

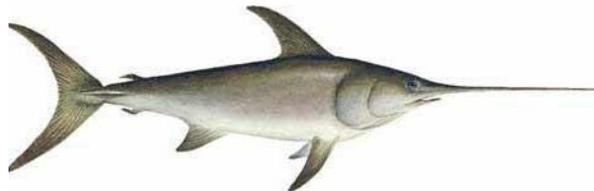


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## **A review of Taiwan's billfish fisheries in the North Pacific Ocean**

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# A review of Taiwan's billfish fisheries in the North Pacific Ocean<sup>1</sup>

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Billfishes are incidental catch of distant-water tuna longline fishery and offshore tuna longline fishery in Taiwan. Also the offshore gillnet and the coastal harpoon fisheries catch a small amount of billfishes in Taiwan waters. This paper briefly reviews these four Taiwanese fisheries for billfishes in the North Pacific Ocean. The catches data used for coastal harpoon and offshore tuna longline and gillnet fisheries in this study were from the Yearbooks of Taiwan Fisheries Agency. For the distant-water tuna longline fishery, we used the catch and effort data, summarized by five degree squares and month, provided by the Taiwan Overseas Fisheries Department Council.

## **Distant-water tuna longline fishery**

The distant-water tuna longline fishing fleets of Taiwan consist of vessels larger than 100 gross tons (GRT). They have been operating in the Pacific Ocean since early 1960s. The main fishing grounds have been in the western-central Pacific Ocean and extended to the eastern Pacific Ocean in late 1990s. Major target species of this fleet is albacore tuna in the temperate regions for canning. Traditionally the fleet was mainly fishing southern albacore in the south, but the northern albacore has become an important seasonally-targeted species in the northern region since 1996. After the expansion of fishing ground to the eastern Pacific Ocean, bigeye tuna has become another important target in the tropical waters of the entire Pacific Ocean in recent years for the Japanese frozen sashimi market. Billfishes are, however, only incidental species in the fishery. Catches of some of the billfish species have increased recently following the development of the fishery that is targeting bigeye tuna.

According to the logbook data provided by the Overseas Fisheries Development Council of the Republic of China (OFDC), swordfish is ranked first in the billfish catches, consisting of 49.26% of the total billfishes catch by weight, blue marlin is the second with 32.35%, followed by striped marlin of 13.07% and black marlin of 2.06%.

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Annual catches and CPUE of the billfishes by species and the fishing effort of this fishery during 1968 to 2006 were shown in Figs. 1-3..

### **Offshore tuna longline fishery**

The offshore tuna longline fleets consist of vessels smaller than 100 GRT. There are two groups of vessels according to the fishing ports they are based in. Group I vessels are mostly 20-50 GRT and based in domestic fishing ports such as Tung-Kang and Kaohsiung. They operate in the seas nearby for short trips of 7-10 days and land their catch at their home-port. Group II vessels are mostly 50-70 GRT and based in fishing ports of western Pacific island countries. They have been fishing yellowfin and bigeye tuna for Japanese sashimi market, with billfishes as their incidental catch.

The annual catches of billfishes by species for Group I shown in Fig. 4 indicate that blue marlin has been a dominant species of billfish with catches fluctuating between 691 tons (1963) and 4617 tons (1987) and at an annual average of 3,745 tons during 1992 to 2007.

### **Offshore gillnet fishery**

The mesh size of the offshore drift gillnet fishery is 6 to 8 inches for sailfish and 1.0 to 1.2 inches for black marlin. Sailfish is the main target species caught during summer season and black marlin is the second target species caught during winter season. The annual catches of billfishes by species during 1982 to 2006 were shown in Fig. 5.

### **Coastal harpoon fishery**

The harpoon fishery for billfishes was introduced to Taiwan by the Japanese in 1913. Its vessels operated primarily in the coastal waters of eastern Taiwan along the edge of the Kuroshio Current. This fishery appears to target a complex of billfishes with swordfish and striped marlin at a low level. Blue marlin and black marlin are the main target species in the winter season. The annual catches of billfishes by species during 1982 to 2006 were shown in Fig. 6.

### **Research**

Among billfishes, our laboratory at National Taiwan University (NTU) has conducted biological studies for swordfish, sailfish, blue marlin and black marlin.

We also have finished the studies on population dynamics and stock assessment for swordfish and sailfish. Currently we are conducting the stock assessment studies for blue marlin and black marlin. We are also undergoing the collection of biological data and samples for striped marlin. A tagging program for sailfish is being conducted by Taiwan Fisheries Research Institute. We expect that more results from billfish studies will come out in the near future.

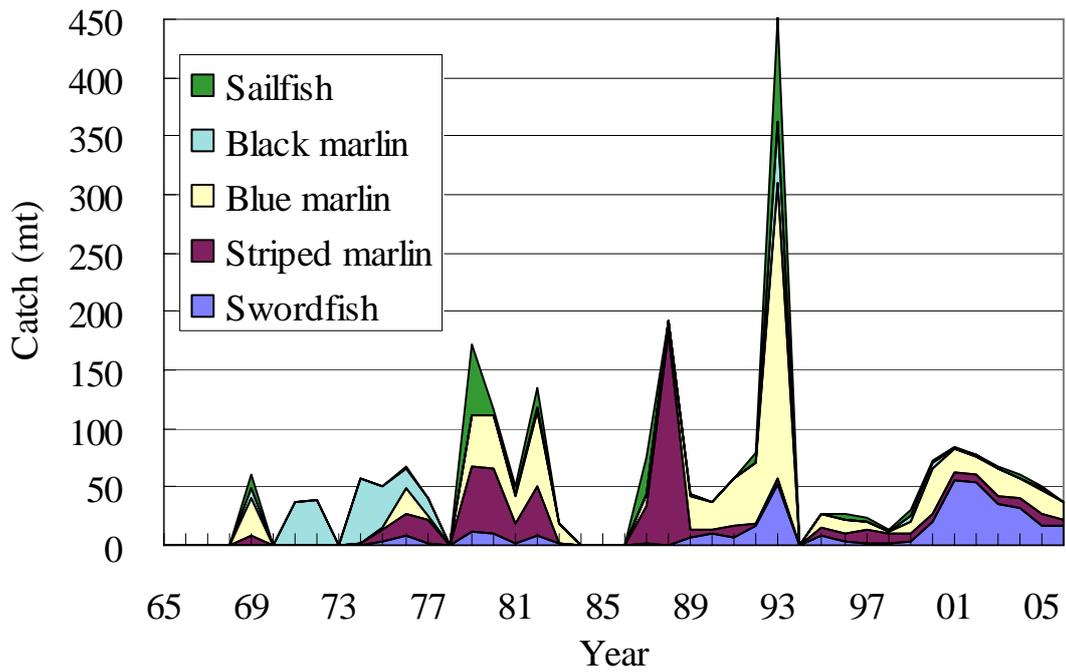


Fig. 1. Annual catches of billfishes by species of the Taiwanese distant-water tuna longline fishery in the North Pacific Ocean, 1968-2006.

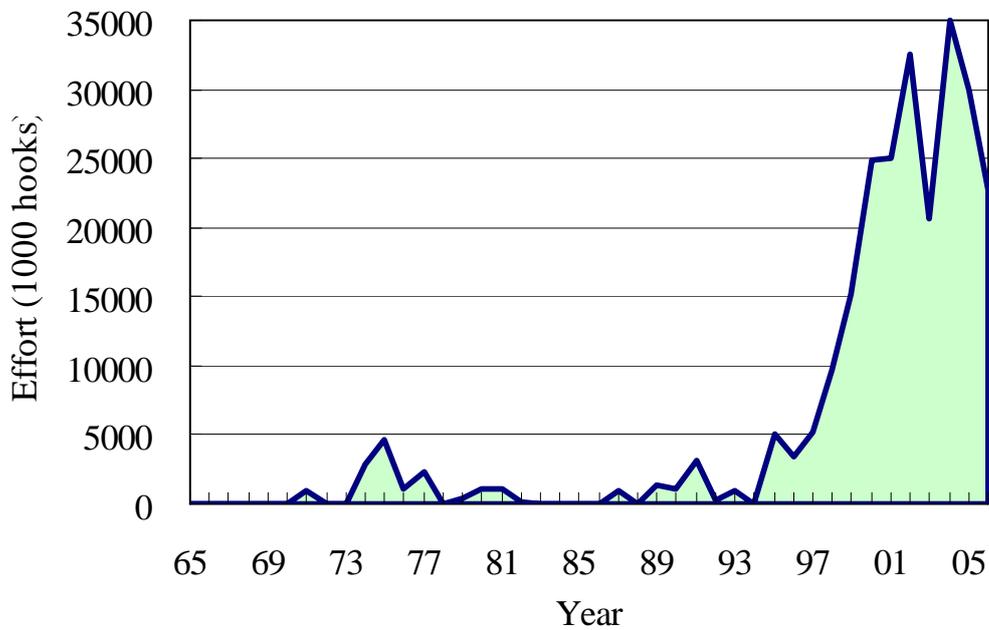


Fig. 2. Annual fishing efforts of Taiwanese distant-water tuna longline fishery in the North Pacific Ocean, 1968 to 2006.

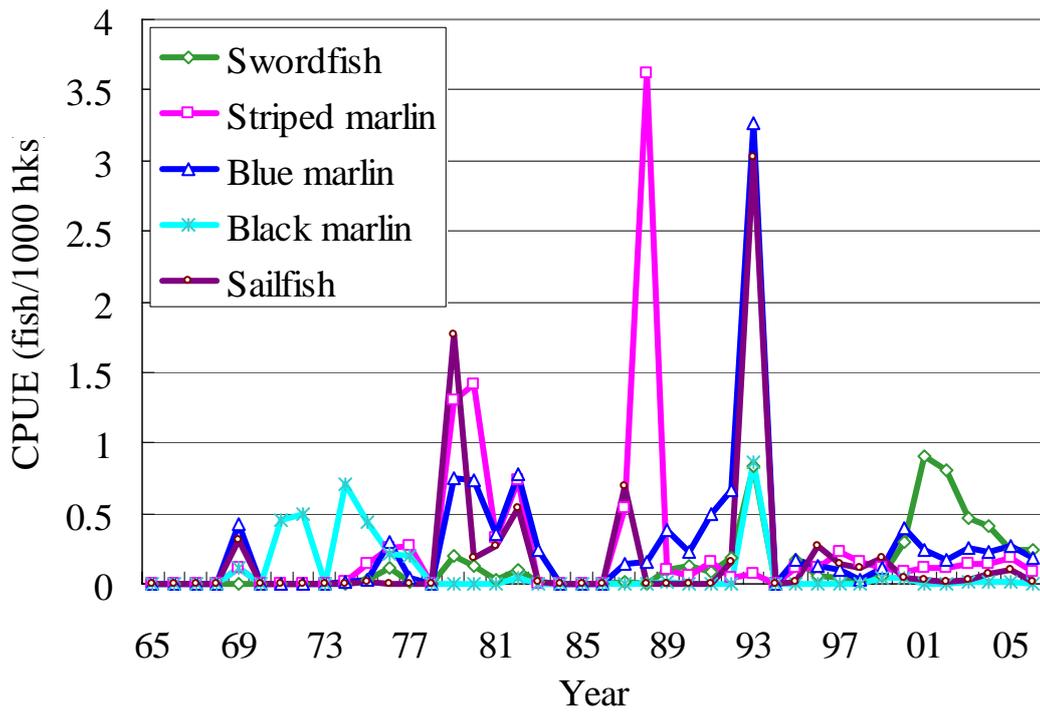


Fig. 3. Annual CPUE of billfishes by species of the Taiwanese distant-water tuna longline fishery in the North Pacific Ocean, 1968 to 2006.

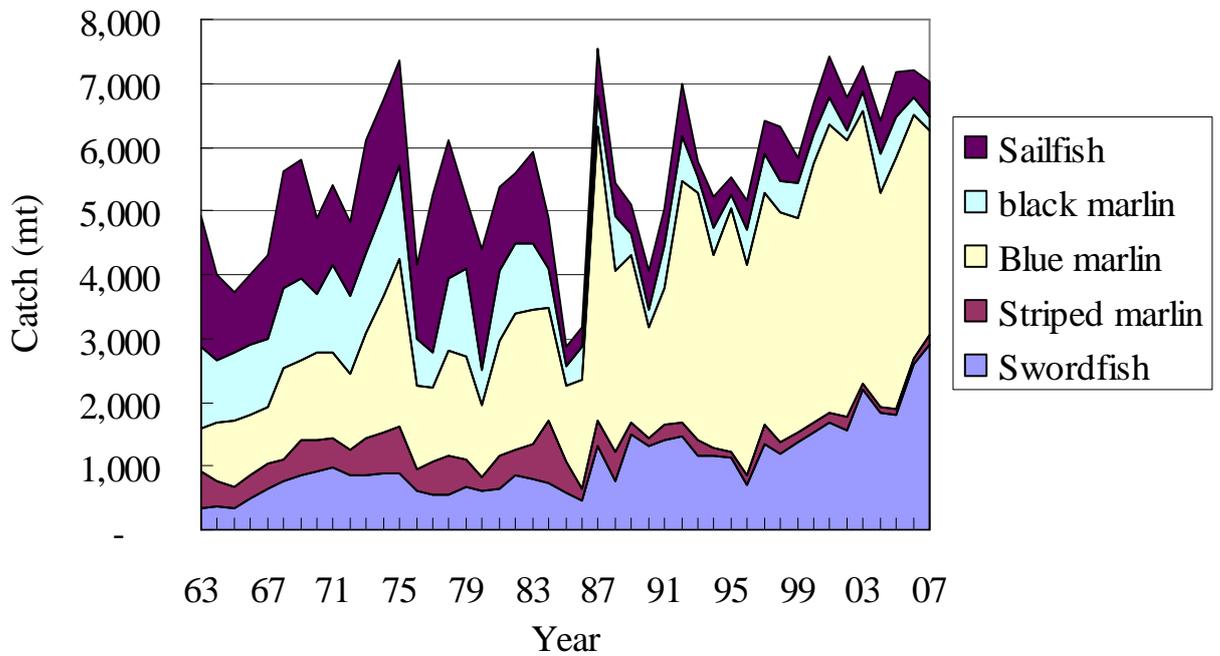


Fig. 4. Annual catches of billfishes by species of the Taiwanese offshore tuna longline fishery in the North Pacific Ocean, 1963-2007.

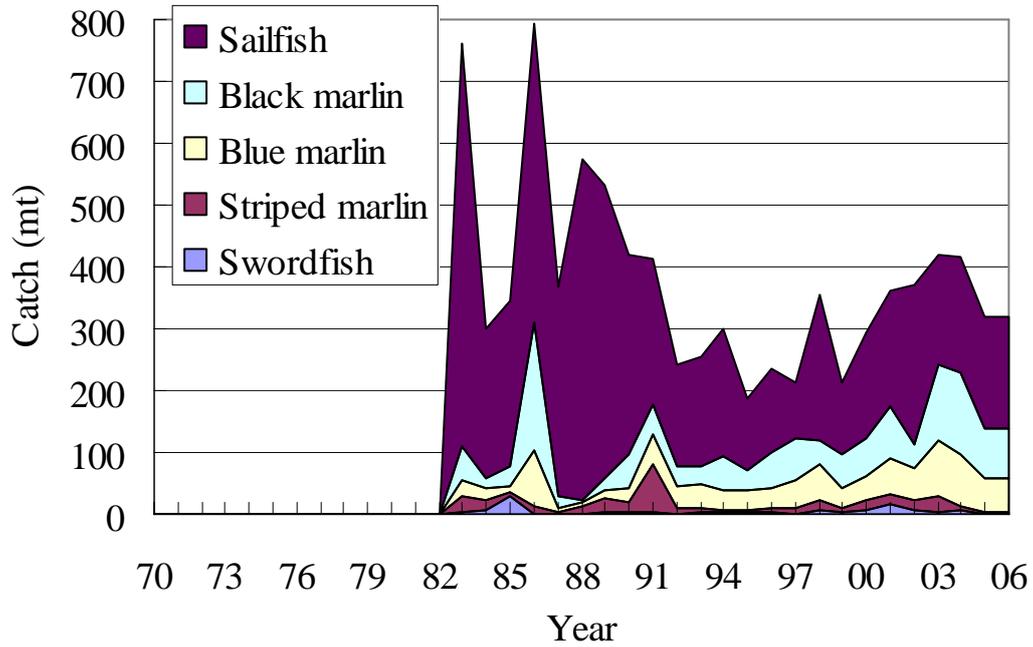


Fig. 5. Annual catches of billfishes by species of the Taiwanese offshore gillnet fishery in the North Pacific Ocean, 1982-2006.

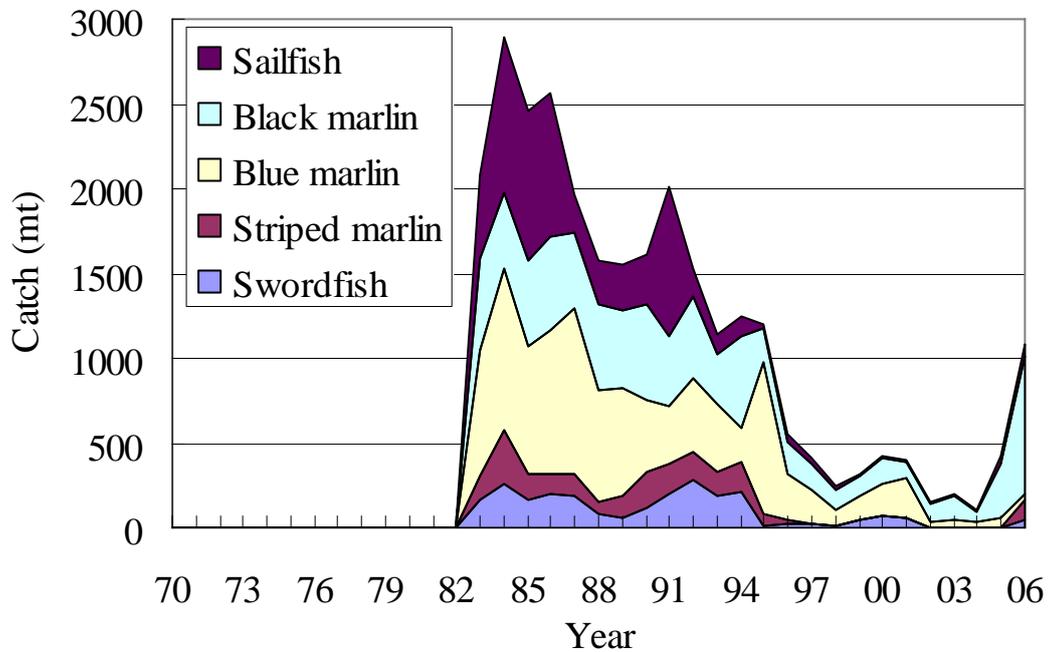


Fig. 6. Annual catches of billfishes by species of the Taiwanese coastal harpoon fishery in the North Pacific Ocean, 1982-2006.