

REPORT OF THE SECOND WPEA – PHILIPPINES NSAP TUNA DATA REVIEW WORKSHOP

12-13 May 2011
Eurotel Hotel Meeting Room
Manila, Philippines



Western and Central Pacific Fisheries Commission
Pohnpei, Federated States of Micronesia
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1. INTRODUCTION

The Western and Central Pacific Fisheries Commission (WCPFC) has been involved in supporting tuna fishery data collection in the Philippines since 2006, initially through the Indonesia and Philippines Data Collection Project (IPDCP) and more recently through the **West Pacific East Asia Oceanic Fisheries Management (WPEA OFM)** project (funded by the Global Environment Facility - GEF), which began in 2010 (see <http://www.wcpfc.int/doc/2009/wpea-ofm-project-document>). The activities to be carried out under the WPEA 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 for use in WCPFC scientific work presents a challenging task. The catch, effort and size data collected at landing centers collected in the Philippines through the BFAR National Stock Assessment Project (NSAP) provide fundamental information for tuna stock assessments and therefore, ensuring the appropriate quality and coverage of these data through the annual tuna data review workshop is a key activity of the WPEA OFM project.

The breakdown of species catch estimates by gear type for the Philippines domestic fisheries has been one of the most significant gaps in the provision of data to the WCPFC, and the annual tuna data review workshop also serves to produce tuna catch estimates that are subsequently used in the annual Philippines tuna catch estimates workshop.

The opening address by the Interim Executive Director of BFAR/NFRDI, Melchor Tayamen, noted the following:

- Regional offices are the front-line for monitoring the fishery and the data they collect are fundamental to the Philippines and the WCPFC;
- The workshop is important for providing an opportunity for the WCPFC to review the NSAP data used for regional tuna stock assessments; specifically, to identify any problems with NSAP data collection, and thereby improve quality of data collected;
- The workshop would provide an opportunity for reviewing progress on recommendations from the first workshop
- These annual workshops provide an opportunity to compile important species composition and catch estimates at the Philippines region level as input into the Annual catch estimates workshop;
- Given the importance of the NSAP data, ensuring that NSAP is a long-term, permanent activity is an important goal of the Philippines and the WCPFC.

2. REVIEW OF PROGRESS ON RECOMMENDATIONS FROM THE FIRST WORKSHOP

The Workshop briefly reviewed each of the recommendations from the First Workshop and noted the current status, in particular, which recommendations would be covered by specific agenda items in this second workshop. **APPENDIX 3** provides a summary of the current status of progress on dealing with the recommendations from the First Workshop.

3. NSAP PORT SAMPLING DATA REVIEW

The main focus of these workshops is to (i) review NSAP port sampling data collected in each region and (ii) compile data to use 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 8** 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 and current issues with Philippines tuna data, covering the following areas:

- Data-reporting obligations to the WCPFC
 - Why Collect data ?
 - WCPFC Scientific data submission deadline
 - Why NSAP data is so important to the WCPFC
- Current issues with Philippines domestic tuna data
 - General – Annual catch estimates
 - Philippines Bigeye tuna catch estimate...
 - An important regional issue - uncertainty of BIGEYE TUNA CATCH
 - Differences in catch composition (species and size)
 - Results from recent SPC analyses on NSAP data
 - Distinction between “Baby” purse seine, ringnet and large purse seine
 - Distinction between ‘large-fish’ Handline and ‘small-fish’ Hook-and-line fisheries
 - Accounting of all large-fish Handline catches
 - Catch estimates from non-NSAP landing centers

The purpose of this introductory session was to inform participants of their role and the importance in providing (the NSAP) data to the WCPFC.

One of the most important developments over recent months was the result of a GLM analysis conducted by SPC which determined which variables (REGION, YEAR, MONTH, GEAR, FISHING GROUND, SET TYPE) in the NSAP data had the most effect on size of fish caught. The results showed the dominant effect on length varied by species. Gear had the strongest effect for Yellowfin and bigeye tuna, but this was expected since some gears target adult tuna while other gears are selective for juvenile tuna. Clearly, BROAD AREA (i.e. from Fishing Ground) has a significant effect on the size of SKJ and YFT, slightly less for BET. With this result in mind, the data used for stock assessments will need to be separated to account for the effects that area has on the size data in the future.

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

Recent (2010) data collected from the NSAP in each region data were presented. 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 8** 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 9**). The following are some of the interesting points noted in these presentations:

- There were reports of catch reduction in 2010 in several NSAP monitored landing sites. The drop in catches in Region 1 (Lingayen Gulf) for 2010 was understood to be due to less activity, while the drop in catch (26%) in Region 5 (Lagonoy Gulf) was due to abnormally adverse weather conditions throughout the year. Catches in some other regions increased, with at least one region indicating that increased coverage, due to the establishment of new NSAP monitored landing sites, had improved catch estimates.
- The processing plant based in Puerto Princessa City (Region 4b-Palawan), Citra Mina, closed down recently and this will have no doubt have a negative effect on the large-fish handline landings there, and may result in more activity for this type of gear in the Mindoro landing sites. Catch statistics from the WWF project were provided for the large-fish handline landings from one landing center in Mindoro, which amounted to 162 t., although it is not known whether coverage is complete or not. Based on available information, there were approximately 50 vessels active based out of the two main Mindoro landing sites during 2010. NSAP monitoring of the Mindoro landing sites was identified as a top priority task. An independent estimate using vessel numbers and average catch estimates about 7,000 t taken from the handline (and hook-and-line?) fishery in Mindoro and adjacent areas.
- The first workshop (in May 2010) highlighted the relatively high catches of Albacore tuna from the handline fishery in Lagonoy Gulf (Region 5) in Sept-November 2009 and that seasonal catches of Albacore tuna have been taken in this area and season in other years. Interestingly, there were high catches taken during a different month during 2010, but no apparent explanation as to why this occurred. It was also interesting to note the relatively lower bigeye tuna catches in Lagonoy Gulf compared to other regions, perhaps due to the particular oceanographic and bathymetric features of this area.
- There is potentially several sites in Region 5 on the Pacific Ocean coast where tuna are landed but are not yet covered by NSAP sampling. Further information is required. (see Appendix 11)
- A large % of bigeye tuna (9% and 8%) was reported in Region 3 for 2009 in the hook-and-line and ringnet fisheries (9% and 8%, respectively) according to the NSAP data and further information is required before accepting this species composition. There was also some relatively higher catches of bigeye reported for some months in other regions but was accepted as legitimate on closer review of the data.
- The Region 9 report noted that the Miramar Cannery in Zamboanga had closed.
- The data review by WCPFC/SPC identified a serious problem in Handline data collected at GSC during 2010 and BFAR Regional Office 12 and BFAR/NFRDI indicated they would follow-up as a matter of urgency.

2.3 *Review of the consolidated NSAP data*

A comprehensive description of the consolidated region's data compiled by the central NFRDI/BFAR office in Manila was provided. The presentation looked in detailed at the catch and size composition by GEAR and species for each region and provided a very useful comparison between of the catch composition and volume, and differences in size composition amongst all regions.

The WCPFC representative acknowledged the usefulness of the information presented by the regional offices, but in particular, the BFAR/NFRDI presentation which consolidated all of the regions data and formed the basis for the estimates compiled for each GEAR (see **APPENDIX 9**).

2.4 *Review of NSAP Tuna size data*

A presentation providing a review of the NSAP size data by region was provided. This presentation was structured to provide a basic review of the quality and coverage of the 2010 NSAP data in order to identify any potential inconsistencies/problems in the data. The presentation covered the following areas :

- National NSAP Tuna Samples by GEAR and SPECIES – Coverage
- Species and Size composition by REGION and GEAR
 - Large-fish Handline
 - Small-fish Hook-and-line
 - Purse seine
 - Ringnet

An excerpt of the review is contained in **Appendix 10**.

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 4). One important issue was the significant problem noted in the General Santos City Handline size data that were collected during 2010. The BFAR Regional Office 12 and BFAR/NFRDI were urged to look into this matter as soon as possible to rectify the problems.

It was noted that the WCPFC/SPC would enhance the NSAP database to facilitate the distinction in the data between (i) the “baby” purse seine and “large” purse seine vessels, and (ii) large-fish handline and (ii) “small-fish” hook-and-line, based on the criteria that have been established over the past year. This means that regional offices do not need to make the distinction at the data collection level at this stage, but that future NSAP Database reports would facilitate how data should be collected in the future.

3. **OTHER MATTERS**

The workshop briefly reviewed the status of the NSAP database system and it was noted that there was some remedial work to be undertaken on the NSAP Database in the days following the two workshops. Unfortunately, SPC Database developers do not have the time available to undertake the redevelopment of certain parts of the NSAP Database System and so it was recommended that BFAR/NFRDI and WCPFC consider seeking funds for a consultant to undertake this work under the guidance of SPC database development staff. In the meantime, WCPFC/SPC will endeavour to update the NSAP database system to cover the requirements for WCPFC and requests from BFAR/NFRDI and Regional BFAR offices.

The WCPFC representative also noted that progress on 'audit' resource material had only recently been commenced and the available material would be presented at next year's workshop.

4. CATCH ESTIMATES DERIVED FROM NSAP AND NON-NSAP SITES

The workshop participants reviewed the consolidated catch estimates for each GEAR, broken down by REGION and SPECIES, but with most of the time spent considering the estimates of tuna catch by gear for landing centers in each region that were not covered by NSAP. 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. Tuna catch estimates for each region and gear for the non-NSAP sites were compiled from discussions and are contained in **APPENDIX 9**, which also contain the estimates for the NSAP-monitored landing sites.

5. RECOMMENDATIONS AND WORKSHOP CLOSE

The workshop participants reviewed and agreed on a list of seven recommendations based on discussions made during the two days (see **APPENDIX 4**). All participants agreed to action the recommendations relevant to their organisation/region over the coming year.

The most important recommendation related to NSAP over the longer term was ensuring that NSAP continues as a long-term, permanent activity since it provides fundamental scientific data not available elsewhere, and a major part of the Philippines annual data submission obligation as a member of the WCPFC.

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 2012 (see **APPENDIX 11**).

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 2012.

The representative from 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

SECOND WPEA – NSAP Tuna Data Review Workshop

Eurotel Hotel Meeting Room, Quezon City

12 - 13 May 2011

9AM – 5 PM

- 1. Registration**
- 2. Welcome Message**
- 3. Introduction of Participants**
- 4. Rationale for the Workshop**
- 5. Review of recommendations from First WPEA-NSAP Tuna data review workshop**
- 6. NSAP Port Sampling Data Review**
 - 6.1. WCPFC Requirements for data
 - 6.2. Tuna Catch Estimates by Species and Gear Type for each NSAP region
 - 6.3. Review of consolidated NSAP Regional data
 - 6.4. Review of NSAP Tuna Size and species composition data
- 7. Review of Catch Estimates derived from NSAP and non-NSAP sites**
- 8. Recommendations**
- 9. Workshop Close**

APPENDIX 2 – LIST OF PARTICIPANTS

- | | |
|---|-----------------------------------|
| 1. Asst. Director Rosario Segundina Gaerlan | – NSAP Project Leader, Region 1 |
| 2. Francis Buccat | – Asst. Project Leader , Region 1 |
| 3. Ronald Bathan | – NSAP Project Leader, Region 3 |
| 4. Virgilio Abueg, Jr. | – NSAP Project Staff, Region 3 |
| 5. Maribeth Ramos | – NSAP Project Leader, Region 4A |
| 6. Esmeralda Mendoza | – Asst. Project Leader, Region 4A |
| 7. Myrna Candelario | – NSAP Project Leader, Region 4B |
| 8. Rachel Ann Delfin | – NSAP Project Staff, Region 4B |
| 9. Cirila Perez | – OIC, ETD, Region 4B |
| 10. Virginia Olano | – NSAP Project Leader, Region 5 |
| 11. Eddie Libardo, Jr. | – NSAP Project Staff, Region 5 |
| 12. May Guanco | – NSAP Project Leader ,Region 6 |
| 13. Sheryll Mesa | – Asst. Project Leader, Region 6 |
| 14. Lea Tumabiene | – NSAP Project Leader , Region 8 |
| 15. Elmer Bautista | – NSAP Project Staff, Region 8 |
| 16. Hamilton Ballovar | – NSAP Project Staff, Region 9 |
| 17. Francis Jave – Canillo | – NSAP Project Staff, Region 11 |
| 18. Asst. Director Ambutong Pautong | – NSAP Project Leader , Region 12 |
| 19. Laila Emperua | – Asst. Project Leader, Region 12 |
| 20. Macmod Mamalangkap | – NSAP Project Leader , ARMM |
| 21. Sammy Ayub | – NSAP Project Staff, ARMM |
| 22. Asst. Director Mike Baay | – NSAP Project Leader ,CARAGA |
| 23. Joyce Baclayo | – Asst. Project Leader, CARAGA |
| 24. Interim Exec. Director | – Melchor Tayamen – NFRDI |
| 25. Elaine Garvilles | – NFRDI |
| 26. Suzette Barcoma | – NFRDI |
| 27. Eunice Bognot | – NFRDI |
| 28. Francisco Torres, Jr. | – NFRDI |
| 29. Desiderio Ayanan | – NFRDI |
| 30. April Pagtanac | –NFRDI |
| 31. May Matucad | – NFRDI |
| 32. Peter Williams | – WCPFC/SPC |

APPENDIX 3 – REVIEW OF PROGRESS ON RECOMMENDATIONS FROM FIRST WORKSHOP

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 \(in the First Workshop Report\)](#).

CURRENT STATUS: *Under Agenda Item 6.2 of the Second Workshop, each Regional office presented their tuna fishery report, according to the template provided in the first workshop.*

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 \(in the First Workshop Report\)](#). **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.

CURRENT STATUS: *Some new NSAP landing sites have been established in the past year, but there are potentially more to cover, if funding was available. Mindoro was highlighted as a priority area for consideration. This recommendation was carried over in this workshop's recommendations.*

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

CURRENT STATUS: *Some of the issues were investigated and resolved and those issues that have yet to be investigated or resolved have been carried over in this workshop's recommendations.*

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 \(in the First Workshop Report\)](#).

CURRENT STATUS: *There was only minor progress in this area over the past year and a new approach to resolving this problem has been suggested in a new recommendation from the Second Workshop.*

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.

CURRENT STATUS: No progress in this area. However, a new position (FISHERIES DATA AUDIT OFFICER) started at SPC this year and his job will involve producing resource material to review various types of tuna fishery data. It is hoped this material will be made available to the Philippines in the future, for example, the concept of VMS/Logsheet reconciliation reports will be presented next year.

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.

CURRENT STATUS: Some progress in this area with several requests satisfied. There was an expectation that most of the outstanding work would be undertaken in in the week after the Second workshop (see APPENDIX 4).

APPENDIX 4 – RECOMMENDATIONS FROM SECOND WPEA/NSAP Tuna Data Review Workshop

RECOMMENDATIONS

1. The NSAP data provides fundamental scientific data not available elsewhere, and a major part of the Philippines annual data submission obligation as a member of the WCPFC. Recognising that NSAP data are critical to producing Philippines annual catch estimates by GEAR and SPECIES, and as input to the WCPFC stock assessments (according to the reporting obligations of WCPFC member countries), the WCPFC representative urged BFAR to investigate avenues to ensure the long-term, permanent funding for NSAP sampling. The minimum target level of sampling data to be collected was proposed and is listed in [APPENDIX 5](#).
2. The Workshop recommended that **BFAR/NFRDI** and **WCPFC** consider seeking funds for a database development consultancy to redevelop certain aspects of the NSAP database. In the meantime, **WCPFC/SPC** will endeavour to update the NSAP database system to cover the requirements for WCPFC and requests from BFAR/NFRDI and Regional BFAR offices:
 - a. Support the separation of “baby” purse seine, large purse-seine in the catch/effort and length data
 - b. Facilitate the separation of small-fish hook-and-line and large-fish handline in the catch/effort and length
 - c. Implement the data entry of weight data and produce relevant reports summarising weight data
 - d. Enhance the FISAT reports to cater for the extraction of length frequency data for more than one GEAR
3. The workshop recommended that BFAR/NFRDI, with assistance from WCPFC/SPC, produce a map showing fishing grounds that will help enumerators get precise information from the fishing vessels they sample
4. The First Workshop identified important tuna landing centers not currently covered by NSAP that should be considered for establishing NSAP sampling and this Second Workshop refined this list. The latest list of potential landing centers by region is provided in [APPENDIX 11](#).
 - a. **BFAR/NFRDI** will endeavour to establish sampling in the most important outstanding area, which is considered to be monitoring the large-fish Handline landings in Mindoro.
 - b. **Regional BFAR offices** will continue to update estimates of total tuna (SKJ/YFT/BET) landings for those non-NSAP sites to use as justification for expanded sampling to these landing centers.
 - c. **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.
5. The **WCPFC/SPC** and **BFAR/NFRDI** will distribute the tables for annual catch estimates by GEAR and REGION to each region one month prior to the 2012 NSAP Data review workshop so **Regional BFAR offices** can prepare the tuna species estimates for the non-NSAP landing sites in their region (the tables are provided in [APPENDIX 10](#)).
6. **BFAR/NFRDI and respective BFAR Regional offices** (with assistance from **WCPFC/SPC**) will investigate potential issues identified in the NSAP data for 2010. In particular, **BFAR Regional Office 12** and

BFAR/NFRDI will investigate and rectify the problems identified in the General Santos City (GSC) HANDLINE size data collected during 2010.

7. The First Workshop acknowledged the usefulness of the fishery data audit process (e.g. workbooks) as a tool for improving the quality of fishery data. The Second 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.

APPENDIX 5 – Target estimates for national tuna size and species composition sampling

GEAR	Number of fish to sample			
	TOTAL TUNA	SKIPJACK	YELLOWFIN	BIGEYE
Large-fish Handline	26,000	0	24,000	2,000
Small-fish Hook-and-line	38,000	12,000	24,000	2,000
Ringnet	16,500	12,000	4,000	500
Purse seine	26,000	18,000	7,000	1,000
Each of the other Gears	14,000	6,000	6,000	2,000

Notes

These target estimates should ideally represent the minimum level of sampling required for regional stock assessments. They should be considered as a guide to setting sampling target levels at the NSAP Region level and they will be continually reviewed and enhanced in the future, particularly with respect to available resources.

APPENDIX 6 – Map of Fishing Grounds to be used by NSAP Enumerators

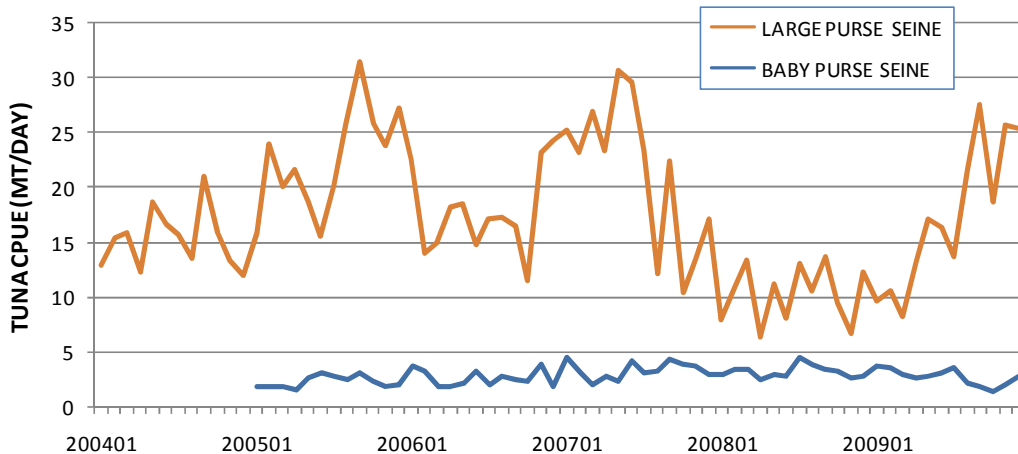
APPENDIX 7 – Notes on the separation of “Baby” purse seine and large purse seine

Introduction

Review of the available Philippines tuna fishery data have shown that the differences in the fishing operations of the traditional “Baby” purse seine and large purse seine components of the Philippines domestically-based fishery that are reflected in the level of catch that each of these types of vessel take (e.g. refer to the Report of the Third Philippines Annual Catch estimates Workshop). The following sections provide data summaries that highlight these differences and suggest an approach for separating the data for these two categories of purse seine vessel for use in stock assessments.

Differences in Catch rates

Figure A7.1 shows the difference in catch rates between what are listed as traditional (“baby”) purse seine vessels and larger purse seine vessels in the available logsheet data. Based on these data, there is a clear separation with monthly CPUE for the traditional “baby” purse seine vessels always below 5t/day and the monthly level for the ‘larger’ vessels generally above 10t/day.



A7.1 Monthly trends in Tuna CPUE by “baby” purse seine and Large purse seine vessels, based on logsheet data, 2004-2009

Figures A7.2 and A7.3 below attempt to show the differences in these categories of purse seine fleet in the NSAP data but also show how “baby” purse seine is more aligned to the ringnet fleet, at least on the basis of catch rates.

An arbitrary line at 10t/day has been added to Figure A7.2 to indicate where a vessel could be assigned as either a “baby” purse-seine or a “large” purse seine vessel. Further information on vessel characteristics is expected to be provided by BFAR Licensing which will confirm and enhance the assignment of these categories in the NSAP data.

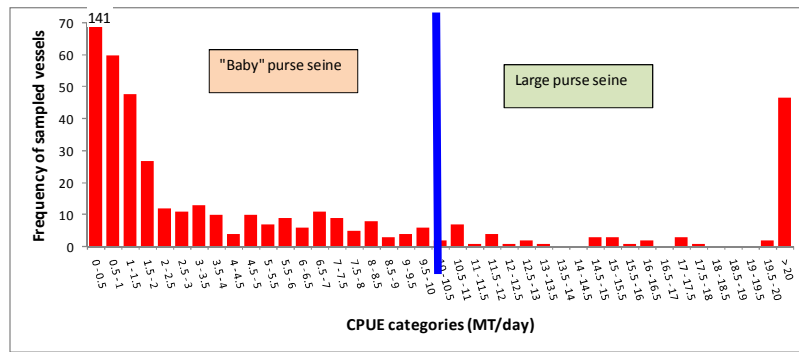


Figure A7.2 Frequency of average CPUE by individual PURSE SEINE vessels sampled during NSAP, 1997-2010

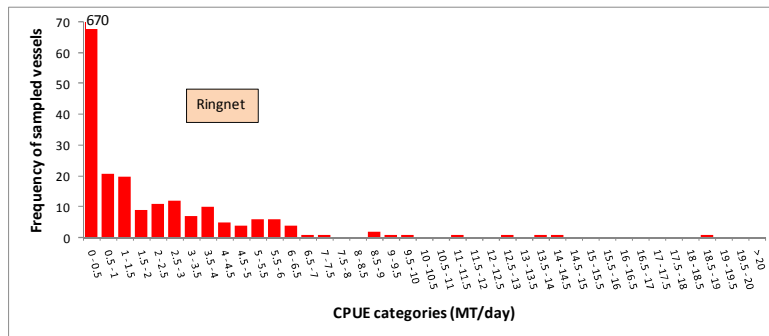


Figure A7.3 Frequency of average CPUE by individual RINGNET vessels sampled during NSAP, 1997-2010

Differences in Areas fished

Figure A7.4 shows the distribution of effort for the domestically based Philippines purse seine fleet, based on available logsheets, with broad areas arbitrarily assigned to represent “inshore” and “offshore” fisheries.

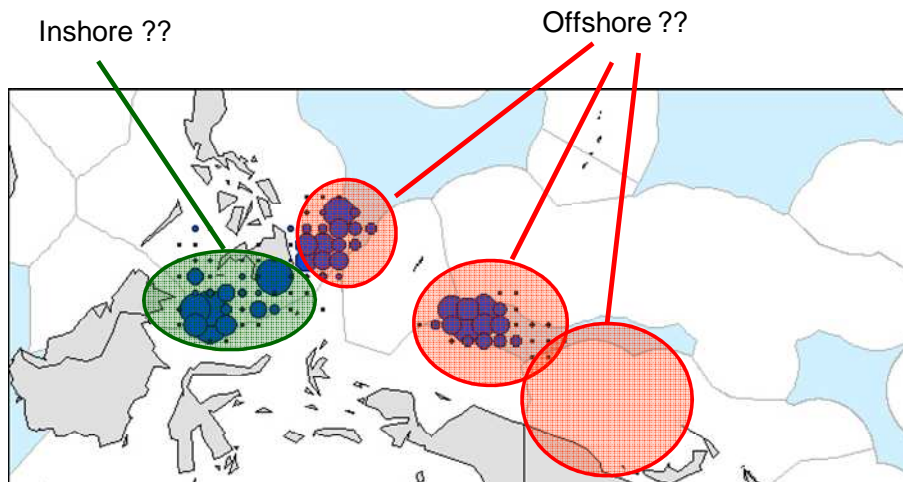


Figure A7.4 Distribution of effort by purse seine vessels based in the Philippines, showing the broad areas assigned for consideration in separating the catch and size data. (Source logsheet data)

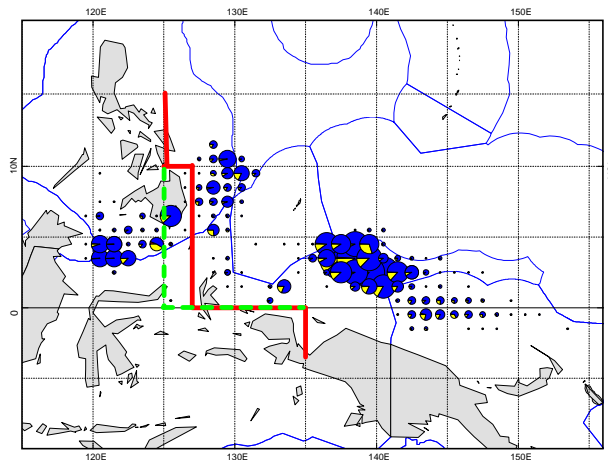


Figure A7.4(b) Suggested boundaries to use to distinguish data collection for the offshore ('oceanic') area and the inshore (archipelagic) area. Red line is at 1°x1° resolution; dashed green-line at 5°x5° resolution

Differences in Size of tuna by Area

Figures A7.5, A7.6 and A7.7 show the size frequencies for skipjack, yellowfin and bigeye tuna taken from "baby" purse seine and "large" purse seine, for all areas, and by broad areas (i.e. inshore and offshore). The broad areas correspond to those shown in Figure A7.4 based on the fishing grounds recorded in the NSAP data. The key observation from these data is that the size composition is more dependent on area than by category of purse seine vessel, which doesn't appear to show significant differences. Also, it is important to note that the number of samples in the inshore area 'overwhelms' the number of samples for the offshore area, but that the overall catch may be distributed between these two broad areas differently.

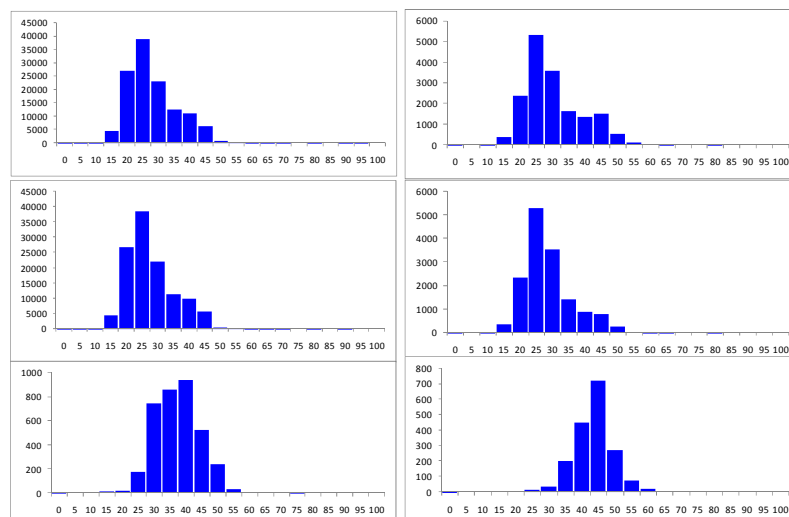


Figure A7.5 Skipjack size frequency from "baby" purse seine (left) and "large" purse seine (right), from NSAP data, 1997-2010.

(Top – All areas; middle – Inshore areas; bottom – Offshore areas)

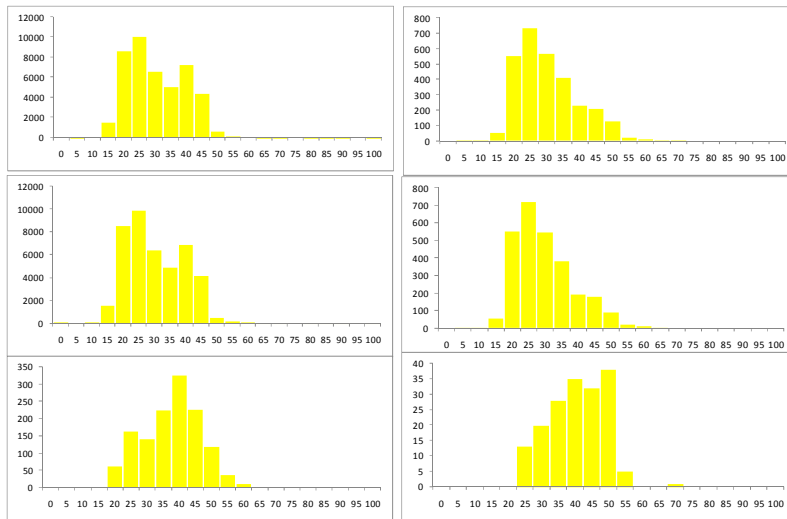


Figure A7.6 Skipjack size frequency from “baby” purse seine (left) and “large” purse seine (right), from NSAP data, 1997-2010.

(Top – All areas; middle – Inshore areas; bottom – Offshore areas)

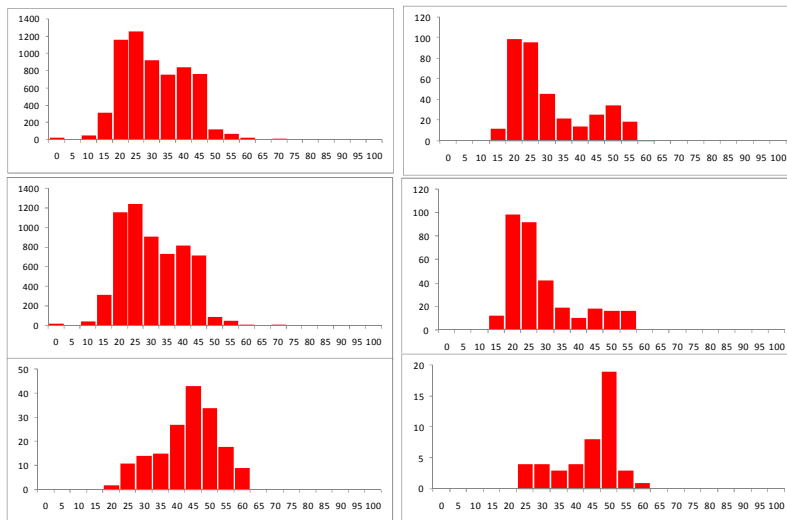


Figure A7.7 Skipjack size frequency from “baby” purse seine (left) and “large” purse seine (right), from NSAP data, 1997-2010.

(Top – All areas; middle – Inshore areas; bottom – Offshore areas)

Proposed changes to data used in stock assessments

- Separate the annual catch estimates, aggregated catch/effort data and size data for “baby” purse seine and large purse seine vessels on the basis that catch rates for these two categories are different. However, there does not appear to be a reason for this separation based the size composition of the catch by these two categories over broad areas (i.e. inshore and offshore).
- Split the aggregated catch/effort data for both “baby” purse seine and large purse seine vessels into what is understood to be the level of catch for (i) INSHORE and (ii) OFFSHORE areas.

- Allocate the Size data for both “baby” purse seine and large purse seine vessels into what is understood to be (i) the INSHORE and (ii) OFFSHORE areas.
- Consider that the Philippine purse seine vessels fishing in the OFFSHORE areas are taking the same size and species composition as the other DWFN purse seine fleets in that area, and perhaps should be included in that fishery definition.

APPENDIX 8 – LIST OF PRESENTATIONS

1. WCPFC data requirements and current issues with the Philippines catch data	WCPFC/SPC (Peter Williams)
2. NFRDI – Overview of NSAP data collected in 2010	BFAR/NFRDI (Elaine Garvilles)
3. Region 1 – Luzon	<i>REGION 1 (Francis Buccat)</i>
4. Region 3 – Zambales	<i>REGION 3 (Ronald Bathan)</i>
5. Region 5 – Bicol	<i>REGION 5 (Virgiña Olaño)</i>
6. Region 6 – Visayas	<i>REGION 6 (Sheryll Mesa)</i>
7. Region 8 – Samar	<i>REGION 8 (15. Elmer Bautista)</i>
8. Region 9 – Zamboanga	<i>REGION 9 (16. Hamilton Ballovar)</i>
9. Region 12 – General Santos City	<i>REGION 12 (19. Laila Emperua)</i>
10. Region ARMM	<i>REGION ARMM (Macmod Mmalangkap)</i>
11. Preliminary review of NSAP data by Region and Gear	WCPFC/SPC (Peter Williams)
12. Catch estimates derived from NSAP and non-NSAP sites	WCPFC/SPC (Peter Williams)

APPENDIX 9 – 2010 Tuna Catch Estimates 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	NSAP	187.700	220.200	0.000	407.900	from NSAP database
	<i>non-NSAP landing sites estimate</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>	
3	NSAP	2,084.580	2,035.500	742.250	4,862.330	
	<i>non-NSAP landing sites estimate</i>	<i>239.000</i>	<i>156.000</i>	<i>0.000</i>	<i>395.000</i>	raised based on actual catches in 2001 for Santa Cruz, Zambal
4	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No purse seine
5	<i>non-NSAP landing sites estimate</i>	<i>200.000</i>	<i>0.000</i>	<i>0.000</i>	<i>200.000</i>	<i>rough estimate</i>
6	NSAP	42.760	10.050	0.000	52.810	
	<i>non-NSAP landing sites estimate</i>					
8	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No purse seine
11	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No purse seine
12	NSAP	10,173.000	2,442.000	138.000	12,753.000	Market 3
	<i>Private landing wharfs</i>				<i>27,000.000</i>	estimated for 27 sites ... Assume half of 54,000 is foreign-flag
	<i>non-NSAP landing sites estimate</i>					
ARMM	NSAP	65.968	6.276	1.416	73.660	
	<i>non-NSAP landing sites estimate</i>					
		<i>12,993.008</i>	<i>4,870.026</i>	<i>881666</i>	<i>45,744.700</i>	
	NSAP	80%	19%	1%		
		36,490.303	8,759.394	495.003	45,744.700	
	2009	23,556.240	4,002.492	502.397	28,061.129	
		84%	14%	2%		

RINGNET						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	23.600	0.400	0.000	24.000	
	<i>non-NSAP landing sites estimate</i>				<i>10.000</i>	Few ringnet vessels ??
3	NSAP	681.200	537.100	180.600	1,398.900	
	<i>non-NSAP landing sites estimate</i>					
4	<i>non-NSAP landing sites estimate</i>					No ringnet vessels
5	NSAP	94.170	138.560	0.000	232.730	
	<i>non-NSAP landing sites estimate</i>				<i>450.000</i>	<i>activity outside Lagoney Bay</i>
6	NSAP	115.180	20.369	0.000	135.549	
	<i>non-NSAP landing sites estimate</i>					No oceanic tuna catch from ringnet vessels in this region
8	NSAP					
	<i>non-NSAP landing sites estimate</i>	<i>36.600</i>	<i>25.900</i>	<i>0.000</i>	<i>62.500</i>	determined from expected proportion by gear type; Eastern Samar only
11	<i>non-NSAP landing sites estimate</i>				<i>1,000.000</i>	Time series in Davao Gulf raised based on 5 NSAP landing sites covering RN; but more realistic estimate is 1,000 t.
12	NSAP	12,135.000	3,839.000	207.600	16,181.600	
	<i>Private landing wharfs</i>				<i>10,000.000</i>	Significant catches landed in private wharves ...
					
ARMM	NSAP	594.000	1.600	2.500	598.100	
	<i>non-NSAP landing sites estimate</i>	<i>160.000</i>	<i>0.000</i>	<i>0.000</i>	<i>160.000</i>	
CARAGA	NSAP					
	<i>non-NSAP landing sites estimate</i>		<i>6.022</i>		<i>6.022</i>	
		<i>13,839.750</i>	<i>4,568.951</i>	<i>390.700</i>	<i>30,259.401</i>	
	NSAP	75%	24%	1%		
		22,692.306	7,178.885	388.210	30,259.401	
	2009	18,153.250	4,466.536	176.702	22,796.489	
		80%	20%	1%		

HOOK-AND-LINE						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	25.900	71.890	0.900	98.690	
	<i>non-NSAP landing sites estimate</i>	<i>27.300</i>	<i>53.100</i>	<i>0.000</i>	<i>80.400</i>	based on vessel inventory - raised
3	NSAP	297.558	357.743	20.000	675.301	218 t of bigeye originally estimated considered too high...
	<i>non-NSAP landing sites estimate</i>				<i>10.000</i>	
4	NSAP					Attributed to HANDLINE
	<i>non-NSAP landing sites estimate</i>				<i>1,000.000</i>	rough estimate -- does not include Mindoro
5	NSAP	10.201	148.396	0.098	158.694	
	<i>non-NSAP landing sites estimate</i>				<i>500.000</i>	rough estimate since H&L is the major gear used throughout
6	NSAP	311.305	738.950	24.924	1,075.179	not quite complete .. Needs to raised ..
	<i>non-NSAP landing sites estimate</i>				<i>3,312.000</i>	rough estimate but no base information available - probably hi
8	NSAP	125.400	187.400	3.972	316.772	
	<i>non-NSAP landing sites estimate</i>	<i>193.670</i>	<i>101.980</i>	<i>4.000</i>	<i>299.650</i>	Eastern Samar only
10	NSAP					
	<i>non-NSAP landing sites estimate</i>					
11	NSAP	2.674	72.696	0.043	75.413	
	<i>non-NSAP landing sites estimate</i>				<i>1,000.000</i>	Dominant gear; estimate based on NSAP
12	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	Municipal
	<i>non-NSAP landing sites estimate</i>					
					
ARMM	NSAP	8.231	9.654	2.020	19.905	
	<i>non-NSAP landing sites estimate</i>	<i>11.550</i>	<i>0.540</i>	<i>0.060</i>	<i>12.150</i>	
CARAGA	NSAP	2.300	9.358	2.248	13.906	
	<i>non-NSAP landing sites estimate</i>		<i>0.529</i>		<i>0.529</i>	
		1,016.088	1,752.236	58.265	8,622.003	
		36%	62%	2.06%		
		3,099.394	5,344.883	177.726	8,622.003	
	2009	1,519.075	2,744.071	186.144	4,449.290	
		34%	62%	4%		

DRIFT GILLNET

NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	5.680	1.080	0.000	6.760	
	<i>non-NSAP landing sites estimate</i>	<i>45.900</i>	<i>25.873</i>	<i>0.000</i>	<i>71.773</i>	based on boat inventory - raised
3	NSAP				<i>0.000</i>	No drift gillnet
4	<i>non-NSAP landing sites estimate</i>					No drift gillnet
5	<i>non-NSAP landing sites estimate</i>	<i>0.230</i>	<i>0.820</i>	<i>0.030</i>	<i>1.080</i>	
6	NSAP	54.300	3.490	0.000	57.790	
	<i>non-NSAP landing sites estimate</i>				<i>100.000</i>	Estimated production - all species (50 units) incl non oceanic tuna s
8	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	None
11	<i>non-NSAP landing sites estimate</i>				<i>100.000</i>	Not covered by NSAP - estimated catch
12	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	Not likely to catch oceanic species
ARMM	NSAP	98.020	4.368	0.344	102.733	
	<i>non-NSAP landing sites estimate</i>	<i>62.760</i>	<i>1.830</i>	<i>0.185</i>	<i>64.775</i>	Estimate
		204.130	35.631	0.374	440.136	
		85%	15%	0%		
		374.142	65.307	0.686	440.136	
	2009	248.844	98.120	8.889	355.853	
		70%	28%	2%		

MULTIPLE HOOK-AND-LINE						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	1.870	5.782	0.000	7.652	
	<i>non-NSAP landing sites estimate</i>	<i>14.992</i>	<i>11.395</i>	<i>0.000</i>	<i>26.387</i>	based on vessel inventory; raised
3	NSAP	198.221	299.394	198.918	696.533	Subic is only landing site for MHL
	<i>non-NSAP landing sites estimate</i>				<i>10.000</i>	rough estimate
4	NSAP	21.224	2.630	0.000	23.854	
	<i>non-NSAP landing sites estimate</i>				<i>50.000</i>	rough estimate
5	NSAP	3.125	6.715	0.000	9.840	
	<i>non-NSAP landing sites estimate</i>				<i>10.000</i>	
6	NSAP	146.405	263.074	0.000	409.479	
	<i>non-NSAP landing sites estimate</i>				<i>500.000</i>	
8	NSAP	6.000	2.000	0.000	8.000	
	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	no
11	<i>non-NSAP landing sites estimate</i>				<i>100.000</i>	Estimate based on NSAP data
12	<i>non-NSAP landing sites estimate</i>				<i>200.000</i>	rough estimate
ARMM	NSAP	6.168	7.000	3.350	16.518	
	<i>non-NSAP landing sites estimate</i>					no
CARAGA	NSAP	1.579	5.799	0.499	7.877	
	<i>non-NSAP landing sites estimate</i>	<i>0.235</i>	<i>0.120</i>	<i>0.000</i>	<i>0.355</i>	
		399.819	603.909	202.767	2,076.495	
		33%	50%	17%		
		688.127	1,039.386	348.982	2,076.495	
	2009	727.288	988.439	0.000	1,715.727	
		42%	58%	0%		

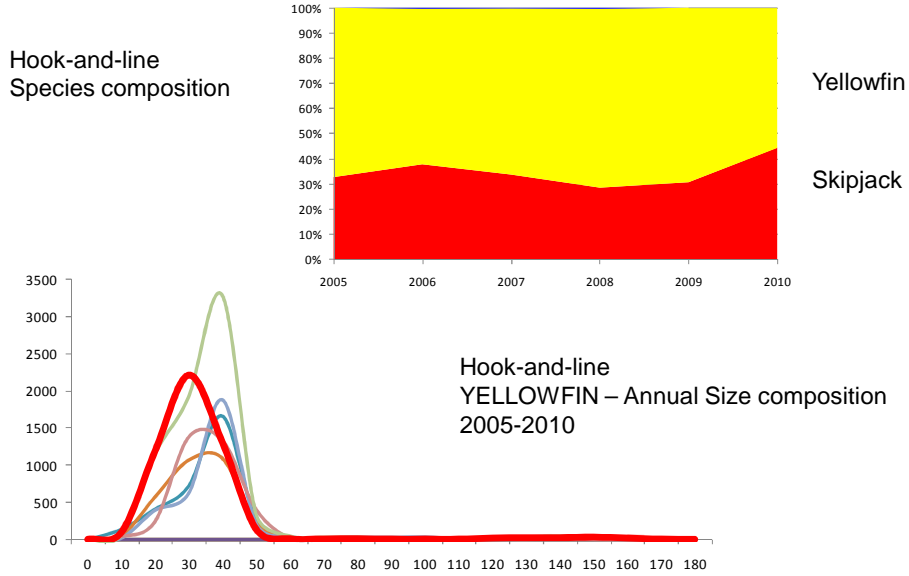
HANDLINE (large-fish)						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	2.000	2.000	0.000	4.000	
	<i>non-NSAP landing sites estimate</i>					(included in hook-and-line)
3	NSAP	34.700	48.480	3.920	87.100	
	<i>non-NSAP landing sites estimate</i>	13.000	6.000	0.000	19.000	based on 2001 data
4	NSAP	40.249	704.847	27.513	772.609	Counted as Hook-and-line
	<i>non-NSAP landing sites estimate</i>				1,600.000	rough estimate to include potential other sites (e.g. Mindoro)
5	NSAP	4.439	132.650	0.097	137.186	
	<i>non-NSAP landing sites estimate</i>					(included in hook-and-line)
6	<i>non-NSAP landing sites estimate</i>				0.000	no large-fish target HANDLINE
8	NSAP	3.000	1.000	2.000	6.000	
	<i>non-NSAP landing sites estimate</i>	0.000	0.000	0.000	0.000	
11	NSAP	4.820	157.230	0.040	162.090	
	<i>non-NSAP landing sites estimate</i>				1,000.000	based on NSAP sampling sites and those sites not sampled
12	NSAP	0.000	7,751.544	186.750	7,938.293	8 months
	<i>Private landing wharfs</i>					
					
ARMM	<i>non-NSAP landing sites estimate</i>					
CARAGA	NSAP	0.030	2.519	0.349	2.898	
	<i>non-NSAP landing sites estimate</i>				0.000	
		102.238	8,806.270	220.669	11,729.176	
		1%	96%	2%		
		131.356	11,314.305	283.515	11,729.176	
	2009	102.229	7,767.669	329.602	8,199.500	
		1%	95%	4%		

TROLL						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	30.162	5.560	0.000	35.722	
	<i>non-NSAP landing sites estimate</i>	<i>3.022</i>	<i>4.160</i>	<i>0.000</i>	<i>7.182</i>	Raised - based on vessel inventory
3	<i>non-NSAP landing sites estimate</i>				0.000	No known troll activity
4	<i>non-NSAP landing sites estimate</i>				<i>50.000</i>	
5	NSAP	5.040	0.224	0.000	5.264	
	<i>non-NSAP landing sites estimate</i>					No known troll activity
6	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No known troll activity
8	NSAP	65.848	104.615	1.632	172.095	
	<i>non-NSAP landing sites estimate</i>					there is in eastern samar
11	NSAP	0.000	3.355	0.000	3.355	
	<i>non-NSAP landing sites estimate</i>				<i>100.000</i>	Estimate based on NSAP sites and considering other s
12	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No known troll activity
	<i>Private landing wharfs</i>				<i>0.000</i>	
					
ARMM	<i>non-NSAP landing sites estimate</i>					No known troll activity
CARAGA	<i>non-NSAP landing sites estimate</i>	<i>804.530</i>	<i>128.894</i>	<i>0.000</i>	<i>933.424</i>	
	NSAP	19.748	56.943	11.400	<i>88.091</i>	Surigao del norte only ...
		928.350	303.751	13.032	1395.133	
		75%	24%	1%		
		1,040.187	340.344	14.602	1,395.133	
	2009	224.861	96.445	5.726	327.032	
		69%	29%	2%		

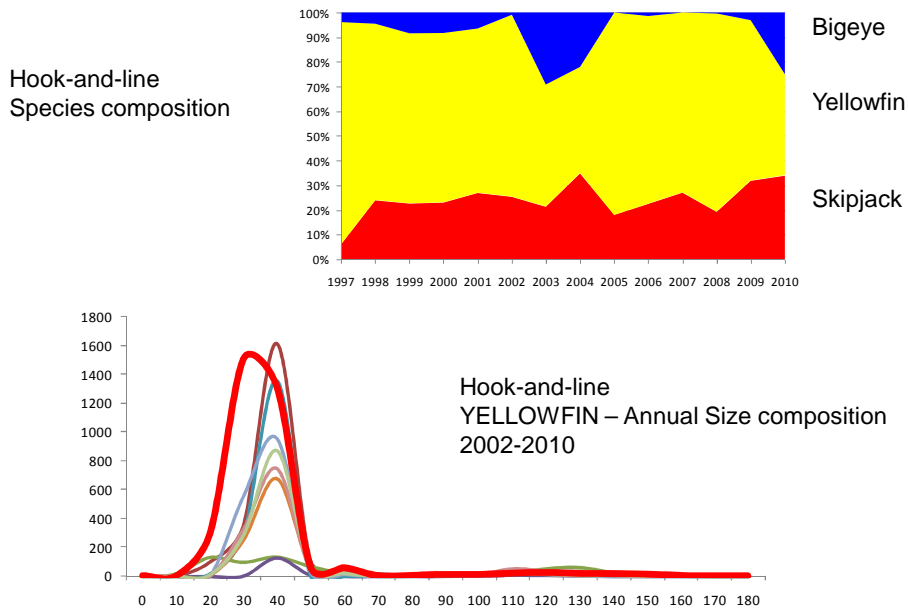
TUNA DRIFT LONGLINE						
NSAP + estimates for areas not covered by NSAP						
Region	Source of estimate	SKJ	YFT	BET	TOTAL	Comments
1	NSAP	50.858	51.187	0.000	102.045	
	<i>non-NSAP landing sites estimate</i>	<i>12.720</i>	<i>1.200</i>	<i>0.000</i>	<i>13.920</i>	Raised - based on vessel inventory
3	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No TDLL
4	<i>non-NSAP landing sites estimate</i>					No TDLL
5	<i>non-NSAP landing sites estimate</i>					No TDLL
6	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	No TDLL
8	<i>non-NSAP landing sites estimate</i>					No TDLL
11	<i>non-NSAP landing sites estimate</i>				<i>1.000</i>	based on 3 units
12	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	Yes - but no data - < 1 t.
ARMM	<i>non-NSAP landing sites estimate</i>				<i>0.000</i>	?
CARAGA	NSAP	0.523	1.753	0.379	2.654	?
		<i>64.101</i>	<i>54.140</i>	<i>0.379</i>	<i>119.619</i>	
		54%	46%	0%		
		64.641	54.596	0.382	119.619	
	2009	153.990	143.930	0.000	297.920	
		52%	48%	0%		

APPENDIX 10 – Review of NSAP species composition and size data by region (major tuna gears only)

REGION 1 - LINGAYEN GULF

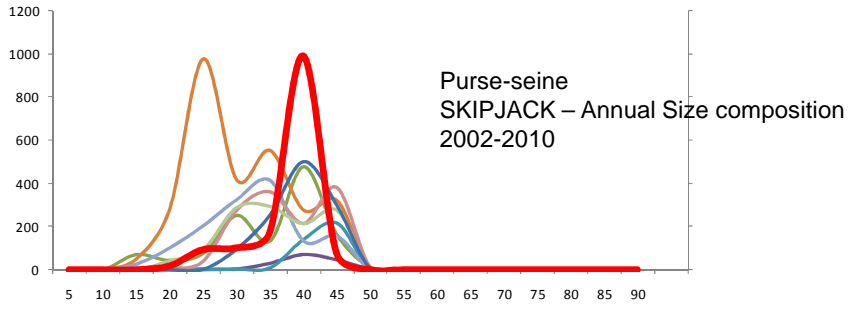
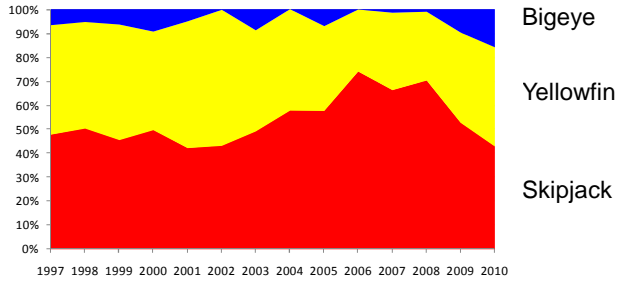


REGION 3 - ZAMBALES



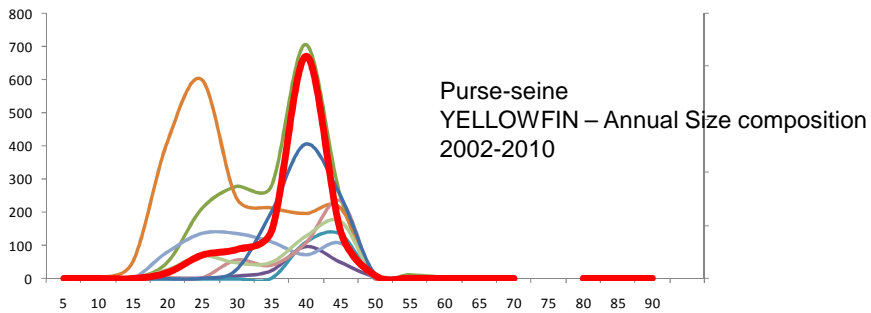
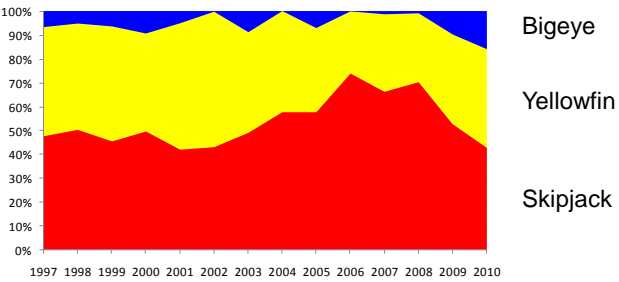
REGION 3 - ZAMBALES

Purse-seine
Species composition

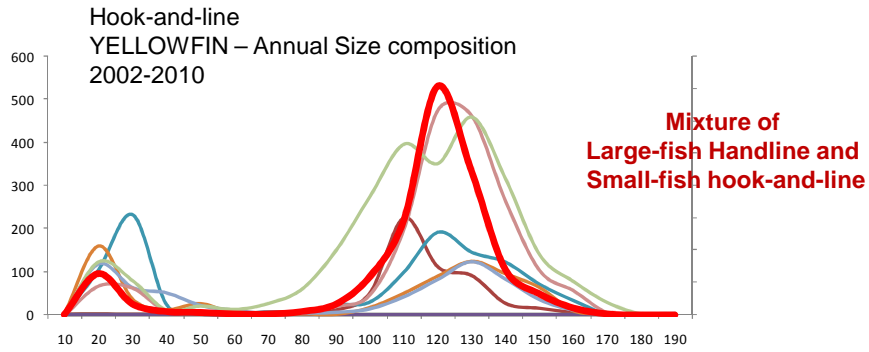
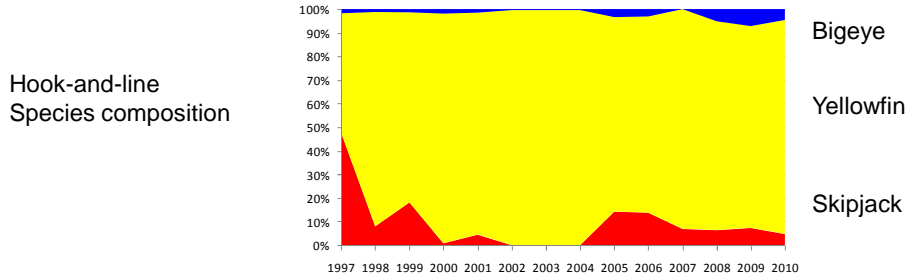


REGION 3 - ZAMBALES

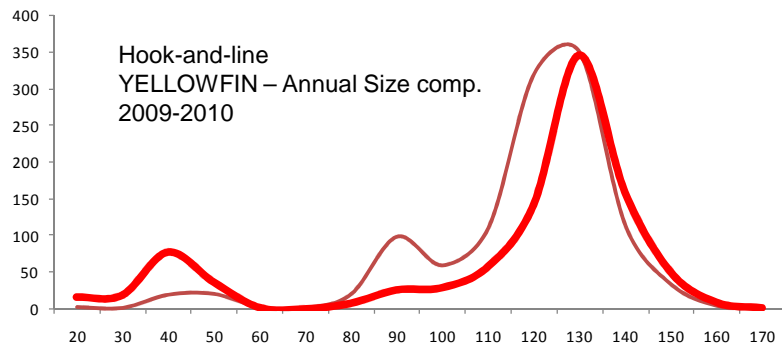
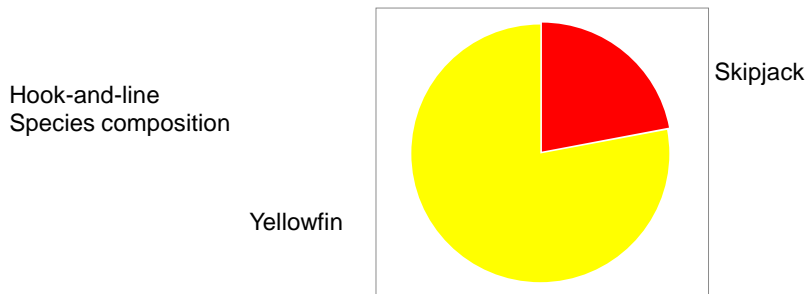
Purse-seine
Species composition



REGION 4 – HONDA BAY

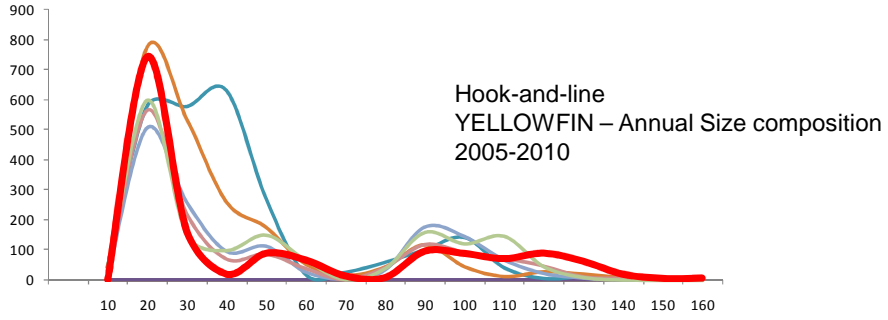
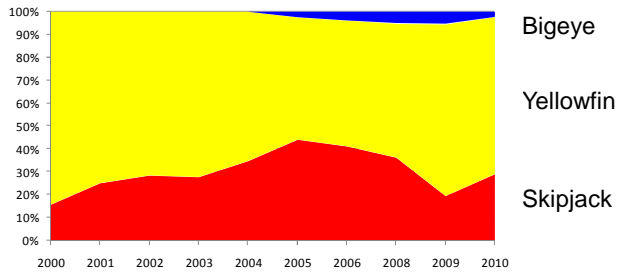


REGION 5 - BICOL



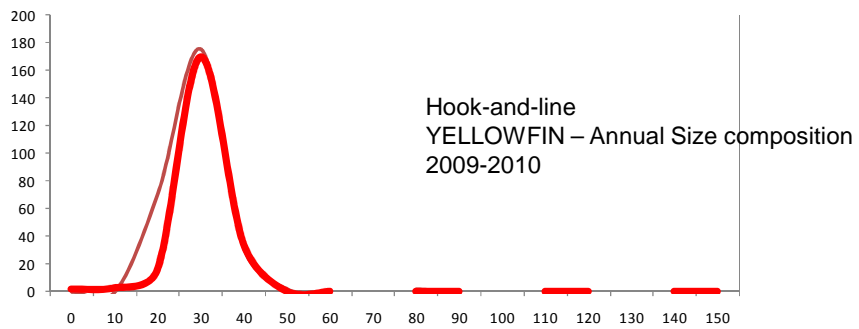
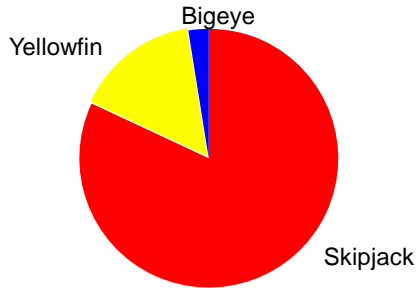
REGION 6 – Cuyo east pass

Hook-and-line
Species composition

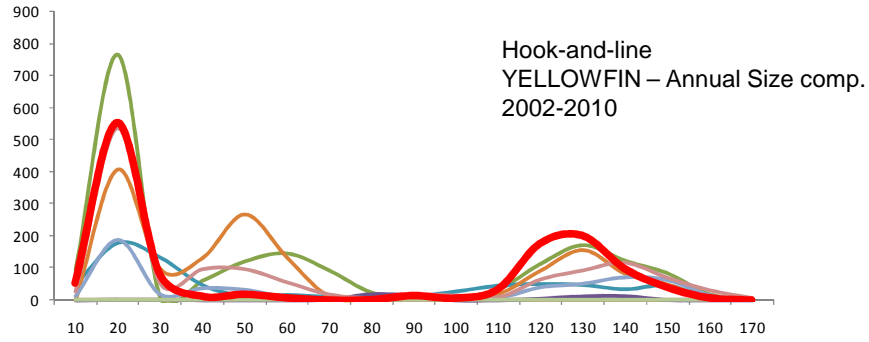
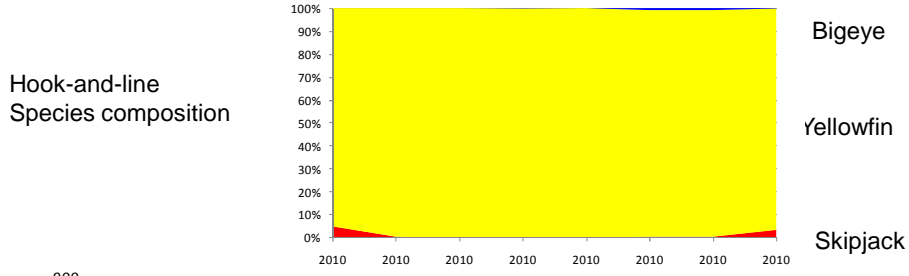


REGION 8 - SAMAR

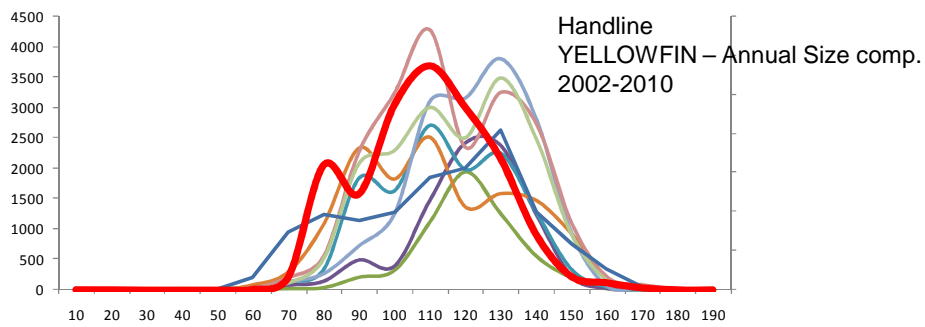
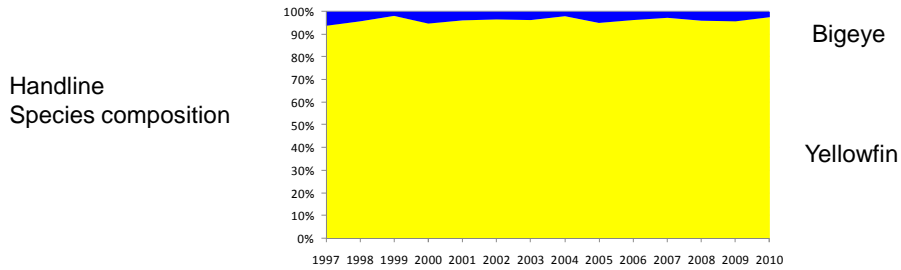
Hook-and-line
Species composition



REGION 11 – DAVAO

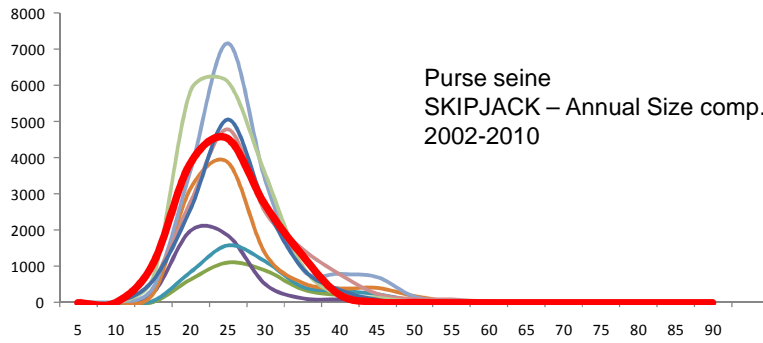
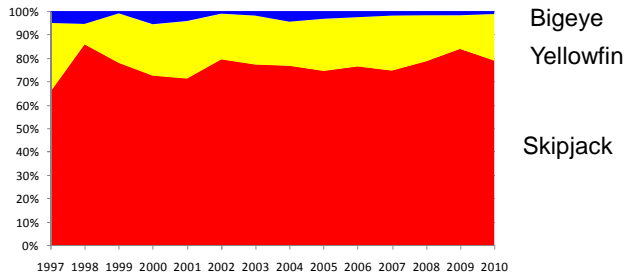


REGION 12 – GENERAL SANTOS CITY



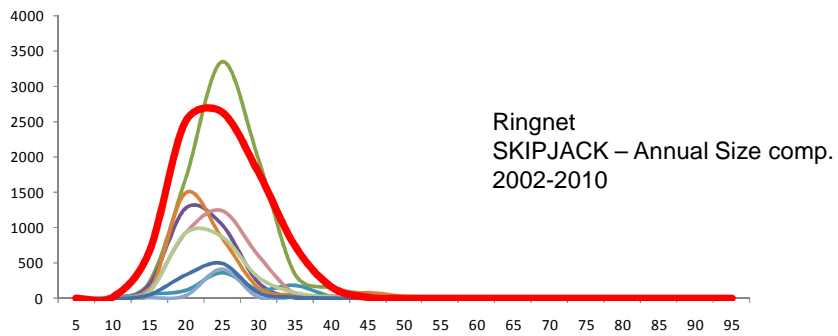
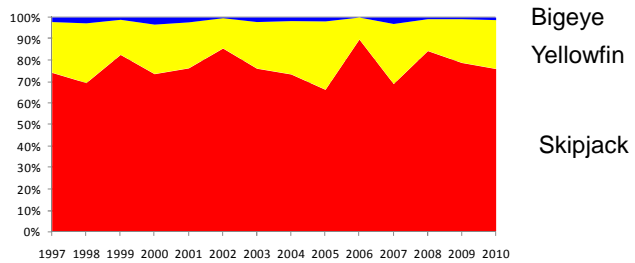
REGION 12 – GENERAL SANTOS CITY

Purse seine
Species composition



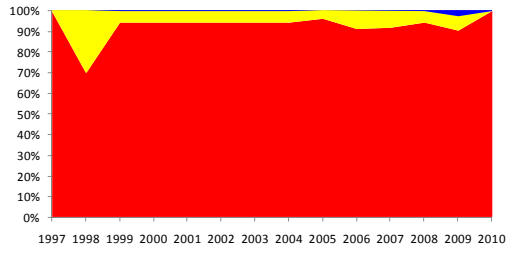
REGION 12 – GENERAL SANTOS CITY

Ringnet
Species composition

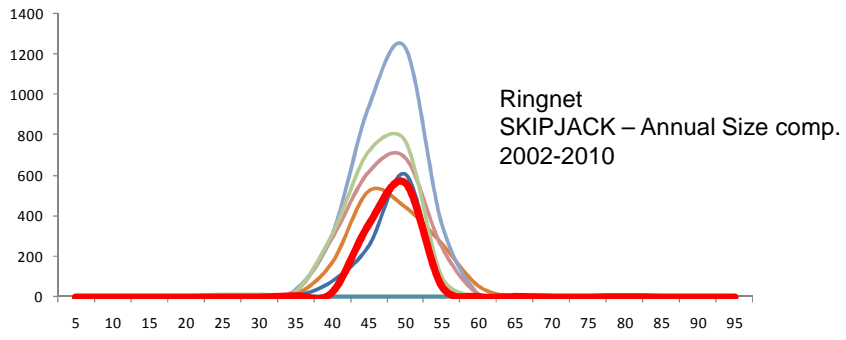


REGION ARMM

Ringnet
Species composition



Bigeye
Yellowfin
Skipjack



APPENDIX 11. 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	Troll line = 4,559,618.40 kgs. Handline = 1,355,220 kgs.	Consolidated data from Tandag and Cagwait, Surigao del Sur, CY 1999-2002.
	2. Cagwait, Surigao del Sur		
	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 HI= 2600 HL=2600	Non-NSAP Trend shows that 64% of tuna production is landed in Borongan
	Llorente	HL=350 HI= 200	Non-NSAP
	Maydolong	HL = 100 HI= 80	Non-NSAP
	Guiuan	HL=340 HI=200 RN=540	NSAP 209 HL/HI units x 270 fishing days x 10 kg catch/day = 564.3 3 units ring netters; approximately catch ration of RN:HL/HI = 1:100
	Oras	HL=100 HI=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	<i>Coryphaena hippurus</i>	346	tuna unraised catch production based on NSAP Sampling of BFAR 4A in Aurora Province from July 2001 to June 2002
					<i>Elagatis bipinnulata</i>	168	
					<i>Katsuwonus pelamis</i>	954	
					<i>Thunnus albacares</i>	3085	
					<i>Thunnus macoyii</i>	160	
					<i>Thunnus obesus</i>	60	
				Gillnet	<i>Katsuwonus pelamis</i>	4	
					<i>Rastrelliger brachysoma</i>	23	
				Multiple Hook and Line	<i>Katsuwonus pelamis</i>	254	
					<i>Rastrelliger brachysoma</i>	6	
					<i>Scomberomorous commerson</i>	5	
				Troll Line	<i>Coryphaena hippurus</i>	235	
					<i>Auxis thazard</i>	302	
					<i>Elagatis bipinnulata</i>	62	
					<i>Euthynnus affinis</i>	190	
					<i>Katsuwonus pelamis</i>	11480	
					<i>Scomberomorous commerson</i>	46	
					<i>Thunnus albacares</i>	74	
					<i>Thunnus obesus</i>	10	
				<i>Thunnus tonggol</i>	32		
				Long Line	<i>Coryphaena hippurus</i>	13319	
<i>Istiophorus platypterus</i>	179						
<i>Elagatis bipinnulata</i>	872						
<i>Euthynnus affinis</i>	9						
<i>Katsuwonus pelamis</i>	1669						
<i>Scomberomorous commerson</i>	64						

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

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

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

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