

UPDATING OF BLUEFIN TUNA CATCH-BY-SIZE DATA BASE

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I. LEGEND

- Trapani Meeting: Data Preparatory Meeting on Bluefin Tuna (Trapani, Italy, May 23-27, 1983). The Report is contained in Appendix 3 of the "Collective Volume of Scientific Papers, Vol. XIX".
- 1983 BFT Meeting: Bluefin Workshop (Tsukuba/Shimizu, Japan, August 31-September 8, 1983). The Report is contained in the "Collective Volume of Scientific Papers, Vol. XIX".
- Miami Session: Bluefin Tuna Data Working Session (held at the NMFS Southeast Fisheries Center Laboratory, Miami, Florida, May, 1984). The results are reported in SCRS/84/26 contained in "Collective Volume of Scientific Papers, Vol. XXII".
- 1984 BFT Meeting: Working Group on Bluefin Tuna Meeting (Dartmouth, Canada, September 27-October 4, 1984). The Report is contained in the "Collective Volume of Scientific Papers Vol. XXII".
- 1985 BFT Meeting: Working Group on Bluefin Tuna Meeting (Miami, U.S.A., September 18-27, 1985).
- Japanese fishery: In this report only, files of the Japanese fishery also include all the fisheries to which the Japanese size data were used as substitution (e.g. Korea, Cuba, Dominican Republic, etc.)

II. HISTORY OF CURRENT CATCH-BY-SIZE DATA BASE

The current bluefin catch-by-size (catch-at-length) data base has been developed in several steps in the past. Following is a summary of this development.

1. East Atlantic and Mediterranean fisheries (except Japanese), 1960-81

The file was prepared by the Secretariat based on Task I catches, Task II monthly catches and size data and according to the data substitution scheme agreed upon by the scientists at the Trapani meeting (1983). The file was first prepared on a yearly base but at the 1983 BFT meeting (Japan), the data were assigned to quarters. The data base thus finalized at the meeting in Japan is still valid.

2. West Atlantic fisheries (except Japanese), 1960-81

The file was prepared by U.S. scientists using the Task II monthly catch and size data, and according to the data substitution scheme agreed upon by scientists at the Trapani meeting (1983). This yearly base file was used at the 1983 BFT meeting (Japan).

However, according to a 1983 SCRS recommendation, U.S. scientists have recreated the entire file using monthly size frequencies instead of monthly size frequencies summed up by year. This monthly catch-by-size file has not been printed anywhere but was distributed in July, 1984, by the Secretariat to whomever requested it. This new file was used during the 1984 BFT meeting (Canada), and has been valid until very recently. However this file has been replaced with a new one just before the 1985 BFT meeting. (See recent updating of the file under Section IV.2)

3. Japanese fishery in the East Atlantic and Mediterranean Sea, 1960-70

The file for the Japanese longline fishery and those fisheries to which the Japanese data were used as substitutions (1960-70) was prepared by the Secretariat according to the scheme agreed upon at the Trapani meeting and was presented to the 1983 BFT meeting (Japan). The file which had been on a yearly base was further divided at that meeting into quarters using Japanese catch and effort and quarterly size data.

At the 1983 SCRS, it was recommended that (until further review is completed,) "the catches made by the Japanese longline fishery in 1957-66 from the equatorial and south Atlantic regions be designated from the western stock, for analysis purposes". Accordingly, the Secretariat re-compiled the file and that file is currently in use (Coll. Vol. XIX).

4. Japanese fishery in the East Atlantic and Mediterranean Sea, 1971-81

The file was prepared by Japanese scientists following the scheme agreed upon at the Trapani meeting and was presented to the 1983 BFT meeting. The yearly catch-by-size file was divided further at that meeting into quarters using Japanese catch and effort and quarterly size data. This base is currently in use (Coll. Vol. XIX).

5. Japanese fishery in the West Atlantic, 1960-81

The file was first prepared in exactly the same way as for the east Atlantic, either by the Secretariat (1960-70) or by Japanese scientists

(1971-81), and revised at the 1983 BFT meeting into quarter periods using catch and effort and quarterly size data. The shifting of earlier years' catches from the east Atlantic to the west Atlantic was done by the Secretariat (Coll. Vol. XIX).

Following a 1983 SCRS recommendation, the quarterly file was tentatively revised at the Miami Working Session (1984) into monthly strata (SCRS/84/26, Coll. Vol. XXII) using catch and effort data. The listing of the file is not printed anywhere, but the file was distributed by the Secretariat in July, 1984, to those who requested it. This monthly file was approved at the 1984 BFT meeting (Canada) and is currently valid.

#### 6. U.S. fisheries, 1982

This file was created in 1984 by U.S. scientists and distributed in July, 1984. The listing is included in Coll. Vol. XXII. The method was the same as described under (2) above. However it has been replaced by new file prepared just before the 1985 BFT meeting.

#### 7. Japanese fishery, 1982

Since the Japanese scientists felt that the sample size for 1982 was inadequate to estimate catch-by-size, nothing was done until the 1984 BFT Meeting (Canada). However, at that meeting, it was agreed that the sampling coverage relative to the catch was not as bad as for many other fisheries and that the catch-by-size file was created based on these data for the west Atlantic.

Other west Atlantic fisheries to which Japanese size data used to be applied as substitutions were also discussed at that meeting. For the west Atlantic, they are Grenada, Mexico, Dominican Republic, Taiwan, Uruguay, Panama and Brasil-Japan. Since the Japanese fishery no longer catches large fish in the Gulf of Mexico, U.S. large fish samples were used as a substitution for those fisheries and the files were also created at the meeting.

Since this work were done during the meeting, the files were not distributed, nor are there any descriptions as to how the data were substituted and treated. Appendix 3 summarizes the data treatment done at that time.

#### 8. All fisheries (except Japan and U.S.), 1982

The files were created through a joint effort of the Secretariat and U.S. scientists at the Miami Working Session (1984). The listings of the files are available in Coll. Vol. XXII and the data were distributed by the Secretariat in July, 1984, to those who requested them.

### III. WHICH FILES ARE CURRENTLY VALID?

The Section II of this report indicates which files are still valid or have been valid until very recently. In short, there have been three tapes distributed in the past to those who requested them. Most of those files are contained in these three tapes but not all the files in these tapes are valid. Since the matter is somewhat complicated, a summary of the valid files is shown below.

#### 1. 1983 BFT Meeting tape

When: At the end of the 1983 BFT meeting.

By whom: Japanese scientists and the Secretariat.

Valid files: All the fisheries (except the Japanese fishery, 1960-66) for the east Atlantic and Mediterranean Sea, 1960-81.

#### 2. Secretariat tape distributed in January, 1984

When: In January, 1984, after the 1983 SCRS meeting.

By whom: Secretariat.

Valid files: Japanese quarterly file for the east Atlantic, 1960-66.

#### 3. Secretariat tape distributed in July, 1984

When: In July, 1984, after the Miami Session.

By whom: Secretariat.

Valid files: All the fisheries (except Japanese and U.S.) for 1982. West Atlantic fisheries, 1960-81 with exception of U.S. and Canada.

#### 4. Files not included in any of the tapes

Files for 1982 west Atlantic Japanese (and Japan-like) fisheries were created at the 1984 BFT meeting and are not included in any of these tapes. 1982 Japanese (and Japan-like) fisheries for the east Atlantic and Mediterranean have not yet been created.

### IV. REORGANIZATION OF THE 1960-82 DATA BASE

#### 1. Data format

Since the files have been created in several steps, at various laboratories, it was suspected that there could be some problem in the data format. The formats were critically reviewed and indeed found to have many inconsistencies. The attached Table 1 shows the units in which the data are recorded in the files.

The Secretariat has worked on each file in order to keep the file format consistent. The new format and special codes used are attached as Appendix 1.

#### 2. Updating of the files, 1960-1982

As we checked closely all the files currently available (particularly those for 1982), some errors and omissions have been found. Also, for some

fisheries, the data (either in Task I catch or Task II catch and effort) have been revised either by the national offices or by the Secretariat. Those have been corrected or updated in the new file. Appendix 2 gives a summary of the updating of the files (including the substitution scheme if that is the case).

Besides, just before the 1985 BFT meeting, an updated version of the U.S. (1960-82), Canadian (1960-81) and Japan-like fisheries (1982) files has been submitted from U.S. scientists. It was explained that the new files were created with improved programs to eliminate errors which might have been introduced by rounding off the figures. The explanations further said that the changes are minor and would not have any effect on the catch-by-age table. Nevertheless, data accuracy should have been increased.

As mentioned earlier, the files for the Japanese and Japan-like fisheries for the west Atlantic were created at the 1984 BFT meeting, but these for the east Atlantic and Mediterranean have not been created. Therefore, at this time the Secretariat, in consultation with the Japanese scientists, created the catch-by-size for them. The substitutions made are summarized in Appendix 3. (Please note that in the same tables, descriptions for the west Atlantic are for those which have already been made at the 1984 BFT meeting.)

### 3. Combining all the files

After all the files were updated and reformatted in a uniform format, they were combined into one data base. Therefore, the new base contains all the catch-by-size tables for all the fisheries, for the east Atlantic, west Atlantic and Mediterranean, 1960-82, as of June 30, 1985.

It is recommended that this new base should replace all the files used in the past, even though many of the current files are still valid. If anyone noted any errors in the new base, they should be alerted to the Secretariat immediately.

### V. LENGTH-WEIGHT RELATIONSHIP

The length-weight relationship currently in use by the Secretariat is summarized in Appendix 4.

According to 1983 SCRS recommendations, for the west Atlantic, monthly length-weight relationships reported in SCRS/79/98 are currently used. For the east Atlantic and Mediterranean, the equations agreed upon at the Trapani meeting for these areas were maintained.

All the raising of size data to the catch (in weight) done by the Secretariat used those equations. Also, the mean weight and estimated weight of fish in the frequencies were calculated by the Secretariat using these equations. However, some of the catch-by-size files have been created by the national offices and some of these seem not to have been based on these length-weight relations. Therefore, the catch estimated for those data by applying the standard length-weight equation gives quite different values from what was expected (e.g. 1982 Spanish BB in the east Atlantic).

In cases where the size data were raised to the total catch in number of fish, there are some discrepancies between the estimated weight from the frequencies (mean weight x total number of fish) and the reported Task I catch. This problem has been discussed at several bluefin meetings. The problem can be two fold (i.e. length-weight equations and reported Task I catch). As has been agreed, whenever the total number of fish has been reported, the raising was done to the number rather than to the weight.

### VI. 1983 DATA BASE

Table 2 shows Task I catches for 1983 and the availability of the data (Task II catch and effort data and biological data) necessary to create the catch-by-size files. The Secretariat created the 1983 catch-by-size files for east and west Atlantic and Mediterranean. When size data were missing for a fishery, data substitutions were made. These substitutions had been proposed in July, 1985, and accepted by the scientists. They are listed in the same Table 2. The catch-by-size table was not complete for the Mediterranean due to a lack of small bluefin tuna size frequencies.

Table 1 Formats in which the files currently in use have been created.

COUNTRY	YEAR	FREQUENCIES		TOTAL #	EST. WSHT	REPT CATCH
		TABLE	FILE			
ICCAT Stand.	60-81	#	F20.1	#	MT	MT OR #
CANADA	60-81	# * 10	110	# * 10	100 KG	MT OR #*10
CUBA	60-81	# * 10	110	# * 10	MT	MT
JAPAN	60-81	# * 10	110	# * 10	MT	#
NORWAY	60-81	# * 10	110	# * 10	MT	MT
U.S.A.*	60-82	# * 10	110	# * 10	100 KG	MT OR #*10
GRENADA	60-81	# * 10	110	# * 10	MT	MT
MEXICO	60-81	# * 10	110	# * 10	MT	MT
DOMIN.R.	60-81	# * 10	110	# * 10	MT	MT
OTH. LL	60-81	# * 10	110	# * 10	MT	MT
MAROC	82	#	110	#	100 KG	MT
NORWAY	82	#	110	#	100 KG	MT
PORTUGAL	82	#	110	#	100 KG	MT
AZORES	82	#	110	#	100 KG	#
MADEIRA	82	#	110	#	100 KG	#
SPAIN	82	#	110	#	100 KG	#
CANADA	82	#	110	#	100 KG	#
ALGERIE	82	#	110	#	100 KG	MT
FRANCE (UNCL)	82	#	110	#	100 KG	MT
FRANCE (PSM)	82	#	110	#	100 KG	#
ITALY	82	#	110	#	100 KG	MT
ITALY (Lig.)	82	#	110	#	100 KG	MT
LIBYA	82	#	110	#	100 KG	MT
MALTA	82	#	110	#	100 KG	MT
TUNISIE	82	#	110	#	100 KG	MT
TURKEY	82	#	110	#	100 KG	MT
YUGOSLAVIA	82	#	110	#	100 KG	MT

\* PS, HAND, RR and UNCL have more than one frequencies per yr/month stratum.

TABLE 2. 1983 BLUEFIN DATA SUBSTITUTIONS (As of Sept. 27, 1985)

COUNTRY	GEAR	AREA	DATA AVAILABILITY				TIME	DATA SUBSTITUTIONS OR REMARKS
			CATCH	C/E	SIZE	C/SIZE		
Cap Vert	BBF	East	10	+	No	No	M7	Azores PS East 83
Chi.Taiw	LLFB	East	2	+	+	No	Q1y	C/Size created by Sec. using size data
France	BB	East	400	No	No	No	M1y	Spain BB East 83
Japan	LL	East	2609	+	No	+	Q1y	C/size received just now
Korea	LLFB	East	3	+	+	No	M1y	C/Size created by Sec. using size data
Morocco	TRAP	East	94	No	No	No	M5	Spain TRAP East 83
Morocco	PS	East	187	No	No	No	Q3	Morocco PS East 72+73
Morocco	SURF	East	84	No	No	No	Q3	Morocco PS East 72+73
Norway	PS	East	1	+	+	+	M1y	C/Size available
Portugal								
Azores	PS	East	14	No	+	+	M1y	C/Size available
Azores	BB	East	6	No	No	No	M1y	Azores PS East 83
Madeira	BB	East	47	+	+	No	M1y	C/Size created by Sec. using size data
Mainld	PSM	East	60	No	No	No	M1y	Spain BB East 83
Mainld	SURF	East	47	No	No	No	M1y	Spain BB East 83
Spain	BB	East	2264	+	+	+	M1y	C/Size available
Spain	LLHB	East	12	No	No	No	M1y	Spain BB East 83
Spain	TRAP	East	1862	No	+	No	M1y	C/Size created by Sec. using size data
Sp-Canar.	BB	East	305	+	+	No	M1y	C/Size created by Sec. using size data
Spain	SURF	East	2	No	No	No	M1y	Spain BB East 83
Sweden	UNCL	East	1	No	No	No	M7	Norway PS East 83
Algerie	UNCL	Med	271	No	No	No	Q3	Japan LL Med 83
France	PSM	Med	3600	No	+	+	M1y	C/Size available
France	SPDR	Med	30	No	No	No	M1y	France PSM Med 83
France	UNCL	Med	30	No	No	No	M1y	France PSM Med 83
Italy	LL	Med	29	No	No	No	Q2	Japan LL Med 83
Italy	Trap	Med	284	No	No	No	Q2	Japan LL Med 83
Tyrrhen	PS	Med	2560	No	No	No	Q2	Japan LL Med 83
Ligur.	PS	Med	1992	No	No	No	M1y	France PS Med 83
Adriat	PS	Med	400	No	No	No	Q2	Italy Adriatic PS Med 78
Japan	LL	Med	677	+	No	+	Q1y	C/Size just received
Libya	UNCL	Med	300	No	No	No	Q2	Japan LL Med 83
Malta	UNCL	Med	21	No	No	No	Q2	Nothing done
Morocco	SURF	Med	1	No	No	No	Q3	Nothing done
Spain	HYD	Med	151	No	No	No	Q3	Nothing done
Spain	LLHB	Med	233	No	No	No	Q3	Nothing done
Spain	TRAP	Med	37	No	No	No	Q2	Nothing done
Spain	SURF	Med	391	No	No	No	Q4	Nothing done
Tunisie	TRAP	Med	80	No	No	No	Q2	Japan LL Med 83
Turkey	UNCL	Med	427	No	No	No	Q2	Japan LL Med 83
Yugoslav	PS	Med	1222	No	No	No	Q2	Ital Adriatic PS 78

Bras-JPN	LLFB	West	1	+	No	No	Q1y	Japan LL West 83, Q3
Canada	HAND &							
	R. R.	West	426	No	+	No	M1y	C/Size created by Sec. using size data
Canada	TRAP	West	7	No	No	No	M1y	Canada Hand Length freq. West 83
Chi.Taiw	LLFB	West	2	+	+	No	Q1y	C/Size created by Sec. using size data
Domin.R.*	SURF	West	115	No	No	No	M1y	U.S. HAND West 83
Grenada*	UNCL	West	14	No	No	No	M1y	U.S. HAND West 83
Japan	LL	West	711	+	No	+	Q1y	C/Size Just received
Mexico*	UNCL	West	14	No	No	No	M1y	U.S. HAND West 83
U.S.A.	HAND	West	332	No	+	+	M1y	C/Size revised recently
U.S.A.	HARP	West	159	No	+	+	M1y	C/Size revised recently
U.S.A.	LL	West	114	No	+	+	M1y	C/Size revised recently
U.S.A.	PS	West	384	No	+	+	M1y	C/Size revised recently
U.S.A.	R R	West	405	+	+	+	M1y	C/Size revised recently

\* Combined as "OTH UNCL"

APPENDIX 1

NEW DATA FORMAT AND SPECIAL CODES USED

DATA FORMAT (RECORD DESCRIPTION)

Field No.	Columns	Format	Description
Header record (19I3, 3I10, 2F10.0, F10.6, 2F10.4, 3X)			
1	1-3	I3	Year
2	4-6	I3	Country (see list of special codes)
3	7-9	I3	Gear
4	10-18	9X	Blank
5	19-21	I3	Time strata
6	22-33	12X	Blank
7	34-36	I3	Species
8	37-39	I3	Kind of frequency
9	40-42	3X	Blank
10	43-45	I3	Intervals (in mm)
11	46-48	I3	Area (see list of codes)
12	49-51	3X	Blank
13	52-54	I3	1st class (IMI) (in cm)
14	55-57	I3	Last class (IMA) (in cm)
15	58-67	I10	Total number of fish in the frequency (KM)
16	68-77	I10	Estimated catch in 100 kg (KC = KM*HW/100)
17	78-87	I10	Reported catch for which raising was done (ICATCH) (either in number of fish or weight in MT)
18	88-97	F10.0	Number of fish in the records used for raising. (SN) (If sample is used, this is the number of fish in the sample; if data were substituted, this represents the total number of fish in the data used for the substitution.)
19	98-107	F10.0	Weight in kg of all the fish used for raising. (SW = SN*HW) (see SN)
20	108-117	F10.6	Raising factor (RF). If ICATCH = number of fish: RF = ICATCH/SN. If ICATCH = weight of fish: RF = ICATCH*1000/SW.
21	118-127	F10.4	Mean length (cm)
22	128-137	F10.4	Mean weight (kg)
23	138-140	3X	Blank

Data records (14F10.1)

1	1-10	F10.1	Frequency in first class (IMI)
2	11-20	F10.1	Frequency in second class (IMI+1)
-			
-			
14	131-140	F10.1	Frequency in 14th class

Fields 1-14 are repeated until the frequency of the last class F(IMA) is encountered. Last data record may be zero-filled if necessary.

SPECIAL CODES USED (Other than the ICCAT standard codes)

Field	Code	Description
ICCAT area:	1	East Atlantic
	2	West Atlantic
	3	Mediterranean
Country/gear	91/25	Italy Tyrrhenian PSFB
	91/26	Italy Ligurian PSFS
	11/25 or 26	Italy Adriatic
	11/27	Italy hand - large fish
	11/28	Italy hand - small fish
	45/17	Spain Canary Islands BB
	23/10	Tunisia Sidi Daoud TRAP
	92/10	Tunisia Monastir TRAP
	99/ 1	Other minor longline countries* to which Japanese size data were applied as substitution
	19/19	Portugal (Madeira) BB+HAND

\*Country code 99 includes:

West Atlantic: Argentina, Brasil, Brasil-Japan, China (Taiwan), Korea, Panama, and Uruguay.  
East Atlantic: China (Taiwan), Korea, Panama, and South Africa.

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APPENDIX 2

UPDATING\* OF CATCH-BY-SIZE DATA BASE

(JULY 1, 1985)

1980-82 Morocco east Atlantic trap catch records became available.

1981-82 Algeria Task I catch has been changed.

1981-82 China (Taiwan) LL Task I catch. The southern bluefin tuna catch was separated from the bluefin catch and the separation between the east and west Atlantic was accurately done using Task II catch and effort data. Therefore, the "OTH" records were adjusted for the changes.

1981 Denmark Task I catch has been added.

1982 French baitboat (Bay of Biscay) catch-by-size was somehow missing from the base. Since neither monthly catch records nor size data for this fishery are available, the Spanish monthly Bay of Biscay fishery catch-by-size records were raised by the factor of "French BB total catch/Spanish BB total catch".

1982 Japanese longline catch-by-size files for west has double entries of months 1,2,3. Second months 1,2,3 should be read as months 4,6,7.

1982 The Japanese (and similar) fisheries file had not yet been created for the east Atlantic or Mediterranean. It is newly created at this time. The Japanese size data were raised to the monthly Japanese catch (in number of fish) calculated from the Task II catch and effort data. The substitutions made are listed in Appendix 3.

1982 The Spanish baitboat data (catch-by-size) for the east Atlantic have been revised slightly since the monthly catches (in number of fish) have been changed. Besides, baitboat data were found entered twice for monthly and yearly. The yearly total record was removed.

1982 The catch-by-size tables for the Spanish fisheries, except for east Atlantic baitboats, were assigned to year. According to the quarters agreed upon at the 1983 BFT meeting for each fishery, a specific quarter is now assigned to those fisheries.

1982 The Spanish Canary Islands catch was found improperly raised. These data were re-raised to the reported Task II monthly catches.

\* The attached Table summarized actual procedures of updating.

TABLE OF APPENDIX 2. Summary of updating for the files up to 1982

YR	COUNTRY	GEAR	AREA	TIME	TASKI (MT)	REMARKS (SUBSTITUTION)	RAISING FACTORS
<u>WEST</u>							
81	OTH (99)	LL	WEST	MON	22	TAIW catch changed	22/30=.73333
82	Japan	LL	WEST	MON		Second months 1,2,3 to be chagned to 4,6,7.	
<u>EAST</u>							
80	MOROCCO	TRAP	EAST	14	6	SPAIN TRAP EAST 80 (New Task I available)	6/700=.00857
81	DENMARK	UNCL	EAST	15	4	NORWAY PS EAST 81 (New Task I available)	4/161=.02484
81	MOROCCO	TRAP	EAST	14	72	SPAIN TRAP EAST 81 (New Task I available)	72/787=.09149
81	OTH (99)	LL	EAST	QTR	54	TAIW catch changed	54/103=.52427
82	OTH (99)	LL	EAST	MON	29	JPN LL EAST 82	28/2573=.01088
82	MOROCCO	TRAP	EAST	14	393	SPAIN 82 TRAP EAST (New Task I catch)	393/1916=.20511
82	ESPANA						
	(CANAR)	BB	EAST	2	12	Re-raise	12/2.6=4.6154
	(CANAR)	BB	EAST	4	27	Re-raise	27/7.3=3.6986
	(CANAR)	BB	EAST	5	4	Re-raise	4/1.14=3.5088
82	ESPANA	LL	EAST	15	104	Change time from 17 to 15	
82	ESPANA	TRAP	EAST	14	1916	Change time from 17 to 14	
82	ESPANA	SURF	EAST	15	15	Change time from 17 to 15	
82	ESPANA	BB	EAST	7		Re-raising	10533/10640=.98994
82	ESPANA	BB	EAST	10		Re-raising	17729/18540=.95628
82	ESPANA	BB	EAST	17		Delete record	
82	ESPANA	HAND	EAST	15	12	Change time from 17 to 15	
82	FRANCE	BB	EAST		150	SPN BB EAST 82	150/734=.20436
<u>MEDITERRANEAN</u>							
80	ALGERIE	UNCL	MED	15	190	Change in catch	190/150=1.26667
81	ALGERIE	UNCL	MED	15	220	Change in catch	220/150=1.46667
82	ESPANA	LL	MED	15	538	Change time from 17 to 15	
82	ESPANA	PS	MED	15	277	Change time from 17 to 15	
82	ESPANA	TRAP	MED	14	66	Change time from 17 to 14	
82	ESPANA	SPOR	MED	15	55	Change time from 17 to 15	
82	ESPANA	BB	MED	16	53	Change time from 17 to 15	

APPENDIX 3

1982 JAPAN AND JAPAN-LIKE FISHERIES  
DATA SUBSTITUTIONS

1. JAPANESE FISHERIES, 1982

MONTH	WEST*			EAST*			MED*		
	CATCH (#)	SAMPLE (#)	SIZE DATA USED	CATCH (#)	SAMPLE (#)	SIZE DATA USED	CATCH (#)	SAMPLE (#)	SIZE DATA USED
1	487		JPN LL WEST Q1	5		JPN LL EAST Q2	0		
2	395	138	JPN LL WEST Q1	14	0	JPN LL EAST Q2	0	0	
3	187		JPN LL WEST Q1	305		JPN LL EAST Q2	0		
4	26		JPN LL WEST Q1	2021		JPN LL EAST Q2	143		JPN LL MED Q3
5	0	0		6994	56	JPN LL EAST Q2	331	0	JPN LL MED Q2
6	2		JPN LL WEST Q1	5911		JPN LL EAST Q2	351		JPN LL MED Q3
7	13		JPN LL WEST Q1	894		JPN LL EAST Q2	3978		JPN LL MED Q3
8	9	5	JPN LL WEST Q3	0	0		0	122	
9	2		JPN LL WEST Q3	2		JPN LL EAST Q2	0		
10	57		JPN LL WEST Q4	0			0		
11	621	15	JPN LL WEST Q4	4	0	JPN LL EAST Q2	0	0	
12	717		JPN LL WEST Q4	17		JPN LL EAST Q2	0		
TOTAL	2516	158		16167	56		4803	122	

\* Size data are recorded quarterly and by ICCAT sampling areas. WEST = BF51 + BF52 + BF53; EAST = BF58; MED = BF59. Descriptions for WEST are based on what was done at the 1984 BFT meeting and those for EAST and MED are based on what is being done at this time.

2. SUBSTITUTIONS FOR JAPAN-LIKE FISHERIES, 1982

COUNTRY	GEAR	AREA	CATCH (MT)	SIZE DATA USED FOR SUBSTITUTION
DOM. REP.	SURF	WEST*	115	U.S. 82 RRFB + PSFB + HARP
GRENADA	UNCL	WEST*	14	U.S. 82 RRFB + PSFB + HARP
MEXICO	UNCL	WEST*	14	U.S. 82 RRFB + PSFB + HARP
BRAS-JPN	LL	WEST*	1	U.S. 82 RRFB + PSFB + HARP
CHI-TAIWAN	LL	WEST*	11	U.S. 82 RRFB + PSFB + HARP
PANAMA	LL	WEST*	12	U.S. 82 RRFB + PSFB + HARP
URUGUAY	LL	WEST*	3	U.S. 82 RRFB + PSFB + HARP
CHI-TAIWAN	LL	EAST**	16	JPN 82 LL EAST
PANAMA	LL	EAST**	12	JPN 82 LL EAST

\* The data were created at 1984 BFT meeting.  
\*\* The data are being created at this time.

APPENDIX 4

LENGTH-WEIGHT RELATIONS USED BY THE SECRETARIAT

$$W = aL^b$$

Where

W = weight in kg

L = fork length in cm (mid-point of the class)

a =

b =

1. East Atlantic	.0000295	2.898958
2. Mediterranean	.000019607	3.0092
3. West Atlantic		
January	.00002861	2.9290
February	.00002861	2.9290
March	.00002861	2.9290
April	.00006043	2.7794
May	.00006043	2.7794
June	.00004044	2.8272
July	.00003733	2.8683
August	.00002227	2.9704
September	.00001520	3.0531
October	.000003871	3.3172
November	.000003871	3.3172
December	.00002861	2.9290