

## Review of Taiwanese SBT Fishery of 2004/2005

---

---

### 1. INTRODUCTION

Southern Bluefin Tuna (SBT) was mainly a bycatch species of Taiwan tuna longline fishery in the past, but after being equipped with deep-frozen freezers, vessels have started to target at SBT seasonally in recent years. Annual catch of SBT was smaller than 250 MT in early 1980s (Table 1). However, due to the increase of fishing fleet size and the expansion of fishing grounds, the catches of SBT increased thereafter. From 1989 onwards, the annual catch of SBT was over 1,000 MT, of which the catches of drift net accounting for about 25% of the total catches in 1989 and 1990. Since 1991, the catch of SBT fluctuated between 800 and 1,600 MT. The total annual catch in 2005 was preliminarily estimated as 903 MT, decreased by 395 MT from 1,298 MT in 2004. Since our overcatch of 2004 was 158 MT, so we set the catch limit for 2005 as 982 MT.

### 2. CATCH AND EFFORT

Three types of data were collected to compile the catch and effort data for SBT, namely, (1) weekly report (SB data), (2) logbooks (LG data) and (3) commercial trading information such as statistical documents of TIS and certified weight reports of Shin Nippon Kentai Kaisha or Organization for the Promotion of Responsible Tuna Fisheries (OPRT) (OT data).

In addition to the requirement of logbook reports, since 1996, authorized fishing vessel fishing for SBT has to weekly report the SBT catch in weight and its fishing location, to collect SBT catch information and to manage the total SBT catch under the self-restrained level. However, the weekly report has only the catch information of SBT without the catch information of other tuna and tuna-like species. The trading information of SBT product was also collected through the subscription of certified weight reports of Shin Nippon Kentai Kaisha from 1994 to 2003, and by OPRT since 2004. The weekly reports of fishing vessels have been cross-checked with the

logbook and trading information.

The estimated annual catch of SBT by gear from 1971 to 2005 is shown in Table 1. The catch distribution of 2001-2005 is mapped in Figure 1. The 2005 data is still preliminary and may be revised in the coming year.

### **3. NOMINAL CPUE**

The catch of SBT was relatively low compared with the catches of other tuna and tuna-like species for Taiwanese deep-sea tuna longline fishery and there was no separate 'SBT' item on logsheet issued to fishermen before 1994. Because the catch information on SBT collected through logbook system is insufficient to reflect the fishing pattern, the weekly report data system has become the major source of catch and effort information since 1996. However, since the weekly report system was designed for monitoring the SBT catch to control the quota allocation rather than to replace the logbook system on catch and effort data collection, the fishing effort information was collected incompletely, and this could lead to the over-estimation of CPUE of Taiwanese SBT longline fishery. After crosschecking with other available information from fishing companies and logbook later recovered, the CPUE over-estimation has been improved.

For estimating the CPUE of Taiwanese SBT longline fishery from 1996 to 2004, the nominal CPUE series were derived from the LG data excluding the daily set operating during off-season (February to May) or in the northern area of 20° S. The catch and effort data for 2005 is preliminary and may be revised after more information is collected.

Figure 2 shows the nominal CPUE trend of Taiwanese longline fishery for SBT from 1996-2005. The CPUE (number of fish caught per 1000 hooks) appeared to be varied from 0.85 to 1.1 during 2002-2004. The CPUE of 2005 is preliminary estimated as 1.06 and may be revised in the coming year.

#### **4. SIZE COMPOSITION**

The measurement scheme of catch length has been applied to Taiwanese deep-sea longline fishery statistical systems. Fishermen are requested to measure the FL-length of the first 30 specimens from daily catch, and fill the length data in logbook. Besides, the fishermen are requested to report SBT catch positions and weights on weekly basis to Fisheries Agency for implementing quota limit control, and they also have to report the size of each SBT specimen caught.

Figure 3 shows the length frequency of SBT during 2002-2005. The size predominately ranged from 100 cm to 130 cm. It was noted that the mode of the size distribution in 2002 lies between 104-108 cm, and there were no substantive modes during 2003-2004. In 2005, there was one mode observed between 114-120 cm.

#### **5. FLEET SIZE AND DISTRIBUTION**

According to the weekly report and trading information, there were more than 100 vessels fishing SBT during 1998-2001. Due to the quota management regulation set by Fisheries Agency, the number of vessels applied for fishing SBT decreased drastically to 61 in 2002, increased to 100 in 2003, decreased to 92 in 2004, and further decreased to 79 in 2005. However, the active vessels fishing for SBT was 65 in 2005. Their catches were mainly in the waters of 20°S - 40°S in the Indian Ocean and areas adjacent to the Atlantic Ocean. There were two major fishing grounds in general: one is the central Indian Ocean around 55°E-95°E, 30°S-40°S, and the other one locates in off the southeast coast of Africa around 30°E-55°E, 35°S-45°S. Seasonally, SBT was caught in the southern and central Indian Ocean from June to September, and in the southern and western Indian Ocean extending to the eastern boundary of the Atlantic Ocean from October to February of the following year.

#### **6. SCIENTIFIC OBSERVATION PROGRAM**

Appendix 1 provides the summary report on the implementation of the CCSBT observer standards and the overall review and results of the SBT scientific observer program.

## **7. OTHER RELEVANT INFORMATION**

The collaboration on SBT archival tagging program between Taiwan and Australia had been initiated in 2004. The observers dispatched on SBT fishing vessels have been carrying out the SBT tagging program for 3 years (2004-2006). There were 37 and 48 archival tags successfully settled in 2004 and 2005 respectively.

Table 1. Annual SBT catches by Taiwanese deep-sea longline and drift net fisheries during 1971-2005. Unit: MT

Year	Deep-sea Longline	Drift Net	Total
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
2004	1,298		1,298
2005*	903		903

\*Preliminary estimation.

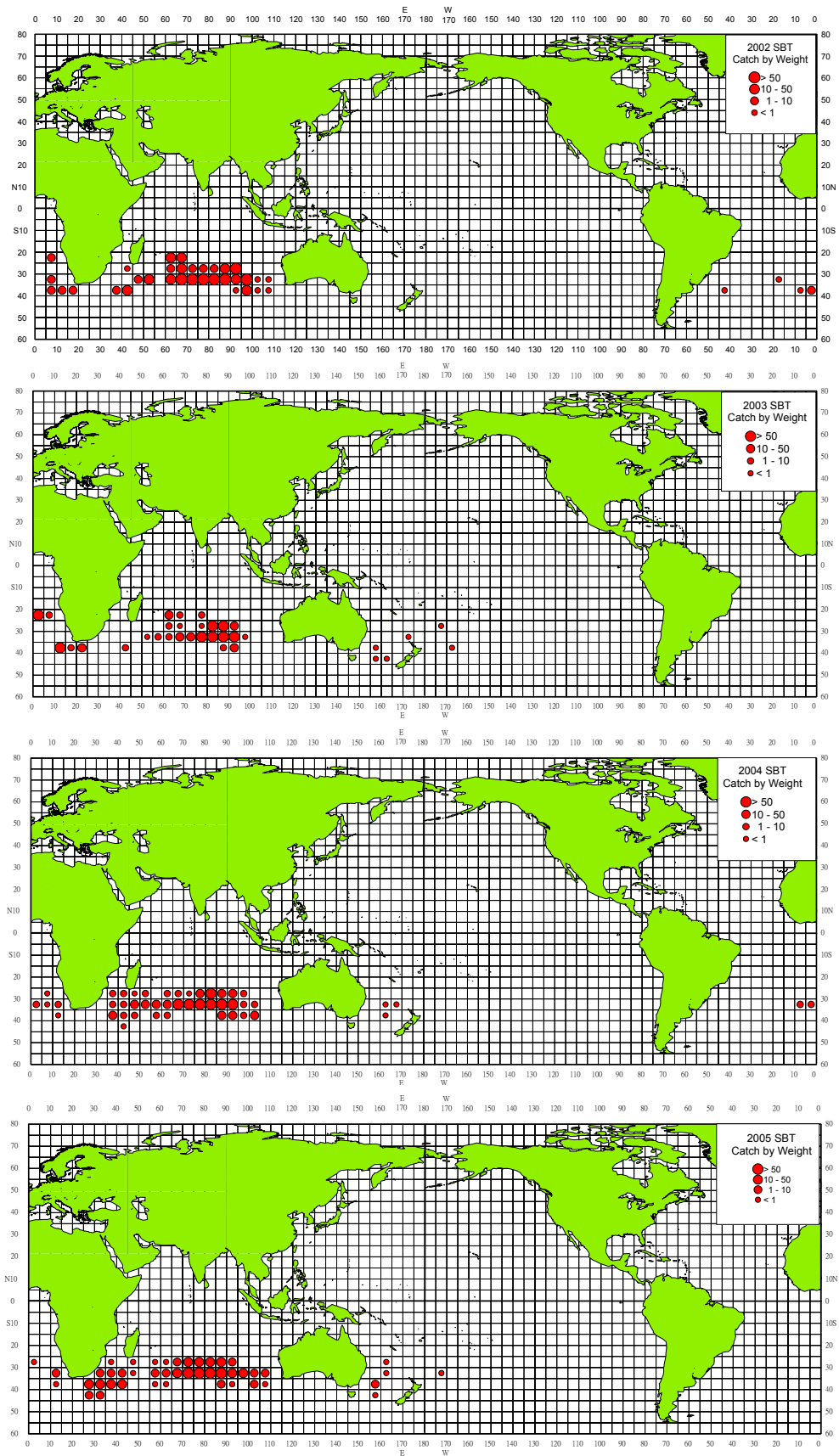


Figure 1. The SBT catch distribution of Taiwanese longline fishery from 2002 to 2005 period. (Data of year 2005 is preliminary and may be revised.)

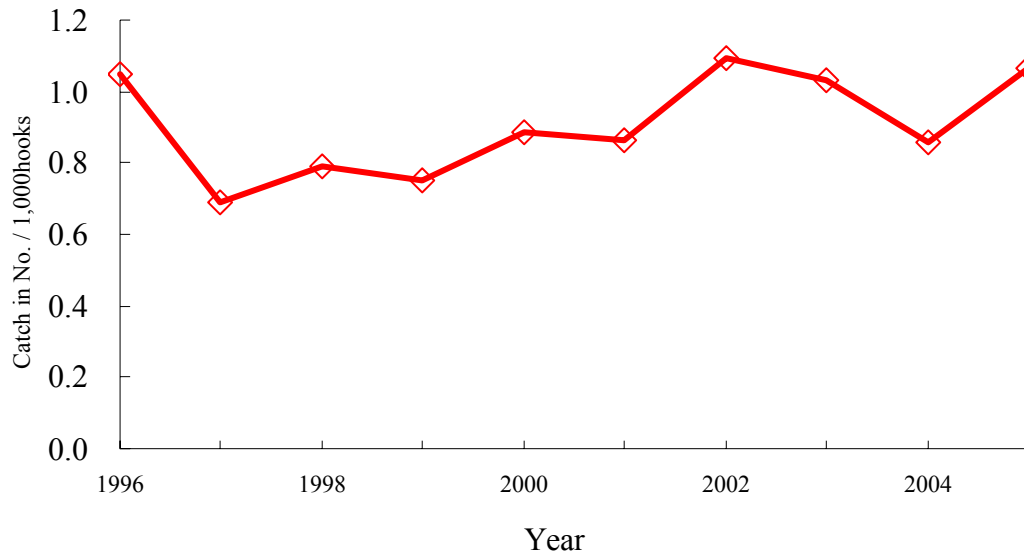


Figure 2. The nominal CPUE series of SBT during 1996-2005. (Data of 2005 is preliminary.)

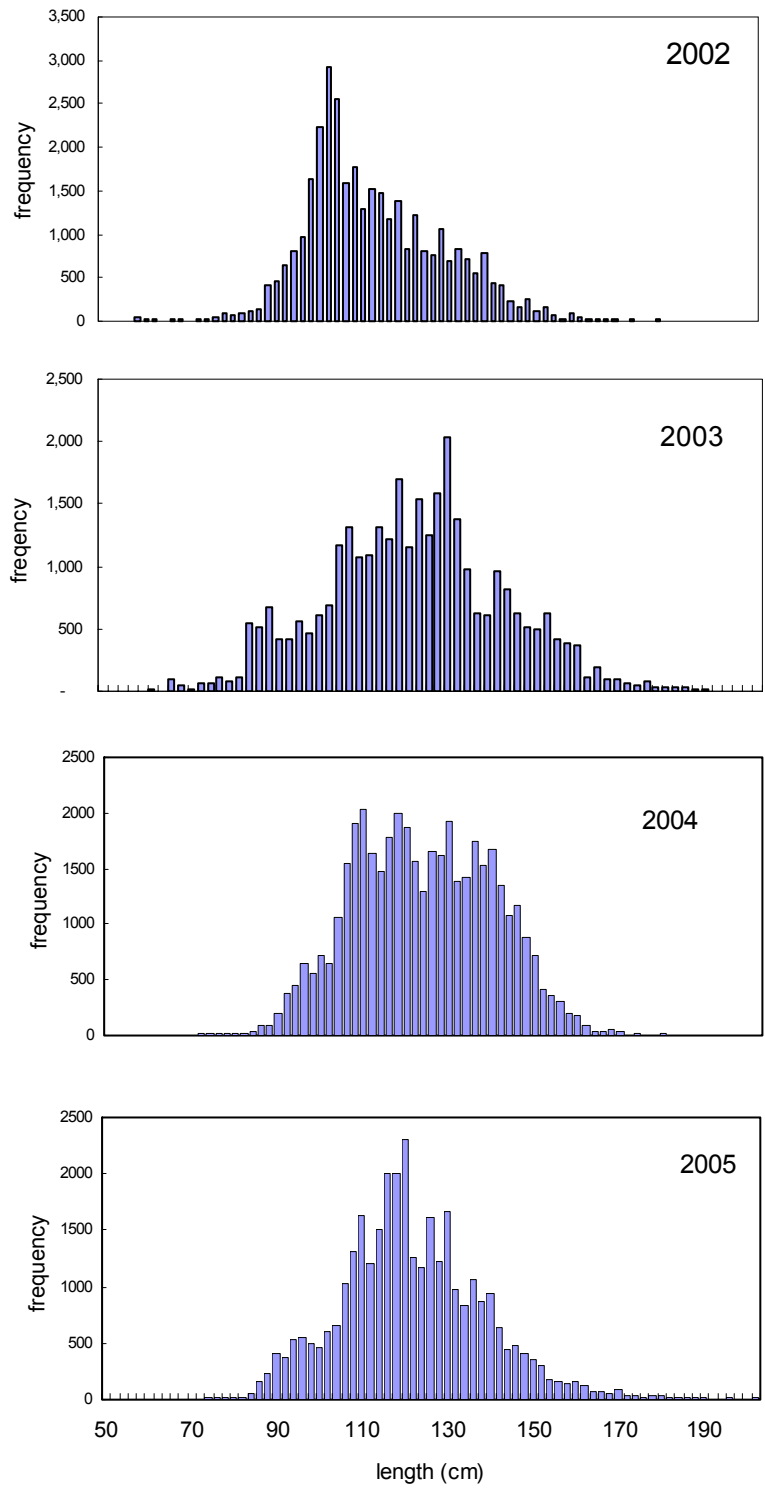


Figure 3. The FL-length frequency distributions of SBT caught by Taiwanese longline fishery during 2002-2005. (Data of 2005 is preliminary.)



## Appendix 1

### Scientific observer program

To collect the scientific information of tuna longliners, the scientific observer program of deep-sea tuna fisheries of Taiwan was launched in 2001. Fisheries Agency (FA) is responsible for carrying out the program and recruiting scientific observers. FA also invited researchers on fishery sciences and senior observers (with 2-year' experience) to form a special panel for designing the observer training program, items of observation, biological and by-catch information to be collected for scientific researches and the format of data records.

The qualification for applicants is college graduated or senior high school graduated with at least 5-year experience on-board. Applicants who have passed the oral examination will have to take a 3-week training program, and only those who pass the training program and medical check will be qualified and deployed as scientific observers.

#### A. Observer Training

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

In 2005, 25 persons were qualified and deployed as scientific observer, increasing by 16 persons from previous year, and 4 of them were placed on SBT vessels during the fishing season.

#### B. Scientific Observer Program Design And Coverage

With 5-year experience of implementing scientific observer program and with the distribution of Taiwan's fishing fleet in three Oceans, the Fisheries Agency has made its best effort to improve the observer program with satisfactory progress in 2005.

The boat owners, whose vessels were intended to catch SBT, have to make registration with the Fisheries Agency before the fishing season. Because the sampling fishing vessels will get additional catch quota, boat owners who have registered to catch SBT and want to be sampling vessels have to express their intention and the sampling vessels will be determined by lot. In 2005, 4 sampling vessels were selected from the SBT registered vessels.

The number of active longliners fishing for SBT was 65 in 2005 and the number of fish caught was 28,339, so the coverage rate calculated by vessel was about 6.15%. There were 444 observation days in total were made by the observers.

### C. Observer Data Collected

The data recorded by observer on board includes 3 categories: vessel and gear attributes, set details and others (sighting of marine mammals, sea turtles and sea birds). The sampling protocols include sampling length and weight, live condition of the first 60 fish, and collecting otoliths, muscle tissues and gonads. Figure1 shows the catch distribution of sampling vessels during 2003-2005.

Table1 shows the SBT number recorded during observation. Table2 and table3 show the number of biological samples collected and FL-length measured and recorded during observation.

Table 1. The observation data of SBT sampling vessels (including fish that bitten by whales/sharks and discard)

Year	2002	2003	2004	2005
Days of Observation (days)	68	133	165	444
SBT sampling number (No. of fish)	498	226	1295	3200

Table 2. Numbers of biological samples collected by observers.

Year	2003	2004	2005
Otoliths (No. of fish)	102	316	210
Stomach content (No. of fish)	-	93	257

Table 3. Number of FL-length measurement.

Year	2002	2003	2004	2005
SBT sampling number (No. of fish)	338	174	1290	2217

#### D. Tag Return Monitoring

There were no tagged SBT returned in the presence of observer on board in 2005.

#### E. Problems Experienced

Although the program was fully supported by boat owners and skippers of SBT sampling vessels, there are still some difficulties could not resolve technically. Since the distance from homeport to the fishing ground is very far, the transportations for supplies and equipments needed for sampling will take more than 1 month from Taiwan, and sometimes the supplies could not reached to observers on board in time. Besides the difficulty in supplies transportation, it is also hard for researchers to

arrange interviews with skippers to collect information on fishing activities for these SBT fishing vessels will not return to Taiwan after SBT fishing season.

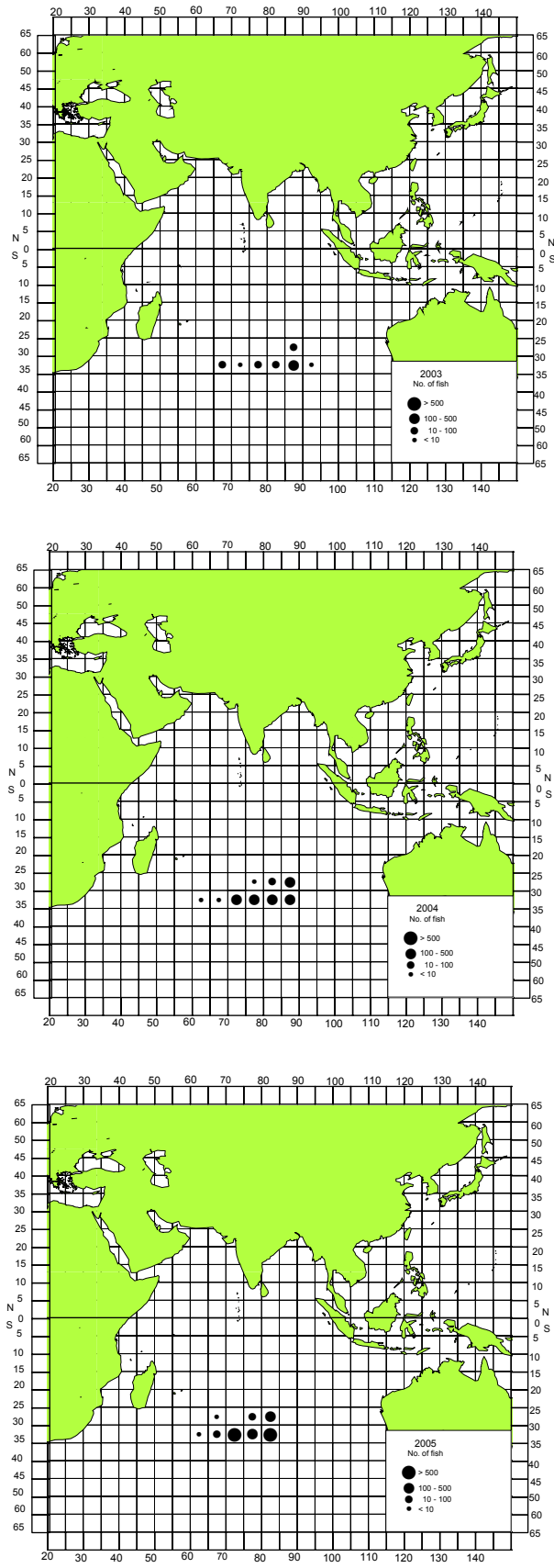


Figure 1. The catch distributions of SBT caught by sampling longliners during 2003-2005.