



**REPORT OF THE EASTERN INDONESIA TUNA FISHERY
DATA COLLECTION WORKSHOP**

30–31 January 2007

Jakarta, Indonesia



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

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Meeting documents, working papers and presentations are available on the WCPFC website at:

<http://www.wcpfc.int/eitfdc/index.htm>.

1. OPENING

The Eastern Indonesia Tuna Fishery Data Collection Workshop was held at the headquarters of the Research Center for Capture Fisheries in Jakarta, from 30 to 31 January 2007. The workshop was attended by 29 participants from five Indonesian government agencies, industry, Australia, the Secretariat of the Pacific Community, the Secretariat of the Western and Central Pacific Fisheries Commission and other agencies (see Appendix III).

The workshop was part of the Indonesia and Philippines Data Collection Project, which was developed by 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 are (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.

Prior to the workshop, during 2005 and 2006, a review of the tuna fisheries and the current statistical system in Indonesia was conducted as part of the IPDCP by Mr Craig Proctor of the Commonwealth Scientific and Industrial Research Organisation of Australia and Mr Budi Nugraha of RCCF and the Research Institute for Marine Fisheries of Indonesia. The objectives of the workshop were to consider the tuna fisheries and the current statistical system, and to draft recommendations for the improvement of tuna fishery data collection.

Funding for the IPDCP has been provided by Chinese Taipei, France, New Zealand and the United States of America. The review of the tuna fisheries and the current statistical system was funded by the Australian Centre for International Agricultural Research and CSIRO.

Dr Wudianto, Director of RCCF, welcomed the participants and introduced the opening speaker, Dr Indroyono Soesilo, Chairman of the Marine and Fisheries Research Agency.

Dr Soesilo spoke of Indonesia's participation in regional fisheries management organisations, such as CCSBT and IOTC, and of the benefits that have accrued to Indonesia through collaboration with those organisations, particularly in regard to the monitoring of tuna fisheries in the Indian Ocean waters of Indonesia. Such monitoring should be replicated in Eastern Indonesia and, in this regard, he proposed establishing a tuna monitoring station, similar to the station in Benoa, for Eastern Indonesia in Manado. He noted that Indonesia was in the process of becoming a member of WCPFC and that Indonesia intended to participate very actively. Dr Soesilo gave a warm welcome to the participants and wished them success in their deliberations.

Dr SungKwon Soh welcomed the participants on behalf of the WCPFC Secretariat, SPC and CSIRO.

2. APPOINTMENT OF CHAIRPERSONS AND RAPPORTEURS

Dr Wudianto and Dr Soh were appointed chairman and vice-chairman respectively. Mr Timothy Lawson was appointed head rapporteur, and Mr Peter Williams and Mr Budi Iskandar were appointed rapporteurs.

3. ADOPTION OF THE AGENDA

The agenda was adopted as presented in Appendix I.

4. OBLIGATIONS FOR THE PROVISION OF DATA TO THE WESTERN AND CENTRAL PACIFIC FISHERIES COMMISSION

Mr Lawson gave a presentation on the obligations of members, cooperating non-members and participating territories for the provision of data to WCPFC. The policy on the provision of data was drafted by the Statistics Specialist Working Group of the WCPFC Scientific Committee at its inaugural session in August 2005, and adopted by the Commission at its second session in December 2005. The policy (see Appendix IV) concerns the provision of estimates of annual catches, the number of vessels active, operational (logsheet) catch and effort data, catch and effort data aggregated by time period and geographic area, and size composition data. The policy also includes standards for the provision of operational catch and effort data. A table describing the data to be provided to the Commission by Indonesia is presented in Appendix V.

Discussion

WCPFC Statistical Area

During the discussion, it was explained that the WCPFC Convention Area does not have a western boundary north of Australia; however, such a boundary is necessary for the compilation of estimates of annual catches, since catch estimates must refer to a geographic area, as well as a time period. It was therefore decided at SC1 to use the western boundary of the WCPO Area, which was the statistical area used by the Standing Committee on Tuna and Billfish, the precursor to the WCPFC Scientific Committee, for the WCPFC Statistical Area (Figure 1). The boundary is defined as “from the north coast of Australia due north along the 129° meridian of east longitude to its intersection with the 8° parallel of south latitude, thence due west along the 8° parallel of south latitude to the Indonesian peninsula; and from the Indonesian peninsula due east along the 2°30' parallel of north latitude to the Malaysian peninsula”. (It was noted that the term “Indonesian peninsula” was incorrect and should be replaced with “Indonesian archipelago”.) This boundary is also the eastern boundary of the Indian Ocean Tuna Commission and the boundary between FAO Area 57 in the Indian Ocean and FAO Area 71 in the Pacific Ocean.

There was some question regarding whether Indonesia was required to provide data covering the whole of the eastern EEZ or only those areas comprising mainly non-archipelagic waters, i.e., Indonesian Fishery Management Areas 7 (Tomini Bay and Seram Sea) and 8 (Sulawesi Sea and Pacific Ocean) (Figure 2). However, it was noted that scientists need data covering the whole of the WCPFC Statistical Area in order to evaluate the status of the stocks, and also that all other Commission members, cooperating non-members and participating territories (CCMs) provide data for their entire EEZs, including those CCMs with archipelagic waters (i.e., Fiji, Papua New Guinea and the Philippines). It was further noted that the WCPFC Statistical Area is used strictly for research and monitoring purposes; the whole issue of management measures is a separate matter from research.

Definition of size categories for the number of vessels active

It was suggested that length overall be considered in regard to the definition of size categories for the number of vessels active, and it was acknowledged that compiling the number of vessels (and vessel and gear attributes) for vessels less than 24 metres LOA in Indonesia will be a difficult task. It was noted that the current definition of vessel size categories, which refers to gross registered

tonnage, was a temporary measure carried over from SCTB and that the definition will probably be reconsidered by the Scientific Committee.

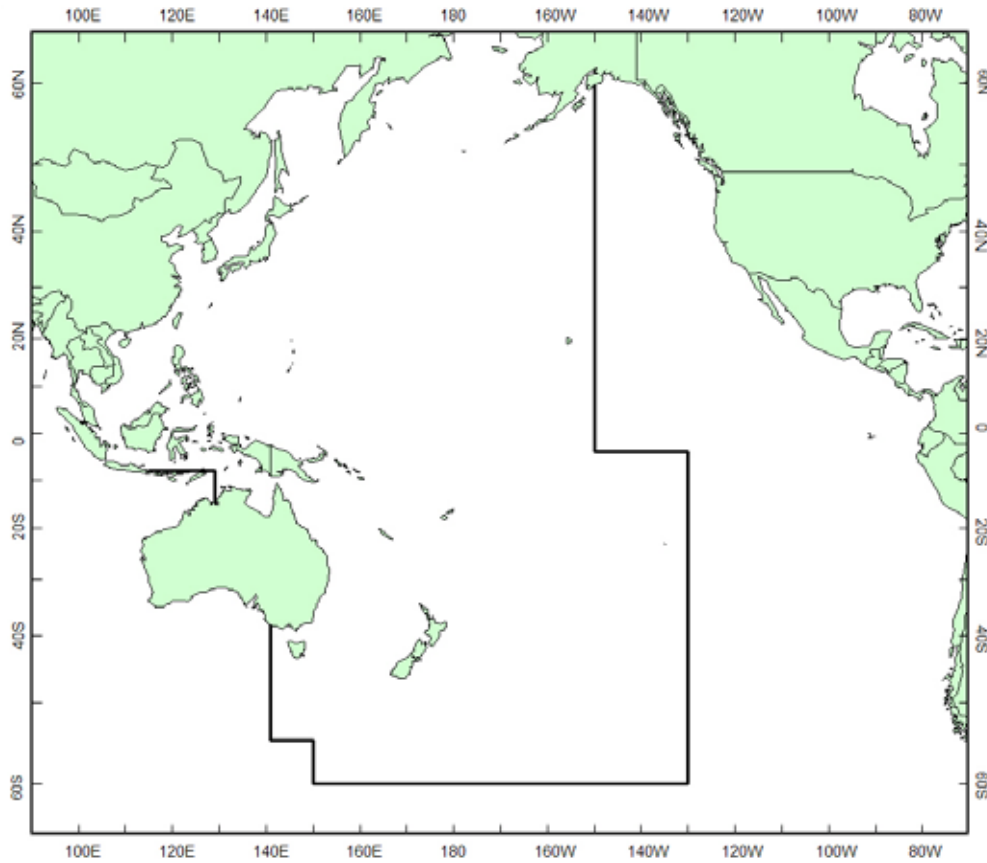


Figure 1. WCPFC Statistical Area

Operational catch and effort data for small vessels

The potential difficulties involved in collecting operational catch and effort data on small vessels in Indonesia was raised. In this regard, it was noted that in the WCPFC policy on the provision of data “it is also recognised that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels, such as certain sectors of the fisheries of Indonesia, the Philippines and small island developing States”. Hence, the potential difficulties in collecting operational catch and effort data from small vessels in Indonesia will certainly be taken into consideration by the Commission. It was suggested that catch and effort data covering small vessels could perhaps be collected by the buyers of their fish.

Capacity development

It was stated that the capacity to collect operational catch and effort data, and other types of data, needs to be developed in Eastern Indonesia and that the Commission could assist in this regard, similar to the manner in which IOTC has assisted with the collection of operational catch and effort data covering the Indian Ocean waters of Indonesia. It was noted that capacity development will be a key component of future IPDCP activities in Eastern Indonesia.

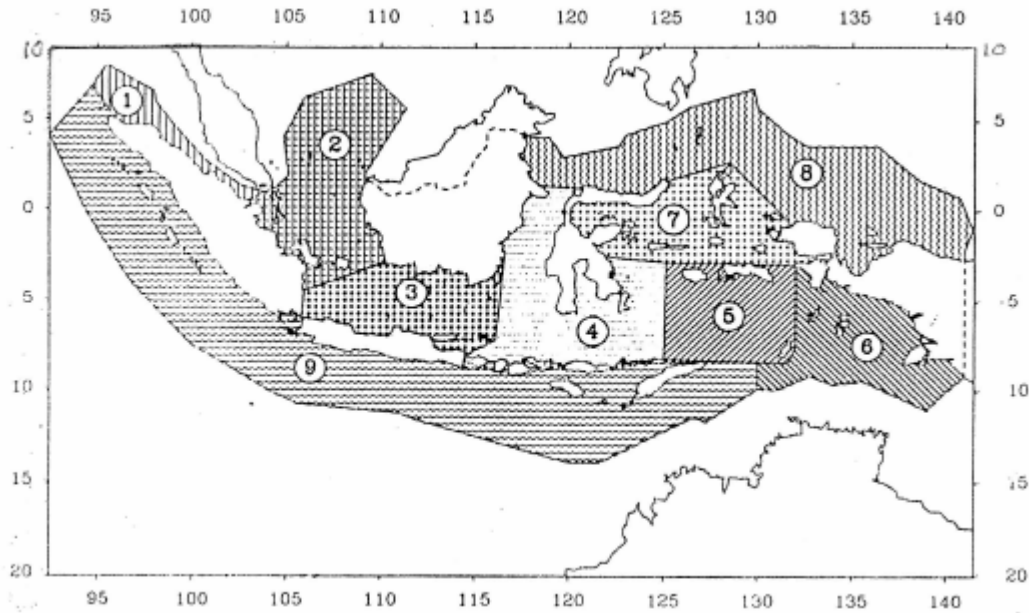


Figure 2. Indonesian Fishery Management Areas

1. Malaca Strait. 2. South China Sea. 3. Java Sea. 4. Makasar strait and Flores Sea. 5. Banda Sea. 6. Arafura Sea. 7. Tomini Bay and Seram Sea. 8. Sulawesi Sea and Pacific Ocean. 9. Indian Ocean.

Importance of fishing port authorities and translation of the workshop report

It was noted that the fishing port authorities (of which three — Bitung, Kendari and Ternate — were represented at the workshop) play a key role in the collection of fisheries data, and that their role will become increasingly important in regard to the collection of operational catch and effort data and the monitoring of IUU fishing.

It was suggested that the report of the workshop should be translated into Bahasa, particularly for the benefit of local staff based in the fishing ports.

5. STATUS OF THE INDONESIA AND PHILIPPINES DATA COLLECTION PROJECT

Dr Soh gave a presentation on the status of the Indonesia and Philippines Data Collection Project. The project was originally developed in 2003, during the Preparatory Consultation, to improve the monitoring of tuna fisheries in the Philippines and Indonesia, and to fulfill their future obligations in regard to the provision of fisheries data to the Commission. The IPDCP Steering Committee has met three times and the reports of the meetings are available on the WCPFC website.

Contributions for IPDCP have been received from Chinese Taipei, France, New Zealand and the United States of America, and Australia has separately funded reviews of the tuna fisheries and the statistical system of Indonesia and the Philippines. However, the funds have not been sufficient to carry out the IPDCP activities in Eastern Indonesia, including the establishment of a port sampling programme. On the other hand, a small amount of funding, USD 45,000, is available for data-related activities in Indonesia and the Philippines in the WCPFC work programme for 2007; the WCPFC indicative budget for 2008 includes USD 100,000 for data collection in Indonesia and the Philippines; and the Global Environment Facility has expressed interest in a multi-year project for Indonesia, the Philippines and Vietnam on the order of USD 1 million. There is therefore reason for

optimism that IPDCP activities in Eastern Indonesia can commence with preliminary work in 2007 and the establishment of a full port sampling programme during 2008.

Discussion

GEF project development

With respect to development of the GEF funding proposal, it was noted that the relevant Indonesian government agencies and the GEF Focal Point in Indonesia will be contacted by the WCPFC Secretariat over the coming months.

Given the long duration usually required for the development of GEF projects — even relatively small projects such as the one envisioned for Indonesia, the Philippines and Vietnam — it was stressed that the development of the GEF project should commence as a matter of urgency. Ideally, a first draft of the proposal should be developed in time for consideration by the meetings of the IPDCP Steering Committee and the Scientific Committee in August 2007, with a view to commencing GEF activities in Eastern Indonesia in 2009.

6. REVIEW OF THE TUNA FISHERIES IN EASTERN INDONESIA

Review the tuna fisheries in Eastern Indonesia

Mr Craig Proctor presented some of the findings of a review of the tuna fisheries in Eastern Indonesia conducted under ACIAR Project FIS/2002/074, Capacity Development to Monitor, Analyse and Report on Indonesian Tuna Fisheries. The objectives of the review were to:

- Provide information on the historical development and the current status of tuna fisheries in Eastern Indonesia, with particular focus on fisheries operating in Western Pacific Ocean, Sulawesi Sea, and Banda Sea waters, including the fleet size and structure for each port identified as a major landing centre for tunas, fleet operations (e.g. species targeted, geographic areas and seasons fished, trip duration, gear attributes), and post-harvest processing and marketing.
- Review current monitoring systems including the methods used to collect, aggregate and report tuna and tuna-like species catch data, including the roles played by DGCF, provincial-, regency- and district-level fisheries offices, port authorities, and research institutions, such as RCCF and RIMF, examining the nature and extent of data validation, verification and cross-checking in each agency, and making recommendations for improvements to the current monitoring systems.
- Summarize the available catch data for tunas and tuna-like species held by provincial and national fisheries agencies, and assess the quality and suitability of the data for stock assessment requirements of WCPFC, producing estimates of total catch of key tuna species within both commercial and artisanal sectors for Eastern Indonesia region, and providing an assessment of the current scale of the fisheries on stocks of juvenile yellowfin and bigeye tunas.
- Examine the suitability of select ports for a port-sampling programme, and identify minimum requirements with respect to manpower and facilities, making recommendations for choice of ports for establishing monitoring, based on current and predicted levels of tuna fishing activity, regional coverage, and likely availability of financial resources, and examining the feasibility of establishing a trial observer program.

Information for the review was obtained through interviews with staff at provincial, regency, and district fisheries offices, and fishing port authorities; interviews with companies, vessel owners, skippers, crew and fish sellers; interviews with fishing associations; a literature review; and accessing knowledge of scientists experienced with Eastern Indonesia tuna fisheries. The ports of Jayapura, Sorong and Biak were visited in September 2005, Bitung and Ternate in February 2006, and Bone and Kendari in July 2006 (Figure 3). Three to five days were spent in each port.

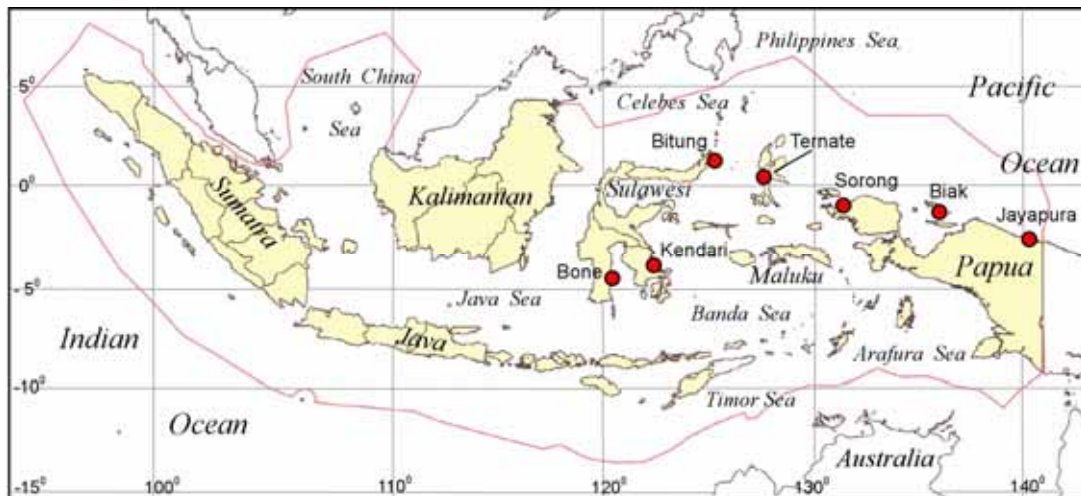


Figure 3. Ports visited during the review of tuna fisheries in Eastern Indonesia

The following is a summary of the information presented for each port, with a focus on the monitoring of catches:

Bitung

Landing places potentially important for monitoring include the Bitung Fishing Port, located 6 km from the city centre. The facilities were established in 2002 and formally opened in 2004. The wharf measures 126 m by 14 m and can handle vessels up to 300 GT, and one section can handle vessels up to 450 GT. The fish auction centre is 1,420 m². Vessels using the port include pole-and-line vessels of 30–100 GT, catching skipjack, yellowfin, bigeye and small pelagics, mini purse-seiners of less than 30 GT, catching small pelagics, and handline vessels catching small and large tunas.

Also important for monitoring are private fishing company wharves, including approximately 26 companies in Kota Bitung that are involved with catching tuna, processing and export, two Filipino-owned canneries, companies that export fresh and/or frozen product, and katsuobishi plants. Fifteen of these companies have their own wharves. Larger industrial companies include at least one company (PT Anekaloka Indotuna), which operates a longline fleet of 28 vessels of 40–60 GT that catch yellowfin, bigeye and marlin, which are exported fresh to Japan. The two canneries import frozen product from the Philippines and Papua New Guinea, and source fish from local vessels (pole-and-line, handline) landed direct to company or collected by carrier vessels. They also have their own purse seiners, which fish in the western Pacific around Papua New Guinea and whose fish are exported to the United States, Europe and Japan. Other large industrial companies deal primarily with the export of fresh and frozen product (loin, fillet, steak), and operate with *mitra kolaborasi* (collaboration) arrangements with small-scale local vessels, some using carrier vessels that collect from handline vessels in areas quite distant from Bitung. Other companies include those whose

operation is wholly or partly the production of katsuobishi, with four operating in North Sulawesi (and two others that do yet produce); their supply is generally from pole-and-line vessels and mini purse-seiners.

Finally, other landing places that are important for monitoring are other private landing wharves and landing places for owners of small-scale vessels that operate mini-plants and also supply fish to larger processing companies. They are often associated with households.

Sorong

The main landing places important for monitoring is the Sorong Fishing Port (Pelabuhan Perikanan Pantai Sorong or PPPS). It has been operational since 1991, has wharves of 112.5 m by 2.44 m for berthing and 50 m by 15 m for unloading, with capacity for vessels up to 500 GT, and a fish auction centre of 300 m². Previously, tuna fisheries were the most significant activity at PPPS (e.g., the pole-and-line fleet of PT Keselamatan Cinta Bahari), but this is no longer the case. Most activity at the fish auction centre concerns shrimp.

Another important place for monitoring is the fish section at the markets of Pasar Remu which is close to PPPS. Vessels unload catch direct to fishers' households that back onto the river and then fish are transported to the market. The fish sold at this market are caught primarily by handline vessels. There is also another fish market at Pasar Boswesani on the other side of the city from PPPS, which is a landing site for artisanal vessels, including handline and gillnet, with unloadings direct from vessels to wharves and adjacent fish markets.

Of industrial companies that are important for monitoring, only two companies are currently active since the cessation of operations of PT Usaha Mina in 2003 and PT Keselamatan Cinta Bahari in 2005. At its peak, PT Usaha Mina cannery had a large fleet of pole-and-line vessels, then, in the 1990s, used carrier vessels. PT Keselamatan Cinta Bahari had 12 wooden pole-and-line vessels of 71–78 GT and two carrier vessels of 268 and 521 GT; some of these vessels are still in port, while the location of others is unknown.

The PT Citra Raja Ampat cannery is supplied by a pole-and-line fleet of 31 vessels of 70 GT, which fish near Pulau Gag (to the west of Sorong), Makbon (near Sorong), around Pulau Waigeo, Pulau Misool and the Seram Sea. They spend a maximum of one week at sea and catch an average of 5–7 tonnes. The company also has three carrier vessels of 7–16 GT, with an average load of 10–15 tonnes, which obtain fish through *mitra kolaborasi* arrangements with two fishers groups — the Gorontalo fishers operate about 30 vessels 60 nm northeast of Sorong, catching skipjack and yellowfin using FADs, while fishers from the Buton region of Central Sulawesi, who live on Pulau Waigeo, use about 30 vessels with single baited lines, passive floats, and live-bait to target yellowfin. The company has its own private wharves, with a 600 tonne cold-storage facility.

The other active industrial company is PT Radios Apirja, which exports only frozen fish, supplied by six wooden pole-and-line vessels of less than 50 GT (with nine fiberglass pole and line vessels of 87 GT, under construction at the time of the review visit). The fishing grounds are Cendrawasih Bay, Bintuni Bay and around Halmahera, and the vessels spend a maximum of one week at sea, catching yellowfin, skipjack and Indo-Pacific king mackerel. The company is also supplied by five pump-boats (handline) that catch yellowfin and some bigeye, 12 large fiberglass *bagan* (lift-net vessels) and has *mitra kolaborasi* arrangements with local artisanal gillnet and handline vessels. This company has private wharves, also with a 600 tonne cold-storage facility.

Kendari

An important place for monitoring is the Kendari Fishing Port (Pelabuhan Perikanan Samudera Kendari or PPSK), which is located on southern shore of Kendari Bay, about 8 km from main city area. It has been operational since 1990, with wharves of 130 m by 10 m. There is a fish auction centre of 600 m², with most fish supplied by pole-and-line vessels.

The industrial company PT Sultra Tuna exports frozen product to Japan and is supplied by a fleet of 16 pole-and-line vessels of 29–35 GT, and seven other pole-and-line vessels under a *mitra kolaborasi* arrangement. It has eight carrier vessels of 50–80 GT, which collect fish from the Banda Sea, the Tukangbesi island group to the south and areas to the north, including the islands of Sinoa and Salabanka. Both schools associated with FADs and free-swimming schools are fished. The company has cold storage facilities that can hold 2 x 300 tonnes of tuna and 2 x 300 tonnes of octopus and Decapterus.

PPI Sodoha is a fish landing place on the northern shore of Kendari Bay, approximately 6 km from the main city district. It was established in 1978 and has landing wharves of 50 m by 3 m, a fish auction centre and a fish market. Fish are supplied by about 100 troll-line vessels, with 5–8 crew, that take one- or two-week trips to fish the Banda Sea and the Flores Sea, and catch small yellowfin, skipjack and bigeye. They also fish larger yellowfin with handlines. They have a capacity of about 3–4 tonnes. PPI Sodoha is also supplied by about 30 mini purse seiners; these vessels have 15–20 crew, take trips of about 20 days and catch small pelagics, with a low percentage of tuna. Some fish are distributed locally, through the auction and the market, some to PT Sultra Tuna, and some are sent by truck and ferry to Makassar for processing and export.

Other landing places in the province include Pasar Wajo, Kamaru, Meo Meo and Bau Bau.

Two other large companies used to process tuna at Kendari — PT Dharma Samudera and PT Bonecom — but not since 2002 and 2001 respectively.

Ternate

An important place for monitoring is the Ternate Fishing Port (Pelabuhan Perikanan Nusantara Ternate or PPNT). The wharves are 560 m² and 161 m², with a jetty of 450 m². The fish market is 500 m² and there are plans to expand from 4 to 10 hectares, starting in 2008. Most of the activity is unloadings from carrier-vessels; pole-and-line vessels refuel, but unload their catch at Dufa-Dufa.

Dufa-Dufa is several kilometers north along the coast from Ternate fishing Port and has upgraded wharf and fish auction facilities, and cold storage and ice-factory facilities are under development. Sixteen pole-and-line vessels, some of 29 GT and 25 crew and others of 20 GT and 18 crew, fish around Pulau Mayu and Pulau Tifore, and also Pulau Bacan, Pulau Sanana and the Dan Sula Island group, and unload regularly. There are also mini purse-seiners and handline vessels. Previously there were filleting operations at Dufa-Dufa and shipments by air to Makassar, but these no longer occur.

The only industrial company currently operating in Ternate is PT Ocean Mitra Mas, which markets frozen product. It began operations in 1988 as Nelayan Bakti and became Mitra Mas in 1994. It is supplied by 60 pole-and-line vessels under a *mitra kolaborasi* arrangement; however, only seven vessels were operating during the review. The company operates six large carrier vessels of 550–780 GT that collect skipjack, yellowfin and bigeye; most of the fish are transported by the carriers to Banyuwangi or Surabaya (East Java), although sometimes unloaded in Ternate. Fish are also purchased from handline vessels and transported from Ambon and Papua.

Jayapura

There are two main fish landing places in the Jayapura area. At Pasar Hamadi, several kilometers south of Jayapura, there are wharves, fish auction areas, and fish markets, and there are up to 500 troll-line vessels, 78 mini purse seiners and 2 mini longline vessels. Fish are also landed at Tanjung Ria, located about 6 km north of Jayapura city district. There is currently no industrial tuna fishery activity in Jayapura.

Biak

The cannery owned by PT Biak Mina Jaya has extensive facilities and used to be supplied by three purse seiners, two of 907 GT and one of 1025 GT; however, the cannery appears to be inactive and the status of the purse-seine operations is unknown.

The Biak fish market is supplied by artisanal handline and troll-line vessels.

Bone

There are two main landing wharves used for unloading fish catch in Bone; one at Bajoe which is 3 km in length, and a new 1 km long wharf at Lonrae a few kilometers north of Bajoe. There are new fish auction centre and cold storage facilities under development at Lonrae. There are pole and line vessels up to 29 GT, handline vessels of 5–10 GT, and purse seiners of less than 30 GT. Fishing activity is mostly to the south in the Flores Sea, and many FADs are used. Many vessels only use Bone as home base, while catching and landing fish elsewhere, such as Kupang and Bali; these vessels can be away for two to three months.

Some vessels unload at Bone direct to households associated with mini plants. The fish are supplied primarily by locally-made handline vessels of 10 m length.

Some fish are also shipped from Bone to Chen Hoo, the only company still handling tuna in Makassar.

Conclusions

Mr Proctor concluded the presentation with recommendations regarding the ports that should be monitored and the challenges that will be involved, and also the recruitment of enumerators, their training and supervision, and data processing.

The review recommended that port-based monitoring should be developed to a level that will meet WCPFC data requirements at Bitung, Sorong and Kendari. If funding is available, Ternate should also be considered. Based on current levels of activity, Jayapura, Biak and Bone were considered lower priority.

Mr Proctor noted that it will be challenging to gain unrestricted access to company wharves for daily, or at least regular, monitoring, and official notification from DGCF, together with meetings with industry at each port, should be considered.

It will also be difficult to adequately cover the at-sea transshipment of tunas by both artisanal and industrial fleets to carrier vessels that subsequently land their fish in places outside Eastern Indonesia, such as Jakarta, Surabaya and Banyuwangi.

In regard to the recruitment of enumerators, preference should be given to existing staff in local port authority or fisheries offices, or from other local sources, such as the fisheries high schools). Enumerators should be hired on a full-time basis, for monitoring and sampling, wherever possible.

Regarding training and supervision, adequate training needs to be provided by DGCF, RCCF / RIMF, with assistance from SPC or other agencies, on monitoring protocols and fish identification, which should be considered a particularly high priority. Emphasis should be given to the standardisation of monitoring techniques, reporting formats and the use of standard fish names, and issues concerning the confidentiality of data. Training is best provided locally, rather than in Jakarta or elsewhere. Regular supervisory trips need to be made to the ports by DGCF, RCCF and RIMF, and possibly SPC or other agencies, particularly during the establishment phase.

Data entry into database preferably should be done locally, by the enumerator who collected the data, to foster ownership of the data and to provide the opportunity for timely validation and checking of outliers. This would also provides the opportunity for enumerator to add explanatory notes to explain unusual data. On the other hand, the entry of data locally relies on either adequate local database and computer maintenance skills or regular supervisory visits by a database manager.

Discussion

Handline vessels in Bitung

It was noted that the handliners operating in Bitung comprise unlicensed pump boats that may be foreign-owned.

It was also observed that most of fish landed in Bitung come from Maluku waters; the fishing ground is from Sula island to the open Pacific Ocean. The numerous pump boat that operate in Maluku waters include both legal and illegal vessels; however, the amount and species composition of the catch is unknown. It was also explained that apprehending the illegal pump boat creates other, such as social, problems.

Monitoring transshipment

The question was raised regarding the best way to monitor transshipments to carriers. One option is to place enumerators at the ports that receive the transshipped catches, although this may not be cost effective. There is definitely a need to determine the extent of carrier activity. It was suggested that improving the reporting from companies might resolve this problem.

Other potentially important sites for monitoring

It was noted that there are other places in Eastern Indonesia that were not visited during the review that are possibly important tuna landing centres; these include Gorontalo (North Sulawesi), Labuha (North Maluku), Ambon (Central Maluku), and Tual (South Maluku).

Gorontalo was once a major handline landing port. However, recent information indicates that activity in this port has declined considerably, so it was not considered in the review. The Philippines have intended to set up a cold storage in Gorontalo, which suggests activity might increase again.

Ambon was also mentioned as a port where significant tuna landings had occurred in the past, and where considerable unloadings from handline vessels occur at present. It might therefore be considered for monitoring; however, Ambon was not considered in the review due to civil unrest.

Monitoring of industrial and artisanal fisheries

It was stressed that monitoring programmes for Eastern Indonesia must cover both industrial and artisanal vessels, since both are important components of the tuna fisheries in the area. However, it was recognised that there may be difficulties in obtaining operational catch and effort data from artisanal vessels.

Dynamic nature of the fisheries and the design of monitoring programmes

It was noted that the tuna fisheries in Eastern Indonesia are dynamic, with changing types and levels of activity in the ports, and that monitoring programmes should take this into account with regular review of the design of the programme.

Standard names of gear types

There is a need to standardise the naming of the gear types. For example, is “mini longline” actually “handline” and “mini purse seine” actually “ringnet”? In fact, there are several categories of handline operating in North Sulawesi and this should be acknowledged.

Kendari

It was noted that the Fishing Port Authority in Kendari has its own data collection system. Compared to data collected by the district or municipal fisheries services, the fishing port data are more accurate. The fishing port also records vessel activity, such as the name of the fishing vessel, when it arrives, amounts unloaded, information on catches, and when the vessel intends to depart. Moreover, catches are distributed not only to domestic markets, such as Makasar, but also to international markets, such as Hong Kong, using the 3000 GT carrier vessels.

7. REVIEW OF THE CURRENT STATISTICAL SYSTEM

Tuna fishing in the Sulawesi Sea

Dr Wudianto gave a presentation on a study on tuna fishing in the Sulawesi Sea. The main fishing gears are pole-and-line, purse seine and handline. Pole-and-line vessels are generally 50–80 gross tonnes, with 20–30 crew. Pole-and-line vessels caught 77% yellowfin and 14% skipjack from the area shown in Figure 4.

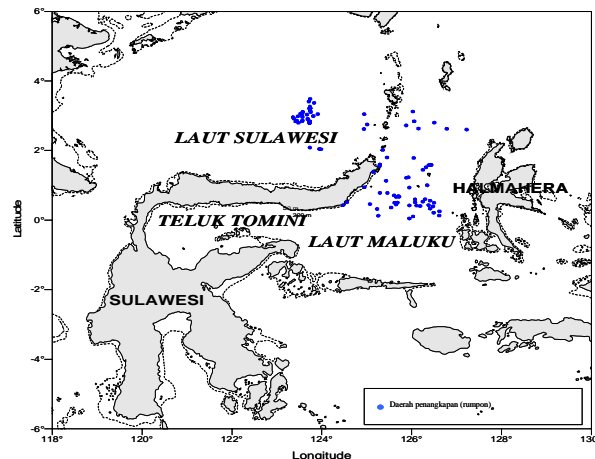


Figure 4. Area fished by pole-and-line vessels

Purse seiners are around 138 gross tonnes, with 30 crew. Purse seiners caught 89% yellowfin and 11% skipjack from the area shown in Figure 5.

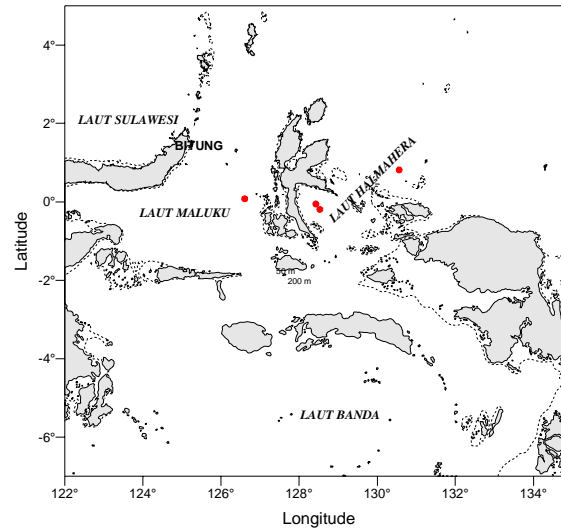


Figure 5. Area fished by purse seiners

Discussion

Rumpons

It was asked whether information on the use of rumpons (fish aggregating devices) were available; however, while information was available a few years ago, the use of rumpons is dynamic and more recent information should be requested from the fishing companies.

Species composition

The much higher proportion of yellowfin in the species composition of the catch by pole-and-line vessels and purse seiners, compared to adjacent fisheries in the Philippines and the results from tagging studies conducted in Indonesia, was noted.

Marine capture fisheries statistical system

Ms Dyah Retnowati gave a presentation on the statistical system for marine capture fisheries maintained by the Directorate General of Capture Fisheries. The original system, designed by FAO in 1973, provided for the collection of data from sampled villages, main fish landing places and fishing companies, and the transmission of data to the Directorate General of Fisheries until 1999, and to DGCF since 2000, through district, municipal and provincial agencies. Improvements have been made to the methods of data collection, the data collection forms and data collection has been expanded to involve fishing ports authorities. A data validation meeting with DGCF, provincial authorities and fishing port authorities takes place on annual basis, and a data validation meeting with provincial, district/municipal authorities and fishing port/fish landing place authorities takes place at least once year. Recent improvements have concerned the breakdown by species and geographic areas. The number of marine species covered has increased from 62 to 114 in 2005, and catch statistics are available for nine Fisheries Management Areas.

SISPT, the statistical information system for capture fisheries, allows for the electronic entry and processing of data by districts and municipalities, and the transmission of data to provincial agencies, and then to DGCF, over the Internet. Implementation of this system will start in 2007; both the SISPT and non-SISPT systems will coexist.

Catch statistics are published by DGCF in two series, Capture Fishery Statistics of Indonesia and Statistics of Marine Capture Fisheries By Fisheries Management Area.

Discussion

Validation meetings

It was suggested that data quality should be addressed at the level of the data enumerators, and not solely by DGCF and the provinces; however, there are logistical reasons for not doing so. While it is not possible to involve enumerators in the validation meetings directly, they are provided with reports of the validation meetings and so receive feedback on the quality of their work.

Catch statistics by Fisheries Management Area

It was noted that the publication of catch statistics by Fisheries Management Area represents a considerable improvement in the statistical system and that the provision to the Commission of tuna fishery statistics by Fisheries Management Area and, for each Fisheries Management Area, by gear type, would contribute greatly to improving the assessments of the stocks.

Species of special interest

Mr Imam Musthofa of the World Wildlife Fund — Indonesia gave a brief summary of Ingles et al. (2006), Assessment of Tuna Fisheries of Indonesia and Identification of Approaches to EBM for Tuna Management.

It was noted that the primary means of collecting data on species of special interest (turtles, sea birds, marine mammals, sharks) is through observers onboard the fishing vessels and that consideration should be given to including an observer programme in the GEF proposal to be developed following the workshop.

Review of the current statistical system

Mr Proctor presented the observations and recommendation of the review team regarding the current tuna fisheries statistical system.

Disaggregation of the species category “tuna”

Prior to 2005, the statistical system aggregated yellowfin, bigeye and marlin species into a single species category. Since then, data reporting forms such as the SL-3 and LL-3 forms for reporting to DGCF have been modified to include yellowfin, bigeye, black marlin, blue marlin and striped marlin separately, in addition to skipjack, albacore, southern bluefin and longtail tuna. However, the adoption of the new data collection and reporting procedures has been problematic, with many offices experiencing difficulties in meeting the new reporting requirements due to limitations of their current methods of data collection, the lack of sufficient fish identification skills and the lack of sufficient resources, such as transport.

The review team therefore recommended that the methods used to collect data at the level of the enumerators need to accommodate the reporting of the species that were previously in the category

of “tuna”. In this regard, further training is required at many offices in species identification; additional resources are required; and enumerators should be educated in regard to the objectives of the new data requirements.

Standardisation of data collection procedures

The review team felt that there needs to be higher level of standardisation in data collection procedures at the level of data ‘capture’. With greater authority devolving to the provinces in 2000, there have been difficulties with introducing new procedures. Nevertheless, efforts should be made to standardise procedures, while ensuring that they are still sufficiently flexible to suit the variety of fish landing environments. In this regard, a nation-wide review is required to better evaluate the full suite of current data ‘capture’ methods.

Provision of notes on catch statistics

In examining the annual and quarterly reports at the levels of district, regency and province, the review team often found dramatic fluctuations in catch statistics, or sometimes unusually consistent catch statistics, across years. The review team therefore recommended that the procedures for the collection of data be modified to allow notes regarding unusual trends to be recorded.

Timeliness of catch statistics

The review team found that there are long waiting times for catch statistics to become available for scientific assessment purposes, primarily due to the necessity for data validation prior to release of catch statistics. They therefore suggested that consideration be given to how to speed up the validation process. This could perhaps be achieved through the provision of additional resources to enable efficient electronic transfer of data and more frequent validation meetings at lower levels of the system.

In this regard, the review team noted that the website of the Fishing Ports Information Centre — www.pelabuhan.perikanan.or.id — presents Indonesian fisheries statistics and suggested that websites like this are useful for further improving the availability and timeliness of tuna statistics.

Communication between government agencies

In some cases, the review team felt that there appears to be a too low level of interaction and communication between offices collecting fisheries data in the same district or municipality, and that there might be duplication of effort and inefficiencies. They therefore suggested that the level of communication between port authorities and district and municipal fisheries offices should be increased, and that regular coordination meetings be established, if they do not already occur.

Reporting by fishing companies

In general, the review team found that reporting requirements for fishing companies are not being adhered to at a sufficiently high level, in terms of the timeliness and regularity of reporting and possibly also the quality of the information. This poses considerable problems for monitoring of the fisheries, particularly if access by enumerators to company facilities is restricted. The ongoing problem is that fishing companies perceive that data will be used for determining taxes or will lead to restrictions on fishing activity.

The review team therefore recommended that consideration should be given to ways of ensuring the reporting requirements are rigorously adhered to, through enforcement and incentives. Furthermore, there needs to be increased delivery of information to the companies in regard to the purposes of

data collection and the subsequent benefits to industry. This could be accomplished through meetings with companies, liaison with fishing industry associations, and newsletters.

Catch and effort logsheets

The review team recommended catch and effort logsheets be established for both industrial and artisanal tuna fishing vessels.

Monitoring programmes in Eastern Indonesia

The review team are gave specific recommendations regarding improvements to the monitoring programmes in Bitung, Sorong, Kendari and Ternate:

Port	No. Enum	Considerations for adequate coverage	Resources required
1. BITUNG	5 - 6	<ul style="list-style-type: none"> • Many different places of landing – Bitung Fishing Port (PPNB), but also many companies with private wharves • Companies spread out over large area considerable travel times • Night-time landings from pole & line vessels at PPNB 	<ul style="list-style-type: none"> • Transport – motorbikes x 2 • Computer x 1, + printer • Internet (broadband ?) • Training & supervision
2. SORONG	2 - 3	<ul style="list-style-type: none"> • Only 2 primary sites for industrial landings (i.e. 2 companies, PT Citra Raja Ampat and PT Radios Apirja, but PT Radios Apirja is approx 1 hour travel by road from Sorong city (shorter distance by boat). • 2 other sites for artisanal landings – Pasar Remu, Pasar Boswesan 	<ul style="list-style-type: none"> • Transport – motorbikes x 2 (or possibly 1 motor-bike and one boat + outboard) • Computer x 1, + printer • Internet (broadband ?) • Training & supervision
3. KENDARI	2	<ul style="list-style-type: none"> • 2 primary sites for monitoring – Kendari Fishing Port (PPSK), approx 8km from city centre, and Sodoaha, approx 6 m from city centre (but on opposite sides of the harbour). 	<ul style="list-style-type: none"> • Transport – motorbikes x 2 • Computer x 1, + printer • Internet (broadband ?) • Training & supervision
4. TERNATE	2	<ul style="list-style-type: none"> • 1 primary industrial monitoring site (PT Ocean Mitra Mas), close to Ternate Fishing Port (PPNT). • Artisanal/small-scale landings at PPNT • Additional artisanal/small scale landings at Dufa Dufa 	<ul style="list-style-type: none"> • Transport – motorbike x 2 • Computer x 1, printer • Internet (broadband ?) • Training & supervision

Discussion

Adoption of the new data collection procedures

It was mentioned that the port authorities have adjusted to the new data collection procedures and forms well, but that there needs to be additional efforts made at the other government agencies.

Numbers of vessels active

Mr Lawson presented Gillett (2006), Report of Visit to Indonesia: Information on Longline and Pole/Line Vessels in the Pacific Area, and referred to discrepancies in the number of longliners and pole-and-line vessels reported by the central licensing system and the fisheries statistical system. In the summary of the paper, Mr Gillett writes:

There appears to be a large discrepancy between the various sources in the number of longliners greater than 30 GT based/fishing in northeast Indonesia. Most of the estimates range from zero to about 65, but the central licensing system indicates almost one thousand. This inconsistency can be summarized as:

- *Data from the central licensing system indicates that the number of LL vessels greater than 30 GT in 2005 was 891.*
- *Data from the fisheries statistical system indicates that the number of LL vessels of all sizes in 2004 was 2016 – but this reveals little about the number of longliners greater than 30 GT.*
- *Information from the visit of C. Proctor to northeast Indonesia in late 2005 and early 2006 indicates that about 30 to 40 longliners are actually based in the area.*
- *Information from the visit of M. McCoy to Bitung in late 2005 indicates that about 60 conventional longliners were actually based/operating in the area.*
- *Tuna industry representatives indicate that few LL vessels are based in northeast Indonesia and little longline fishing takes place in that area.*
- *Gillett (2005) indicates that in late 2003 longlining was not significant in northeast Indonesia.*
- *The IOTC website data and observer information supports the contention that a substantial amount fishing by LL vessels nominally based in northeast Indonesia actually occurs in the Indian Ocean.*

Selectively using the above information, it is likely that about 50 longliners greater than 50 GRT operated in northeast Indonesia in 2005.

It was noted that vessel numbers from the central licensing system are based on the fishing ground and vessel numbers from the fisheries statistical system are based on the domicile, and so it is not appropriate to compare the two sets of data. However, Mr Lawson stressed that regardless of the discrepancies between the two sources of the number vessels licensed, the WCPFC policy on the provision of data (see Appendix IV) specifies that the annual number of vessels active, by gear type, must be provided to the Commission, rather than the number of vessels licensed.

Overview of the Philippines National Stock Assessment Project Database System

Mr Williams gave a presentation of the database system at the National Fisheries Research and Development Institute of the Philippines, which is used to manage research data collected under the National Stock Assessment Project. The presentation referred to the history of NSAP, the development of the database system by SPC in collaboration with NFRDI, the structure and components of the system, data entry, data quality, data management, regional and national statistical reports, and graphics summarising the port sampling data. He suggested that when port sampling programmes are established in Eastern Indonesia, a similar database system could be developed by SPC in collaboration with RCCF and RIMF.

8. RECOMMENDATIONS FOR IMPROVING TUNA FISHERY DATA COLLECTION IN EASTERN INDONESIA

Throughout the workshop, the participants recognised the improvements to the marine fisheries statistical system that had taken place in recent years and the key role that DGCF has played in this regard. Nevertheless, it was also recognised that further improvements to the statistical system should be made, both for national purposes and to fulfill Indonesia's data-related obligations to the

Western and Central Pacific Fisheries Commission. The participants at the Eastern Indonesia Tuna Fishery Data Collection Workshop therefore made the following recommendations.

Capture fisheries statistical system

- (1) It was recommended that DGCF, provincial, district and municipal agencies, and fishing port authorities, continue to collaborate to facilitate the collection of data on the catches of tuna and tuna-like species, separated by individual species on the revised SL forms, including training data collectors in species identification, educating them in regard to the objectives of the data, and providing them with additional resources.
- (2) It was recommended that all agencies collaborate to introduce data collection procedures to allow data collectors to report changes in trends in fishing activity and catches.
- (3) It was recommended that all agencies continue to collaborate to improve the timeliness of the collection, provision and processing of catch data, so that the current delays in the availability of annual catch statistics are reduced.
- (4) It was recommended that DGCF continue to improve online access to annual catch statistics, by gear type, species, and landing sites and management areas.
- (5) It was recommended that DGCF, provincial, district and municipal agencies, and fishing port authorities, improve their levels of communication with regular coordination meetings to facilitate the collection of data and to avoid duplication of effort.
- (6) It was recommended that all agencies strive to enforce the reporting requirements of companies and to increase their awareness and encourage them to cooperate, through the provision of fisheries information to industry, such as tuna fisheries newsletters and statistical publications, and stakeholder consultations.

Catch and effort logsheets

- (7) It was recommended that DGCF, RCCF, provincial, district and municipal agencies, and fishing port authorities, collaborate to establish logsheets for the collection of operational catch and effort data from industrial vessels, and to consider trialing logsheets with certain types of artisanal vessels, including fishers and buyers. The data collected on the logsheets should be consistent with the standards for the provision of operational catch and effort data to the Western and Central Pacific Fisheries Commission.

Port sampling programmes

- (8) It was recommended that DGCF, RCCF, provincial, district and municipal agencies, and port authorities, collaborate to establish tuna fishery port sampling programmes in Eastern Indonesia to collect data on the species composition and size composition of the catches by vessels of all gear types and size categories. Priority should be given to the most active ports, i.e., Bitung, Sorong, Kendari and Ternate. Consideration should also be given to establishing port sampling programmes at other ports, as the need arises and where funding and resources permit.

Tuna monitoring station

- (9) It was recommended that a tuna monitoring station, similar in scope and function to the tuna monitoring station for the Indian Ocean waters of Indonesia in Benoa, be considered for the Pacific Ocean waters of Indonesia in Bitung.

Species of special interest

(10) It was recommended that DGCF, RCCF and relevant NGOs collaborate to collect data on catches of species of special interest (e.g., turtles, sea birds, marine mammals, sharks) through observer programmes and, if possible, through port sampling and from fishing companies.

Numbers of vessels active

(11) It was recommended that DGCF and port authorities endeavor to estimate the annual number of domestic and foreign tuna fishing vessels, by gear type, that have actively fished in Eastern Indonesia, as distinct from the number of vessels licensed or the number of vessels by home port. Where possible, the number of vessels active by size category, within each gear type, should be determined.

Illegal, Unreported and Unregulated (IUU) fishing

(12) It was recommended that the relevant agencies endeavor to determine the general level of unreported catches of tuna in the waters of Eastern Indonesia, to avoid the double-counting or under-estimation of catches.

Project development

(13) It was recommended that Indonesia liaise with the WCPFC Secretariat to access WCPFC work programme funds to conduct preliminary work during 2007 towards the establishment of sampling programmes and other activities in Eastern Indonesia.

(14) It was recommended that the Western and Central Pacific Fisheries Commission endorse the indicative budget for 2008 for the Indonesia and Philippines Data Collection Project, to establish sampling programmes in Eastern Indonesia during 2008, and that the WCPFC Secretariat develop memoranda of understanding with the relevant agencies in Indonesia in this regard.

(15) It was recommended that the WCPFC Secretariat develop a proposal during 2007 for funding by the Global Environment Facility (GEF) for sampling programmes in Eastern Indonesia during the period 2009–2012. To ensure the continuity of sampling programmes in Eastern Indonesia, it was also recommended that the WCPFC continue to support these programmes from the Commission's core budget, until the GEF project commences.

In regard to recommendations (14) and (15), the MOUs and the GEF proposal should take into consideration the recommendations regarding the implementation of port sampling that are presented in the review of tuna fisheries in Eastern Indonesia (Proctor & Nugraha, in preparation) and should consider funding for the position of National Tuna Data Coordinator.

9. OTHER MATTERS

There were no other matters.

10. CLOSING

The participants thanked the Chairman, the Vice-Chairman and the rapporteurs for a job well done, RCCF for hosting the workshop, providing secretarial assistance and arranging the catering, and SPC, CSIRO and the WCPFC Secretariat for assistance with organising the workshop. Appreciation

was also expressed for the support of the donors — ACIAR and CSIRO in regard to the review of the tuna fisheries in Eastern Indonesia, and France, New Zealand, Chinese Taipei and the United States of America, which have contributed to the WCPFC Indonesia and Philippines Data Collection Project, through which the participation of several of the Indonesian participants based outside of Jakarta was made possible. The meeting was closed with a vigorous round of applause.

APPENDIX I. AGENDA

1. Opening
2. Appointment of chairpersons and rapporteurs
3. Adoption of the agenda
4. Obligations for the provision of data to the Western and Central Pacific Fisheries Commission
5. Status of the Indonesia and Philippines Data Collection Project
6. Review of the tuna fisheries in Eastern Indonesia
7. Review of the current statistical system
8. Recommendations for improving tuna fishery data collection in Eastern Indonesia
9. Other matters
10. Closing

APPENDIX II. WORKING PAPERS

- Anon. 2003. Proposal for Monitoring the Catches of Highly Migratory Species in the Philippines and the Pacific Ocean Waters of Indonesia. Prepared for the Preparatory Conference for the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific. Oceanic Fisheries Programme, Secretariat of the Pacific Community, Noumea, New Caledonia.
- Anon. 2005. WCPFC Policy on the Provision of Data, Adopted at the Second Regular Session of the WCPFC, December 2005. Annex VII of the Report of the First Regular Session of the WCPFC Scientific Committee, 8-19 August 2005, Noumea, New Caledonia. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Anon. 2006. Report of the Third Meeting of the Steering Committee of the Indonesia and Philippines Data Collection Project, 4 and 8 August 2006, Manila, Philippines. Western and Central Pacific Fisheries Commission, Pohnpei, Federated States of Micronesia.
- Gillett, R. 2006. Report of Visit to Indonesia: Information on Longline and Pole/Line Vessels in the Pacific Area. Gillett, Preston & Associates, Nadi, Fiji.
- Ingles, Jose A., Imam Musthofa Zainudin, Jimely O. Flores, Priyanto Rahardjo, Purwito Martosubroto & Hasjim Djalal. 2006. Assessment of Tuna Fisheries of Indonesia and Identification of Approaches to EBM for Tuna Management. World Wildlife Fund — Indonesia, Denpasar, Bali, Indonesia.
- Proctor, C. & B. Nugraha. 2006. Preliminary Notes From “A Review of Tuna Fisheries of Eastern Indonesia”. ACIAR Project FIS/2002/074. Commonwealth Scientific and Industrial Research Organisation, Hobart, Australia.

APPENDIX III. LIST OF PARTICIPANTS

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APPENDIX IV. WCPFC POLICY ON THE PROVISION OF DATA

Scientific Data to be Provided to the Commission

1. *Estimates of annual catches*

The following estimates of catches during each calendar year shall be provided to the Commission for each gear type:

- catches of bigeye (*Thunnus obesus*), skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), striped marlin (*Tetrapturus audax*), blue marlin (*Makaira mazara*), black marlin (*Makaira indica*) and swordfish (*Xiphias gladius*) in (i) the WCPFC Statistical Area (see paragraph #8) and (ii) the portion of the WCPFC Statistical Area east of the 150° meridian of west longitude; and
- catches of albacore (*Thunnus alalunga*), striped marlin and swordfish in (i) the Pacific Ocean south of the Equator, (ii) the Pacific Ocean north of the Equator, (iii) the WCPFC Statistical Area north of the Equator, (iv) the WCPFC Statistical Area south of the Equator, and (v) the portion of the WCPFC Statistical Area east of the 150° meridian of west longitude.

For trollers targeting albacore in the Pacific Ocean south of the Equator, the following estimates of catches during the fishing season (July to June) should also be provided:

- catches of albacore in the Pacific Ocean south of the Equator.

Catch estimates shall also be provided for other species as determined by the Commission.

Estimates of discards should also be provided.

Longline catch estimates shall be for whole weight, rather than processed weight.

All catch estimates shall be reported in tonnes (i.e., metric tons).

The statistical methods that are used to estimate the annual and seasonal catches shall be reported to the Commission, with reference to the coverage rates for each type of data (e.g., operational catch and effort data, records of unloadings, species composition sampling data) that is used to estimate the catches and to the conversion factors that are used to convert the processed weight of longline-caught fish to whole weight.

2. *Number of vessels active*

The number of vessels active in the WCPFC Statistical Area during each calendar year shall be provided to the Commission for each gear type.

For longliners, pole-and-line vessels and purse seiners, the number of vessels active shall be provided by gross registered tonnage (GRT) class. The GRT classes are defined as follows:

- Longline: 0–50, 51–200, 201–500, 500+
- Pole-and-line: 0–50, 51–150, 150+
- Purse seine: 0–500, 501–1000, 1001–1500, 1500+

For trollers targeting albacore in the Pacific Ocean south of the Equator, the number of vessels active in the WCPFC Statistical Area during the fishing season (July to June), shall also be provided and should be provided for the Pacific Ocean south of the Equator.

3. *Operational level catch and effort data*

Operational level catch and effort data (e.g., individual sets by longliners and purse seiners, and individual days fished by pole and line vessels and trollers) shall be provided to the Commission, in accordance with standards to be established by the Commission. It is recognised that certain members and cooperating non-members of the Commission may be subject to domestic legal constraints, such that they may not be able to provide operational data to the Commission until such constraints are overcome. Until such constraints are overcome, aggregated catch and effort data and size composition data as described in (4) and (5) below shall be provided. Unraised longline catch and effort data stratified by the number of hooks between floats and the finest possible resolution of time period and geographic area shall also be provided.

It is also recognised that certain members and cooperating non-members of the Commission may have practical difficulties in compiling operational data for fleets comprised of small vessels, such as certain sectors of the fisheries of Indonesia, the Philippines and small island developing States.

4. *Catch and effort data aggregated by time period and geographic area*

If the coverage rate of the operational catch and effort data that are provided to the Commission is less than 100%, then catch and effort data aggregated by time period and geographic area that have been raised to represent the total catch and effort shall be provided. Longline catch and effort data shall be aggregated by periods of month and areas of 5° longitude and 5° latitude. Catch and effort data for surface fisheries shall be aggregated by periods of month and areas of 1° longitude and 1° latitude.

If the coverage rate of the operational catch and effort data that are provided to the Commission is less than 100%, then catch and effort data that have been raised to represent the total catch and effort shall also be aggregated by periods of year and areas of national jurisdiction and high seas within the WCPFC Statistical Area.

The statistical methods that are used to derive the aggregated catch and effort data shall be reported to the Commission, with reference to the coverage rates of the operational catch and effort data, and the types of data and method used to raise the catch and effort data.

5. *Size composition data*

Length and/or weight composition data that are representative of catches by the fisheries are essential for stock assessments and therefore shall be provided to the Commission at the finest possible resolution of time period and geographic area.

6. *The roles of flag states and coastal states*

Flag states or entities shall be responsible for providing to the Commission scientific data covering vessels they have flagged, except for vessels operating under joint-venture or charter arrangements with another state such that the vessels operate, for all intents and purposes, as local vessels of the other state, in which case the other state shall be responsible for the provision of data to the Commission.

It is recognised that the ability of flag States or entities to provide scientific data to the Commission may be constrained by the terms of bilateral or regional arrangements, such as the Treaty on Fisheries Between the Governments of Certain Pacific Island States and the Government of the United States of America.

Scientific data compiled by coastal states shall also be provided to the Commission.

7. *Time periods covered and schedule for the provision of data*

Estimates of annual or seasonal catches should be provided to the Commission from 1950 onwards or, if the fleet began operating after 1950, from the year in which the fleet began operating.

Operational catch and effort data, and size composition data, should be provided for all years, starting with the first year for which the data are available.

For all gear types, except trollers targeting albacore in the Pacific Ocean south of the Equator, estimates of annual catches, the number of vessels active, catch and effort data, and size composition data, covering a calendar year should

be provided by April 30 of the year following the calendar year (e.g., data covering calendar year 'x' should be provided by 30 April of year 'x+1').

For trollers targeting albacore in the Pacific Ocean south of the Equator, estimates of annual catches, the number of vessels active, catch and effort data, and size composition data, covering a fishing season (July to June) should be provided by April 30 of the year following the year in which the season ends (e.g., data covering the season from July of year 'x' to June of year 'x+1' should be provided by 30 April of year 'x+2').

Estimates of annual catches, the number of vessels active, catch and effort data, and size composition data should be revised, and the revisions provided to the Commission, as additional data become available.

8. *Definition of the WCPFC Statistical Area*

The WCPFC Statistical Area is defined as follows: from the south coast of Australia due south along the 141° meridian of east longitude to its intersection with the 55° parallel of south latitude; thence due east along the 55° parallel of south latitude to its intersection with the 150° meridian of east longitude; thence due south along the 150° meridian of east longitude to its intersection with the 60° parallel of south latitude; thence due east along the 60° parallel of south latitude to its intersection with the 130° meridian of west longitude; thence due north along the 130° meridian of west longitude to its intersection with the 4° parallel of south latitude; thence due west along the 4° parallel of south latitude to its intersection with the 150° meridian of west longitude; thence due north along the 150° meridian of west longitude; and from the north coast of Australia due north along the 129° meridian of east longitude to its intersection with the 8° parallel of south latitude, thence due west along the 8° parallel of south latitude to the Indonesian peninsula; and from the Indonesian peninsula due east along the 2°30' parallel of north latitude to the Malaysian peninsula.

9. *Periodic reviews of the requirements for scientific data*

The Commission, through its Scientific Committee, shall periodically review the requirements for scientific data and shall provide the Commission with revised versions of this recommendation, as appropriate.

Standards for the Provision of Operational Catch and Effort Data to the Commission

1. *Data items that shall be reported to the Commission*

1.1 Vessel identifiers, for all gear types

Name of the vessel, country of registration, registration number, international radio call sign: The registration number is the number assigned to the vessel by the State that has flagged the vessel. A code may be used as a vessel identifier instead of the name of the vessel, registration number and call sign for vessels that have fished and that intend to fish only in the waters of national jurisdiction of the State that has flagged the vessel.

1.2 Trip information, for all gear types

The start of a trip is defined to occur when a vessel (a) leaves port after unloading part or all of the catch to transit to a fishing area or (b) recommences fishing operations or transits to a fishing area after transshipping part or all of the catch at sea (when this occurs in accordance with the terms and conditions of article 4 of Annex III of the Convention, subject to specific exemptions as per article 29 of the Convention).

Port of departure, date of departure, port of unloading, date of arrival in port of unloading: If the start of a trip coincides with recommencing fishing operations or transiting to a fishing area after transshipping part or all of the catch at sea, then "Transshipment at sea" shall be reported in lieu of the port of departure, and if the end of a trip coincides with transshipping part or all of the catch at sea, then "Transshipment at sea" shall be reported in lieu of the port of unloading.

1.3 Information on operations by longliners

Activity: This item should be reported for each set and for days on which no sets were made, from the start of the trip to the end of the trip. Activities should include “a set”; “no fishing — in transit”; “no fishing — gear breakdown”; “no fishing — bad weather”; and “no fishing — in port”.

Date of start of set and time of start of set: The date and start of set time should be GMT/UTC. If no sets are made, the date and main activity should be reported.

Position of start of set: The position of start of set should be reported in units of at least minutes of latitude and longitude. If no sets are made, the noon position should be reported.

Number of hooks per set.

Number of branch lines between floats. The number of branch lines between floats should be reported for each set.

Number of fish caught per set, for the following species: albacore (*Thunnus alalunga*), bigeye (*Thunnus obesus*), skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), striped marlin (*Tetrapturus audax*), blue marlin (*Makaira mazara*), black marlin (*Makaira indica*) and swordfish (*Xiphias gladius*), and other species as determined by the Commission.

If the total weight or average weight of fish caught per set have been recorded, then the total weight or average weight of fish caught per set, by species, should also be reported. If the total weight or average weight of fish caught per set have not been recorded, then the total weight or average weight of fish caught per set, by species, should be estimated and the estimates reported. The total weight or average weight shall refer to whole weights, rather than processed weights.

1.4 Information on operations by pole-and-line vessels and related gear types

Activity: This item shall be reported for each day, from the start of the trip to the end of the trip. Activities should include “a day fishing or searching with bait onboard”; “no fishing — collecting bait”; “no fishing — in transit”; “no fishing — gear breakdown”; “no fishing — bad weather”; and “no fishing — in port”.

Date: The date should be GMT/UTC.

Noon position: The noon position should be reported in units of at least minutes of latitude and longitude.

Weight of fish caught per day, for the following species: albacore, bigeye, skipjack, yellowfin, and other species as determined by the Commission.

1.5 Information on operations by purse-seiners and related gear types

Activity: This item shall be reported for each set and for days on which no sets were made, from the start of the trip to the end of the trip. Activities should include “a set”; “a day searched, but no sets made”; “no fishing — in transit”; “no fishing — gear breakdown”; “no fishing — bad weather”; and “no fishing — in port”.

Date of start of set, time of start of set and time of end of set: The date and time of the start of set and the time of end of set should be GMT/UTC. If no sets are made, the date and main activity should be reported.

Position of set or noon position: If a set is made, then the position of the set shall be reported. If searching occurs, but no sets are made, then the noon position shall be reported. The position should be reported in units of at least minutes of latitude and longitude.

School association: All common types of school association should be reported, while uncommon types of association should be reported as “other”. Common types of school association are “free-swimming” or “unassociated”; “feeding on baitfish”; “drifting log, debris or dead animal”; “drifting raft, FAD or payao”; “anchored raft, FAD or payao”; “live whale”; and “live whale shark”.

Weight of fish caught per set, for the following species: albacore, bigeye, skipjack, yellowfin, and other species as determined by the Commission.

1.6 Information on operations by trollers and related gear types

Activity: This item shall be reported for each day, from the start of the trip to the end of the trip. Activities should include “a day fished”; “no fishing — in transit”; “no fishing — gear breakdown”; “no fishing — bad weather”; and “no fishing — in port”.

Date: The date should be GMT/UTC.

Noon position: The noon position should be reported in units of at least minutes of latitude and longitude.

Number of fish caught per day, for the following species: albacore, bigeye, skipjack, yellowfin, and other species as determined by the Commission.

If the total weight or average weight of fish caught per day have been recorded, then the total weight or average weight of fish caught per day, by species, should also be reported. If the total weight or average weight of fish caught per day have not been recorded, then the total weight or average weight of fish caught per day, by species, should be estimated and the estimates reported. The total weight or average weight shall refer to whole weights, rather than processed weights.

2. *Geographic area to be covered by operational catch and effort data to be provided to the Commission*

The geographic area to be covered by operational catch and effort data to be provided to the Commission shall be the WCPFC Statistical Area, except for fisheries targeting albacore in the Pacific Ocean south of the Equator, for which the geographic area should be the Pacific Ocean south of the Equator.

3. *Target coverage rate for operational catch and effort data to be provided to the Commission*

The target coverage rate for operational catch and effort data to be provided to the Commission is 100%.

4. *Procedures for the verification of operational catch and effort data*

Operational catch and effort data should be verified as follows:

- The amount of the retained catch should be verified with records of unloading obtained from a source other than the crew or owner or operator of the fishing vessel, such as an agent of the company responsible for unloading or onward shipping or purchasing of the catch.
- Positions of latitude and longitude should be verified with information obtained from vessel monitoring systems.
- The species composition of the catch should be verified with sampling conducted by observers during fishing operations or by port samplers during unloading.

APPENDIX V. DATA TO BE PROVIDED TO WCPFC BY INDONESIA

TYPE OF DATA	GEAR TYPE	AREA	SPECIES	COMMENT
Annual catch estimates	All gear types	WCPFC Statistical Area	albacore, bigeye, skipjack, yellowfin, blue marlin, black marlin, striped marlin, swordfish	The catch estimates must represent whole weight, rather than processed weight. Discards should be included. Statistical methods must be reported.
Annual number of vessels active	All gear types	WCPFC Statistical Area		The number of vessels active must be reported, rather than the number of vessels licensed. The number of vessels should be reported by size category.
Operational (logsheet) catch and effort data	All gear types, although industrial gear types are higher priority	WCPFC Statistical Area	Longline, handline: albacore, bigeye, skipjack, yellowfin, blue marlin, black marlin, striped marlin, swordfish Pole-and-line, purse seine, ringnet, troll line: albacore, bigeye, skipjack, yellowfin	The data must be consistent with the “Standards for the Provision of Operational Catch and Effort Data to the Commission”. Target coverage is 100%.
Aggregated catch and effort data	All gear types	5x5 by month for longline and 1x1 by month for other gear types, although Fisheries Management Area by month or quarter would be acceptable initially	See ‘Operational catch and effort data’	The aggregated data must be provided if the coverage of operational data is incomplete, and must be raised to represent the total catch and effort. Statistical methods must be reported.
Size composition data	All gear types	Finest resolution possible	See ‘Operational catch and effort data’	Data for individual samples (e.g., date, latitude and longitude of catch, and sizes of fish) could be provided, although data summarised by Fisheries Management Area and month or quarter would also be acceptable.

APPENDIX VI. ACRONYMS

ACIAR	Australian Centre for International Agricultural Research
BBRPBL	Balai Besar Riset Perikanan Budidaya Laut (Indonesia)
CCMs	WCPFC members, cooperating non-members and participating territories
CCSBT	Commission for the Conservation of Southern Bluefin Tuna
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DGCF	Directorate General of Capture Fisheries (Indonesia)
FAD	Fish aggregating device
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GRT	Gross registered tonnage
GT	Gross tonnes
OFP	SPC Oceanic Fisheries Programme
IOTC	Indian Ocean Tuna Commission
LOA	Length overall
NFRDI	National Fisheries Research and Development Institute (Philippines)
NSAP	National Stock Assessment Project (Philippines)
RCCF	Research Center for Capture Fisheries (Indonesia)
RIMF	Research Institute for Marine Fisheries (Indonesia)
SC1	Inaugural session of the WCPFC Scientific Committee, 8–19 August 2005
SCTB	Standing Committee on Tuna and Billfish
SISPT	Statistical information system for capture fisheries
SPC	Secretariat of the Pacific Community
WCPFC	Western and Central Pacific Fisheries Commission