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**Recent Status of Chinese-Taipei Tuna Fisheries in the North Pacific  
Region for 2005<sup>1</sup>**

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# **Recent Status of Taiwanese Tuna Fisheries in the North Pacific Region for 2005**

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## **ABSTRACT**

Distant water tuna longline (DWLL) and offshore tuna longline (OSLL) fisheries are the two major Taiwan tuna fisheries in the North Pacific Ocean. The total number of DWLL vessels operated in the Pacific Ocean was 133 in 2005, but reduced to 117 in 2006. Albacore is the major catch of DWLL in the North region and the catch had been increasing significantly since 1995, but declined in recent years. The size of albacore caught in DWLL for 2004-2006 ranged from 40 to 130 cm with a clear peak in the range of 80-90 cm. The swordfish and bluefin tuna are mainly caught by OSLL fishery, and the catch estimates for 2005 were 1,813 mt and 1,368 mt, and 2,587 mt and 1,148 mt in 2006, respectively. The catch of swordfish of OSLL fishery does not include the landing in frozen form, and will be estimated and verified in the future between Pacific and Indian Oceans.

## **1. FISHERIES AND CATCHES**

### **1.1. General overview**

There are two Taiwan tuna fisheries operating in the North Pacific Ocean: the distant water longline (DWLL) and the offshore longline (OSLL) fisheries. Since the distant water purse seine fleets operate mainly in the equatorial areas, the following introduction focuses on DWLL and OSLL fisheries. The catches of the major species concerned by ISC and the data collection system of these two fisheries are provided in the following sections:

### **1.2. Distant water longline fishery**

The DWLL vessels refer to those vessels larger than 100 gross registered tons (GRT) mostly operate in the high sea areas or in the EEZs of coastal countries under license. The total number of vessels operating in the Pacific Ocean in 2005 was 133, and the number of vessels reduced to 117 in 2006.

Before 1995, the catch of albacore in the North region was very low for Taiwanese fleet. For the opportunities of access agreements to South Pacific were constrained, the Taiwanese fishing efforts and catch in the North region increased thereafter. The ALB catch of 2005 estimated as 3,990 mt, a continuous decrease since 2000, and the preliminary catch of 2006 estimated as 3,848 mt, a slight decrease from previous year.

For DWLL fisheries, the catch of bluefin tuna in the North Pacific has been very minimal and the catches were less than 1 mt in recent years. Before 2000, the catch of swordfish in the North

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Pacific region was low and less than 100 mt. Thereafter, the catch increased substantially to more than 1,000 mt in 2001 to 2003 for the increasing of fishing efforts on BET, but declined below than 1,000 mt in 2004 to 2006 period.

The effort distribution of Taiwanese DWLL vessels operated in the North Pacific region during 2002-2005 is shown in Figure 1. These vessels fish for northern albacore seasonally from September to next March, and shift to the South Pacific fishing for southern albacore from April to August.

### 1.3. Offshore longline fishery

The offshore tuna longline (OSLL) vessels generally refer to those vessels smaller than 100 GRT (mostly 50-70 GRT). These vessels generally operate in the waters of Taiwan. Table 1 shows the OSLL fishery's catches of the main species concerned and being considered as from the EEZ of Taiwan. From Table 1, the catch of albacore is generally low and fluctuated between 100 and 900 mt in recent ten years. A preliminary estimate of 2006 catch is 453 mt. The catch of swordfish of 2005 was estimated as 1,813 mt and a preliminary estimate for 2006 is 2,587 mt. And the catch of bluefin tuna shows an increasing trend during recent ten years, up to the peak record of 3,000 mt in 1999 and reduced to a level of 1,500 to 2,000 mt after year 2000. The catch of 2004 was estimated at 1,714 mt, but declined to 1,365 mt in 2005. In 2006, the catch of bluefin tuna further declined to 1,148 mt.

The fishing effort distribution of OSLL vessels based at domestic ports during 2002-2005 is shown in Figure 2. The operation was mostly located in area of 110-150 E/10-30 N, especially waters south and east of Taiwan and northeast of the Philippine Islands. Some OSLL vessels based in Suao, located in the northeast coast of Taiwan, operating in the area east of 150 E and their catches are in frozen form as the same form as the catches transported from the small tuna longline fishing vessels operating in the Eastern Indian Ocean and the south Pacific Ocean. The catches figures provided to ISC do not include the catches from these fishing vessels.

### 1.4. Size samples from the longline fisheries

The size measurements on major tuna and tuna-like species caught by DWLL and OSLL fisheries in the North Pacific region are shown in Figure 3.

For DWLL fisheries, the catch size data is recorded in logbook. The size numbers of albacore and swordfish were 116,234 and 8,924 respectively from 2004-2006. The albacore caught by DWLL for 2004-2006 ranged from 40 to 130 cm with a clear peak in the range of 80-90 cm. The low jaw fork length frequency distributions of swordfish shows one mode in the range of 120-200 cm.

For OSLL fisheries, the size numbers of albacore and swordfish sampled from domestic fishing ports were 1,317 and 1,296 respectively from 2004-2006. The catch size of albacore is one mode located between 90-100 cm. The low jaw fork length frequency distributions of swordfish is mainly between 120-170 cm, and the fork length distribution of bluefin tuna is mainly between

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200-250 cm.

## **2. FISHERY MONITORING AND DATA COLLECTION**

### 2.1 Fishery-dependent data collecting

#### Distant water longline fishery

Two types of fishery statistical data are routinely collected from DWLL fishery: the commercial data (for estimation of total catch), and the logbook data (for stock assessment purposes). Several sources of commercial information were available from traders, Taiwan Tuna Association, Japanese market, and so on. After cross-checking and compilation, the commercial information was used to estimate total catches of the Category I data.

The logbook data include each set of catch in number and weight by species, effort deployed, fishing location, and so on, as well as the size measurement of the first 30 fish caught each day. Categories II and III data were all compiled from this data set.

#### Offshore longline fishery

As mentioned in previous section, two categories of OSLL are defined: OSLL that based in Taiwan and unloading their catches at domestic fishing ports (domestic-based OSLL), and that based and unloading catches at foreign ports (foreign-based OSLL). For domestic-based OSLL, the commercial landing records from local fishing markets provide the best information for estimating the ISC Category I data of total catches. Since, there was not much information to estimate total catches for foreign-based OSLL, preliminary estimations were basically made from fishing vessels activities and importing statistics to the Japanese markets. In addition, some OSLL vessels fishing in the South Pacific or Eastern Indian Ocean, their catch of billfish were transshipped back to Taiwan by containers, reefers or fishing vessels in frozen form, and unloaded/auctioned in the domestic markets. These catches in frozen form were excluded from the estimation of ISC Table 1.

Logbooks of OSLL fishery have been collected since 1997, though at this stage, the recovery rate of about 2% to 5% is too low to be compiled to Category II data, and insufficient for the purposes of stock assessment. To improve the coverage of logbook, Fisheries Agency has launched a data improvement program on domestic-based OSLL fishery. As required by the program, additional manpower- the statisticians will be deployed to local ports to collect logbooks, interview with fishermen, and conduct port-sampling program. Logbook coverage rate will be improved in the near future subsequently.

### 2.2 Fishery-independent data collection

#### 2.2.1 Port sampling

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Taiwanese DWLL vessels fished for northern albacore only seasonally from about September to next March, and based in Pago Pago, South Pacific. In 2005, 4 port samplers were sent to carry out the port-sampling in Pago Pago, Suva and Levuka, where the fish size was measured, muscle tissues collected and skippers interviewed. In 2006, 2 port samplers were sent to carry out the port-sampling in Pago Pago.

For domestic-based OSLL, port sampling at domestic fish markets has started in 1997, collecting size data of the major tuna species (mainly bigeye and yellowfin tunas). In 2004, we carried out a pilot port sampling in Davao, Philippines in the North Pacific. However, the catch of Taiwan in North region was provided by domestic-based OSLL, there exists a need to augment a port sampling program at domestic ports. Through the data improvement program, port sampling on both the trip information (location, catches and effort) and size of major tuna species in Tong-Kang, Suao and Sin-Kang, the domestic tuna-fishing main ports, has been, therefore, independently conducted. These data were compiled and made available for the scientific uses.

#### 2.2.2 Observer program

The experimental observer program for three Oceans was launched in 2001. There were 2 trips dispatched to the North Pacific region respectively in 2004 and 2005, and further increased to 3 trips in 2006, to collect fishery data and size measurements, otoliths, and gonad samples of albacore. In addition, the number of observers will be increased for the three oceans in the near future.

#### 2.2.3 VMS monitoring

For better management of tuna fishery resources, it is mandatory for all DWLL operating in the Pacific Ocean to equip with Vessel monitoring system (VMS) equipment by 30 June 2004. Besides of better monitoring the vessel activities, the data could be used to verify the logbook data and to improve the data quality.

### 3. RESEARCH

Among the billfish species, National Taiwan University (NTU) has completed studies on population dynamics and stock assessment for swordfish and sailfish and is currently conducting a stock assessment study on blue marlin. Through collaborations with the Fisheries Research Institute (FRI) of Council of Agriculture (COA), and funding from the Fisheries Agency of COA, NTU is also studying the age/growth and reproductive biology of black marlin, and collecting biological data from striped marlin. A billfish tagging program has also being conducted by FRI. More results from billfish studies are expected in the near future.

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Table 1. Catch estimates of North Pacific albacore, bluefin tuna and swordfish by Taiwanese fisheries during 1996-2006. DWLL stands for catches by the distant-water longline fishery, OSLL for the offshore longline fishery that unloaded in Taiwanese domestic ports. (Note: Data of 2006 is still preliminary)

Unit: mt

Year	Albacore		Bluefin tuna		Swordfish	
	DWLL	OSLL	DWLL	OSLL	DWLL	OSLL**
1996	7,596	113	-	956	9	701
1997	9,119	337	-	1,814	15	1,358
1998	8,617	193	-	1,910	20	1,178
1999	8,186	207	-	3,089	70	1,385
2000	7,898	802	-	2,780	325	1,531
2001	7,852	747	-	1,839	1,039	1,691
2002	7,055	910	-	1,523	1,633	1,557
2003	6,454	712	-	1,863	1,084	2,196
2004	4,061	927	-	1,714	884	1,828
2005	3,990	477	-	1,368	392	1,813
2006*	3,848	453	-	1,148	438	2,587

\* Data of 2006 is still preliminary

\*\* The catch of swordfish of OSLL fishery does not include the landing in frozen form, and will be estimated and verified in the future.

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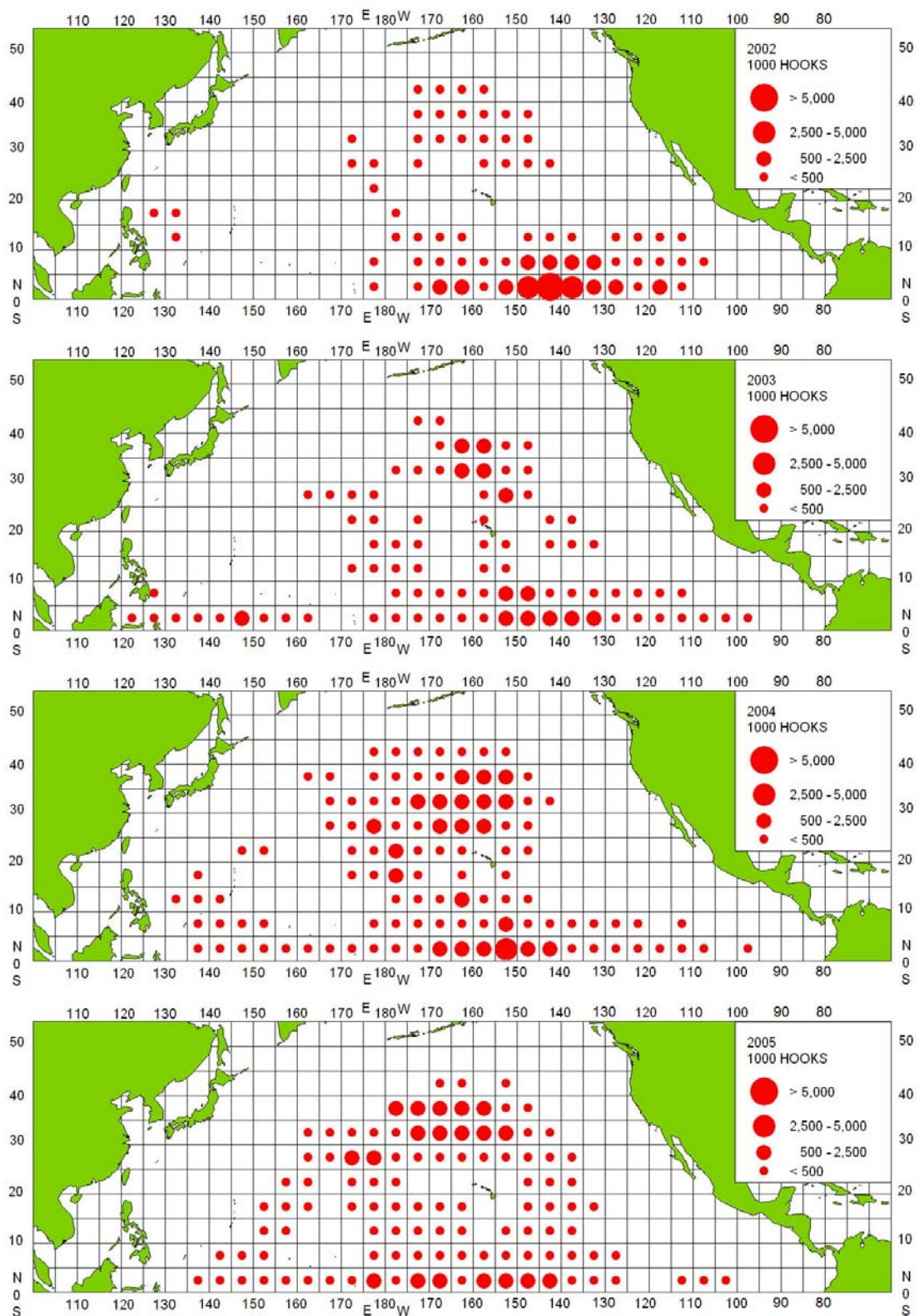


Figure 1. The effort distribution of the distant water longline fishery operated in the North Pacific region during 2002-2005. (Note: Map of 2005 is still preliminary and will be revised shortly.)

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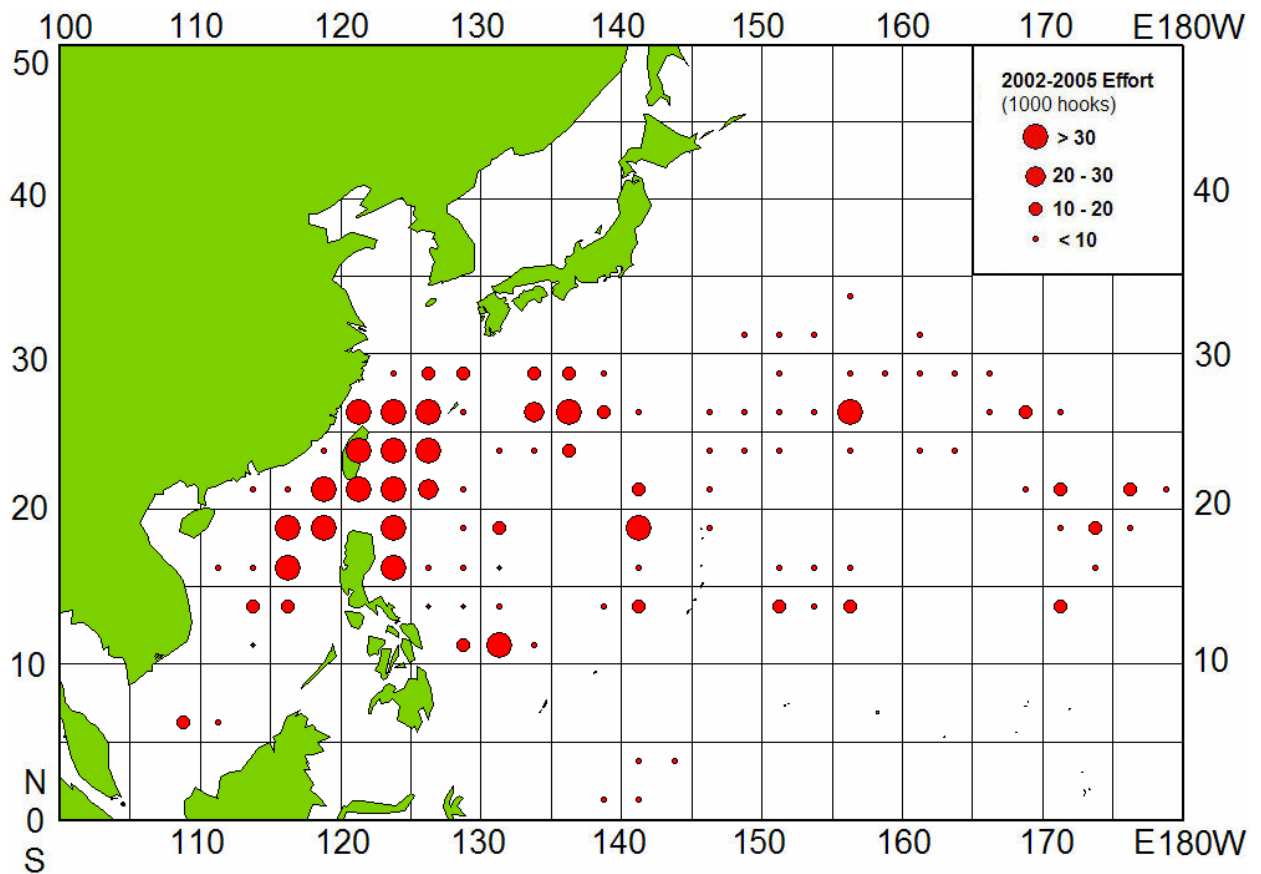


Figure 2. The effort distribution of Taiwanese domestic-based offshore longline fishery for 2002-2005. (Note: the coverage rate is about 2% to 5% each year)

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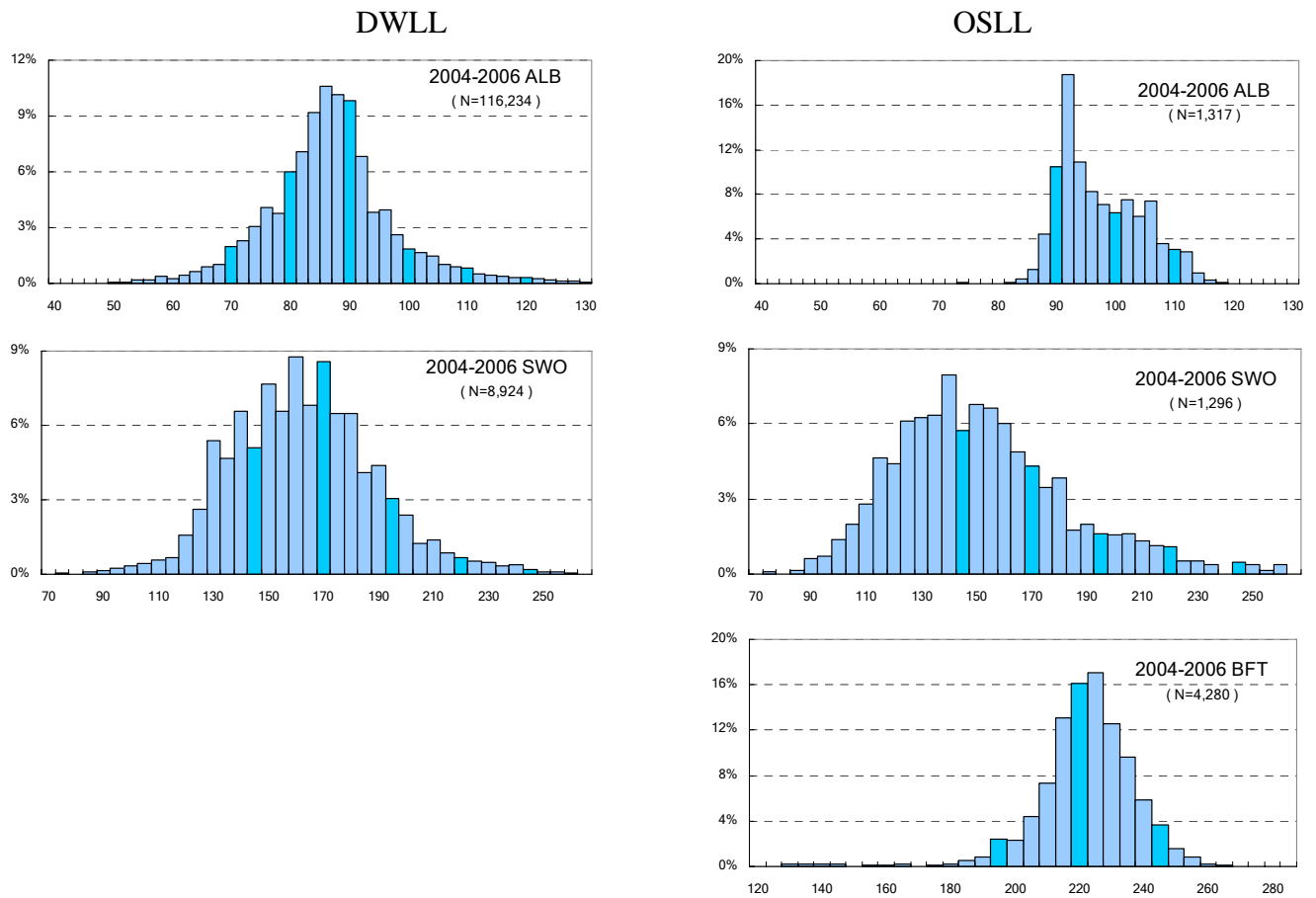


Figure 3. Length frequencies of albacore, bluefin tuna and swordfish by the distant water longline (DWLL) and offshore longline (OSLL) fisheries in the North Pacific Ocean during different periods of time (depending on the data available). The length scales vary for different species.

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