

**A review of Taiwan's billfish fishery in the Pacific
Ocean¹**

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A review of Taiwan's billfish fishery in the Pacific Ocean¹

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Billfishes are an incidental catch of the distant-water tuna longline fishery and the offshore tuna longline fishery in Taiwan. Also, the offshore gillnet and the coastal harpoon fisheries catch a small amount of billfishes in the waters of Taiwan. This paper briefly reviews these four Taiwanese fisheries for billfishes in the Pacific Ocean. The catch 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 Development Council.

Distant-water tuna longline fishery

The distant-water tuna longline fishing fleets of Taiwan consist of vessels larger than 100 gross tons (GRT), mostly at 150-250 GRT. They have been operating in the Pacific Ocean since 1963. The main fishing ground is in the central and southern region of the Pacific with albacore as a target species and billfishes as a by-catch. But in recent years, a higher proportion of the fleets targeted tropical species for Japanese frozen sashimi market. Fig. 1 shows the trend of annual catch by species. In recent years, the catch of swordfish increased sharply. The yearly distributions of fishing effort and CPUE (number of fish per thousand hooks) by species during the period 1998-2003 are shown in Fig. 2 and Fig. 3, respectively. The trends of yearly CPUE by species are shown in Fig. 4.

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.

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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 in the western Pacific since 1988. Both types of longline vessels primarily target yellowfin and bigeye tunas for the Japanese sashimi market, with billfishes as their by-catch.

The annual catches of billfishes by species for Group I during 1983-2004 are shown in Fig. 5. Apparently, blue marlin is a dominant species of billfish with catches fluctuating between 1,200 tons (1985) and 4,850 tons (1997).

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. Apparently, 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 by species during 1983 to 2004 are shown in Fig. 6.

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 rank. Blue marlin and black marlin are the main target species of the harpoon fishery in the winter season. The annual catches by species during 1983 to 2004 are shown in Fig. 7.

Catch of species by gear

Fig. 8 shows the yearly catch of billfishes by species and gear for the north Pacific. Apparently, offshore longline fishery is the main fishing gear used to catch billfish.

Research

Among billfishes, our laboratory at National Taiwan University (NTU) has finished studies on population dynamics and stock assessment for swordfish and

sailfish. Currently, we are conducting a stock assessment study on blue marlin. Also, we are studying the age, growth and reproductive biology for black marlin and collecting biological data for striped marlin. A tagging program for billfish is being conducted by Taiwan Fisheries Research Institute. We expect that more results from billfish studies will come out in the near future.

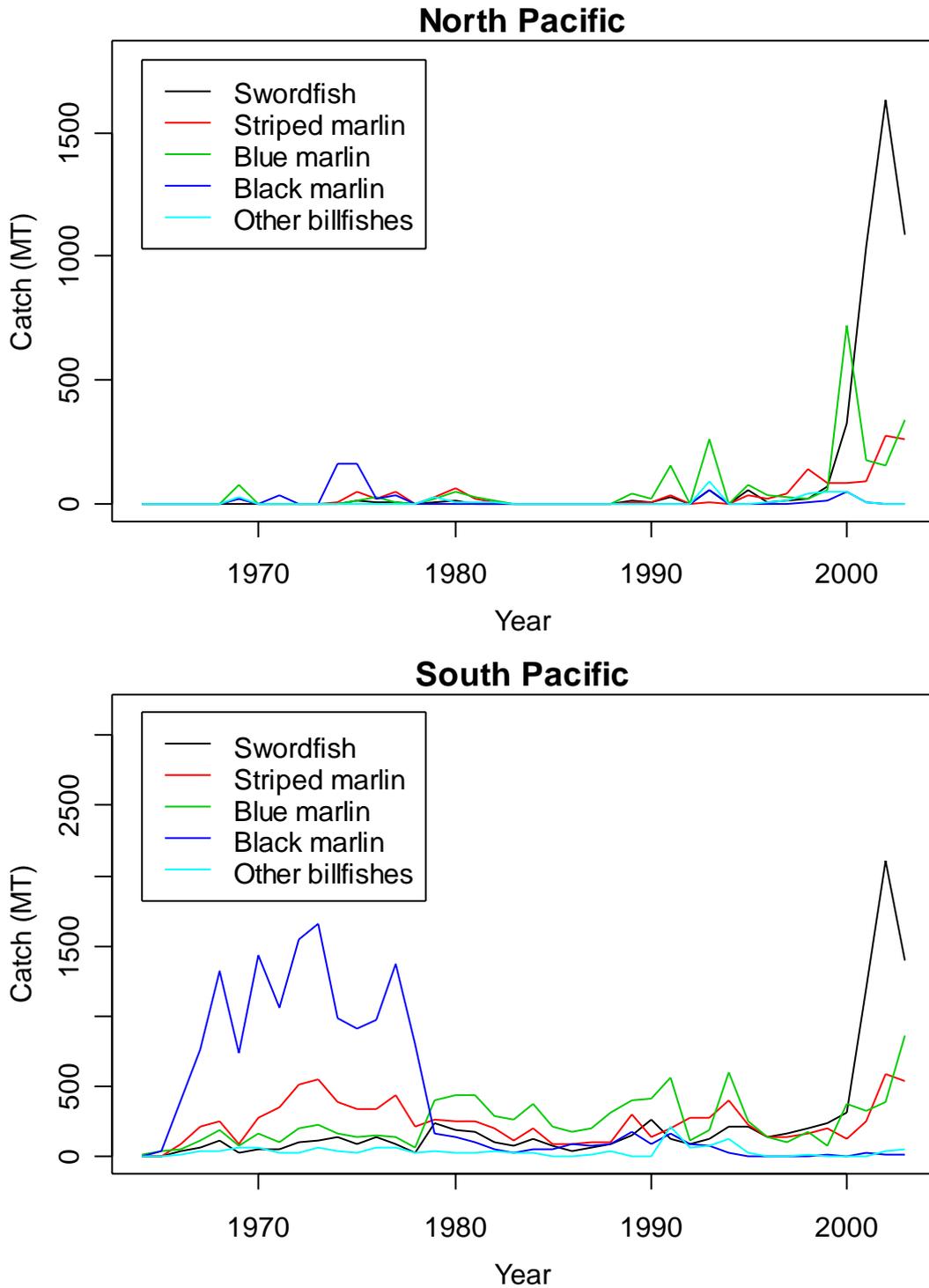


Fig. 1. Annual catches of billfish by species during 1964-2003 from Taiwanese distant water longline fishery in the North and South Pacific Ocean.

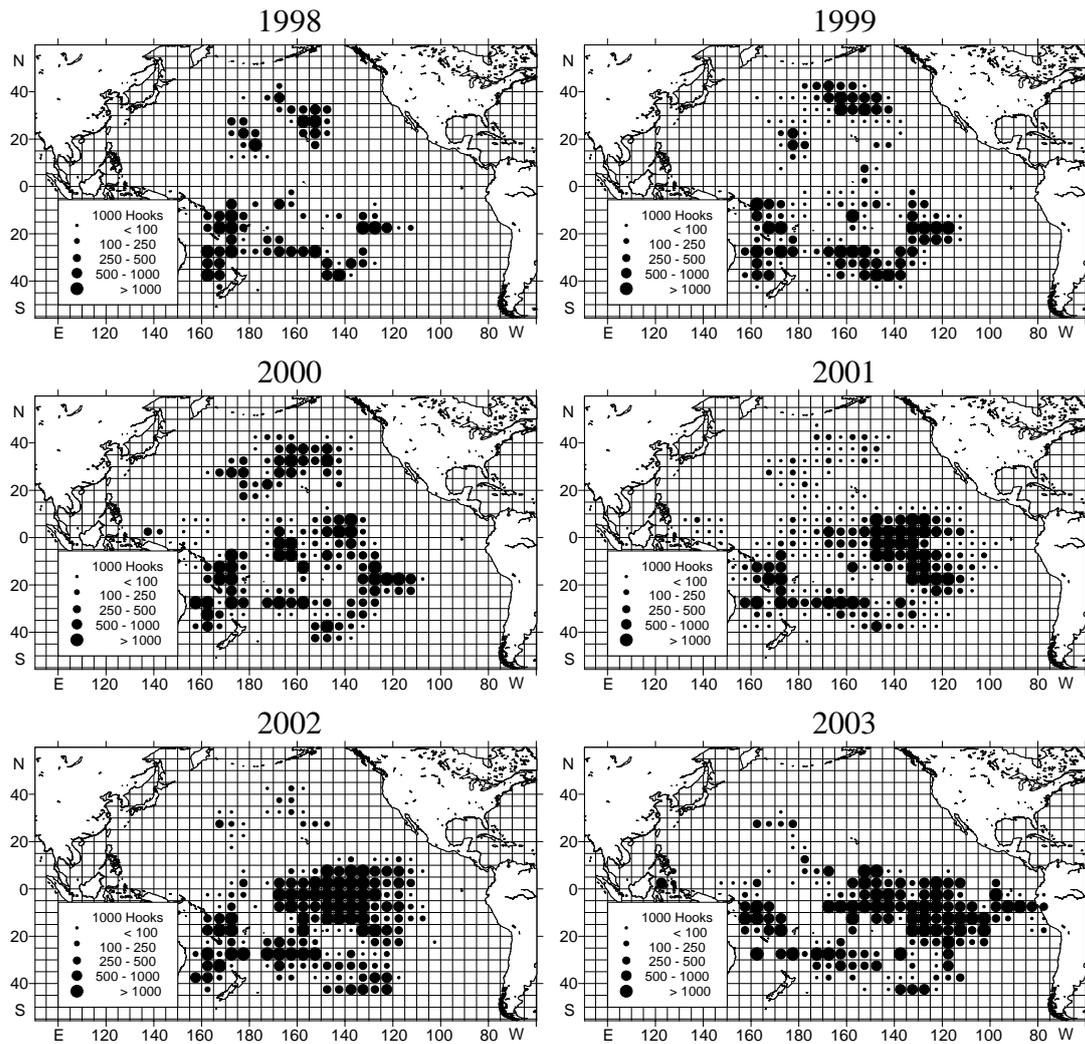


Fig. 2. Annual distribution of fishing efforts for Taiwanese distant-water tuna longline fishery in the Pacific Ocean, 1998 to 2003.

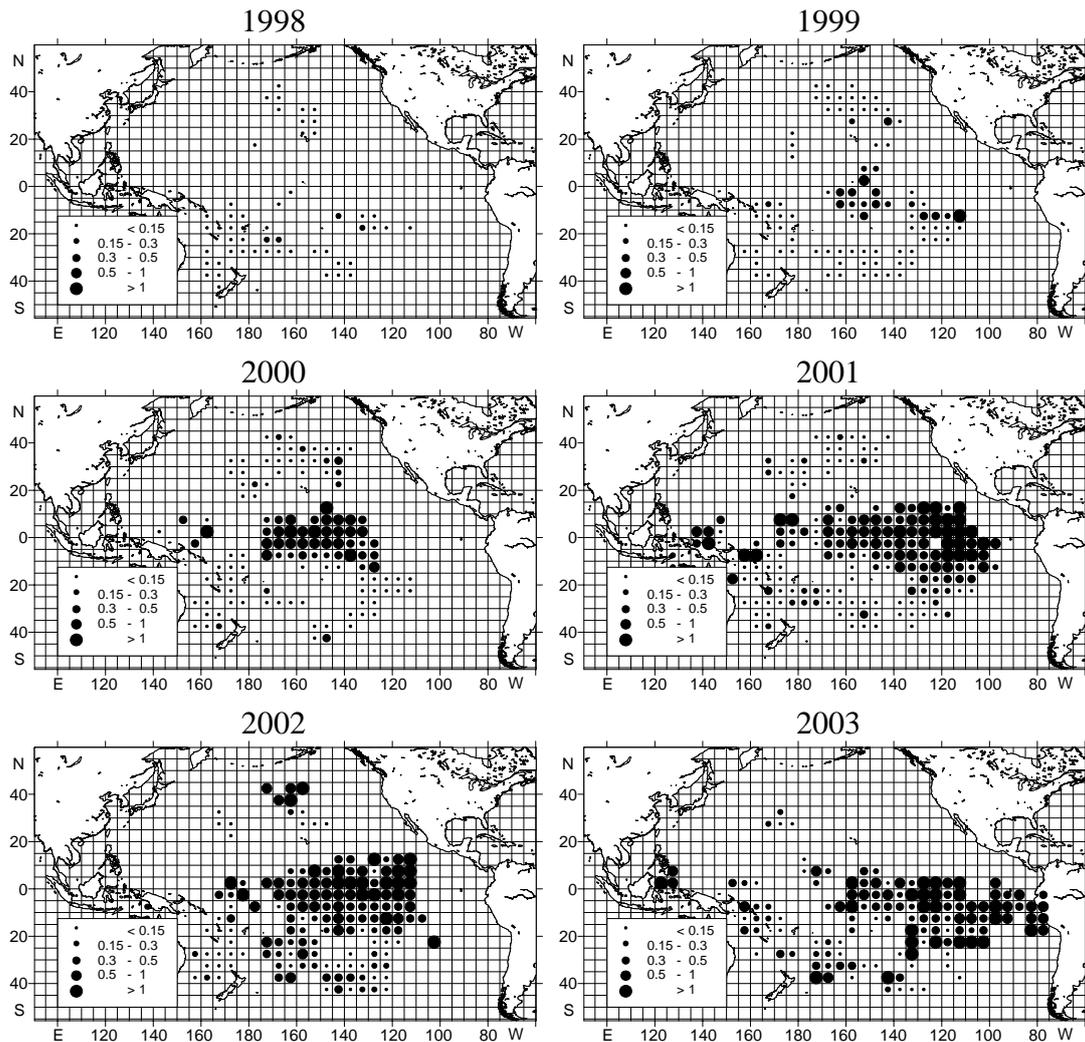


Fig. 6. CPUE of swordfish.

Fig. 3-1. Annual distribution of swordfish CPUE for Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1998-2003.

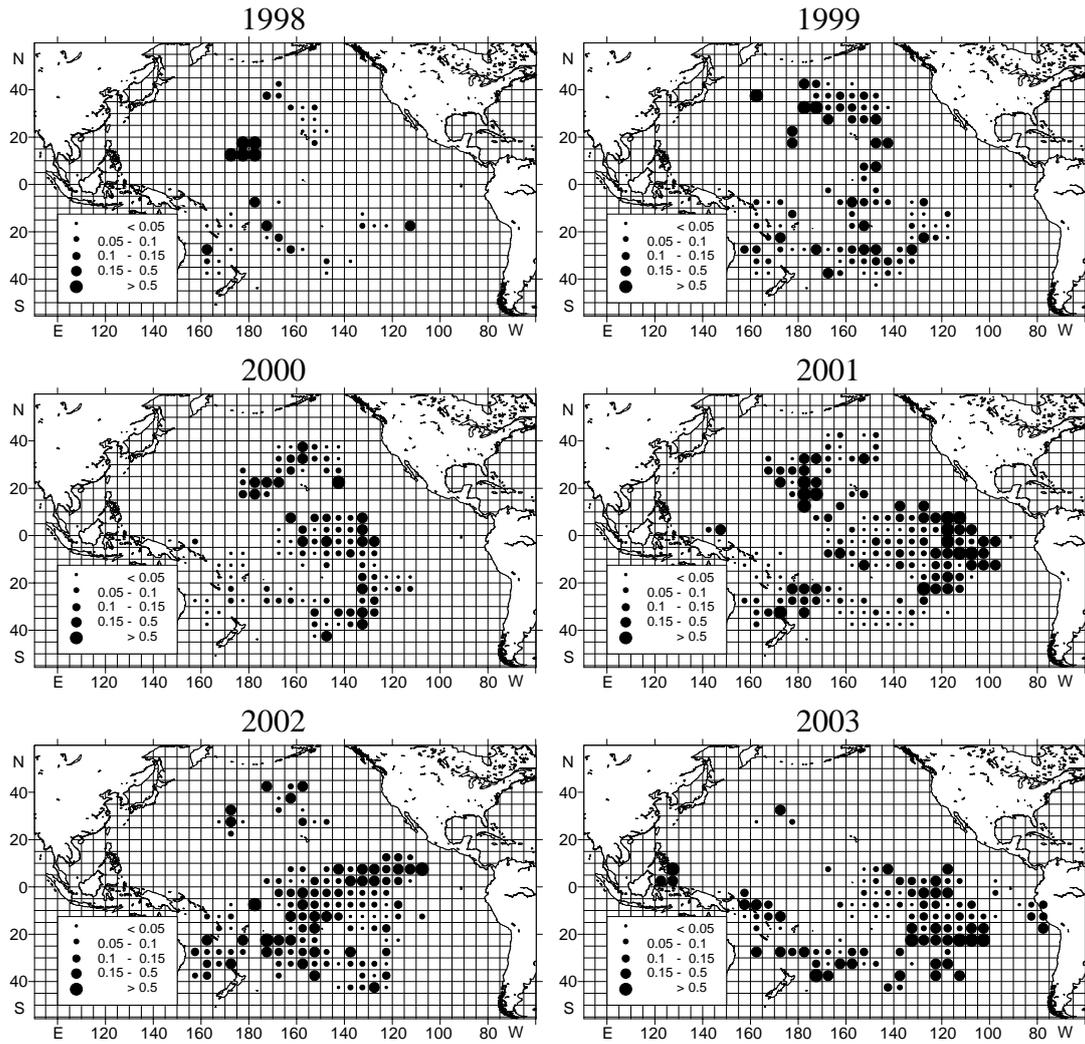


Fig. 3-2. Annual distribution of striped marlin CPUE for Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1998-2003.

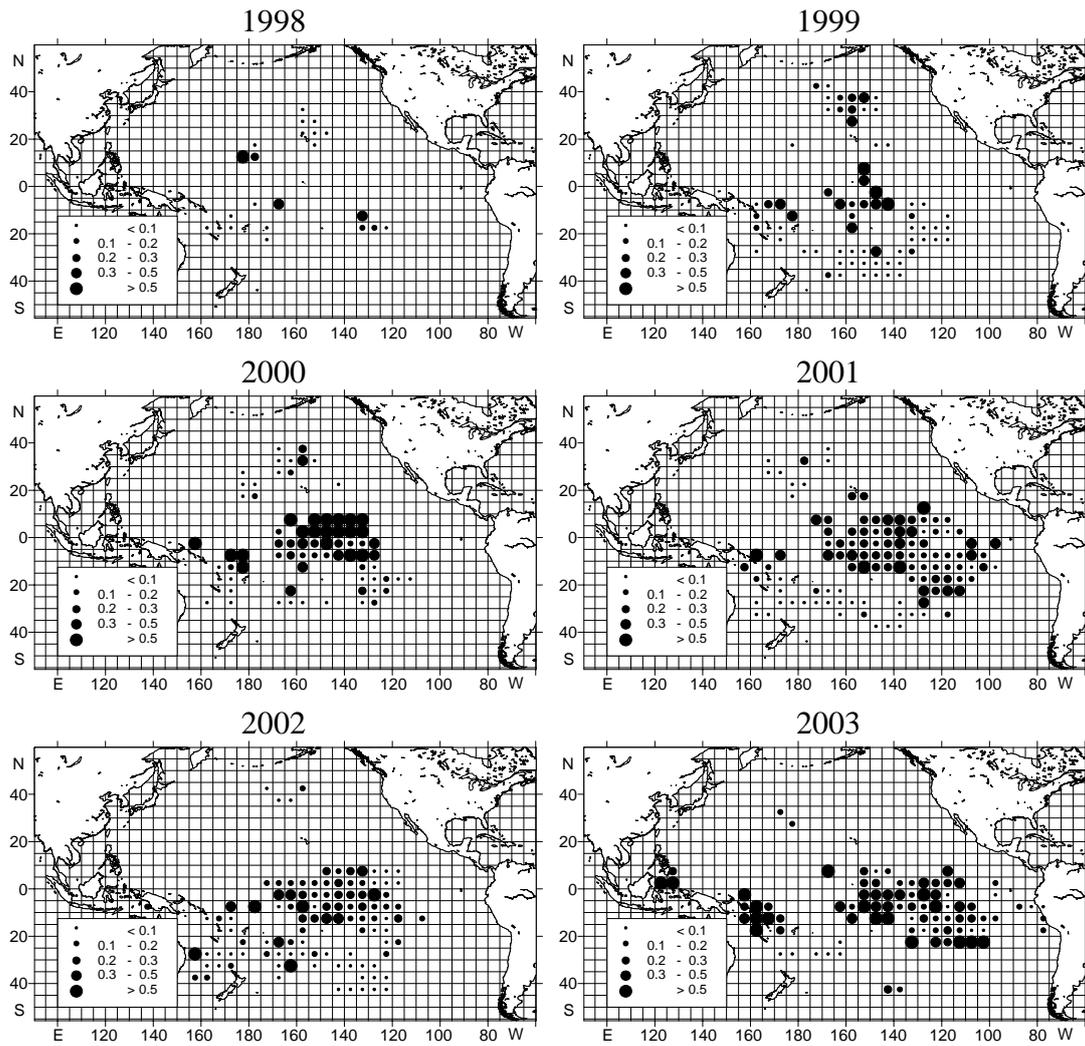


Fig. 3-3. Annual distribution of blue marlin CPUE for Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1998-2003.

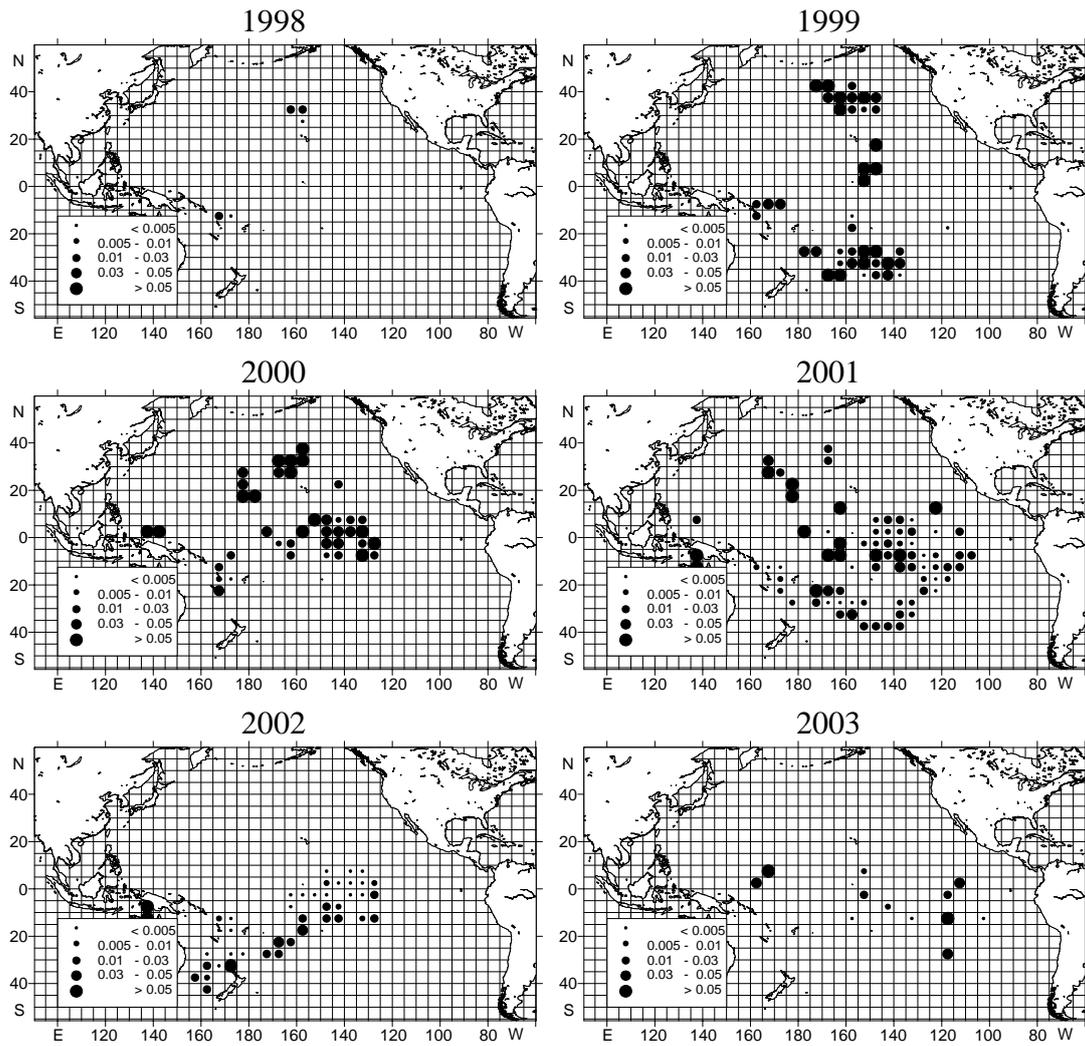


Fig. 3-4. Annual distribution of black marlin CPUE for Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1998-2003.

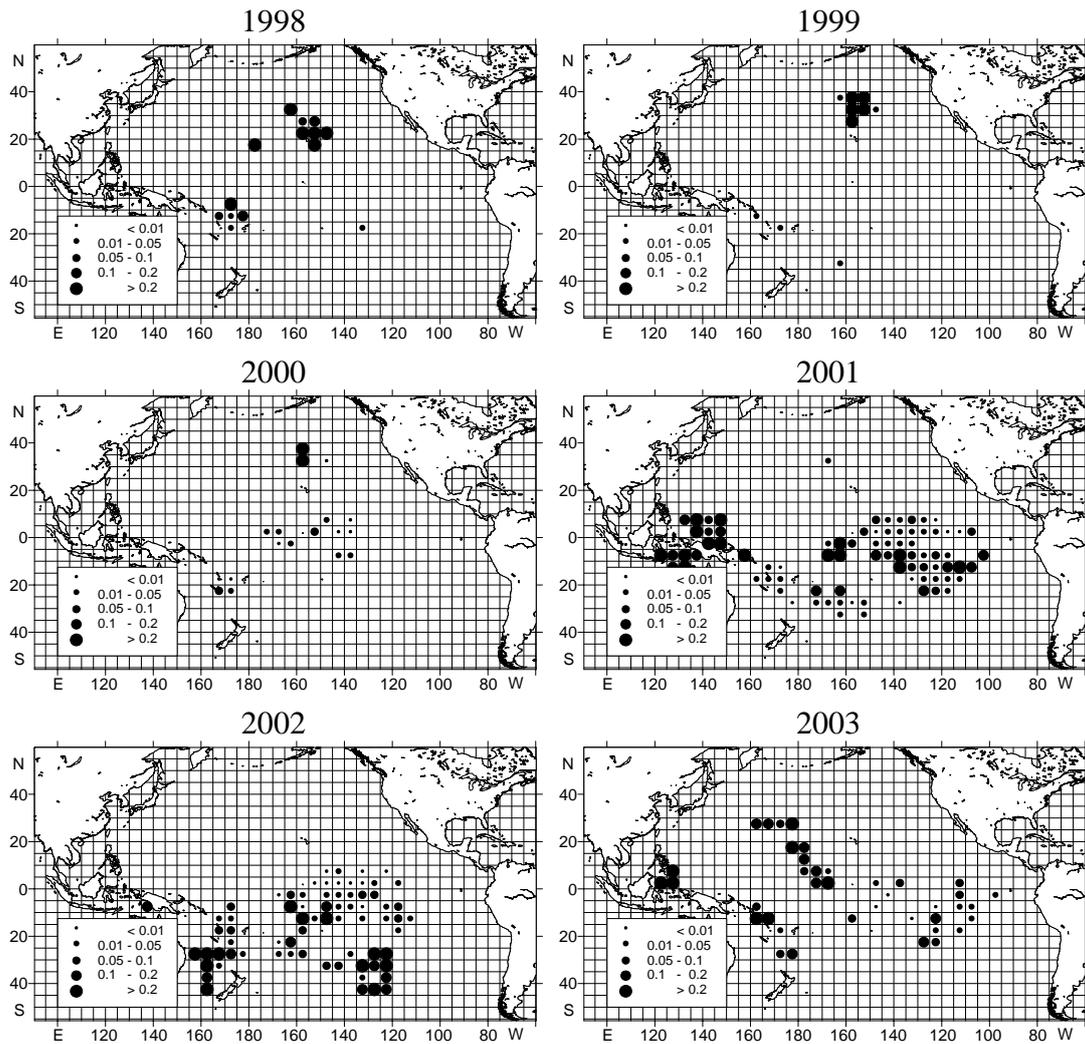


Fig. 3-5. Annual distribution of other billfish CPUE for Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1998-2003.

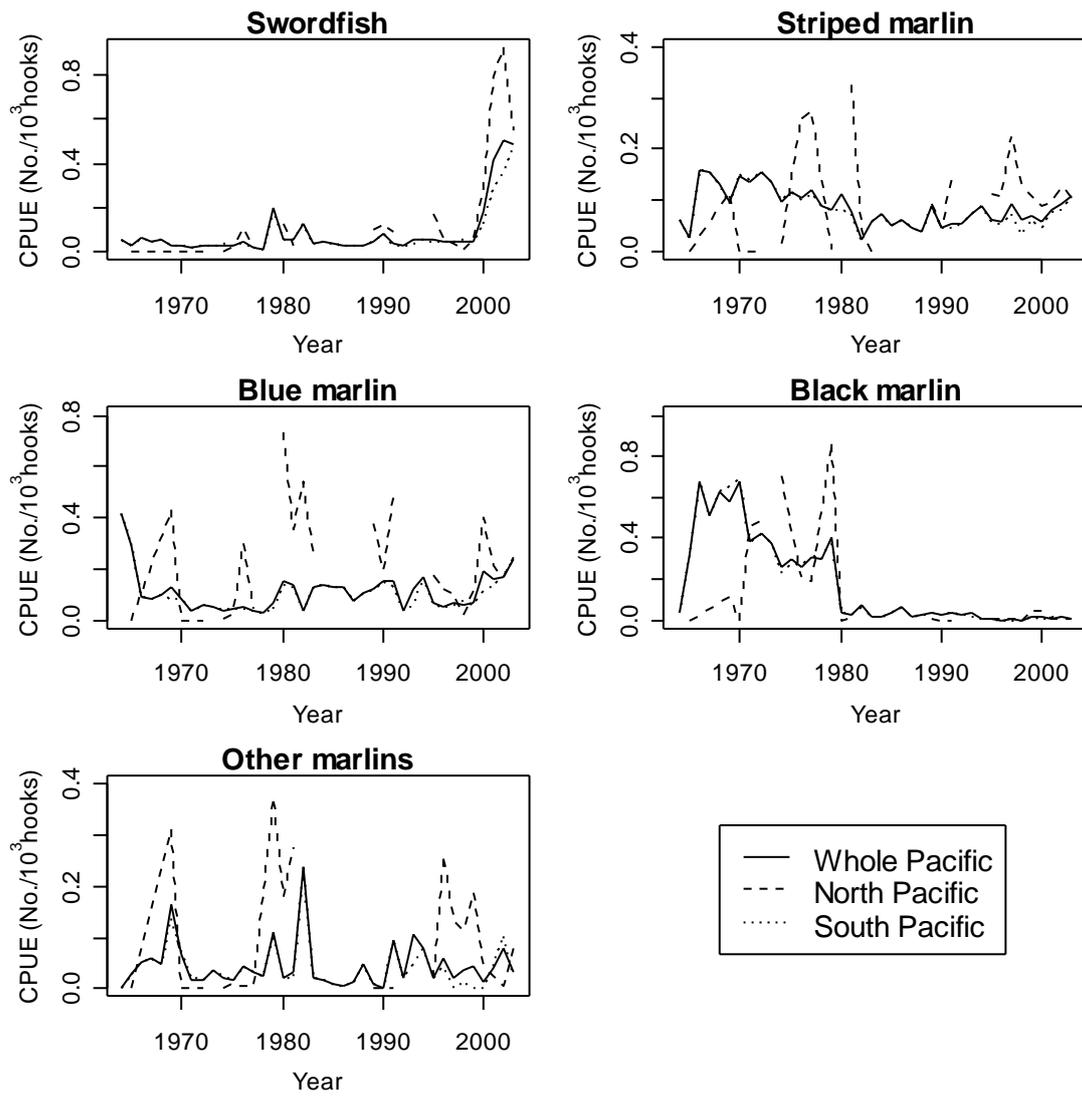


Fig. 4. Annual CPUE by species for the Taiwanese distant water tuna longline fishery in the Pacific Ocean, 1964-2003.

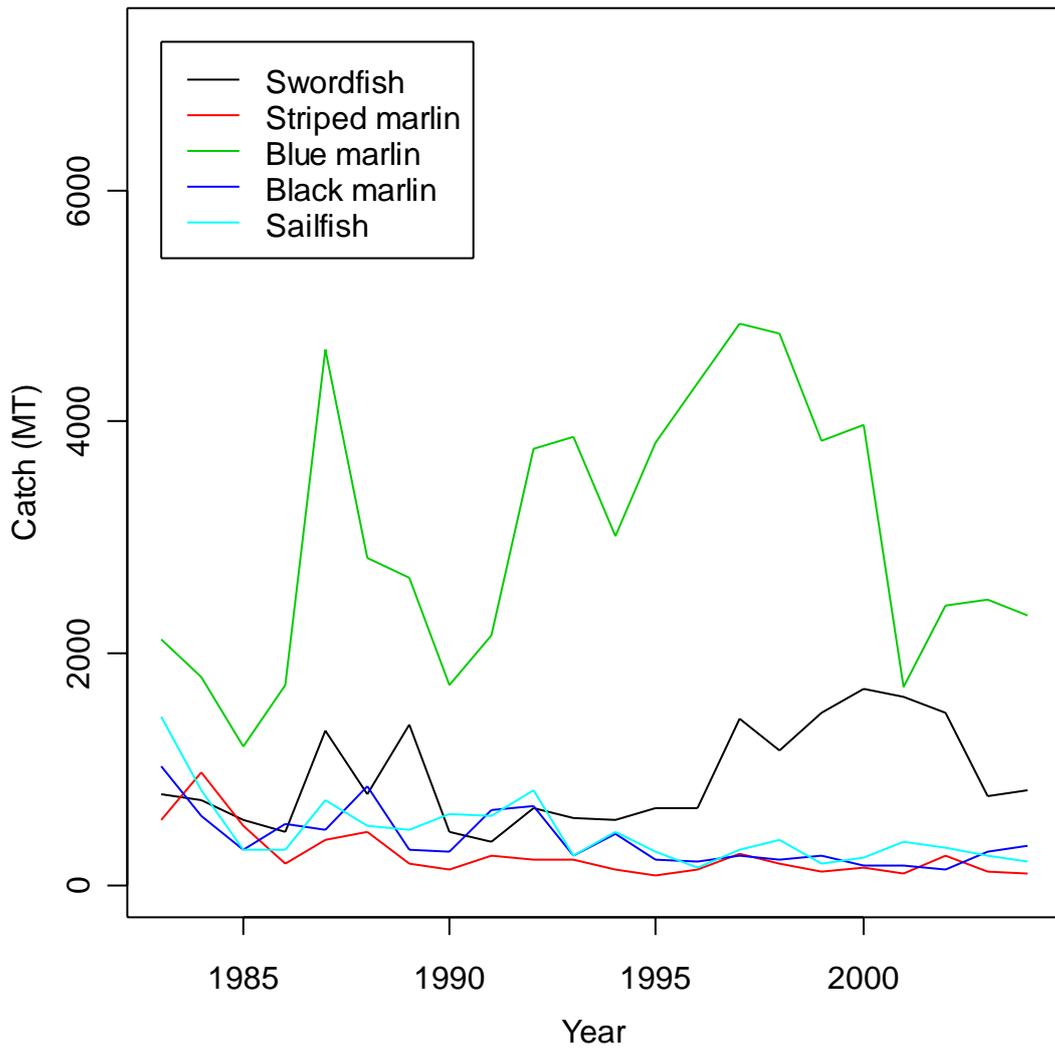


Fig. 5. Annual catches of billfish by species during 1983-2004 from Taiwanese offshore longline fishery.

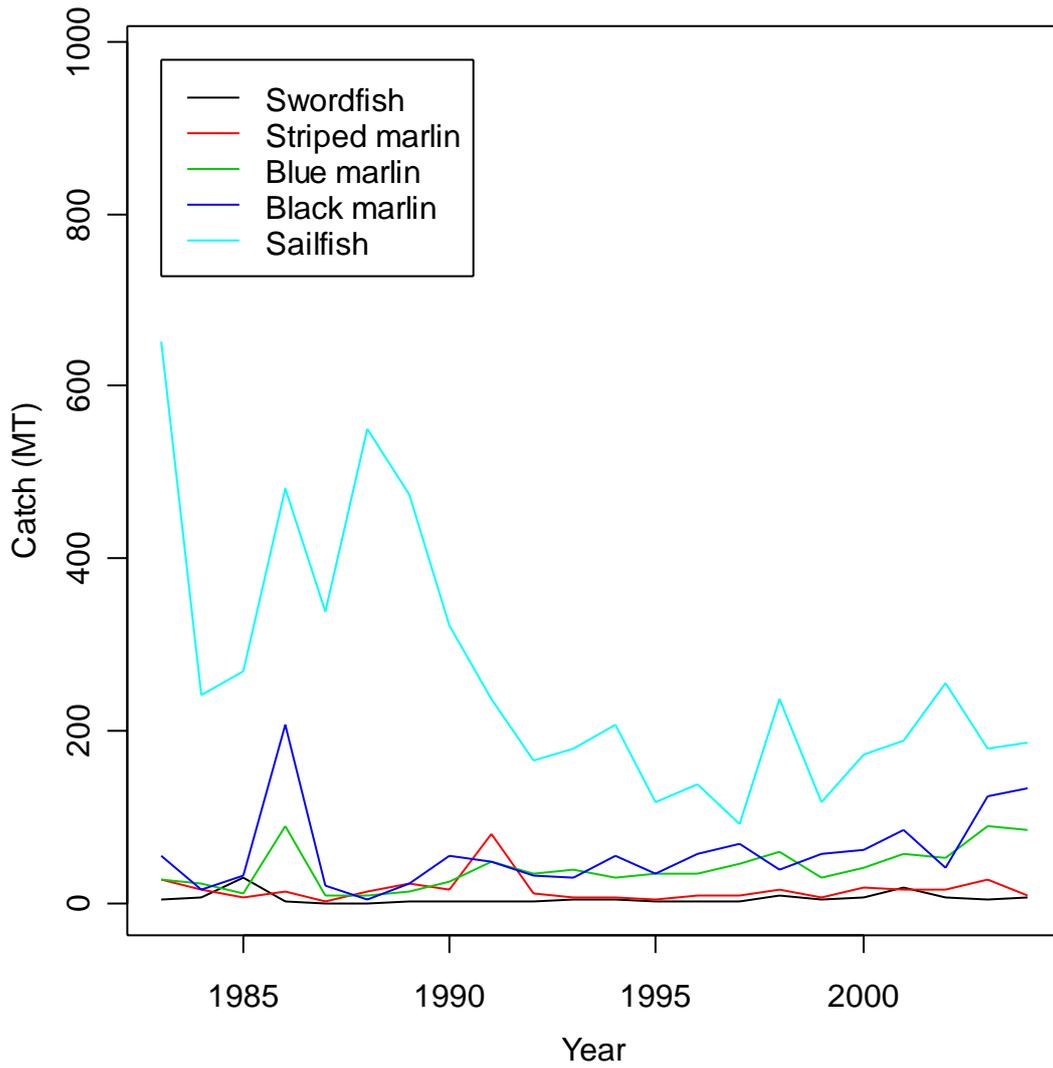


Fig. 6. Annual catches of billfish by species during 1983-2004 from Taiwanese offshore gillnet fishery.

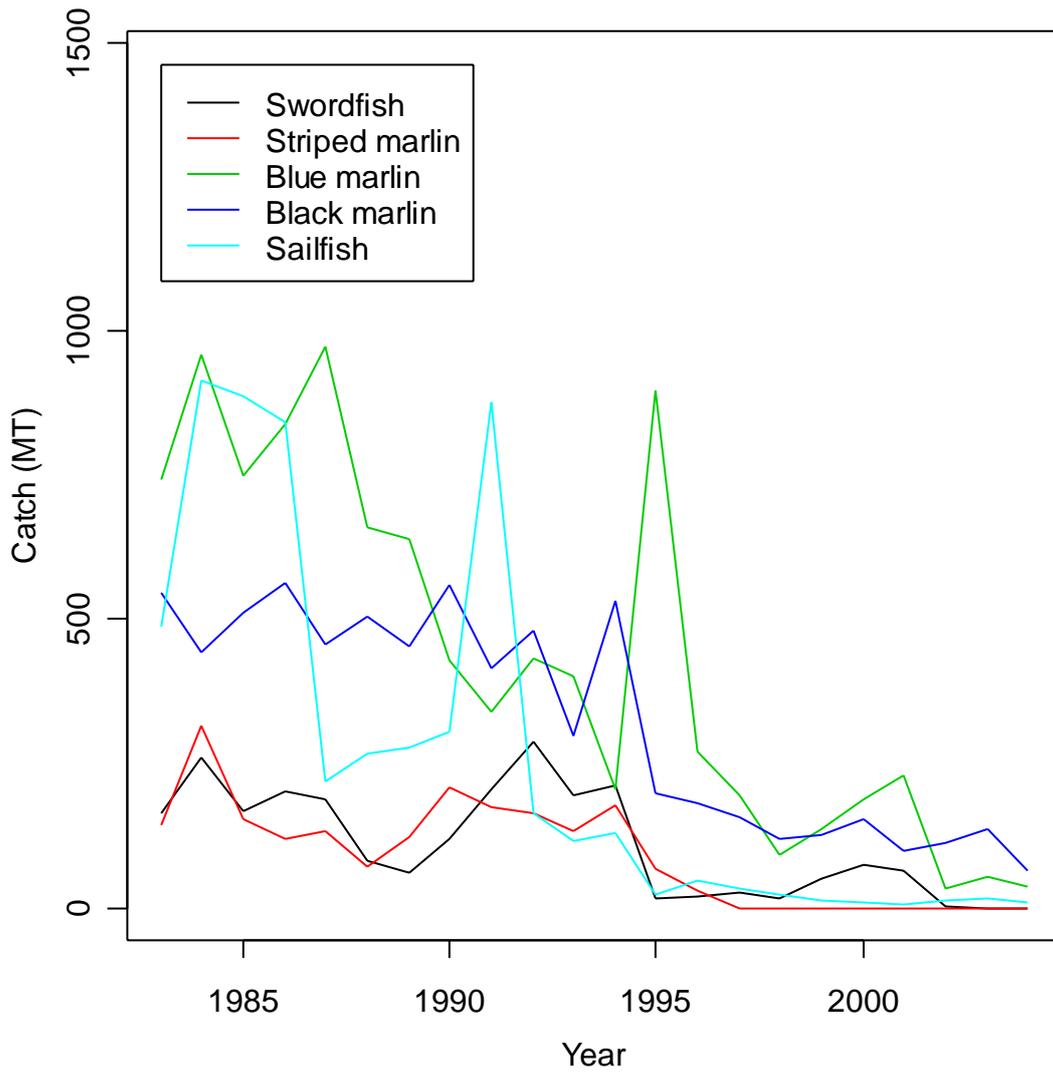


Fig. 7. Annual catches of billfish by species during 1983-2004 from Taiwanese coastal harpoon fishery.

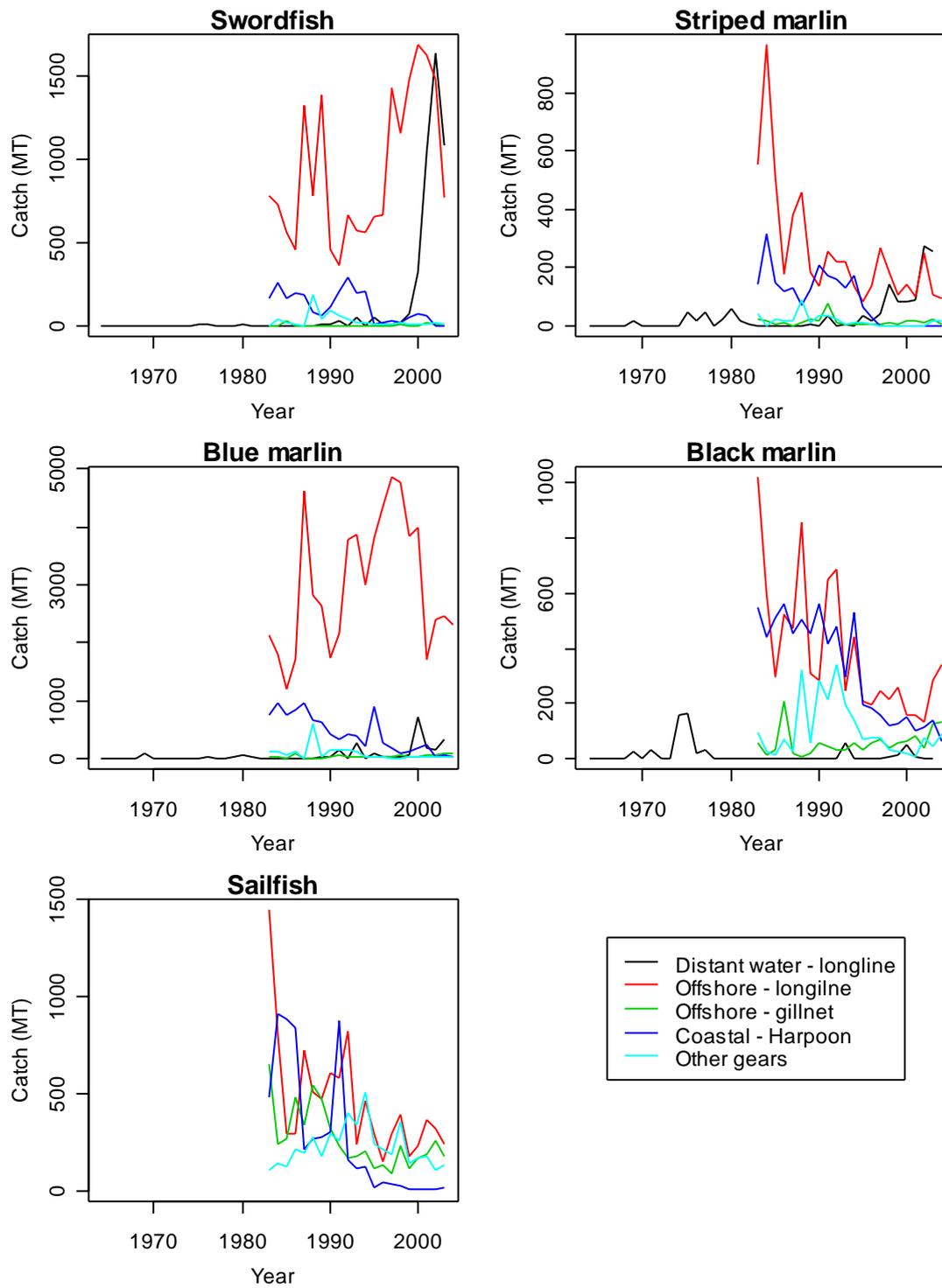


Fig. 8-1. Yearly catches of billfish by gears during 1964-2004 in the North Pacific Ocean.

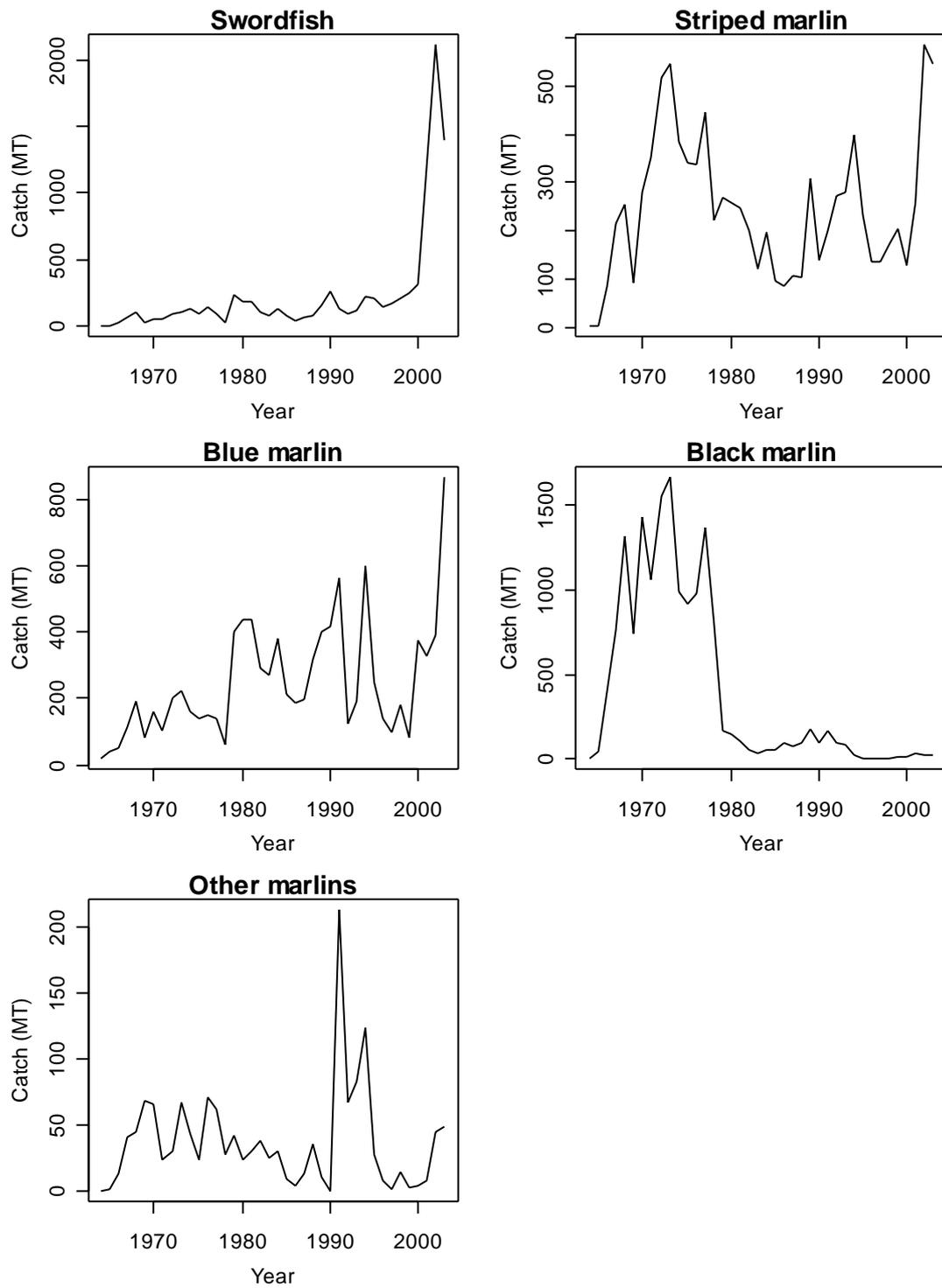


Fig. 8-2. Yearly catches of billfish from distant water tuna longline fishery during 1964-2004 in the South Pacific Ocean.