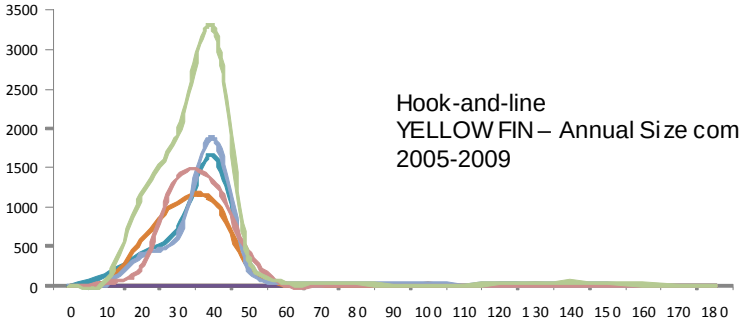
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	133.000	135.000	0.000	268.000	
	non-NSAP landing sites estimate	*12.720*	*1.200*	*0.000*	*13.920*	Raised - based on vessel inventory
3	*non-NSAP landing sites estimate*				*0.000*	No TDLL
4	*non-NSAP landing sites estimate*					No TDLL
5	*non-NSAP landing sites estimate*					No TDLL
6	*non-NSAP landing sites estimate*				*15.000*	based on 120 units using size no 18 (J) hook
8	*non-NSAP landing sites estimate*					No TDLL
11	*non-NSAP landing sites estimate*				*1.000*	based on 3 units
12	*non-NSAP landing sites estimate*				*0.000*	Yes - but no data - < 1 t.
ARMM	*non-NSAP landing sites estimate*				*0.000*	?
		145.720	*136.200*	*0.000*	*297.920*	
		52%	48%	0%		
		153.990	143.930	0.000	297.920	

APPENDIX 9 – Review of NSAP species composition and size data by region (major tuna gears only)

REGION 1 - LINGAYEN GULF

Hook-and-line
Species composition

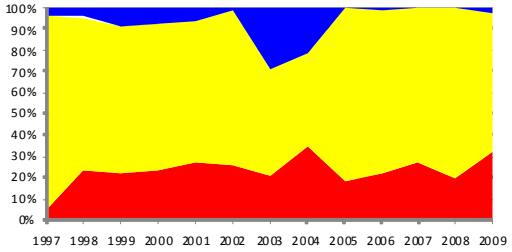


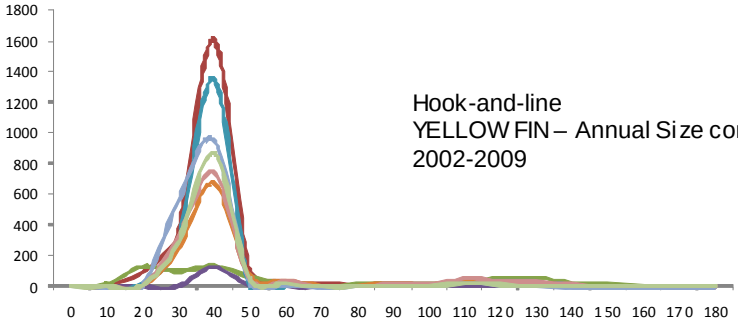


Hook-and-line
YELLOW FIN – Annual Size composition
2005-2009

REGION 3 - ZAMBALES

Hook-and-line
Species composition

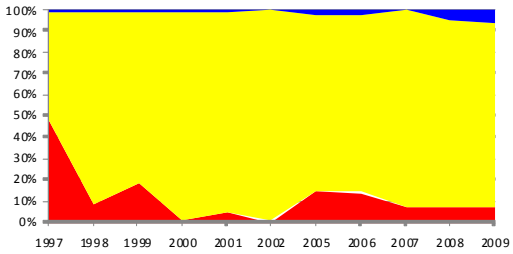


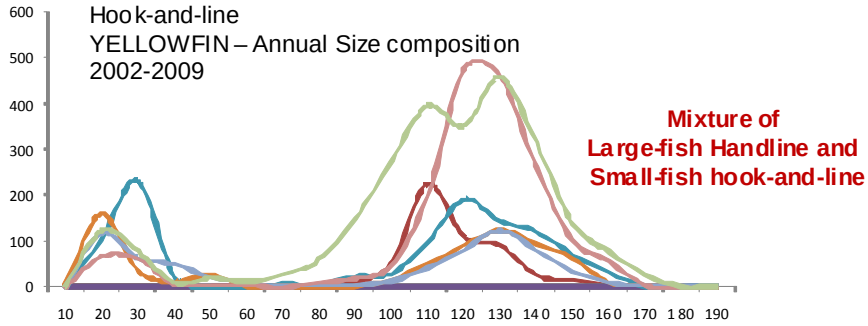


Hook-and-line
YELLOW FIN – Annual Size composition
2002-2009

REGION 4 – HONDA BAY

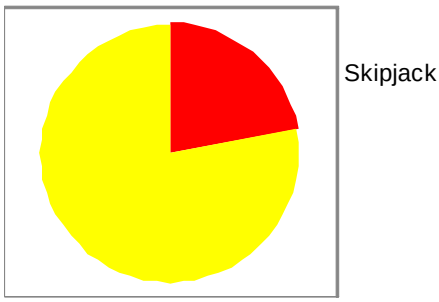
Hook-and-line
Species composition

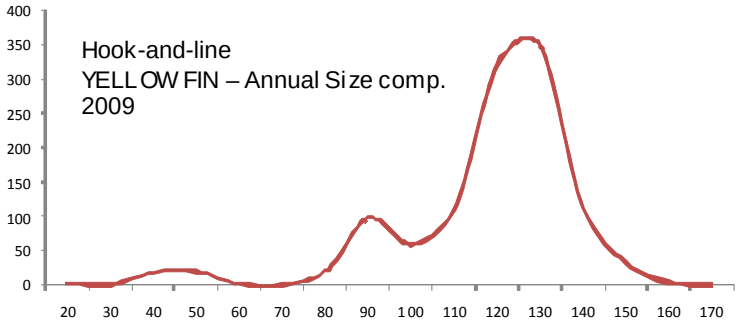




REGION 5 - BICOL

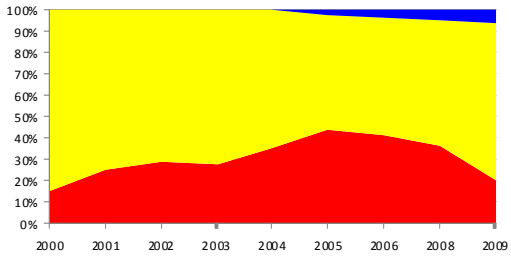
Hook-and-line
Species composition

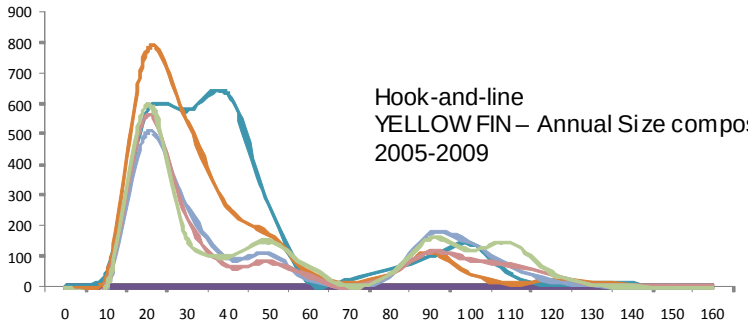




REGION 6 – Cuyo east pass

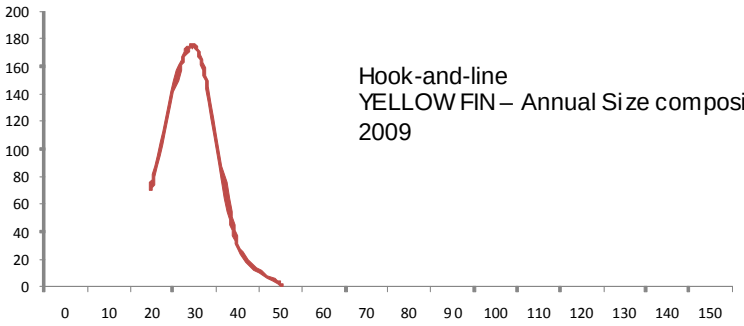
Hook-and-line
Species composition





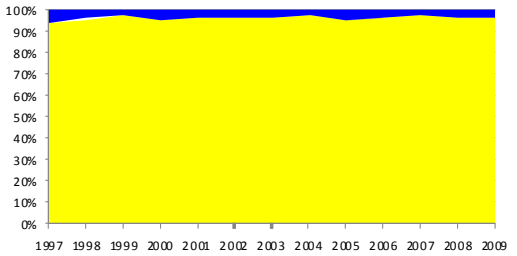
REGION 8 - SAMAR

Hook-and-line
Species composition



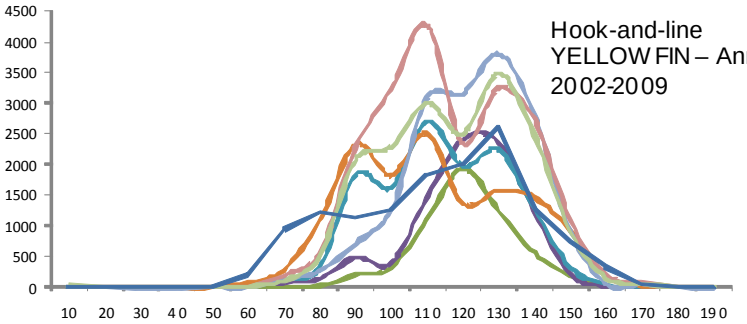
REGION 12 – GENERAL SANTOS CITY

Hook-and-line
Species composition



Bigeye

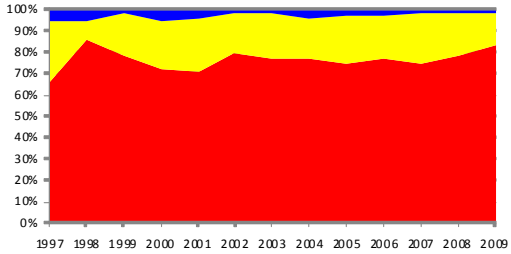
Yellowfin



Hook-and-line
YELLOW FIN – Annual Size comp.
2002-2009

REGION 12 – GENERAL SANTOS CITY

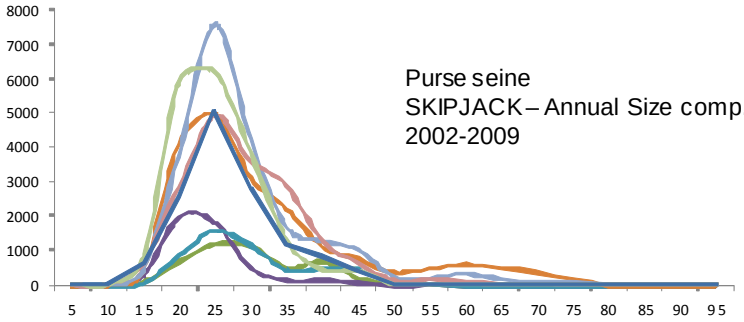
Purse seine
Species composition



Bigeye

Yellowfin

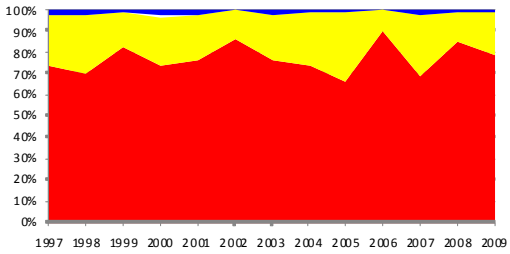
Skipjack



Purse seine
SKIPJACK – Annual Size comp.
2002-2009

REGION 12 – GENERAL SANTOS CITY

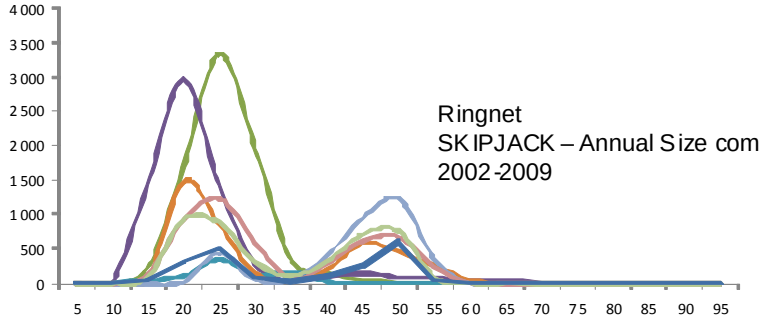
Ringnet
Species composition



Bigeye

Yellowfin

Skipjack



Ringnet
SKIPJACK – Annual Size comp.
2002-2009

APPENDIX 10. List of potential new NSAP landing centers

List of potential tuna landing centers where NSAP sampling should be established in the future (Regions 1, 5, 8, 11 and CARAGA)

Region	Landing center	Total tuna catch estimate (by Gear)	Comments
CARAGA	1. Tandag, Surigao del Sur 2. Cagwait, Surigao del Sur	Troll line = 4,559,618.40 kgs. Handline = 1,355,220 kgs.	Consolidated data from Tandag and Cagwait, Surigao del Sur, CY 1999-2002.
	3. Barobo, Surigao del Sur		No available data
5	Poblacion,Pioduran,Albay	20 50 10	The total production was 85 metric tons caught by the following fishing gears:RN,PS,DGN and HL
		Total= 85 metric tons	
	Mercedes Port, Camarines Norte	84 7	The total production was 91 metric tons of Yellow Fin Tuna and Skip Jack Tuna and the estimated number was 2-5 pcs per kilo
	Panganiban Port,Camarines Norte	84	The 84 metric tons of tuna caught by RN
		Total =175 metric tons	
	Pasacao, Port, Cam.Sur	50=RN 100=PS 20=DGN 10=HL	180 metric tons of tuna caught by: RN, PS, DGN and HL.
	Apad,Ragay,Cam.,Sur	20=RN 5=HL	The 25 metric tons of assorted tuna caught by RN and HL
	Poblacion,Balatan,Cam.Sur	50=PS 20=RN 5=HL 5=DGN	80 metric tons of assorted tuna caught by PS,RN,HL and DGN
		Total=285 metric tons	
	Province of Camarines Sur	10.07=BET 189.35=SKT 2048.53=YFT	Total production of assorted tuna in the Province of Camarines Sur.
		Grand total for Cam.Sur 2532.95 metric tons	The grand total came from the data of PFO Cam.Sur and BAS
8	Borongan	RN= 5400 Hl= 2600 HL=2600	Non-NSAP Trend shows that 64% of tuna production is landed in Borongan
	Llorente	HL=350 Hl= 200	Non-NSAP
	Maydolong	HL = 100 Hl= 80	Non-NSAP
	Guiuan	HL=340 Hl=200 RN=540	NSAP 209 HL/Hl units x 270 fishing days x 10 kg catch/day = 564.3 3 units ring netters; approximately catch ration of RN:HL/Hl = 1:100
	Oras	HL=100 Hl=70	Non-NSAP
	Sulat	HL=100	Non-NSAP
	Tacloban		Where commercial fishing boats from other regions land
	Tanauan	RN=50	NSAP
	Abuyog	RN=75	NSAP
	Maasin	HL= 100	Non-NSAP

Region	Landing center	Total tuna catch estimate (by Gear)	Comments
	Sogod	HL=100	Non-NSAP
	Liloan	HL=100	Non-NSAP
11	Don Marcelino	1000 MT	This might be underestimated (Hand line). This is a major landing center
	Digos, Davao del Sur	1000 Mt	Tuna drift gill net could be found and hand liners
	Jose Abad Santos	1000 Mt	Also a major landing center for Tuna
	Jamboree,Dvo. Or.	1000MT	Major landing center for Tuna
	Gov. Generoso,Dvo.Or	1000Mt	Major landing center for Tuna
	Baganga, Dvo. Or	1000 Mt	Facing Pacific Ocean and tuna major landing Center
	Cateel, Dvo. Or	1000 Mt	Facing Pacific Ocean and Tuna major landing center
	Babak, Samal	1000 Mt	Tuna Long line fishing gear /Troll line with 54.1 Gross tonnage fishing vessels and fishing in the pacific ocean
1	Arosan, Bolinao, Pangasinan	HL = 514,732.80 MHL = 281,752.32	441 boats (438HL, 414MHL) * Annual catch estimate
	Agno, Pangasinan	HL = 495,808.80 kgs MHL = 288,355.89 kgs	423 boats (423HL, 423MHL) * annual catch Estimate
	San Fabian, Pangasinan	Gill net =	160 boats (160 Gillnets) * annual Catch estimate
	Luna, La Union	HL = 8,001 kgs	170 boats (104HL, 34BS) * annual Catch estimate
	Bacnotan, La Union	HL = 61,818 kgs BSGN = 40 kgs	183 boats (79HL, 13SGN, 72BSGN) * annual Catch estimate
	San Esteban, Ilocos Sur	HL = 204,379.2 kgs MHL = 22,011.90 kgs BSGN = 40.0 kgs	280 boats (192HL, 1MHL, 120BSGN) * annual Catch estimate
	Pasuquin, Ilocos Norte	HL = 90,835.2 kgs MHL = 55,029.75 kgs TL = 35,020.53 kgs	283 boats (102HL, 105MHL, 176TL, 136MTL) * annual Catch estimate

List of potential tuna landing centers where NSAP sampling should be established in the future (Region 3)

Region	Province	Fishing Ground	Landing Center	Fishing Gear	Species	Tuna catch estimate (kg)	Comments
3	Aurora	Baler Bay	Sabang	Hook and line	*Coryphaena hippurus*	346	tuna unraised catch production based on NSAP Sampling of BFAR 4A in in Aurora Province from July 2001 to June 2002
					Elagatis bipinnulata	168	
					Katsuwonus pelamis	954	
					Thunnus albacares	3085	
					Thunnus macoyii	160	
					Thunnus obesus	60	
				Gillnet	*Katsuwonus pelamis*	4	
					Ratrilleger brachysoma	23	
				Multiple Hook and Line	*Katsuwonus pelamis*	254	
					Rastrelliger brachysoma	6	
					Scomberomorous commerson	5	
				Troll Line	*Coryphaena hippurus*	235	
					Auxis thazard	302	
					Elagatis bipinnulata	62	
					Euthynnus affinis	190	
					Katsuwonus pelamis	11480	
					Scomberomorous commerson	46	
					Thunnus albacares	74	
					Thunnus obesus	10	
					Thunnus tonggol	32	
				Long Line	*Coryphaena hippurus*	13319	
					Istiophorus platypterus	179	
					Elagatis bipinnulata	872	
					Euthynnus affinis	9	
					Katsuwonus pelamis	1669	
					Scomberomorous commerson	64	

Region	Province	Fishing Ground	Landing Center	Fishing Gear	Species	Tuna catch estimate (kg)	Comments
					Thunnus albacares	712	
					Cephalopholis miniata	2	
				Floater	*Katsuwonus pelamis*	105	
					Scomberomorous commerson	146	
			Castillo	Hook and Line	*Coryphaena hippurus*	518	
					Istiophorus platypterus	152	
					Elagatis bipinnulata	16	
					Euthynnus affinis	35	
					Katsuwonus pelamis	2073	
					Scomberomorus commerson	2085	
					Scomberomorus guttatus	12	
					Thunnus albacares	11550	
					Thunus obesus	579	
					Xiphias gladius	327	
				Multiple Hook and Line	*Elagatis bipinnulata*	2	
					Katsuwonus pelamis	208	
				Long Line	*Coryphaena hippurus*	44774	
					Istiophorus platypterus	838	
					Elagatis bipinnulata	823	
					Euthynnus affinis	30	
					Katsuwonus pelamis	6910	
					Scomberomorous guttatus	19	
					Thunnus albacares	6061	
					Thunnus obesus	300	
					Xiphias gladius	333	
				Ringnet	*Decapterus akaadsi*	2100	
					Decapterus macrosoma	1100	
					Katsuwonus pelamis	10650	
					Thunnus albacares	2820	
					Thunnus obesus	200	

Region	Province	Fishing Ground	Landing Center	Fishing Gear	Species	Tuna catch estimate (kg)	Comments
				Troll Line	*Katsuwonus pelamis*	35	
				Floater	*Katsuwonus pelamis*	250	
		Dipaculao Coastline	Dinadiawan	Hook and Line	*Coryphaena hippurus*	22	
					Istiophorus platypterus	308	
					Elagatis bipinnulata	9	
					Euthynnus affinis	2	
					Scomberomorous commerson	76	
					Thunnus albacares	32	
				Multiple Hook and Line	*Euthynnus affinis*	1	
					Gymnosarda unicolor	1	
					Scomberomorous commerson	29	
					Thunnus albacares	11	
				Long Line	*Scomberomorous commerson*	14	
					Thunnus albacares	13	
		Casiguran Sound	Esteves	Hook and Line	*Coryphaena hippurus*	234	
					Istiophorus platypterus	31	
					Elagatis bipinnulata	134	
					Euthynnus affinis	1104	
					Katsuwonus pelamis	4512	
					Scomberomorous guttatus	256	
					Thunnus albacares	2814	
				Gillnet / Largarete	*Coryphaena hippurus*	8	
					Elagatis bipinnulata	6	
					Euthynnus affinis	545	
					Katsuwonus pelamis	206	
					Scomber australasicus	88	
					Scomberomorous guttatus	84	
					Thunnus albacares	51	
				Gillnet /	*Coryphaena hippurus*	105	

Region	Province	Fishing Ground	Landing Center	Fishing Gear	Species	Tuna catch estimate (kg)	Comments
				Floater	*Istiophorus platypterus*	2077	
					Euthynnus affinis	32	
					Katsuwonus pelamis	465	
					Scomberomorous guttatus	14	
					Scomberomorous commerson	14	
					Thunnus albacares	87	
			Dibacong	Multiple Hook and Line	*Abalistes stellatus*	9	
					Leiognathus smithursti	1	
		Dingalan Bay	Paltic	Hook and Line	*Istiophorus platypterus*	672	
					Elagatis bipinnulata	926	
					Euthynnus affinis	882	
					Katsuwonus pelamis	5665	
					Scomberomorous commerson	46	
					Thunnus albacares	9931	
					Thunnus tonggol	987	
					Thunnus obesus	2540	
					Xiphias gladius	28	
				Gillnet	*Euthynnus affinis*	136	
					Rastrelliger brachysoma	20	
					Rastrelliger kanagurta	147	
				Ringnet	*Auxis rochei*	160	
					Elagatis bipinnulata	4401	
					Katsuwonus pelamis	819	
					Thunnus obesus	30	
			Aplaya	Hook and Line	*Coryphaena hippurus*	44337	
					Makaira mazara	296	
					Elagatis bipinnulata	1979	
					Euthynnus affinis	91	
					Katsuwonus pelamis	6255	
					Rastrelliger brachysoma	5	
					Scomberomorous commerson	70	

Region	Province	Fishing Ground	Landing Center	Fishing Gear	Species	Tuna catch estimate (kg)	Comments
					Thunnus albacares	4920	
					Thunnus obesus	4106	
					Thunnus tonggol	772	
					Xiphias gladius	92	
				Gillnet	*Euthynnus affinis*	13	
					Katsuwonus pelamis	25	
					Rastrelliger brachysoma	101	
					Rastrelliger faughni	19	
					Rastrelliger kanagurta	115	
					Scomber australasicus	9	
					Scomberomorous commerson	22	
					Thunnus obesus	46	
				Ringnet	*Elagatis bipinnulata*	228	
					Katsuwonus pelamis	1975	
					Thunnus obesus	67	