

REVIEW AND UPDATING OF BLUEFIN CATCH-AT-SIZE BASE, 1988

P. M. Miyake, P. Kebe, D. DaRozda
ICCAT Secretariat, Príncipe de Vergara - 17, Madrid, Spain

Every year, prior to the Standing Committee on Research and Statistics meeting, the Secretariat updates the bluefin catch at size data base as much as possible with new data received on time. In 1988, a somewhat more in-depth review was made of the data base which was used in past stock assessment work. This base was first created and agreed upon by the Bluefin Working Group which met in Japan in September, 1983. Every year since then, this base has been updated with the additional year's data and with the changes made in previous years' catch estimates. However, no review of the entire data base has been made since its creation.

During the Second ICCAT Swordfish Workshop, which was held in September, 1988, some errors in the swordfish catch-at-size data base, created during the first Workshop, were found. At the same time, large discrepancies were found between reported catch in weight (Task I) and the weight estimated from the catch-at-size base; after these examinations, reported catches of some countries have been revised. The experience at the Second Swordfish Workshop, as well as the fact that similar discrepancies have been pointed out in the past, led us to take a little closer look at the bluefin data base created five years ago and updated every year since then.

1. Discrepancies between estimated and reported catch

The total weight of fish were estimated based on each catch-at-length frequency contained in the latest data base (updated in 1987), using the length-weight equations agreed upon by the Working Groups in 1983 and 1984). These estimated weights (from the catch at length) were compared with the Task I catches of bluefin tuna by fishery. Many discrepancies were detected in this comparison. One of the following factors should account for these discrepancies.

- A. There were errors either in the total number of fish caught, or in the total landing weight reported.
- B. Conversion procedures different from those adopted by the Secretariat were used by national offices, in converting number of fish caught into weight (Task I catch). This is not applicable unless the Task I data are estimated from the number of fish landed.
- C. Different sources are used at the national level to estimate Task I and catch at length.
- D. Length-weight equations used by the ICCAT are wrong.
- E. Size samples are biased.

F. Errors were made when a size frequency was substituted and raised to the Task I catch.

If the Task I catch is estimated from the landing weight, while the catch-at-length file is estimated based on the number of fish caught, type B and C discrepancies are unavoidable. If the difference is minor (e.g., within 10 percent), they do not cause serious problems. Therefore, the following criteria were used to flag the discrepancies:

- i) The difference is more than 10 percent and more than 10 MT.
- ii) The difference is more than 100 percent and less than 10 MT.
- iii) The difference is more than 100 MT.

All the differences flagged by these categories are listed in Table 1.

In the data base, it is known whether the size data had been raised to weight or number of fish. If they are raised to the weight by the Secretariat, it is obvious that the discrepancies should have been of type F errors and consequently were corrected at this time and are listed as such in the Table. There are only a few cases of this type of errors.

Rather significant consistent discrepancies are found in Japanese longline and French Mediterranean purse seine data series. These would be most likely errors of type B or C. Therefore, no action has been taken and the decision as to how handle the discrepancies is left for the SCRS. However, in some cases the differences are as large as 80 percent and consequently could not be accounted only by errors of types B and C. Errors of types A and/or E must have been involved in these cases.

2. 1988 data base

Table 2 lists the updating done at this time. All the new catches reported for 1987 in the west Atlantic and for 1986 in the east Atlantic and Mediterranean were matched with size frequencies and raised to the catch. If there were no size data, other size data were substituted following the procedures decided upon in the past. These substitutions are also listed in Table 2.

The Japanese catch-at-size data, which were generally available before the meeting, were not made available this year; therefore, they are left blank, as are the data to be substituted by the Japanese data.

Table 2 also lists some modifications made in the previous years' data base due to the changes in the reported catches. Some of these changes were found while comparing the latest reported catches with estimated catches (Section 1). However, most of the changes are new since 1987 SCRS meeting.

3. Age composition data prepared by national scientists

In the past, some national scientists have estimated independently catch at age for their fisheries (e.g., French Mediterranean purse seine fishery and Spanish Bay of Biscay baitboat fishery). These catch-at-age data were submitted to the SCRS, together with catch-at-length data. In such cases, the SCRS preferred to use catch-at-length data and aged them according to the procedure agreed upon by the SCRS. The reasons for this are:

- i) Procedure to exclude the catch-at-size data for those fisheries from the entire data base and to add them after aging has been done requires extra effort and adds many complications since the updating of the catch-at-size base cannot be completed before, but rather during, the SCRS. It may delay the analysis and the chances to include errors is increased during the meeting when time is very limited.
- ii) The national procedures to estimate catch at age has not been documented; hence, it has not been reviewed by the SCRS. If the national aging procedure follows what has been agreed to by the SCRS and if the same catch-at-size data were used, the results of aging should be the same as that of the aging done by the SCRS.
- iii) When these data are to be used for data substitution, the work with the catch-at-age file will be even more complicated, particularly since the weight estimates would be inaccurate.
- iv) Catch-at-age data are available for some years but not for all years, while catch-at-size data have been more consistently available.

We have noted that there have been some discrepancies between nationally estimated catch-at-age data and the catch at age estimated by the SCRS using the data base submitted by the same scientists. This means that either different catch-at-size data bases have been used by the national scientists or their aging procedures were different. For example, aging at the national level might have been done using catch by weight categories rather than using size length frequency data.

In SCRS/86/50, catch at age data were given for Spanish Mediterranean fisheries (longline, handline, purse seine, surface and baitboat) for 1985, and Mediterranean and Atlantic traps for 1984 and 1985. These data were compared in Table 3 with the catches at age estimated from the catch-at-length files which had been submitted by the same author. The aging program agreed by the SCRS was used in estimation.

For traps and handlines, the difference is relatively minor and total number of fish match in the two series. However, significant discrepancies are very obvious for the purse seine and surface fishery and to a lesser degree for longline and baitboats. Since even the total number of fish did not match, it is suspected that the age data from the national source were created by adding some unreported catches of small fish to the category of age 0-. If this is the case, it is more correct to use the national scientists' estimates, at least for these fisheries, or request national scientists to revise catch-at-size data including these small fish.

Unfortunately this series is available only for these two years and adding these data only for 1985 may have an unfavorable effect on the stock analysis. Therefore, no change in the data base will be made until an SCRS decision is made.

In order to avoid the complications of replacing the size frequencies by age frequencies for those fisheries, we tried to make up a fictitious catch-at-size frequencies from the catch-at-age data. An age is back calculated to a length using the growth equation adopted for aging program and all the fish at each age are assigned to the corresponding length. Hence, if these fictitious age compositions are used in the catch-at-length data base (instead of real ones), the results of aging would be exactly identical as those provided by the national scientists. However, this procedure would still leave the problem in substitutions, since the estimated weight from such fictitious length frequencies would not be valid.

TABLE 1. Discrepancies between reported catches (Task I) and the weight estimated from the catch at size file.

COUNTRY	GEAR	YEAR	EST'D #FISH	CAL'D MT	CURRENT		REMARKS AND SUBSTITUTION	R.F.	FOOT NOTES
					RPT'D MT	RAISED OR MT REPORTED BY			
WEST ATLANTIC									
CANADA	TRAP	64	493	125	318	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??	2.9440	RE-RAISED
CANADA	TRAP	65	284	71	81	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	TRAP	66	304	69	87	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	TRAP	68	357	87	101	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	TRAP	73	510	126	144	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	TRAP	77	958	169	372	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??	2.2012	RE-RAISED
CANADA	TRAP	85	26	10	20	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	RR	64	319	81	99	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	RR	65	293	74	94	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	RR	68	339	83	130	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??		
CANADA	RR	69	213	59	170	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??	2.1687	RE-RAISED
CANADA	RR	70	252	75	151	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??	2.8814	RE-RAISED
CANADA	RR	71	256	78	88	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH??	2.0133	RE-RAISED
JAPAN	LL	60	6824	923	820	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	62	53977	7224	3703	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	63	66924	9502	7809	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	64	62999	9189	12626	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	65	60010	8682	9551	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	66	23020	4234	2521	*JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	67	3435	578	694	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		*EAST+WEST
JAPAN	LL	68	1427	194	272	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	70	399	86	66	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	71	7138	1028	1375	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	72	1344	194	321	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	73	6301	769	1097	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	75	7913	1778	1513	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	76	24286	3385	2902	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	77	30587	3574	3658	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	79	18564	3213	3621	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	80	28152	4547	3936	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	81	36042	4049	3771	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	83	7127	589	711	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
NORWAY	LL	64	24	6	63	U.S. SCIENTISTS	NORWAY 64 LL EAST TO BE WEST		HEADER EDITED.
NORWAY	PS	64	0	0	8	U.S. SCIENTISTS	NORWAY 64 LL WEST TO BE PS		HEADER EDITED.
U.S.A.	LL	83	416	78	114	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	LL	84	496	115	127	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	LL	85	505	101	132	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	LL	86	559	98	139	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	PS	78	33396	905	989	U.S. SCIENTISTS	ORIGINALLY RAISED BY WEIGHT.		
U.S.A.	PS	83	4884	499	394	U.S. SCIENTISTS	ORIGINALLY RAISED BY # C WGT.		
U.S.A.	HAND	83	1246	404	332	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	RR	72	19286	1026	896	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	RR	73	5481	327	230	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	RR	77	5668	278	328	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
U.S.A.	RR	81	5976	281	244	U.S. SCIENTISTS	ORIGINALLY RAISED BY # FISH.		

EAST ATLANTIC

TABLE 1. Discrepancies between reported catches (Task I) and the weight estimated from the catch at size file.

COUNTRY	GEAR YEAR	EST'C #FISH	CURRENT			RAISED OR REPORTED BY	REMARKS AND SUBSTITUTION	R.F.	FOOT NOTES
			CAL'D MT	RPT'D MT	MT				
FRANCE	BB	83	58058	351	400	SECRETARIAT.	SPAIN BB 83 NE USED.	1.1403	RE-RAISED
JAPAN	LL	69	11	0	2	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	70	126	15	21	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	71	812	128	157	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	72	905	132	240	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	73	295	70	44	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	74	20295	2520	2195	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	75	25090	4920	2900	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	76	11643	2581	1973	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	77	9841	1709	1594	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	78	3371	786	577	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	80	3968	575	880	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	82	16168	2899	2573	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	83	15664	2212	2609	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	84	9070	1154	1514	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	85	2658	501	420	JAPANESE SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
NORWAY	LL	69	725	207	85	U.S. SCIENTISTS	ORIGINALLY RAISED BY WEIGHT.	0.4106	RE-RAISED
NORWAY	LL	71	0	0	85	NOT INCLUDED	NORWAY PS 71 NW	0.1496	PROCESSED
NORWAY	PS	84	737	199	243	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	1.2211	RE-RAISED
PORTUGAL	TRAP	60	12452	1391	1016	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.7304	RE-RAISED
PORTUGAL	TRAP	61	12345	1578	1499	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.9499	RE-RAISED
PORTUGAL	TRAP	62	5178	692	666	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.9624	RE-RAISED
PORTUGAL	TRAP	64	2628	342	303	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.8860	RE-RAISED
PORTUGAL	TRAP	66	1305	154	122	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.7922	RE-RAISED
PORTUGAL	TRAP	67	948	144	209	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	1.4514	RE-RAISED
PORTUGAL	TRAP	70	490	23	0	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.0000	DELETED
SPAIN	LL	82	1565	116	104	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
SPAIN	TRAP	82	12375	1714	1916	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
SPAIN	SURF	82	14855	24	15	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
SPAIN	BB	82	55273	633	734	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
SPAIN	BB	83	328607	1985	2264	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
SPAIN	BB	84	178954	2169	2364	SPANISH SCIENTISTS	ORIGINALLY RAISED BY # FISH.		
OTHERS	LL	64	70	7	0	????	ERROR??	0.0000	DELETED.
OTHERS	LL	68	991	177	138	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.7797	RE-RAISED
OTHERS	LL	69	1293	175	114	SECRETARIAT	ORIGINALLY RAISED BY WEIGHT.	0.6514	RE-RAISED
MEDITERRANEAN									
FRANCE	PSM	70	24366	1192	1100	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	71	28071	2413	2200	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	72	61434	1156	1100	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	73	44640	1505	1400	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	74	73601	1930	1800	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	75	115909	1708	1600	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	76	182848	4068	3800	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	77	166247	3340	3192	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM*	78	93477	1655	1597	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		*PSM+UNCL
FRANCE	PSM*	79	65227	1621	1578	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		*PSM+UNCL
FRANCE	PSM**	81	165904	2478	2350	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		**PSM+SPDR+UNCL
FRANCE	PSM	82	449326	4101	4818	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	83	284357	3795	3600	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		
FRANCE	PSM	84	206397	3777	3570	FRENCH SCIENTISTS.	ORIGINALLY RAISED BY ?.		

TABLE 1. Discrepancies between reported catches (Task I) and the weight estimated from the catch at size file.

COUNTRY	GEAR	YEAR	EST'D #FISH	CURRENT		REMARKS AND SUBSTITUTION	R.F.	FOOT NOTES
				CAL'D MT	RPT'D MT REPORTED BY			
FRANCE	PSM	85	299000	5682	5400	FRENCH SCIENTISTS. ORIGINALLY RAISED BY ?.		
JAPAN	LL	72	612	138	112	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	73	1173	267	246	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	74	12823	2923	2195	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	75	6911	1575	1260	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	78	352	98	61	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	79	414	45	99	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	82	4803	1208	951	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	84	6141	1239	1036	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
JAPAN	LL	85	5930	1246	873	JAPANESE SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
SPAIN	LL	82	3920	643	530	SPANISH SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
SPAIN	TRAP	82	590	88	86	SPANISH SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
SPAIN	TRAP	85	2682	344	302	SPANISH SCIENTISTS. ORIGINALLY RAISED BY ??		
SPAIN	SPDR	82	55000	35	55	SPANISH SCIENTISTS. ORIGINALLY RAISED BY # FISH.		
ITALY-LIG.	PSFS	85	169936	3229	3069	SECRETARIAT FRENCH PSN RAISED TASKI/TASKI.		DISCRP. IN FRENCH DATA

TABLE 2. Data availability and suggested substitutions for revised or new bluefin catch data.
(1988 bluefin data base)

COUNTRY	GEAR	YEAR	CURRENT EST'D		OLD RPT'D	TASKI	SIZE DATA RAISED OR REPORTED BY	REMARKS AND SUBSTITUTION	R.F.
			MT	MT					
WEST ATLANTIC									
ARGENTINA	UNCL	87		2			NO SIZE DATA	SBF?? IGNORE	
OTHERS	LL	71	15	15	131			BRAZIL DROPPED. RE-RAISED.	0.1145
CANADA	HAND	87	83	32			CANADIAN SCIENTISTS	TEMPORARY AS UNCL GEAR (RAISED)	TASKI= 83
CANADA	RR	87		1			CANADIAN SCIENTISTS	TEMPORARY AS UNCL GEAR (RAISED)	
CANADA	TRAP	87		17			CANADIAN SCIENTISTS	TEMPORARY AS UNCL GEAR (RAISED)	
CAN. JPN	LL	87		33			CANADIAN SCIENTISTS	TEMPORARY AS UNCL GEAR (RAISED)	
CHI-TAIWAN	LL	86	3	3	5			RE-RAISED.	0.6000
DOMIN. REP	SURF	86	109	109	81			RE-RAISED.	1.3457
DOMIN. REP	SURF	87	216	199			NO SIZE DATA	U.S. HAND WEST 87 (186 MT)	1.0699
JAPAN	LL	86	586	584	575		JPN SCIENTISTS	ORIGINALLY RAISED TO # FISH.	1.0000
JAPAN	LL	87	973	960			JPN & US SCIENTISTS	ORIGINALLY RAISED TO # FISH	1.0000
URUGUAY	LL	85	10	10			NO SIZE DATA	U.S. HAND WEST 85 (284 MT)	0.0352
URUGUAY	LL	86	7	5			NO SIZE DATA	U.S. HAND WEST 86 (190 MT)	0.0316
URUGUAY	LL	87	4	4			NO SIZE DATA	U.S. HAND WEST 87 (186 MT)	0.0215
U.S.A.	PS	87	385	367			US SCIENTISTS		
U.S.A.	HAND	87	202	186			US SCIENTISTS		
U.S.A.	LL	87	238*	30			US SCIENTISTS	*INCL. DISCARDS WHICH IS NOT IN TASK I	
U.S.A.	LL	87	238*	109			US SCIENTISTS	*(GULF OF MEXICO) EST. WGT IS SUM.	
U.S.A.	HARP	87	128	122			US SCIENTISTS		
U.S.A.	RR	87	534	533			US SCIENTISTS		
OTHERS	UNCL	83	169	163	196		US SCIENTISTS	RE-RAISED.	0.8571
BRAZ-JPN	LL	87		2			NO SIZE DATA	SBF?? IGNORE	
EAST ATLANTIC									
DENMARK	UNCL	66	2	2			NO SIZE DATA	DENMARK UNCL 65	0.3667
DENMARK	UNCL	77	4	1				SAMPLE AVAILABLE	1.0000
DENMARK	UNCL	86	0	1			NO SIZE DATA	NORWAY PS NE 86	0.0417
FRANCE	TROL	86	70	76			NO SIZE DATA	SPAIN BB NE 86	0.0405
FRANCE	BB	86	252	272			NO SIZE DATA	SPAIN BB NE 86	0.1451
FRANCE	BB	87		533			NO SIZE DATA		
JAPAN	LL	86	710	739	712		JPN SCIENTISTS	ORIGINALLY RAISED TO # FISH	1.0000
MOROCCO	PS	86	126	122			NO SIZE DATA	SPAIN SURF MED 86	0.5545
MOROCCO	TRAP	87		460			NO SIZE DATA		
NORWAY	PS	86	2	24			NATIONAL OFF.	CONVERTED TO LENGTH	1.0000
OTHERS	LL	92	31	23			NO SIZE DATA	JAPAN LL EAST 82	0.0109
PANAMA	LL	86	11	11			NO SIZE DATA	JAPAN LL EAST 86	0.0149
PANAMA	LL	87		4			NO SIZE DATA		
PORTUGAL	SURF	86	38	41	34		NO SIZE DATA	SPAIN BB NE 86	0.0219
PORTUGAL	SURF	87		102			NO SIZE DATA		
PORT-AZORES	BB	86	23	23			PORT. SCIENTISTS	RAISED BY SECRETARIAT	97.1211
PORT-AZORES	BB	87		58			NO SIZE DATA		
PORT-AZORES	PS	86	123	123			PORT. SCIENTISTS	RAISED BY SECRETARIAT	33.0068
PORT-MADEIR	HAND	86	1	1			PORT. SCIENTISTS		1.0000
PORT-MADEIR	HAND	87		3			PORT. SCIENTISTS		
SPAIN-CANAR	BB	86	70	73			SPANISH SCIENTISTS	RAISED BY SECRET. BY MONTH	VARIABLE
SPAIN-CANAR	BB	87		25			SPANISH SCIENTISTS		
SPAIN	BB	86	1738	1875			SPANISH SCIENTISTS		1.0000
SPAIN	BB	87		1512			SPANISH SCIENTISTS		
SPAIN	LL	86	27	20			NO SIZE DATA	SPAIN TRAP 86 EAST	0.0250
SPAIN	PS	86	3	12			SPANISH SCIENTISTS		1.0000

TABLE 2. (Cont.)

COUNTRY	GEAR	YEAR	CURRENT		TASKI	OLD	SIZE DATA	REMARKS AND SUBSTITUTION	R.F.
			EST'D	RPT'D		RAISED OR	MT REPORTED BY		
			MT	MT		MT			
SPAIN	TRAP	86	1085	799			SPANISH SCIENTISTS		1.0000
SPAIN	TRAP	87		939			SPANISH SCIENTISTS		
MEDITERRANEAN SEA									
ALGERIE	UNCL	86	381	280			NO SIZE DATA	SPAIN LL MED 86	2.3932
FRANCE	PSM	86	3626	3460			FRENCH SCIENTISTS		1.0000
FRANCE	PSM	87		4300			NO SIZE DATA		
FRANCE	SPOR	86	32	30			NO SIZE DATA	FRANCE PSM MED 86	0.0087
FRANCE	SPOR	87		30			NO SIZE DATA		
GREECE	UNCL	86	681	500			NO SIZE DATA	SPAIN LL MED 86	4.2735
ITALY	LL	86	83	62			NO SIZE DATA	SPAIN LL MED 86	0.5299
ITALY-LIG.	PSFS	86	2313	2207			NO SIZE DATA	FRANCE PSM MED 86	0.6379
ITALY-TYR.	PSFB	86	1717	1082			NO SIZE DATA	SPAIN TRAP NE 86	1.3542
ITALY	SPOR	86	50	50			NO SIZE DATA	SPAIN HAND MED 86	3.1266
ITALY	TRAP	86	468	295			NO SIZE DATA	SPAIN TRAP NE 86	0.3692
ITALY-ADR.	PSFS	86	1424	1424			NO SIZE DATA	FRANCE PSM MED 86, <102CM FISH	0.7930
JAPAN	LL	86	422	341	328	JPN SCIENTISTS	ORIGINALLY RAISED TO # FISH		1.0000
LIBYA	UNCL	86	476	300			NO SIZE DATA	SPAIN TRAP NE 86	0.3755
MALTA	UNCL	86	56	41			NO SIZE DATA	SPAIN LL MED 86	0.3504
MALTA	UNCL	87		36			NO SIZE DATA		
MOROCCO	SURF	86	18	13			NO SIZE DATA	SPAIN SURF MED 86	0.0818
SPAIN	LL	86	159	117			SPANISH SCIENTISTS		1.0000
SPAIN	PS	86	22	22			NO SIZE DATA	SPAIN SURF 86 MEDI	0.1000
SPAIN	SURF	86	223	220			SPANISH SCIENTISTS		1.0000
SPAIN	TRAP	86	186	163			NO SIZE DATA	SPAIN TRAP 86 EAST (JUNE-AUG.)	0.3779
SPAIN	TRAP	87		219			SPANISH SCIENTISTS		
SPAIN	HAND	86	29	29			SPANISH SCIENTISTS	RAISED BY SECRETARIAT	1.8135
TUNISIA	TRAP	86	133	84			NO SIZE DATA	SPAIN TRAP NE 86	0.1051
TURKEY	PS	86	1527	1524			NO SIZE DATA	TURKEY PS MED 83	840.5030
TURKEY	PS	87		323			NO SIZE DATA		
TURKEY	UNCL	83	557	557	427		NO SIZE DATA	RE-RAISED.	1.3048
YUGOSLAVIA	PS	86	757	757			NO SIZE DATA	FRANCE PSM MED 86, <102CM FISH	0.4242
YUGOSLAVIA	PS	87		641			NO SIZE DATA		

TABLE 3. Comparison between catch at age (B) prepared by Spanish scientists (SCRS/86/50) and those estimated (A) from the catch at size file also submitted by Spanish scientists.

GEAR YEAR AREA FILES AGE	TRAP 1984		TRAP 1984		LLHB 1985		PS 1985		TRAP 1985		TRAP 1985		SURF 1985		BB 1985		HAND 1985	
	ATL A	B	MED A	B	MED A	B	MED A	B	ATL A	B	MED A	B	MED A	B	MED A	B	MED A	B
0-	0	0	0	0	0	0	0	18135	0	0	20	20	369167	578592	0	0	0	0
1-	0	0	4256	4256	148	167	0	0	14020	14020	0	0	13648	362	44827	28837	0	0
2-	0	0	3	3	773	769	0	0	0	0	0	0	0	19	879	8293	0	0
3-	0	0	14	14	795	755	166	1265	0	0	75	90	0	3	0	339	0	2
4-	13	13	27	27	304	307	1740	16	0	18	545	544	0	12	0	0	9	14
5-	61	61	80	80	181	208	0	346	123	382	167	222	0	19	0	0	102	106
6-	221	221	80	80	124	146	0	29	611	406	313	331	0	1	0	0	283	287
7-	712	712	114	114	79	126	0	0	181	298	330	357	0	1	0	0	307	325
8-	655	655	70	70	47	65	0	0	335	444	244	181	0	0	0	0	430	490
9-	389	389	57	57	37	55	0	0	596	330	202	100	0	1	0	0	448	438
10-	1389	1389	81	81	58	105	0	3	1545	972	211	191	0	0	0	0	303	285
11-	2429	2429	96	96	56	83	0	5	1351	1746	237	267	0	0	0	0	100	88
12-	1378	1378	45	45	36	61	0	2	1209	975	162	134	0	0	0	0	46	24
13-	1220	1220	38	38	17	40	0	1	1029	785	91	98	0	0	0	0	5	6
14-	1174	1174	22	22	15	27	0	0	421	625	45	66	0	0	0	0	6	0
15-	1254	1254	36	36	11	6	0	0	250	689	23	67	0	0	0	0	0	0
16-	218	218	7	7	8	0	0	0	109	96	5	12	0	0	0	0	0	0
17-	80	80	9	9	0	0	0	0	48	20	8	0	0	0	0	0	0	0
18+	94	94	9	9	0	0	0	0	45	66	4	2	0	0	0	0	0	0
TOTAL	11287	11287	5044	5044	2691	2920	1906	19802	21872	21872	2682	2682	382814	579010	45706	37469	2038	2065