



A summary of progress with a trial observer program for Indonesia's tuna longline fishery in the Indian Ocean

Lilis Sadiyah^{1&2}
Retno Andamari³
Budi Iskandar Prisantoso²
Craig Proctor⁴
Dyah Retnowati⁵

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Australian Government
**Australian Centre for
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¹ Research Centre for Capture Fisheries, Jakarta, Java, Indonesia
² School of Zoology, University of Tasmania, Australia
³ Research Institute for Mariculture, Gondol, Bali, Indonesia
⁴ CSIRO Marine and Atmospheric Research, Hobart, Tasmania, Australia
⁵ Directorate General of Capture Fisheries, Jakarta, Java, Indonesia

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Abstract

Indonesia has the largest fleet of commercial longline tuna fishing vessels operating in the Eastern Indian Ocean. One thousand vessels were estimated to be active in the Indonesian fresh tuna longline fleet in 2006. Large rises in national fuel prices in October 2005 and again in May 2008 had major impacts on vessel activity and brought about changes in fleet behaviour by some companies. Primary target species are yellowfin, bigeye, and albacore tunas, and southern bluefin tuna are a valuable bycatch. To address a lack of CPUE data available from this fishery, a trial observer program was developed – a collaboration between Ministry of Marine Affairs and Fisheries (Indonesia) and CSIRO Marine and Atmospheric Research (Australia), with funding from Australian Centre for International Agricultural Research (ACIAR). The program is part of a larger program to further develop Indonesia's capacity to monitor, analyse and report on its tuna fisheries – primary goals being better understanding of catch trends and improved assessments of the tuna stocks and bycatch species. The program commenced in July 2005 and will run till December 2008, with focus on vessels operating from the port of Benoa in Bali. Six observers were recruited and trained in species identification, safety, data management and report writing. At time of writing the team had completed a total of 44 trips to sea, with an average of 21 sets per trip. Observer datasheets and a database, tailored to the Indonesian fishery, were successfully implemented and are being further refined. The ACIAR project team are working with other initiatives in Indonesia to develop a strategy for translation of the trial program into a formal National fisheries observer program. Concurrent with this development are ongoing discussions within MMAF and with industry for development and implementation of a new logbook/logsheets for trial in the tuna longline fishery.

Fishery overview and context

Commercial tuna longline fishing commenced in Indonesian waters during the 1930s with Japanese vessels conducting 'test fishing' (Proctor et al. 2003²). Tuna longline fishing by Indonesian commercial vessels did not commence until 1952. Through the 1960s – 1980s there was gradual expansion of the Indonesian longline fleet, but in the late 1980s/early 1990s there was a dramatic, rapid expansion in vessel numbers following the development of export markets for fresh and frozen whole tuna to Japan and to other international markets.

Indonesia has the largest fleet of commercial tuna longline vessels in the Eastern Indian Ocean, with an estimated 1000 active vessels in 2006 (IOTC 2008³). However, this is a significant reduction from the estimated 1500 – 1800 vessels that were operating from key ports in Java, Sumatera and Bali in 2003. A major fuel price rise (following a lowering of Indonesian Government subsidies on all fuels) in October 2005 resulted in decreased vessel activity within many fishing companies. Another recent fuel-price rise (May 2008) has further impacted on the number of active vessels. Marked changes in fishing behaviours also occurred, in response to the increased operating costs, but also because of continued declines in catches of some target species (Fig. 1). Many vessels have been fishing further from

² Proctor C.H., Merta G.S., Sondita M.F.A., Wahyu I. R., Davis T.L.O., Gunn J.S., and Andamari R. (2003). A review of Indonesia's Indian Ocean tuna fisheries. ACIAR Country Status Report.

³ Presentation by Herrera, M. (IOTC) at Steering Committee Meeting for Monitoring of Indonesia's Tuna Fisheries, 27-28 May 2008, Jakarta.

Indonesian ports in search of better catches and staying at sea for up to 3-5 months (compared to 1-2 months previously) and carrier/collector vessel activity has increased significantly. Although the target species of Indonesia's longline fleet are primarily yellowfin (YFT) and bigeye (BET) tunas (Table 1), the catch of many of these vessels includes southern bluefin tuna (SBT). The amount of SBT catch is relatively small compared to that of YFT and BET, but is significant, as the majority are caught from the only known spawning area for this species, south of Java and Bali (Fig. 2). Long term declines in average size and age of SBT caught by this fishery, and also declines in catches of YFT and BET (Fig. 1), are of serious concern. To better understand the reasons behind these trends, and to assist development of effective management strategies for fishery sustainability, obtaining catch and effort data was identified by all the collaborating organisations and stakeholders as an urgent priority.



Figure 1. The estimated catch of southern bluefin, bigeye and yellowfin tuna landed at Benoa in the years 1993 to 2006.

Overview of the Observer Program

To address the shortage of CPUE information, a trial scientific observer program for commercial longline vessels based at Benoa Fishing Port commenced in July 2005. This program is a collaboration between the Research Centre for Capture Fisheries, within Indonesia's Ministry of Marine Affairs and Fisheries (MMAF), and CSIRO Marine and Atmospheric Research, and is funded by the Australian Centre for International Agricultural Research. Six recruits were provided with observer training. This included fish, cetacean, turtle, and bird identification, data collection and reporting protocols, sea and climate conditions reporting, and guidelines for safety at sea. In the past 12 months two new trained observers have joined the team to replace two who left to take up positions in Government service in Jakarta. Data collection sheets and the observer database (both in Bahasa Indonesia) continue to undergo development to suit the Indonesian fishery. The main difficulty experienced by the program during the past 12 months has been the ongoing challenge to obtain regular placements of the observers on vessels because of the decreased level of vessel activity (i.e. fewer vessel departures/week than previously). In addition, the observers have to

‘compete’ with Fisheries High School students for placements on the longliners, as these students must do a trip to sea as part of their final year of study. The trial program also places high importance on the observers’ health and safety and some vessels are deemed unsuitable for this reason. This further reduces the pool of vessels available for placements.

Summary of Observer Data to Date

To date, Indonesia's Indian Ocean trial observer program has achieved 44 trips to sea, between August 2005 and July 2008, with more in progress at time of writing. Data presented here are for the first 38 trips (data from more recent trips are still being processed). Average trip length was 35 days, on vessels ranging in size from 37 to 140 gross tonnes. The average number of sets/trip was 21, with averages of 1434 hooks/set, 13 hooks between floats, and 128 floats/set (Table 1). Fishing operation areas included Eastern Indian Ocean between latitude 4°S and 35°S and longitude 80°E and 131°E, but also the Banda Sea (Fig. 2). It seems that impact of fuel price not only resulted in expanding the fishing ground vertically, but also horizontally. Some reported longline sets occurred more to the west than previously observed (almost in 80°E). Averaged across all trips, catch composition was 38% tuna (the 4 primary target species), and 62% bycatch (Fig. 3a). SBT and ALB were predominantly caught south of 20°S, whilst BET and YFT were predominantly caught in areas north of 20°S (Fig. 3b).

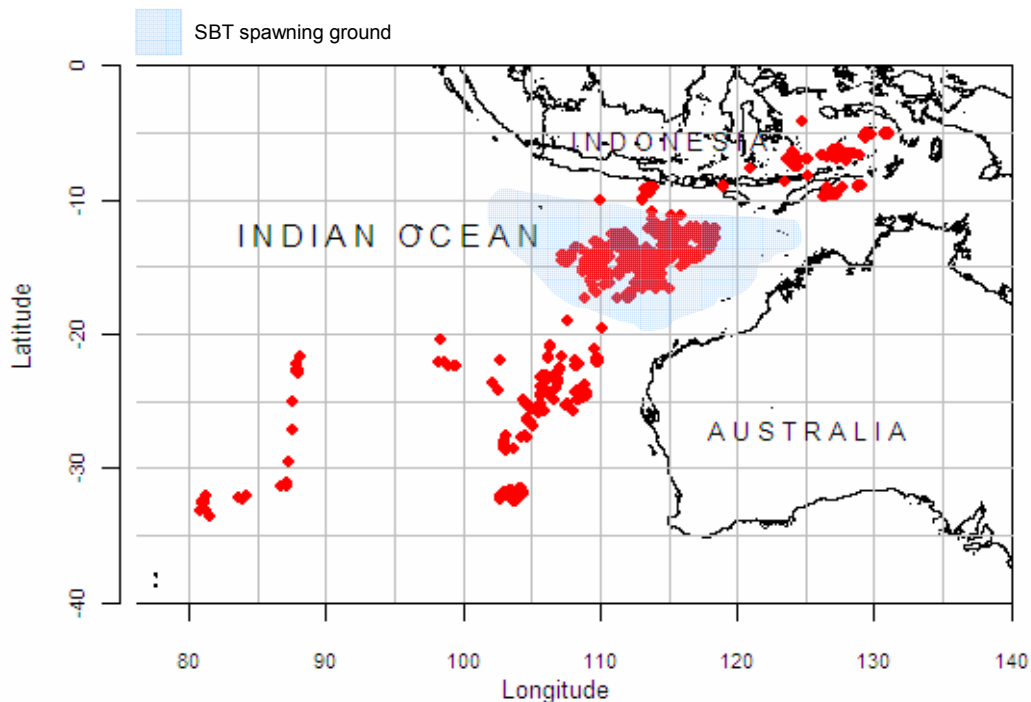


Figure 2. Data from first 38 trips showing set positions.

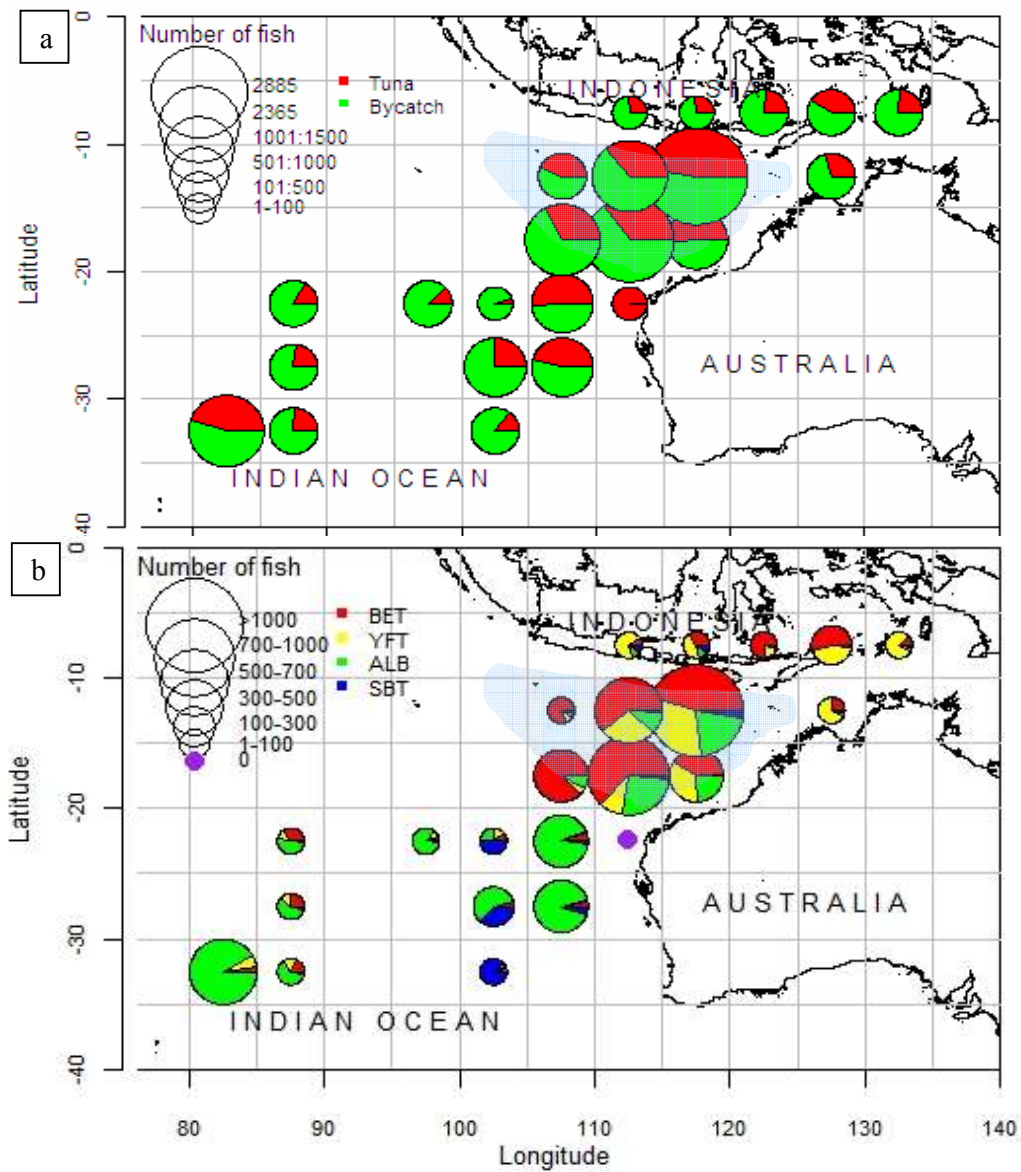


Figure 3. Data from first 38 trips showing (a) catch composition for tuna (aggregated from the four tuna species) and bycatch and (b) catch composition for the 4 target tuna species.

Table 1: Summary of trip information from trial observer program for longline vessels based at port of Benoa, Bali, for period August 2005 – July 2008.

Number of trips*	38*	
	Mean	Range
Length of trip (days)	35	19 - 108
Number of sets/trip	21	8-59
Vessel sizes (GT)	92	37-140
Number of hooks/set	1434	400-1921
Number of hooks between floats	13	4-21
Number of floats/set	128	20-420
Primary target species	Bigeye tuna (<i>Thunnus obesus</i>), Yellowfin tuna (<i>Thunnus albacares</i>), Albacore (<i>Thunnus alalunga</i>)	
Common bycatch species	Southern bluefin tuna (<i>Thunnus maccoyii</i>), Lancet fish (<i>Alepisaurus brevirostris</i>), Oil fish (<i>Ruvettus pretiosus</i>), Pelagic stingray (<i>Dasyatis violacea</i>), Blue shark (<i>Prionace glauca</i>), Black promfret (<i>Parastromateus niger</i>), Swordfish (<i>Xiphias gladius</i>), Crocodile shark (<i>Pseudocarcharias kamoharai</i>), Skipjack tuna (<i>Katsuwonus pelamis</i>), Common Dolphin (<i>Corypahaena hippurus</i>), Moonfish (<i>Lampris regius</i>).	
Common Bait Used	Lemuru (<i>Sardinella spp.</i>), Milkfish (<i>Chanos chanos</i>), Scad mackerel (<i>Decapterus spp.</i>), Gizzard shad (<i>Anodontostoma chacunda</i>), Frigate Tuna (<i>Auxis spp.</i>), Squid (<i>Loligo spp.</i>).	

* A total of 44 trips done during this period but data entry not yet complete for most recent trips.

Further Development of the Observer Program

The trial observer program at Benoa will continue until the end of 2008. As they gain experience at sea, the observers are taking on more tasks. The deployment of hook-timers and temperature depth recorders has been done during the past 12 months, to obtain information to assist the analyses of CPUE and our understanding on factors that influence catch success. Also, the observers have been doing biological sampling at sea for a CSIRO genetics research projects on stock structure of swordfish, *Xiphias gladius*.

The ACIAR Project team continues to work closely with MMAF agencies and with the tuna fishing industry to develop a strategy to expand the trial program (which currently relies entirely on voluntary participation by fishing companies) to become a formal National fisheries observer program, that will include vessels operating from other ports and other vessel gear types. In association with this strategy there have been ongoing discussions among all stakeholder groups to progress the development and strategy for implementation of upgraded log-sheet/logbook for vessel skippers. Directorate of Fisheries Resources

Management⁴ have already made good progress in this area through development of a logbook for implementation for all gear types. However, at the Steering Committee Meeting for “Monitoring of Indonesia’s Tuna Fisheries” in late May’08 in Jakarta, there was general agreement by the meeting that this logbook/logsheets needed further development to make it acceptable and beneficial to Industry, meets all the needs of DFRM, but also of a format that yields the suite of data required for a scientific CPUE assessment of the fishery. It is hoped the observers will play an important role in assisting training of the skippers in the completion of their logsheets.

In recognising the importance of the sustainability of the tuna stocks and, in turn, sustainability of the tuna industry to Indonesia, the nation’s tuna fishing industry associations and the Indonesian Tuna Commission have expressed strong support for these initiatives. A key outcome from the Steering Committee Meeting in May 2008 was the recommendation that a workshop be held in Indonesia later this year to further progress the logbook/logsheets and the National observer program.

This observer program will undoubtedly assist in the monitoring of Indonesia’s annual catch of SBT. Among the 44 trips completed by the observers to date, several have been on vessels fishing in the area south of the spawning ground. As such, the observer database is growing into an important source of data that should enable a thorough comparison of population structure of SBT on these southern grounds and those on the spawning ground. A full report on the results of the observer program will be presented to the CCSBT Scientific Committee meeting in 2009.

Acknowledgements

This Trial Tuna Observer Program in the Indian Ocean would not have been possible without the cooperation of tuna fishing companies and the skippers and crews of their vessels, based at Port Benoa, who have provided vessel placements for the observers and assisted in data collection. We wish to acknowledge the important contributions of the Chairs of the longline tuna fishing associations, Mr Agus (Asosiasi Tuna Longline Indonesia) and Mr Poernomo (Asosiasi Tuna Indonesia), who have encouraged their association members to cooperate in the program, and to the Office of Fisheries and Marine Affairs for Province of Bali⁵, who assisted in the program’s establishment. We are also grateful to the staff of WASKI⁶ (Office for the Supervision of Fishing Vessels) in Benoa, who have provided information on vessel activities to the observers and assisted in assigning the observers to vessels.

The success of the program relies heavily on the quality of the information collected at sea. The amount and quality of information collected to date demonstrates a high degree of professionalism and dedication by the observers and we extend our appreciation to all the observers who are currently or have been involved with this program.

The trial observer program is a key component of a broader capacity building project (“Capacity development to monitor, analyse and report on Indonesian tuna fisheries”), funded by Australian Centre for International Agricultural Research and by CSIRO Marine and Atmospheric Research. This project is a contribution from the CSIRO Wealth from Oceans Flagship.

⁴ Directorate of Fisheries Resources Management is within the Directorate General of Capture Fisheries.

⁵ Dinas Perikanan dan Kelautan Propinsi Bali

⁶ Pengawas Kapal Ikan