Review of Taiwanese SBT Fishery of 2002/2003

1. INTRODUCTION

SBT was mainly a bycatch species of Taiwan tuna longline fishery in the past, and following the development of super-low temperature freezers, vessels equipped with such freezing facilities have started to operate directing seasonally on the species in recent years. Annual catches of SBT were lower than 250 mt in early 1980s (Table 1), but due to the increase of fleet size, fast development of deep longliners, and expansion of fishing ground, the catches of SBT increased thereafter. From 1989 onwards, annual catch of SBT surpassed 1,000 mt, where drift net fishery accounted for about ¼ of the catches in 1989 and 1990. After then, the SBT catches fluctuated between 800 and 1,600 mt. The total annual catch in 2003 was preliminarily estimated to be 1,128 mt, a decrease of 9 mt from 2002 in line with the quota set by CCSBT at the level of 1,140 mt.

2. CATCH AND EFFORT

Three types of data were collected to compile the catch and effort data for SBT, namely: (1) logbooks(LG data), (2) weekly report(SB data) and (3) commercial trading information such as statistical documents of TIS and certified weight reports of Shin Nippon Kentai Kaisha(OT data). SBT has been included in logbooks since 1981, but little information on this species was reported. Weekly report on SBT catches in weight and fishing location was required for vessels that have caught SBT from 1996 onward. Statistical documents were issued for the export of SBT as from June 2000 following the implementation of TIS. These data have been crosschecked with each other to improve their accuracy.

The estimated annual catch of SBT by gears from 1971 to 2003 is shown in Table 1. Catch distribution of 2000-2003 is mapped in Figure 1. In view of the characteristics of Taiwan's SBT fishery as seasonal basis for some vessels, it is difficult to define the effort deployed for this fishery. The 2003 data are still preliminary and may be subject to revision.

3. NOMINAL CPUE

The catch of SBT was relatively low in the total longline catch and there was no separate 'SBT' item on the logsheet collected before 1994. Information on SBT catch was scarce in the logbooks recovered. Weekly reports have been therefore taken to be acting as the main source for catch and

effort information since 1996. However, since the design of weekly report was to monitor the SBT catch, rather than to replace the logbook, the effort information was incomplete in the report. Such situation has led to an over-estimation of CPUE. After crosschecked with other available information from fishing companies and from logbook later recovered, this problem has been resolved. Since 2002, an enhanced regulation has been implemented to avoid this occurrence.

For the estimation of CPUE from 1981 to 2002, the nominal CPUE series was derived from the LG data excluding the daily set operated during the non-season (February ~ May) or in the north area of 20°S. However, the CPUE of 2003 was not calculated from the LG data since logbook information from the period operation bycatch activities is incomplete and thus will overestimate the CPUE. Instead, we propose an effort substitute method to make up the total effort used for the SB data. The fishing days in three seasons, the main season from June to September, the secondary season from October to February of the following year, and the non-season from March to May, were estimated for Taiwanese SBT fishery in 2003 to be 71.70, 31.91, and 47.84 days that were the average operating days in the three seasons of LG and OT data from 1997 to 2001, respectively.

The CPUE trend in Figure 2 shows a two-stage level: the CPUE before 1989 is at a level with comparatively low value, and after 1989 is at another level with higher CPUE values except for 1991-92 when the logbook coverage is at its lowest (<10%).

4. SIZE COMPOSITION

Mean weight distribution of SBT from 2000 to 2003 was shown in Figure 3. In general, larger fish (greater than 40 kg) tends to distribute in waters closer to land mass, i.e., South Africa, Australia, and South America, with exceptions in the Pacific Ocean. Figure 4 shows the length frequency of SBT during 2000-2003. The size mainly ranged from 100-130 cm, except for year 2001 for which more small fish was noted. It was also noted that the mode of the size distribution in 2003 was shifted to the larger size. The phenomenon was supported by the interview with the fishermen. Meanwhile, considering another phenomenon that the fishing season delayed about two months than usual, it is worth tracking the changes in the coming years in order to monitor the status of SBT.

5. FLEET SIZE AND DISTRIBUTION

According to the weekly reports and trading information, more than 100 vessels have caught SBT during 1998-2001. Due to the quota regulation, the number of vessel allowed to catch SBT drastically reduced to around 101 in 2003. Their catches were mainly made in the waters of 20°S - 40°S in the Indian Ocean and seas adjacent to the Atlantic Ocean. There were two clear

fishing grounds in general: one in the central Indian Ocean around 55°E-95°E, 30°S-40°S, and another off the southeast coast of Africa around 30°E-55°E, 35°S-45°S. Seasonally, the fish was caught in the southern and central Indian Ocean during June to September, and in the southern and western Indian Ocean extending to the eastern limit of the Atlantic Ocean during October to February of the following year.

6. SCIENTIFIC OBSERVATION PROGRAM

Appendix 1 provides a short report on implementation of the CCSBT observer standards and the overall review of Taiwanese SBT fishery.

Table 1. Annual SBT catches by Taiwanese deep-sea longline and drift net fisheries during 1971-2003. (Data of 2003 is preliminary.)

Unit: metric ton

Year	Deep Sea Longline	Drift Net	Sum
1971	30		30
1972	70		70
1973	90		90
1974	100		100
1975	15		15
1976	15		15
1977	5		5
1978	80		80
1979	53		53
1980	64		64
1981	92		92
1982	171	11	182
1983	149	12	161
1984	244	0	244
1985	174	67	241
1986	433	81	514
1987	623	87	710
1988	622	234	856
1989	1,076	319	1,395
1990	872	305	1,177
1991	1,353	107	1,460
1992	1,219	3	1,222
1993	958		958
1994	1,020		1,020
1995	1,431		1,431
1996	1,467		1,467
1997	872		872
1998	1,446		1,446
1999	1,513		1,513
2000	1,448		1,448
2001	1,580		1,580
2002	1,137		1,137
2003*	1,128		1,128

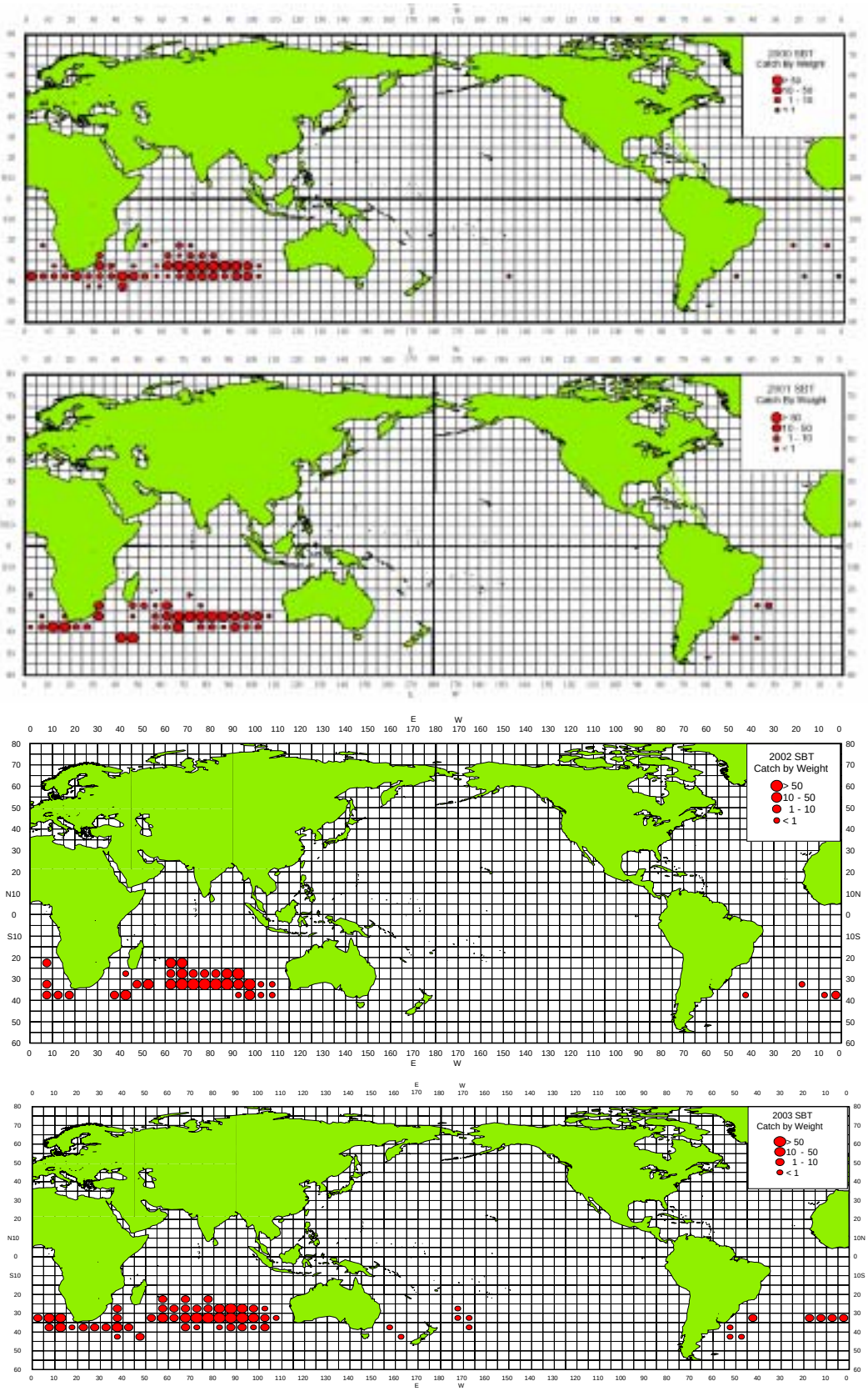

Figure 1. Catch distribution of SBT by Taiwan longline fishery from 2000 to 2003. Data of year 2003 is preliminary and may be subject to revision.

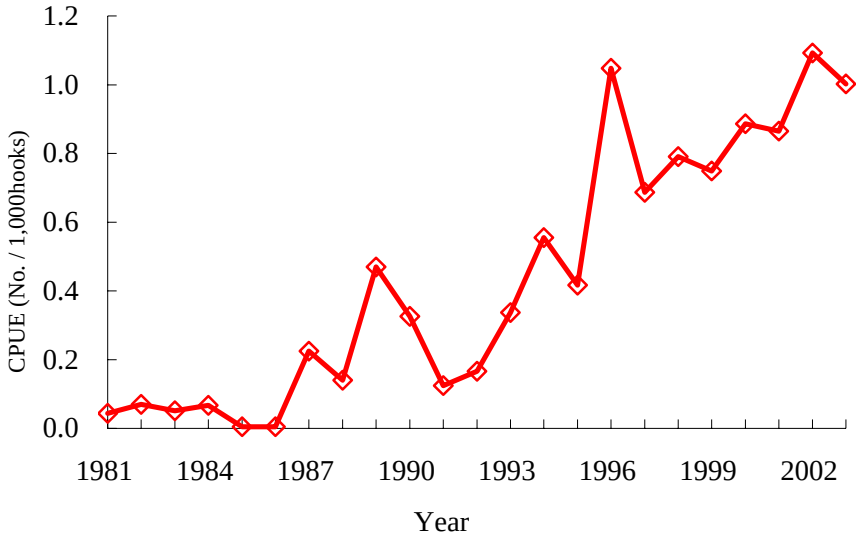

Figure 2. Nominal CPUE series of southern bluefin tuna during 1981-2003. Data of 2003 is preliminary. The entire trip data of the vessels having caught SBT in the year were compiled and used to obtain the series.

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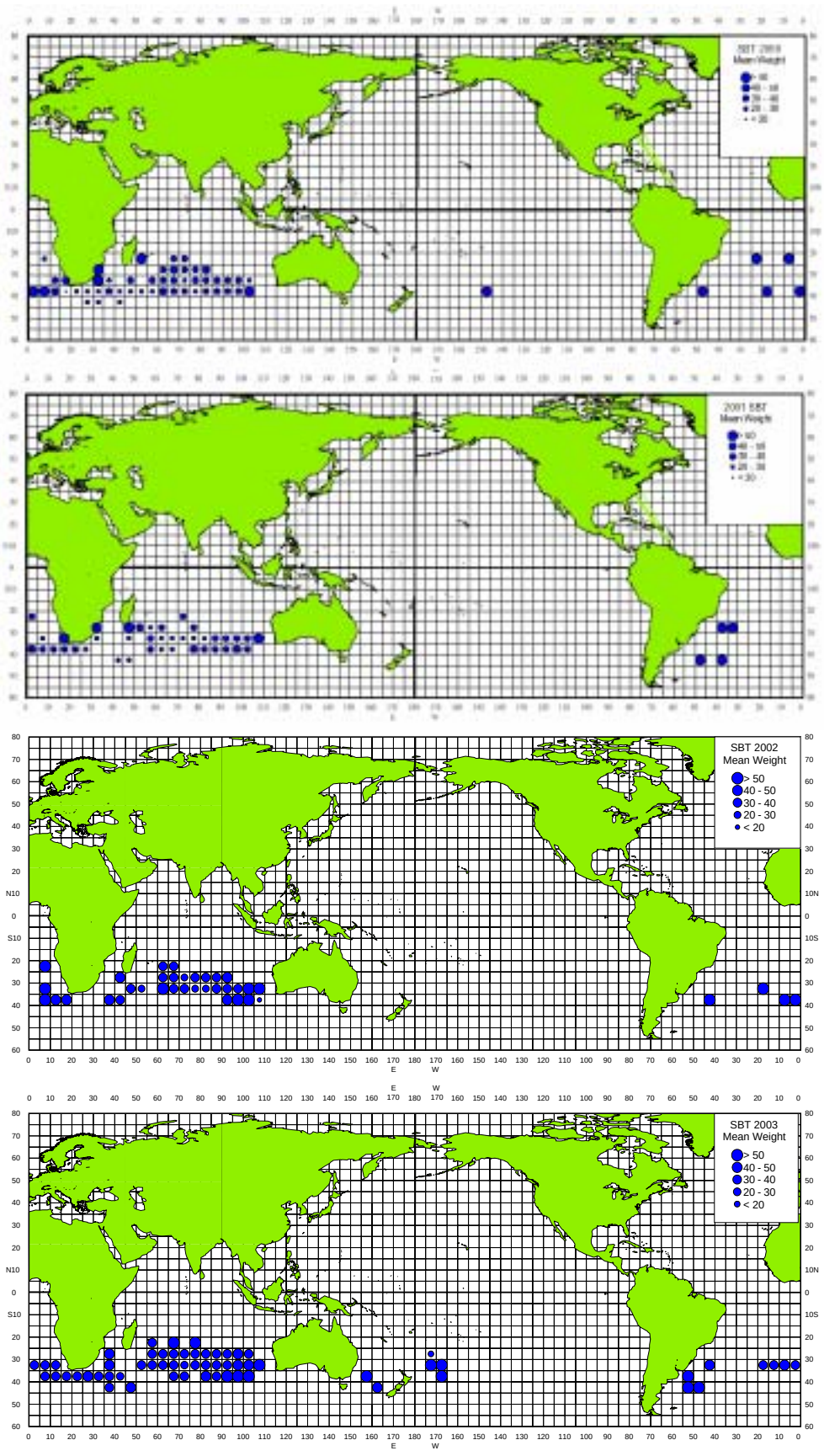


Figure 3. Mean weight distribution of SBT by Taiwan's longline fishery from 2000 to 2003. Data of 2003 is preliminary and may be subject to revision.

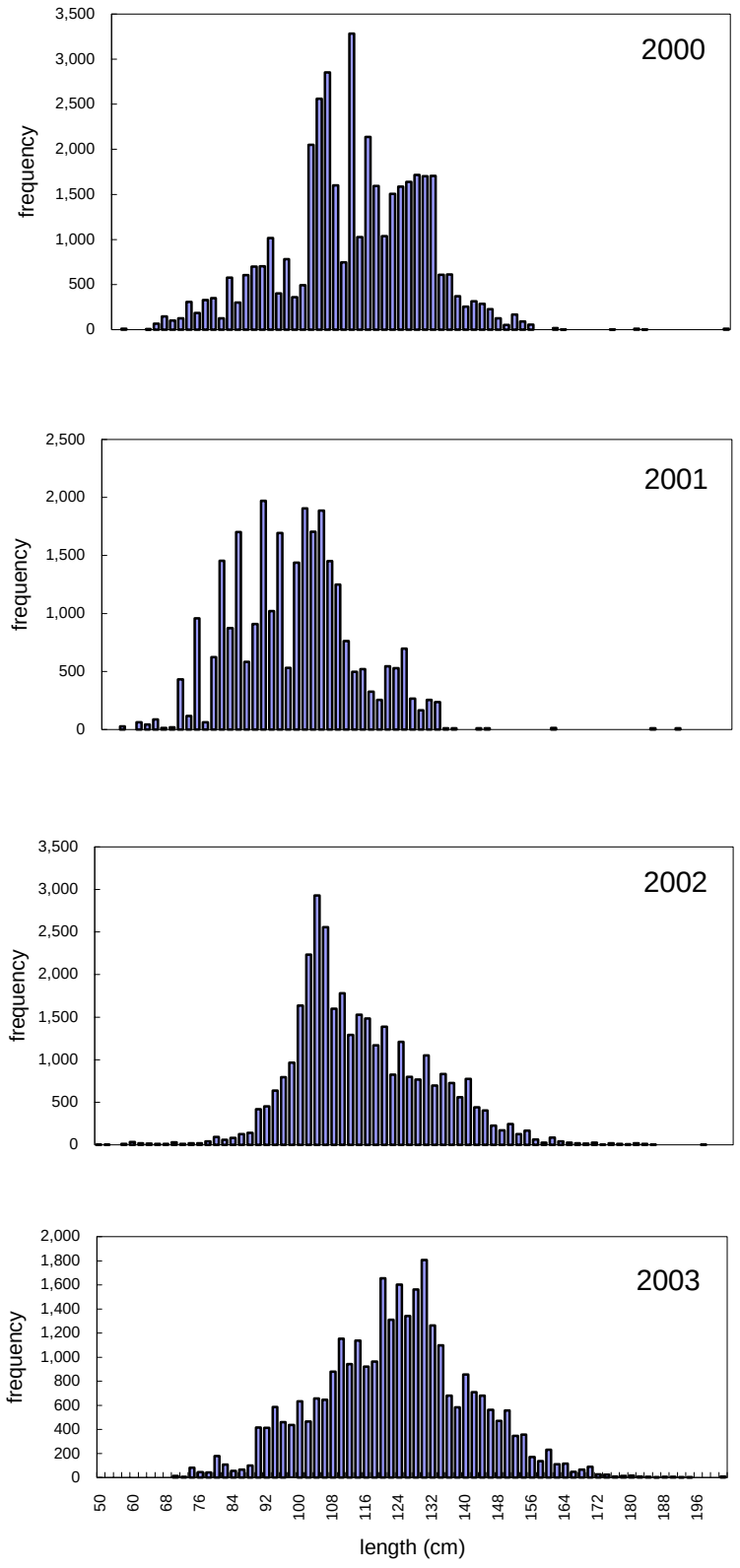


Figure 4. Length frequency of SBT by Taiwan's longline fishery from 2000 to 2003. Data of 2003 is preliminary. The observations of length data were raised to catches in 2000 and 2001.

Appendix 1

Scientific observer pilot program

To fulfill the obligations of a deep-sea fishing nation, the scientific observer pilot program of deep-sea tuna fisheries of Taiwan has been launched since 2001. Overseas Fisheries Development Council of The Republic of China (OFDC) was entrusted by Fisheries Agency (FA) to carry out this program, including recruitment of scientific observers. FA also invited researchers on fishery sciences to form a special penal for working out the observer training program, in which items of observer's tasks, biological and bycatch information need to be collected for scientific researches and the format of data records.

The qualification for applicants is limited to college graduated or senior high school graduated with at least 5 years experience on fishing vessels. The applicants pass the oral examination will be qualified as the candidates of scientific observer, and only who passing the 3 weeks training program and health screening will be employed as scientific observers.

A. Observer Training

All candidates of scientific observer have to attend 3 weeks training program including seafaring basic safety training, operations of navigation devices, mini-log thermometer and VMS system, tuna and tuna-like species, marine turtle, seabirds and marine mammal identification, muscle tissue and otoliths sampling and fishing activities, catches and location data recording requirements. After the training program, these candidates will be deployed on the training ship for one-week trial trip at sea and have a test in identifying the tuna and tuna-like species at local fish market.

In 2003, there were 6 persons employed as scientific observer. Among them, two have master degree of biology, two have college graduated and the rest are senior high school graduated with at least 5 years experience on deep-sea fishing vessels. There were two observers deployed on the SBT longliners during the fishing season, in which one has master degree of biology and the other one is college graduated.

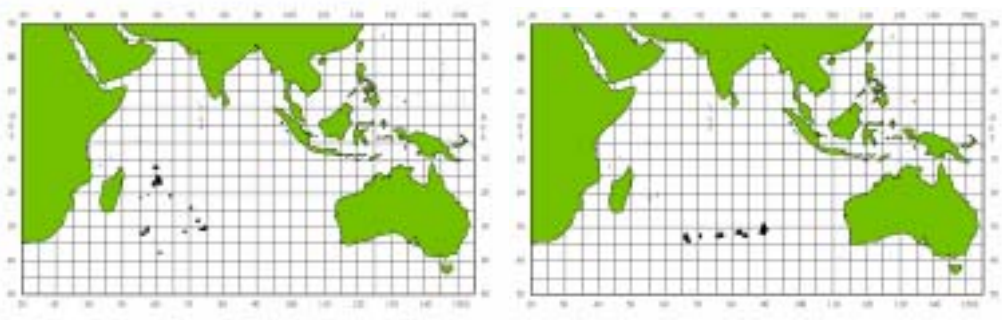
B. Scientific Observer Program Design And Coverage

Due to lack of experience in implementing scientific observer program and having a great number of Taiwanese vast fishing fleet operating in the three oceans, the observer program of Taiwan is still in the trial phase. We endeavor to establish our own observer program system step by step.

The boat owners, whose vessels intend to catch SBT, have to register before the fishing season. Because the sampling fishing vessels will be granted with 3 metric tonnage additional catch quota, the boat owners of the registered vessels who wish to be the sampling vessels have to express their willingness and the sampling vessels will be determined by lots. In 2003, there were 2 sampling vessels selected from these registered ones.

The number of tuna longliners fishing SBT was around 101 in 2003, and the coverage rate by vessel was about 2%. These 2 sampling longliners operated mostly in AREA 51 during SBT fishing season (Fig.1). The number of days deployed on observation work was 133.

Figure 1. The tracks of SBT sampling longliners in 2003.



C. Observer Data Collected

Table 1. The observation data of SBT sampling vessels

Unit : No.of fish

Days of Observation	Hooks	BET	YFT	ALB	SBT	BILLFISH	SHARKS
133	449,950	463	740	3325	222	41	119

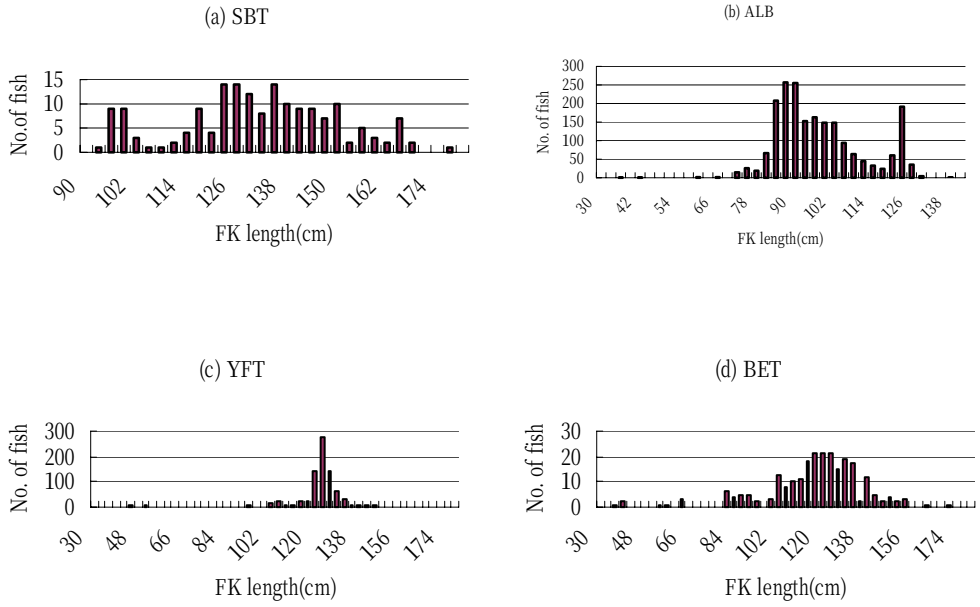
Table 2. Numbers of biological samples collected by observers

Muscle tissue			Otoliths	Beaks of seabird
ALB	BET	SWO	SBT	
28	32	20	102	2

Table 3. Numbers of FK length measurement by species

BET	YFT	ALB	SBT	BILLFISH	SHARKS
241	829	2071	174	89	179

Figure 2. The FK length by species recorded by observers in 2003.



D. Tag Return Monitoring

There was no tag return observed while observers on the sampling vessels.

E. Problems Experienced

The boat owners and skippers of SBT sampling vessels fully supported this program with willingness and have cooperated with FA and OFDC closely. Because the distance from Taiwan to the fishing ground is very far, the transportations of supplies and equipments needed for sampling will take more than 1 month from Taiwan to the sampling vessels. And these SBT fishing vessels will not return Taiwan after SBT fishing season, it is difficult for researchers to arrange interviews with skippers to collect information on fishing activities.