

## CATCH TRENDS OF ATLANTIC WHITE AND BLUE MARLINS BY THE JAPANESE TUNA LONGLINE FISHERY

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## SUMMARY

Fishing data of the Japanese tuna longline in the Atlantic Ocean from 1952 to 1986 were used to analyze catch trends of white and blue marlins. Catch of both species in recent years is very small compared to that in the 1960's. The CPUE for these two marlin species during the most recent ten years is low but remained stable.

## RESUME

Les données sur la pêche de la palangre thonière japonaise dans l'Atlantique entre 1952 et 1966 ont été utilisées pour analyser la tendance des prises de makaire blanc et de makaire bleu. La capture de ces deux espèces ces dernières années est très réduite par rapport à celle des années soixante. La CPUE des deux makaires est très faible depuis dix ans, mais demeure stable.

## RESUMEN

Se emplearon los datos de pesca del palangre japonés para túnidos en el Atlántico de 1952 a 1986 para analizar las tendencias de la captura de aguja azul y aguja blanca. En el caso de ambas especies, en los últimos años la captura ha sido muy escasa en comparación con la de los años 60. La CPUE de las dos especies en el curso de los últimos diez años ha sido baja, si bien ha permanecido estable.

## 1. Introduction

Catch trends of white and blue marlins by the Japanese tuna longline fishing in the Atlantic Ocean from 1956 to 1977 was reported by Kikawa and Honma (1980). This paper, renewal of the previous report, described recent trends of catch for white and blue marlins until 1986.

## 2. Materials and Methods

Catch and effort data of the Atlantic Japanese tuna longline fishery by lat. 5° x long. 5° square and month were used for the period from 1952 to 1986. In estimating the effective effort, we followed Honma method (Honma 1974) as in the previous study. There are two stock hypotheses for Atlantic white and blue marlins, single Atlantic-wide stock and North and South Atlantic separate stocks, therefore analysis was conducted for both case. The boundary between north and south separation was set in 5° N for marlins.

## 3. Results

## 3.1 Total Catch

Annual estimates of Japanese Atlantic tuna longline fishing effort and catch since 1962 are shown in Table 1. The trends of fishing effort and catch of Atlantic white and blue marlins are shown in Figure 1. During 1977 and 1986, 2,000-10,000 fishes per year for white marlin and 1,000-13,000 for blue marlin were taken in the Atlantic. These values were very low compared with the first half of the 1960s. In recent years, as the target for marlins continue a low level in Japanese market, These marlins are target species for tuna longline fishery due to their low commercial values.

### 3.2 Fishing Ground

Figure 2 shows distribution of total catch in number of fish by 5° square for two species during two periods (1977-1979 and 1984-1986). Japanese tuna longline fishery have somewhat shifted its fishing effort to the bigeye tuna fishing ground, mainly the areas between 15° N and 15° S recently (1984-86) where both species were caught as bycatch.

### 3.3 Catch, Effort and CPUE

Estimates of Atlantic white and blue marlins catch in number, number of effective hooks and CPUE (number of fish per 100 effective hooks) by Japanese tuna longline fishing during 1977 and 1986 are shown in Tables 2 and 3. Effective effort were calculated by Honma method using average year from 1965 to 1972, because Japanese tuna longline fishing ground well covered distribution area of both marlins for that period. The area south of 50°N and north of 60° S was set for the computation of the effective effort. The relationships between catch and fishing effort by stocks and annual trends of CPUE for white and blue marlins are shown for 1977-1986 in Figures 3 and 4, respectively.

#### White marlin

In the North Atlantic, relationship between catch and effort for the north stock indicate that fishing effective rose from 1977 to 1981 and rapidly decrease recent years. For the south stock, fishing effort was gradually increased from 1977 year by year, and reached twenty times of the first in 1986, however the corresponding catch in 1986 was only four times of the 1977. CPUE fluctuation in the north stock for ten years was between 0.018 and 0.043. It may be an indication of stable stock condition. CPUE in the south stock was high (more than 0.05) in 1977-1979, and shifted low level (less than 0.025) in 1980-1986. As a result, the Atlantic wide white marlin stock indicate stable relationship between catch and effort. A more detailed examination of the available data is required to determine whether or not the post-1980 decline in white marlin catch reflects a true reduction in abundance.

#### Blue marlin

During latest ten years, annual catch in number of blue marlin in North Atlantic has been subject to sharp fluctuations between 420 and 7,200 fish. The relationship between catch and effort in north Atlantic indicates higher CPUE in recent years than those of the 1970s. It might be some fishing strategy, gear, season, fishing ground, etc. well adapted the movement of blue marlin. In the south stock, it increased steadily from 417 catch in 1978 to 6,370 fishes in 1985, due to shift of the fishing ground from the North to the South Atlantic. In the case of Atlantic wide stock, the relation between catch and effort does not indicate remarkable fluctuation. CPUE for the north stock increased from 0.02 in 1977 to 0.094 in 1984, then decreased to 0.045 in 1986. CPUE in South was comparatively stable, ranged 0.017 to 0.035 during ten years. CPUE for the Atlantic wide stock also showed a stable state.

### 4. Discussion

According to the recent catch trends of white and blue marlins, it seems that stock condition of two marlins at present is stable, although their abundance might be in a low level. Therefore, careful monitoring of both species is necessary. Especially, information of fishing mortality for them by all sorts of fisheries including recreational catch must be collected satisfactorily.

#### References

- Honma, M. 1974 : Estimation of overall effective fishing intensity of tuna longline fishery - Yellowfin tuna in the Atlantic Ocean as an example of seasonally fluctuating stocks. Bull. Far Seas Fish. Res. Lab., (10) : 63-85.
- Kikawa, S. and M. Honma 1979 : Recent trends in catch, effort and size for white and blue marlins based on data from the Japanese Atlantic fishery. ICCAT, CVSP. Vol. IX (3) : 641-645.

Table 1. Annual estimates of fishing effort in nominal numbers of hooks and catch in number by species, by Japanese tuna longline fishery in Atlantic Ocean

Year	Hooks	Catch									
		BFT	SBF	ALB	DET	YFT	SVO	UHM	BUH	BLN	SAI
1962	54,104	53		1,080	371	876	19	111	111	3	87
1963	55,004	67		1,134	285	888	24	07	00	1	51
1964	64,998	63		2,134	364	870	31	183	84	0	110
1965	87,561	60		1,709	650	927	44	129	45	0	118
1966	53,811	22	7	1,588	232	385	22	69	22	0	85
1967	31,154	4	1	666	161	386	16	43	11	0	59
1968	30,247	2	7	917	205	274	17	43	9	0	52
1969	29,878	1	33	390	264	242	57	27	14	0	28
1970	41,580	1	132	611	189	190	37	32	11	0	39
1971	35,873	8	38	553	395	282	29	36	18	0	23
1972	46,139	3	80	211	307	159	32	15	5	0	11
1973	36,316	8	67	100	391	109	29	13	5	0	8
1974	36,495	45	65	139	458	85	25	12	4	0	7
1975	68,722	40	19	115	449	118	22	15	0	0	10
1976	32,835	40	19	93	171	104	15	16	3	0	7
1977	32,501	43	80	59	190	41	14	3	1	0	2
1978	44,747	23	125	44	210	58	15	2	1	0	1
1979	55,458	25	154	88	271	83	16	2	1	0	2
1980	58,102	33	46	94	455	70	37	4	3	0	3
1981	71,974	40	38	154	477	112	39	8	7	0	10
1982	76,388	23	13	91	715	140	66	10	13	0	30
1983	46,734	27	11	85	408	54	33	8	8	0	0
1984	65,244	24	33	83	539	82	63	3	8	0	8
1985	72,080	29	26	91	682	125	73	5	11	0	8
1986	55,455	19	6	82	523	84	45	5	0	0	5

Unit: Hooks 1,000  
Number of fish 1,000

Table 2. Estimates of Japanese longline catch, effort and CPUE for Atlantic white marlin, 1977-1986.

Year	North Atlantic		South Atlantic		Whole Atlantic	
	Catch	Effort	Catch	Effort	Catch	Effort
1977	4638	7424	178	577	3126	7228
1978	1300	7838	228	577	1828	7056
1979	1758	3900	367	730	3125	4811
1980	5178	8397	192	1263	4271	11681
1981	4988	20031	350	3898	5668	24981
1982	4088	13318	843	10723	14770	25123
1983	1417	4484	871	6554	1668	10669
1984	3395	5068	716	12487	3913	15195
1985	1938	7827	3589	15442	4526	20440
1986	2028	8377	2122	14328	4210	18253

Table 3. Estimates of Japanese longline catch, effort and CPUE for Atlantic blue marlin, 1977-1986.

Year	North Atlantic		South Atlantic		Whole Atlantic	
	Catch	Effort	Catch	Effort	Catch	Effort
1977	4288	4340	168	542	1478	7256
1978	477	4806	152	433	570	5014
1979	748	2301	459	1851	1266	4098
1980	1627	4847	1012	5195	2838	8468
1981	3633	7361	1325	4527	5058	11704
1982	7103	10089	4508	30422	11689	24391
1983	3582	4077	2280	12147	4887	15676
1984	3982	4235	4274	18476	8208	17088
1985	4274	6442	6310	25567	11144	23818
1986	1895	5730	3189	14223	5089	14328

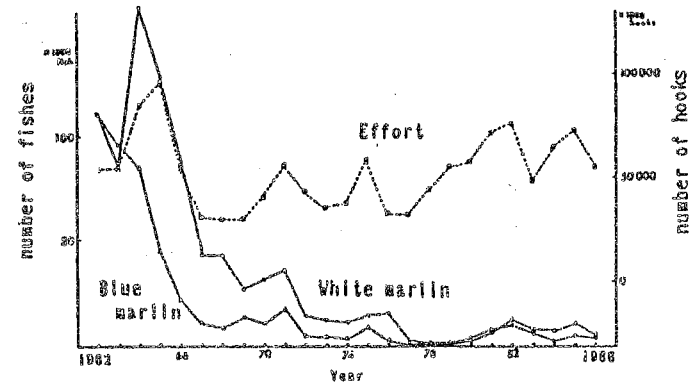


Figure 1. Annual catch trends of white and blue marlins by the Japanese tuna longline fishery in the Atlantic Ocean

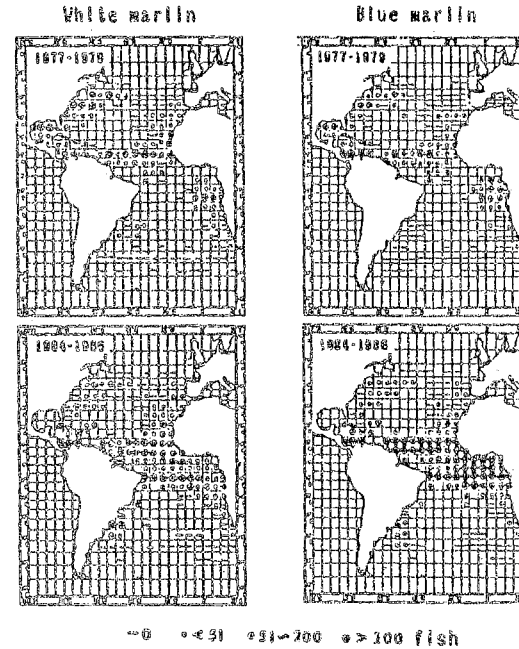


Figure 2. Distribution of catch in number of fish for two periods for white and blue marlins by the Japanese tuna longline fishery in the Atlantic Ocean

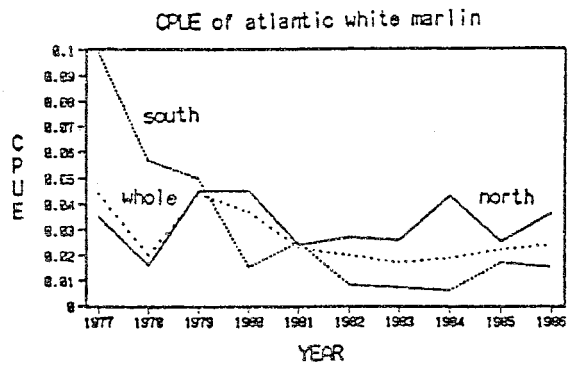
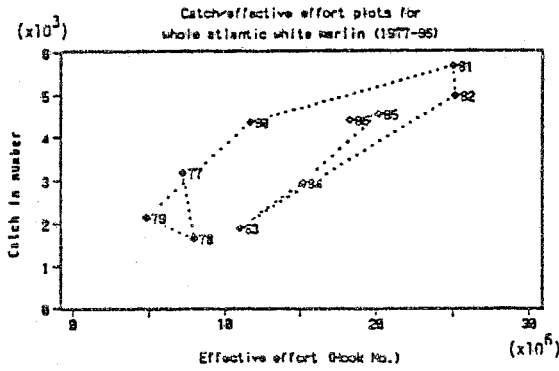
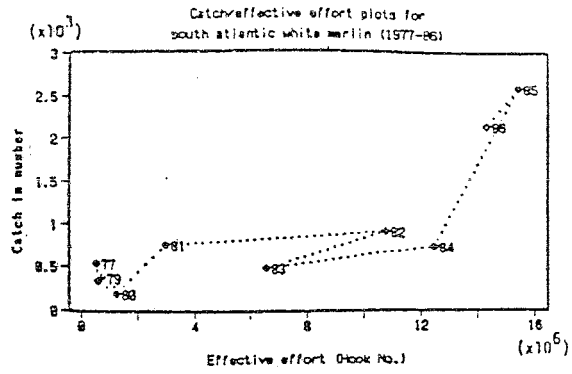
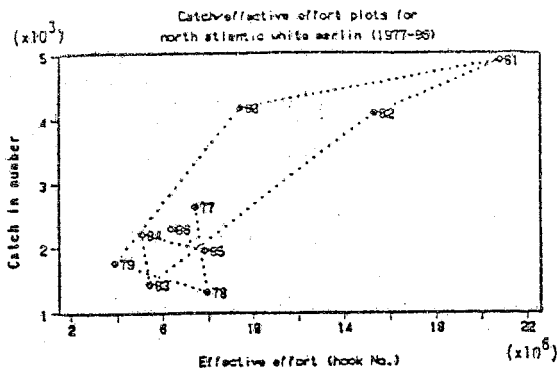


Figure 3. Relationship between catch and effective effort and CPUE trends of white marlin by stock

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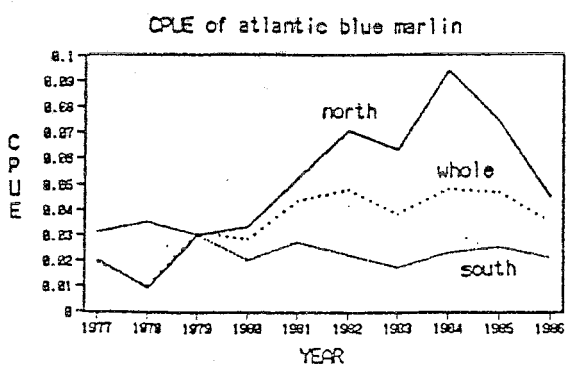
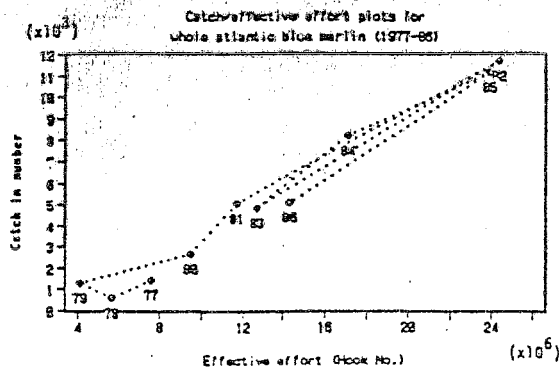
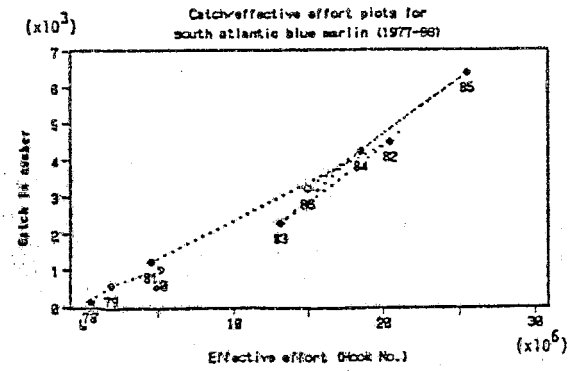
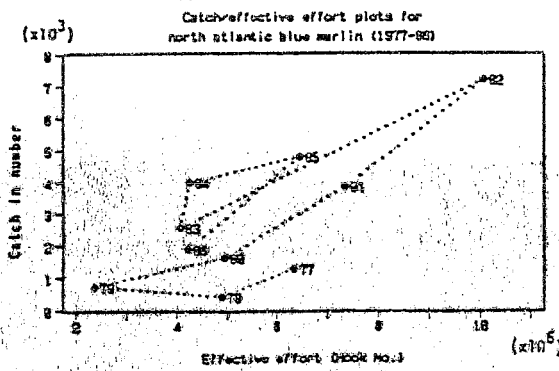


Figure 4. Relationship between catch and effective effort and CPUE trends of blue marlin by stock