



The catch of SBT by the Indonesian longline fishery operating out of Benoa, Bali in 2007

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Abstract

This paper reports on the longline catch of southern bluefin tuna and other tuna and billfish species landed at the Bena Fishing Port, Bali in 2007. There were 1916 landings by tuna vessels at Bena during 2007 which is significantly more than the 1664 landings in 2006. The increase is thought to be the result of increased activity within the Bena-based fleet but also landings from vessels previously based at Muara Baru. The average number of landings per month for the year was 160, compared to 139 in 2006. The 2007 level of landings activity is still well below what was observed in 2003 and 2004. The estimates of landings for 2007 at Bena, for **southern bluefin**, bigeye, yellowfin, and albacore tunas were **1077**, 5293, 5354, and 1132 tonnes respectively. The total landings of tunas, billfish and other species at Bena in 2007 are estimated to be 13,762 tonnes. SBT comprised 8.4% of total tuna landings (YFT, BET, ALB, SBT) which is up from 5.2% in 2006. Large rises in fuel prices in Indonesia in October 2005 and in May 2008 continue to have significant impacts on fleet operations and fishing behaviours. Estimates for landings of SBT and other tunas at Indonesian ports other than Bena are not yet available from Directorate General of Capture Fisheries, but hopefully will be for reporting to the Extended Scientific Committee Meeting in September. The preliminary catch estimate for SBT landings and processings at Bena during January to May 2008 is 455 tonnes, which is significantly lower than for the same period in 2007. The Tuna Monitoring Station at Bena will shift location during the coming year and will be developed as a fisheries research and monitoring centre within the Agency of Marine and Fisheries Research.

Introduction

In 2002 a collaborative project between Indonesia's Research Centre for Capture Fisheries/Research Institute for Marine Fisheries (RCCF/RIMF) and Directorate General for Capture Fisheries (DGCF), CSIRO Marine Research, Australia's Department of Agriculture of Fisheries and Forestry (DAFF), Australian Centre for International Agricultural Research (ACIAR), Indian Ocean Tuna Commission (IOTC) and Overseas Fisheries Cooperation Foundation of Japan (OFCF), established an integrated monitoring program at three major Indonesian ports where tuna and billfish caught by longline fleets operating in the Indian Ocean are landed and processed. SBT are mainly landed in the most eastern port of Bena (south Bali) which services longline vessels fishing on the SBT spawning grounds south and east of Central and Eastern Java. A small quantity of SBT is also landed at Cilacap (south coast, Central Java) and very occasionally SBT is also landed at Muara Baru (North Jakarta) and Palabuhanratu (west Java). This expanded monitoring program built on the earlier RCCF/RIMF/CSIRO catch monitoring initiated in 1993. This paper focuses on monitoring activities at Bena and presents the Indonesian catch estimates for SBT, other tuna, and billfish landed at this port during 2007.

Methods

The Indonesian SBT catch monitoring is focused on the Port of Bena in South Bali where the majority of SBT landings in Indonesia occur. A small amount of SBT is also landed at the Fishing Port of Cilacap, and very occasionally at Muara Baru and Palabuhanratu which are covered by the IOTC monitoring program coordinated by Directorate General of Capture Fisheries (Jakarta), but without additional targeted sampling of SBT landings.

Monitoring at Bena

Catches are monitored by seven enumerators at the fourteen processing plants at Bena where tuna and billfish landings are processed for export. A target of >30% coverage of landings at each processor each month is maintained throughout the reporting period. The information is entered on to IOTC's FINSS database by staff at the Gondol Research Institute of Mariculture, Bali. The resulting data are sent to the Research Centre for Capture Fisheries (RCCF) in Jakarta after each month's data entry is complete. After data checking, the total catch by species and month is estimated by RCCF. Prior to 2007, the catch estimations were made by IOTC using the data provided by RCCF. However, following the handover of responsibility by IOTC/OFCF to Indonesia for the fiscal and operational management of the monitoring programs in Muara Baru and Cilacap at the end of 2006, Indonesia has also taken up full responsibility for providing the annual catch estimates to CCSBT.

The procedure for estimating total catch was detailed in Andamari et al. 2004. This procedure has been the routine since the IOTC/OFCF/RCCF/RIMF/DGCF/CSIRO monitoring program commenced in mid-2002. The sampling protocol calls for sub-sampling of 10% of all tuna landed for length measurement. This is insufficient for determining the biological characteristics of the SBT spawning population as less than 5% of these measurements would be on SBT. By directed targeting of landings that have SBT in them it is possible to measure a much greater number of SBT. These additional data, as well as biological data from IOTC monitored landings, are entered into the SBT Biologicals Database at RIMF and regular updates of the database are provided to CSIRO in Hobart.

Results

Bena Catch Monitoring

A summary of monitoring activities during 2007 and first six months of 2008 are presented in Table 1 and Figure 1. The target of 30% coverage of landings at each processor each month was exceeded during this 18 month period, with an overall coverage of 50% of landings for the 2007 year. In addition, 184,153 individual fish weights (tunas, billfish, and sharks) were recorded, and 6397 lengths measured during 2007.

The number of landings by tuna longline vessels (either fishing vessel or carrier vessel) at Bena during 2007 was higher than during 2006. There were 1916 landings (of which 956 were sampled) compared to a total of 1664 landings in 2006 (Table 2 and Fig. 2). September was the quietest month for landings during 2007 and December was the busiest month, with 119 and 220 landings respectively. The average number of landings per month for the year was 160, compared to 139 in 2006. This increase in landings activity for 2007, compared to 2006, is against the trend of decline seen during the four years previous (Table 2 and Fig.2). However, the 2007 level of landings activity is still well below what was observed in 2003 and 2004.

As discussed in last year's paper to CCSBT (Proctor et al. 2007) there are several reasons that may explain the reduced level of landings activity:

1. The ongoing impacts of the fuel-price rise of October 2005 – fewer vessels going to sea but also more vessels staying out for longer periods (up to 3 – 5 months at sea compared to 1 – 3 months previously)

2. Directly related to 1 above, the increase frequency and use of carrier vessel activity, or at least fishing vessels operating as carriers
3. Prolonged severe weather conditions during some months resulting in many vessels remaining in port.
4. It is also possible that the continued closure of the Japanese markets to export of SBT product from Indonesia during 2007 provided a disincentive to some companies to fish at the same level as during 2005 and earlier years. However, given that most of the fishing companies do not target SBT, this is unlikely to be a major contributing factor.

Table 1. Summary of RCCF/CSIRO monitoring activities at Bena during 2007 and first six months of 2008.

Month	No. Landings	No. Sampled	% Coverage	No. weights recorded	No. of length/weight measured
2007					
January	145	71	48.97	13630	279
February	165	84	50.91	12925	398
March	159	69	43.40	17325	537
April	168	70	41.67	14436	468
May	195	95	48.72	16004	874
June	179	94	52.51	14029	652
July	141	81	57.45	19063	558
August	132	81	61.36	19728	854
September	119	58	48.74	13331	636
October	164	94	57.32	12827	121
November	129	62	48.06	15563	418
December	220	97	44.09	15292	602
Total	1916	956	50.27	184153	6397
2008					
January	168	86	51.19	14575	591
February	177	96	54.24	10097	359
March	190	93	48.95	26519	775
April	208	102	49.04	19857	1208
May	174	89	51.15	22950	769
June	186	90	48.39	22012	981
Total	1103	556	50.49	116010	4683

*Mean monthly coverage. *This includes tuna, billfish and sharks.

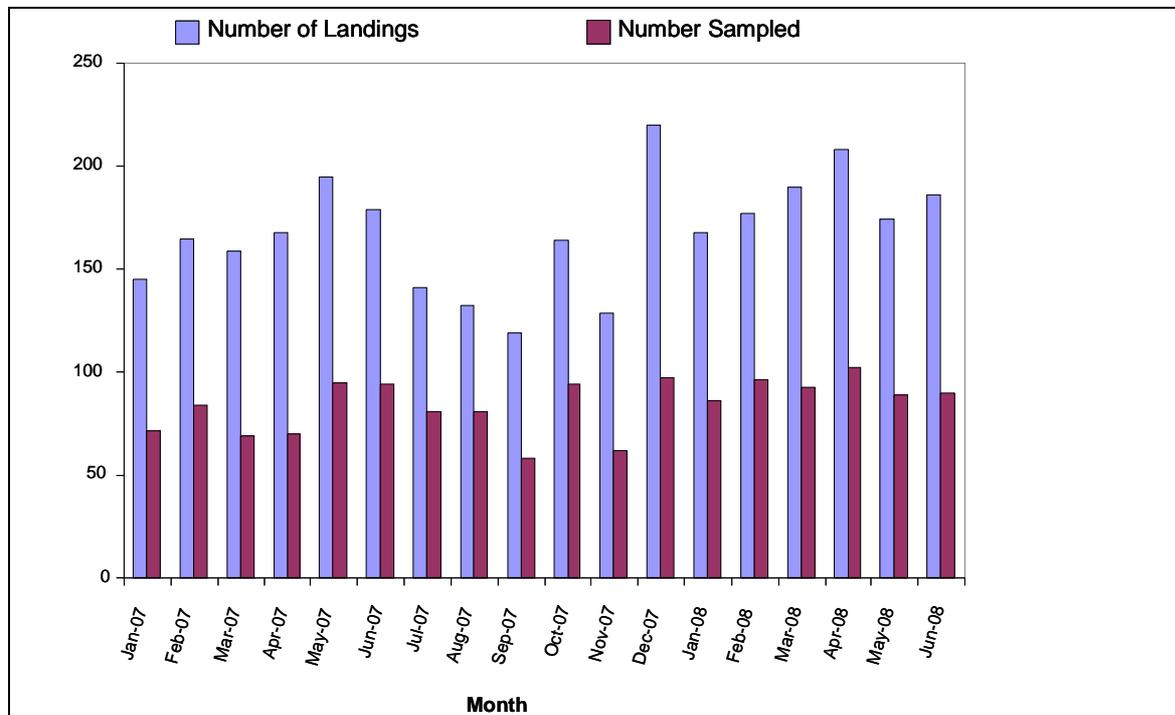


Figure 1. Number of landings and number of samplings at Benoa by month, January 2007 to May 2008.

Table 2. Number of landings by month at Benoa, for period 2003 to 2007.

Year	2003	2004	2005	2006	2007
Month					
Jan	325	320	248	193	145
Feb	310	206	218	111	165
Mar	265	274	198	130	159
Apr	296	234	205	129	168
May	265	234	212	157	195
Jun	323	273	236	170	179
Jul	292	242	218	130	141
Aug	279	249	193	102	132
Sep	286	231	194	119	119
Oct	291	210	237	160	164
Nov	305	235	113	104	129
Dec	268	214	167	159	220
Total	3505	2922	2439	1664	1916
Mean	292.1	243.5	203.3	138.7	159.7

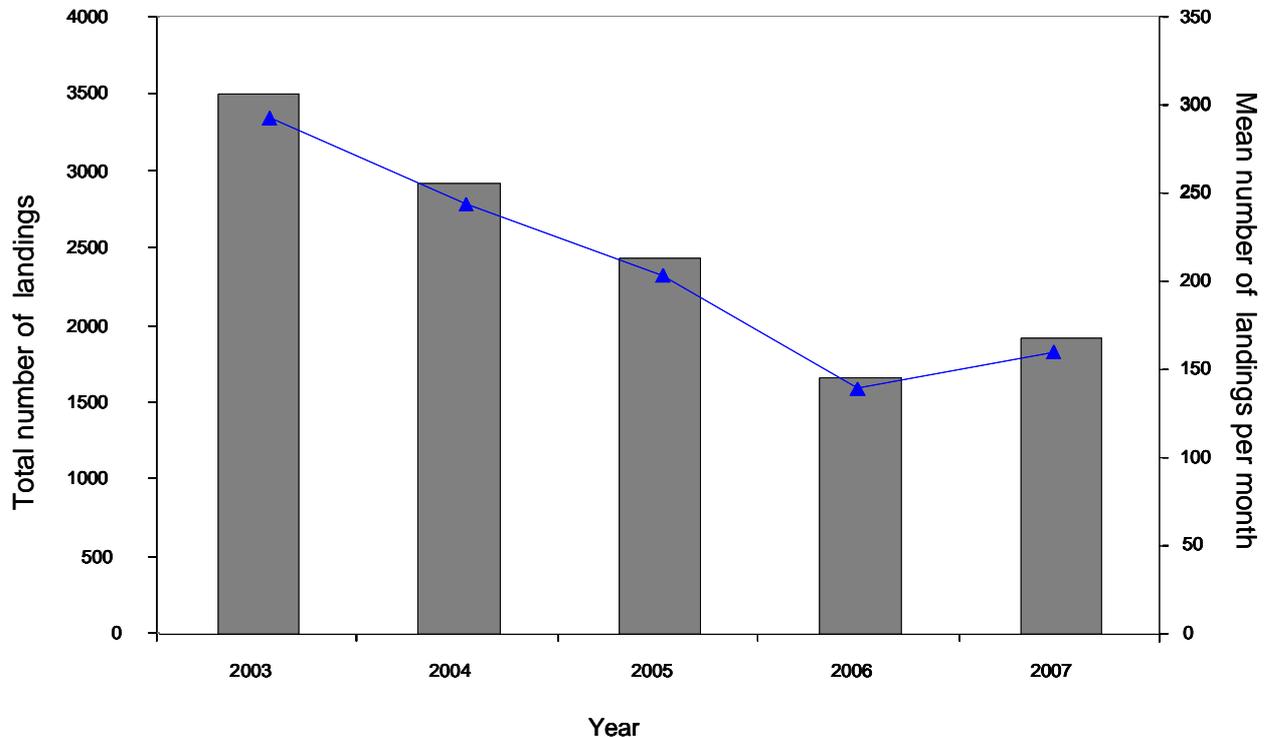


Figure 2. Total number of landings by year (left y-axis and histogram) and mean number of landings per month (right y-axis and blue line) at Benoa for period 2003 – 2007.

Catch Estimates for 2007

The estimate of total landings of SBT by the Indonesian longline fleet, during 2007, is 1077.1 tonnes (Table 4). This estimate is only for SBT landed at Benoa, but as stated in the Introduction, this represents almost all of the Indonesian SBT catch. In previous years a small amount of SBT was landed by longliners operating out of Cilacap (and nearby landing places Batere and Seleko), and very occasionally by vessels landing at Pelabuhanratu and Muara Baru. These ‘non-Benoa’ landings amounted to 33.7 tonnes in 2005 and 39.8 tonnes in 2006; 1.94% and 6.66% of the total SBT landings in those years, respectively. At time of writing this paper the 2007 catch estimates for the non-Benoa ports were unavailable. Directorate General of Capture Fisheries have the reporting responsibility for those ports and it is hoped they will be able to submit their estimates to CCSBT either prior to the 2008 ESC Meeting or at the meeting itself.

During 2007, landings of SBT were highest during the months of February and March; 229.2 and 431.0 tonnes respectively (Table 3, Fig. 3). As per usual, only a small number of fish were landed during the months of June and July. The estimate of 4.9 tonnes landed in August 2007 appears surprisingly high, given that the spawning season does not normally start until September. Only 1 tonne of SBT was estimated for August 2006 and 0 tonnes for August 2005. Almost all the August 2007 fish were fish landed frozen fish and were likely to have been caught some months earlier.

In our paper submitted to the 2007 ESC CCSBT Meeting (Proctor et al. 2007) we predicted a higher level of landings of SBT for 2007 compared to 2006, based largely on the relatively high numbers of fish landed and processed during the second half of the 2006/2007 spawning season. Many of these fish were frozen having come from cold storage (either landed frozen from vessels that had freezer facilities or fresh reject quality fish that had been placed in cold

storage). In that paper we also expressed some concern that the monitoring program may not have adequately ‘captured’ the full extent of landings during the first half of 2007.

Subsequent discussions with the monitoring team give us confidence that the program has provided an accurate measure of landings for 2007 at Benoa. Also, the enumerator team are confident that there is no possibility that ‘double-counting’ occurred in the program as the frozen fish from cold storage, that come into the processing plants for thawing and subsequent filleting, are not recorded by the enumerators. Their recordings are only for fish directly unloaded from vessels into the processing rooms.

Table 3. Estimated catch (kilograms, bottom line totals in metric tonnes) of tunas and other by species landed at Benoa in 2007. Estimates were produced from data collected in the port-based monitoring program, using IOTC protocols.

Month	Total	SBT	YFT	BET	ALB	MLS	OTHR	SKH	SWO
1	1,245,905	140,333	594,308	412,623	36,697	1,252	3,204	3,276	54,212
2	1,159,862	229,171	289,581	495,564	84,690	2,546	5,922	6,867	45,520
3	1,541,491	430,994	518,663	315,521	182,382	5,729	25,871	9,823	52,509
4	1,598,194	23,486	777,811	759,454	8,837	1,865	595		26,146
5	1,383,182	3,177	712,029	550,688	36,079	408	1,342	33,002	46,455
6	1,029,869	175	512,574	378,735	85,794	996	1,236	168	50,190
7	570,907	244	216,868	265,071	39,170		4,025	1,730	43,799
8	741,578	4,869	273,178	200,057	198,583	1,325	5,528	7,770	50,268
9	799,520	5,402	272,567	249,582	203,293	5,119	3,143	17,159	43,254
10	800,758	25,205	269,998	341,033	74,327	7,492	5,365	24,609	52,729
11	1,064,649	53,410	304,078	355,345	175,111	10,526	7,682	45,038	113,460
12	1,826,388	160,641	612,181	968,794	6,933	5,777	3,293	10,676	58,094
Total (MT)	13762.3	1077.1	5353.8	5292.5	1131.9	43.0	67.2	160.1	636.6

MLS = marlins, OTHR = fish nei, SKH = sharks, SWO = swordfish.

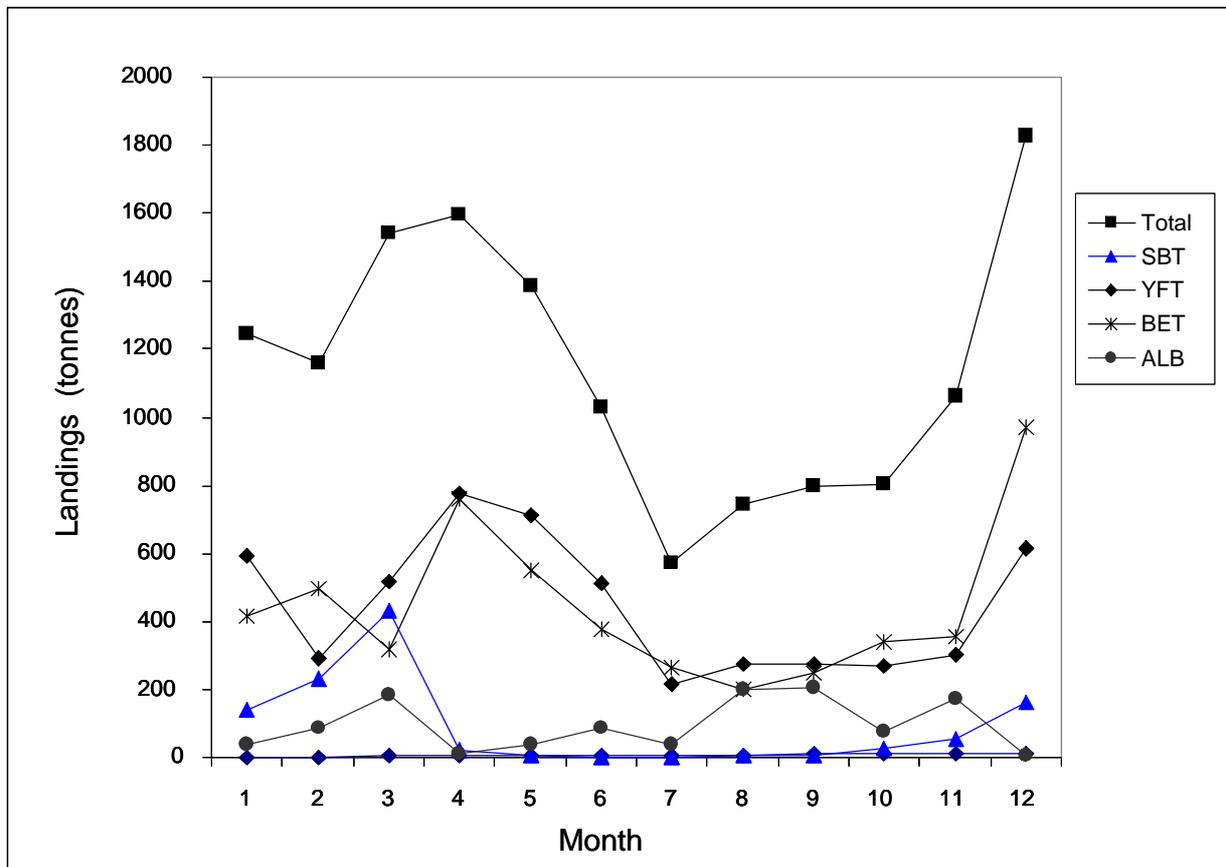


Figure 3. Estimated landings (tonnes) of tunas by month at Benoa for 2007, by total landings and by species.

The estimated catch of SBT as a proportion of total catch of the four target tuna species (YFT, BET, ALB, and SBT) was slightly higher in 2007 compared to 2006; 8.4% of total tuna catch in 2007 compared to 5.2% in 2006 (Table 4). The landings of bigeye and yellowfin tunas were also significantly higher in 2007 compared to years 2004 – 2006. This may reflect some ‘recovery’ of fleet activity following the impact of the Oct’2005 fuel price rise, but also an increase in landings from vessels in Benoa that were previously landing at Muara Baru. During 2007, landings activity was much reduced at Muara Baru compared to previous years, because of problems of flooding in the Muara Baru district. Many of the processing plants were rendered inactive because of abnormally high tidal waters that frequently flooded the port area and also the main access road to the port, making unloading and processing difficult but also creating a lot of problems for movement of processed product out of the port to distribution points. Most recent information received² suggests some of the longliners that were previously unloading at Muara Baru are now unloading in Thailand and Malaysia because of the ongoing access problems. In contrast to yellowfin, bigeye, and SBT, landings of albacore at Benoa were slightly lower in 2007 than for the earlier years.

² Pers.comm. with Mr Mahiswara (RIMF) on 04/08/2008, Regional Manager for Monitoring at Muara Baru.

Table 4. Estimated catch (tonnes) of tuna by species landed at Benoa and % of total catch made up by SBT, by year (2004 to 2007).

Year	BET	YFT	SBT	ALB	Total	%SBT
2004	4,184	4,413	613	1,906	11,116	5.5
2005	3,939	4,196	1,690	1,494	11,319	14.9
2006	4,366	4,323	558	1,450	10,697	5.2
2007	5,292	5,354	1,077	1,132	12,855	8.4

Preliminary Catch Estimates for 2008

The preliminary catch estimates for SBT and other species landed and processed at Benoa, for the first five months of 2008, are shown in Table 5. The landings of SBT follow the expected pattern, with January and February having the highest totals, March a moderately busy month, and then a significant decrease of amount landed through April following the end of the spawning season. The total of SBT landed and processed during this period is 455.3 tonnes. This is only slightly more than half the amount of SBT landed and processed in Benoa during the same period in 2007 i.e. 827 tonnes. Therefore, we predict, albeit cautiously, that the catch estimate for full calendar year 2008 will be significantly lower than the 1077 tonnes reported above for 2007.

Table 5. Estimated catch (metric tonnes) of tunas and other by species landed at Benoa during period January – May 2008. Estimates were produced from data collected in the port-based monitoring program, using IOTC protocols.

Month	Total	SBT	YFT	BET	ALB	MLS	OTHR	SKH	SWO
Jan	1529.6	141.9	654.1	649.5	22.9	1.2	5.9	11.2	42.8
Feb	990.7	152.6	422.3	356.1	10.0	0.7	19.6	2.8	26.7
Mar	362.8	120.1	203.9	75.8	9.7	4.2	27.2	3.4	20.2
Apr	2184.9	34.8	780.0	508.0	645.5	3.1	70.6	67.4	75.6
May	1412.8	5.9	804.4	463.7	43.1	4.3	15.4	5.5	70.5
Total	6480.8	455.3	2864.8	2053.1	731.3	13.5	138.6	90.2	235.9

MLS = marlins, OTHR = fish nei, SKH = sharks, SWO = swordfish.

Developments for future monitoring

In late May 2008 the Indonesian Government agreed to a proposal by the Agency of Marine Affairs and Fisheries Research (AMFR) for the current Tuna Monitoring Station at Benoa to become a Research & Monitoring Facility. The planned development will see the Station move to a new location within the Benoa Port precinct. Funds have already been allocated by Indonesia to ensure salary coverage for 14 staff (7 port-based enumerators, 6 on-board observers, and 1 data entry staff) at Benoa. This reflects the Ministry of Marine Affairs and Fisheries' strong commitment to the continuation of the Benoa monitoring program but also an indication of the desire to see the Station expand its activities to a broader fisheries research role. Dr Gellwynn Jusuf, new Chairman of AMFR, recently (31/07/08) made a visit to the Benoa Station and expressed his strong support for these developments to take place during the coming year and a plan-of-action is currently being formulated within MMAF.

Although not relevant to SBT per se, it is worth mentioning that AMFR also has plans for the establishment of a "Tuna Centre" (research and monitoring) close to Bitung, east of Manado in northern Sulawesi. This development is part of the Indonesia and Philippines Data Collection Project, an initiative of Indonesia, Philippines, Western and Central Pacific

Fisheries Commission, and Australia through ACIAR and CSIRO. This project has already seen the commencement of port-based monitoring of tuna landings at two key eastern ports in Sulawesi - Bitung and Kendari. The monitoring is being done along similar lines to that done at Bena but covering landings of tunas and other pelagic species by all gear types.

Also much discussed by all participating agencies and stakeholders during the past year has been the planned transition of the trial observer program (see Sadiyah et al. CCSBT-ESC/0809/20) to a more formal, National fisheries observer program. A planning workshop to progress this transition is expected to occur before the end of 2008.

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