A MEMORANDUM ON CATCH AND EFFORT STATISTICS, LENGTH AND WEIGHT MEASUREMENT DATA AND TAG RELEASE AND RECAPTURE DATA FOR ATLANTIC BLUEFIN TUNA CAUGHT BY THE JAPANESE TUNA LONGLINE BOATS

by

Division of Pelagic Resources
Far Seas Fisheries Research Laboratory
Shimizu, Japan

1. CATCH AND EFFORT DATA

The Japanese commercial tuna longline fishery in the Atlantic began in 1956. Basic catch and effort statistics for the fishery are catches in number of fish and number of hooks per set in an operation. The catch and effort statistics of the Japanese longline fishery have been available since 1962, compiled by month of the year, 5° x 5° square, species, size of the vessel, type of operation and kind of bait (Research Division, Fishery Agency of Japan, 1965-1979).

As regards the catch and effort statistics prior to 1962, similar data compiled in the same way as explained above are available, but without classification by type of operation and the kind of bait (Shiohama et al, 1965). The former statistics (from 1962 to 1977) have already been sent to the ICCAT Secretariat and in addition, since 1974, the aforementioned statistics are summarized by quarter and included in the ICCAT Data Record (ICCAT 1976-a, 1976-b, 1978, 1979).

In general, the average length of one trip to the Atlantic longline fishing grounds extends over a long period, usually one to one and a half years and the fishermen are required by domestic law to submit their catch records to the Ministry of Agriculture, Forestry and Fisheries within one month after the trip. Therefore, the final statistics are not made available until almost 2 years after the actual year of the trip. As timely reporting, by cable, of the catch of the bluefin tuna are obligational for the Japanese longliners operating in the Atlantic since 1975 when the regulatory measures for this species went into effect, a brief current trend of the fishery is being monitored now.

In compiling the catch in number of bluefin from these statistics for the years before 1966, a problem occurs related to species separation between bluefin and southern bluefin tunas in the areas south of about 20°S lat. where the two species appear to geographically overlap. In these years, the two species were reported together with a single entry item, "bluefin group" in the logbooks for the two species and that is another reason for the insufficient knowledge on the distribution of the southern bluefin tuna at that time.

One of the methods employed to separate these two species in the past was that since southern bluefin tuna in the Atlantic hardly occur in the areas north of about 35°S lat., the bluefin caught from the area south of 35°S lat. before 1966 statistics were all classified as southern bluefin and those caught in the rest of the areas were classified as bluefin (Shingu et al, 1974).

Original report in English.

There are two problems related to this species breakdown. First, there may be some bluefin misclassified as southern bluefin for those years, because bluefin although sporadic, are known to inhabit areas south of 35°S lat. Second, there are rather exceptional years from 1966 to 1968 during which southern bluefin were caught in a significant number in the eastern Atlantic between 25°S and 35°S lat. where the catches of southern bluefin were very scarce during the rest of the years. An experimental fishing cruise by a research vessel in 1966 showed some catches of southern bluefin from the areas in question. Therefore, it is possible that the distribution of southern bluefin during that period may have extended even further north than at present. Looking at the number of bluefin tuna caught in Area 66 in 1965 (Table 1 and Fig. 1), the amount appears to be too high compared with that for the rest of the years. Therefore, in conclusion, the number of bluefin caught in Area 66 in 1965 probably includes the catch of southern bluefin tuna. The problems mentioned here are now being reviewed by the staff of the Far Seas Fisheries Research Laboratory (FSFRL) in preparing the final data bases.

2. LENGTH AND WEIGHT MEASUREMENT DATA

As is stated in the previous section, completion of the compilation of the length and weight measurement data occurs two years after the actual year. These biological statistics are compiled either in fork length (cm) or in gilled-and-gutted weight (GG) in kg.

Three periods are shown for the activities of the size measurements of Atlantic bluefin caught by Japanese longline boats (Table 1).

1) Before 1970 - The measurements are sporadic with small numbers of measured fish. This is mainly due to the lack of measuring opportunities since during this period most of the catches by Japanese longliners which operated in the Atlantic were unloaded at foreign ports (Shingu et al, 1979). A quantity of bluefin were caught during this period in Areas 51, 61 and 64 and the estimations of the length or age composition of the catches and the total catch in weight for these years, based on such fragmental sample composition, are extremely difficult and are subject to considerable error.

2) From 1970 to 1974 - The measurements were improved in some areas reflecting the fact that the bluefin caught by the Japanese longliners began to be unloaded at Japanese ports for domestic consumption. However, the number of measurements is still unsatisfactory to allow for an accurate estimation of the composition of the catches.

3) From 1975 on - On-board measurements of the catches in terms of fork length became mandatory for the Japanese longline boats in the Atlantic. Accordingly, the measurements for recent years appear to have adequate coverage rates of the total catches.

Bluefin tuna were measured both in length and weight before 1975. It is well known that bluefin show a clear seasonal change in weight, especially before and after spawning. Therefore, conversion between length and weight of bluefin should be made taking this fact into account. Hisada (personal communication) estimated the following length-weight relation for the Atlantic bluefin caught by Japanese longline boats during 1970 and 1974; most of the samples were taken in Areas 52 and 54 from June to August:

$$W = 0.000016204 \times L^{2.98664}$$

where W : weight in kg (GG)
L : fork length in cm
Number of fish measured: 395

Bluefin caught by Japanese longliners before 1975 could be converted from weight to length or vice versa by this equation. However, since most of the bluefin caught by the Japanese longliners during this period were post-spawners, this key, based on these data, applies only to post-spawning fish.

3. TAG RELEASE AND RECAPTURE DATA

Few bluefin tuna were tagged in the Atlantic by Japanese longline boats. An incidental tagging program of Atlantic tunas and billfishes by Japanese longliners has been conducted since 1954 in collaboration with the Kanagawa Prefectural Fisheries Experimental Station (KPFES) (Nakagome, 1972). As of August, 1979, only nine fishes were reported to have been tagged as bluefin. However, seven out of a total of nine fish released were recently confirmed as blackfin (Thunnus atlanticus). There is still some uncertainty about the two reported bluefin tuna released in 1971 near Lesser Antilles as to whether they were bluefin or blackfin because this size of bluefin (about 55 cm in fork length) are rarely caught in tropical areas. No recapture of these nine fish was reported as of August, 1979. Although the tagging of the bluefin tuna by Japanese longline boats is scarce, these vessels have been cooperative in reporting their recaptured fish. Data on Atlantic bluefin tuna released by foreign conducting organizations and recaptured by Japanese longline boats are listed in Table 2. Except for those data on the bottom line, all the data in Table 2 have been sent to the ICCAT Secretariat.

4. REFERENCES

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS

1976-a Data Record, Vol. 7, 359 pp.

1976-b Data Record, Vol. 8, 339 pp.

1978 Data Record, Vol. 11, 272 pp.

1979 Data Record, Vol. 13, 121 pp.

NAKAGOME, J.

1972 Oceanic tuna tagging program of Kanagawa Prefectural Fisheries Experimental Station.

RESEARCH DIVISION, FISHERY AGENCY OF JAPAN

1965-79 Annual Report of Effort and Catch Statistics by Area on the Japanese Tuna Longline Fishery, 1962-77 eds.

SHINGU, C., K. HISADA, S. KUME and M. HONMA

1975 Biological Information of Atlantic Bluefin Tuna Caught by the Longline Fishery and Some Views on the Management of the Resources, ICCAT Collective Volume of Scientific Papers, Vol. 4, 145-160 pp.

SHINGU, C., K. HISADA and Z. SUZUKI

1979 Description of Japanese Tuna Longline Fishery for Bluefin Tuna in the Atlantic, (Submitted to the Bluefin Workshop, Santander, Spain, September 1979).

SHIOHAMA, T., M. MYOJIN and H. SAKAMOTO

1965 The Catch Statistics Data for the Japanese Tuna Longline Fishery in the Atlantic Ocean and Some Simple Considerations on it, Rep. Nankai Reg. Fish. Res. Lab., No. 21, 131 pp.

Table 1. Annual catches in number (without parentheses), number of size samples and number of fish measured by ICCAT Statistical Areas for Atlantic bluefin tuna caught by the Japanese tuna longliners.

Area No.	51	52	53	54	55	56	57	58
Year								
1956								
1957								
1958								
1959								
1960								
1961								
1962							7	
1963					17			
1964	5				12762(W-1-69)	4	29	
1965	300	597(W-1-1)	10	3	29762	1187	429	73
1966	82	392	3		12295(L-2-25)	166(L-4-14)	51	2
1967			8		323	33	19	
1968	6	258(W-1-6)			651	17	10	
1969					67	2		
1970	1	279			33	8	23	
1971	1549(L-1-2) (W-2-110)	4536(L-2-363) (W-5-702)		4	486(L-2-8) (W-8-65)	30	682(L-2-20) (W-5-83)	109
1972	291(L-1-1)	843(L-7-34) (W-2-172)	(L-1-1)	19(L-1-20)	69(L-2-4)	1	322(L-1-6) (W-2-26)	474
1973	1431(L-1-139) (W-1-431)	4368(W-1-8)	63		67(L-1-1) (W-1-23)	125	72(L-1-2)	149
1974	5441(W-1-395)	3096(L-4-21) (W-2-114)	20	11216(L-2-45)	1791	13	259(W-1-3)	8710
1975	117(L-1-13)	1168(L-2-34)	15(L-1-7)	2857(L-4-1088)	125(L-1-1)		562(L-5-11)	20928(L-17-2317)
1976	5504(L-5-1023)	1776(L-9-192)	4	348(L-5-116)	6749(L-10-1647)		975(L-8-91)	9576(L-16-1598)
1977	2334(L-3-683)	931(L-5-43)		220	18561(L-7-3613)		51	9271(L-22-1974)

Data sources: Catch - from unpublished data compiled by the FSFRL for 1956-1961 and the Research Division, Fishery Agency of Japan (1965-1979) for 1962-1977.

Length and weight - from unpublished data compiled by the FSFRL.

Table 1 (continued)

Area No.	59	60	61	67	62	63	64	65	66
Year									
1956							1(L-1-1)		
1957							242(L-8-69)	1	
1958							493	6	
1959				2			3313	116	2
1960							5507	1312	
1961					38		3976	117	
1962			91		59	19	50695	3051	52
1963		10	1591	90	12	65	64390	672	75
1964		175	3554	918	378	489	44304	97	281
1965			10349	238	46	139	15433(L-3-5)	284(W-1-2)	1153**(L-3-6)
1966	(L-1-2)	27	7399	9	39	116	1392(L-3-24)	9	457(L-2-2)
1967			2805	30	1		667	2	54
1968		208(W-1-7)	211	17		12	71(L-2-6)	2	84
1969		1	550	2		1	97	2	11(L-2-4)
1970		7	3		86(W-1-64)		82	1	38(L-2-5) (W-3-10)
1971			523	3	8		7	1(W-1-1)	30(L-1-6) (W-3-10)
1972	697	134			(W-1-1)		1	2	26(L-1-1) (W-1-1)
1973	1175	297(L-3-7*) (W-1-35*)			10			1	6(L-1-1)
1974	12894(L-1-1)	1249	4		2		1	3	14
1975	7620(L-2-228)	6445(L-6-1168)	26		11		21	4(L-1-2)	5
1976	5047(L-8-262)	10236(L-11-2579)	3		36(L-1-25)	8(L-1-3)	4	1	2
1977	3052(L-3-280)	8749(L-12-2483)			1				1

*The measurements may include blackfin tuna.
**The catches may include southern bluefin tuna.

Table 2. Bluefin recaptured by the Japanese longline boats in the Atlantic (as of August, 1979)

TAG RELEASE DATA																						TAG RECOVERY DATA																				
CRUISE NO.		GEAR	TAG			SPECIES	DATE			POSITION				LENGTH (mm)	WEIGHT (Kg)	AGE	TYPE OF MEASU.	W. TEMP.	2ND TAG		DATE			POSITION				LENGTH (mm)	WEIGHT (Kg)	TYPE OF MEASU.	REPORTING H.	2ND TAG	SEX	GEAR	PLACE FOUND	NATIONALITY OF RECOVERER	BOATS
	COUNTRY	NUMBER		LETTERS	NUMBERS	TYPE		MONTH	DAY	YEAR	QUADR.	LAT. DEG.	LAT. MIN.	LONG. DEG.	LONG. MIN.							MONTH	DAY	YEAR	QUADR.	LAT. DEG.	LAT. MIN.	LONG. DEG.	LONG. MIN.												
1		5		10			15			20		25				30		35		40	45			50		55		60		65		70		75			80				
	10	XX		WH	039.1		40	06	05	69	4	25	30	79	18					2		02	27	73	4	40	00	53	30	230.0	250.0	4	4	2	9	5	1	12	
	10	XX		D	1339	6	40															01	05	74	4	41	99	65	99	9999	0120		4		9	5	1	12	
	10	XX		H	2298.1	6	40															01	05	74	4	41	99	65	99	0920	9999	4	4		9	5	1	12	
	10	XX		N	011.55		40															05	13	75	4	26	99	85	99	2500	9999	4	4		9	5	1	12	
	10	XX		H	550.046	6	40	07	15	75	4	36		75		1200				1		01	10	76	4	40	99	66	99	1350	0180	4	4	1	9	5	1	12	
	10	XX		H	550056	6	40	07	15	75	4	36		75		1200				2		01	10	76	4	40	99	66	99	1350	0180	4	4	2	9	5	1	12	
	10	XX		D	1390.0	6	40	07	30	73	4	38		74		0720						02	02	76	4	39	99	65	99	1300	9999	4	4		9	5	1	12	
	10	XX		H	42630	6	40	08	01	74	4	39		74		0550						01	16	76	4	40	99	67	99	1530	9999	4	4		9	5	1	12	
	10	XX		H	5098.3	6	40	08	19	74	4	40		73		1000						01	16	76	4	40	99	67	99	1330	9999	4	4		9	5	1	12	
	10	XX		D	0983.7	6	40	08	04	66	4	40		70								04	18	76	4	26	99	88	99	2180	9999	4	4		9	5	1	12	
	10	XX		D	1443.2	2	40	07	28	74	4	38		74		0560						12	23	76	4	39	99	69	99	1080	9999	4	4		9	5	1	12	
	10	XX		H	5020.1	2	40	08	01	74	4	39		74		0550						01	31	77	4	39	99	65	99	1500	9999	4	4		9	5	1	12	
	10	XX		D	5821.4	2	40															12	28	76	4	38	99	71	99	0680	9999	4	4		9	5	1	12	
	10	XX		D	5502.5	2	40															12	30	76	4	38	99	71	99	0900	9999	4	4		9	5	1	12	
	10	XX		H	1363.2	2	40	05	15	71	4	25		79								03	21	76	4	26	99	88	99	2300	9999	4	4		9	5	1	12	
	10	XX	2	D	556056	6	40	07	03	77	4	37	11	75	30	0810			4			12	25	77	4	39	11	69	54	0700	0120	4	4		9	5	1	12	
	10	XX	2	D	582506	6	40	07	07	76	4	38	30	74	20	0550			4			01	02	77	4	39	15	70	20	0830	0260	4	4		9	5	1	12	
	10	XX	2	H	556356	6	40	07	15	76	4	38	40	74	30	0570			4			12	21	77	4	39	04	69	02	0940	0180	4	4		9	5	1	12	
	10	XX	4	D	096899	6	40	06	30	77	4	37	10	75	15	0780			4		2	01	03	78	4	39	30	70	20	9999	0180		4	2	9	5	1	12	
2	10	XX		H	733288	6	40															01	03	78	4	39	30	70	20	9999	0180		4		9	5	1	12	
	10	XX		H	741776		40															01	03	78	4	39	30	70	20	9999	0180		4		9	5	1	12	
	10	XX		H	556846	6	40	07	16	76	4	36	55	75	34	1000			4			12	24	77	4	41	02	63	53	1430	0500	4	4		9	5	1	12	
	10	XX	2	H	750377	6	40	07	09	77	4	38	03	74	49	0800			4			12	31	77	4	39	15	70	30	0980	0150	4	4		9	5	1	12	
	10	XX	2	H	704256	6	40	07	18	76	4	38	40	74	40	0570			4			12	31	77	4	39	20	70	40	1020	0160	4	4		9	5	1	12	
5	10	XX	2	D	557726	6	40	07	09	77	4	38	02	74	43	0790			4		1	12	25	77	4	38	50	69	10	0980	0170	4	4	1	9	5	1	12	
	10	XX	2	D	557727	6	40	07	09	77	4	38	02	74	43	0790			4		2	12	25	77	4	38	50	69	10	0980	0170	4	4	2	9	5	1	12	
	10	XX	2	D	571226	6	40	07	17	76	4	37	10	75	20	0790			4			12	21	77	4	38	50	69	05	1200	0340	4	4		9	5	1	12	
	10	XX	2	H	557933	6	40	07	18	76	4	38	33	74	42	0810			4			12	18	77	4	39	00	68	40	1270	0380	4	4		9	5	1	12	
	10	XX	1	H	516.87	6	40	07	11	75	4	39	40	73	49	0550					2	12	30	77	4	39	15	70	35	1300	0310	4	4	2	9	5	1	12	

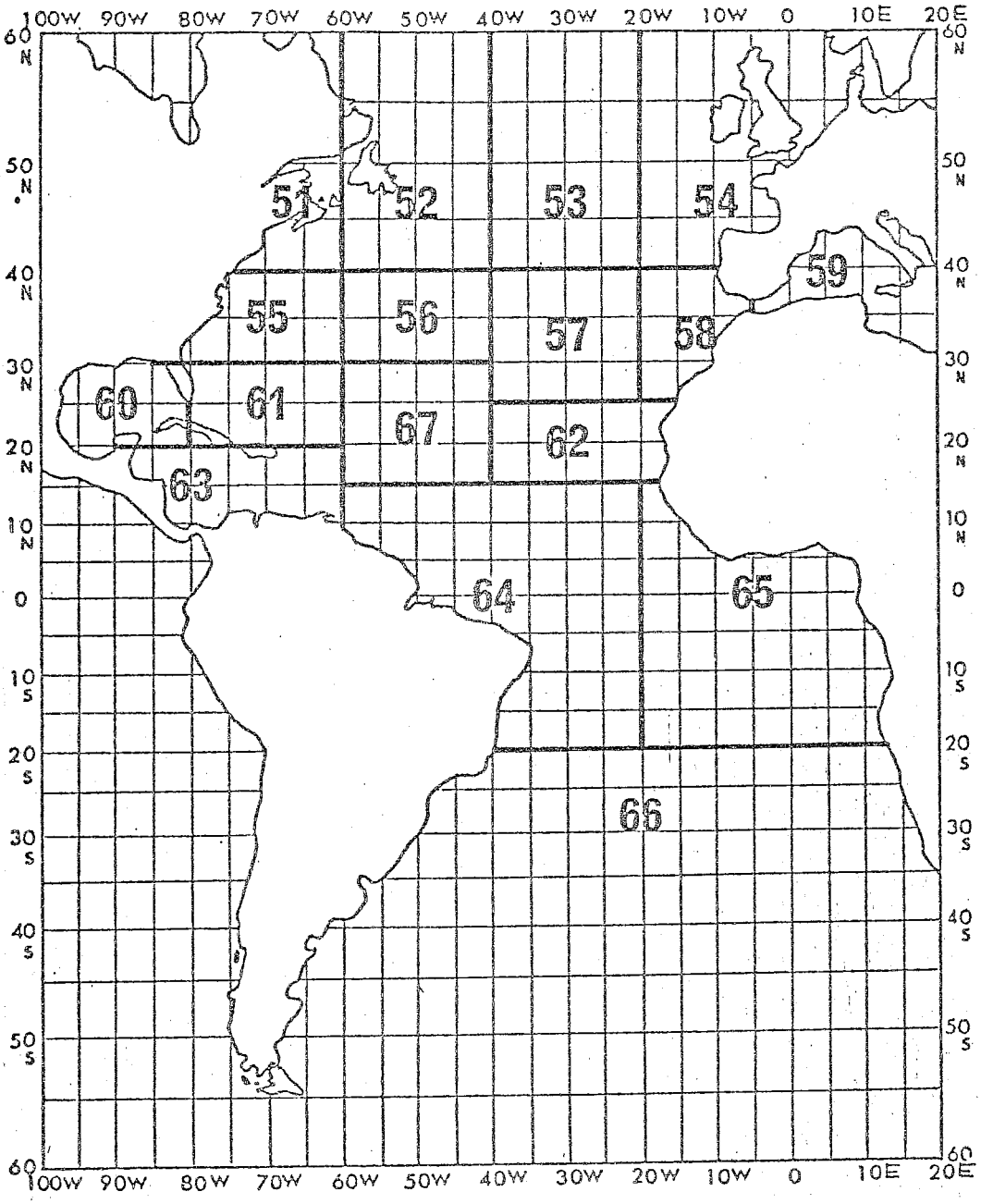

Fig. 1. Division of the Atlantic by ICCAT Statistical Areas for bluefin tuna. (Numbers denote the area numbers.)