

## UPDATE OF ATLANTIC SWORDFISH CATCH-AT-SIZE DATA BASE

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### SUMMARY

*Details are provided on the procedures used by the ICCAT Secretariat to prepare the total catch and catch-at-size statistics for swordfish (*Xiphias gladius*) in the Atlantic Ocean. These data were used in the 2002 assessment of the stocks.*

### RÉSUMÉ

*Des détails sont fournis sur les procédures utilisées par le Secrétariat de l'ICCAT pour élaborer les statistiques de captures totales et de prise par taille de l'espadon (*Xiphias gladius*) dans l'océan Atlantique). Ces données ont été utilisées dans l'évaluation des stocks de 2002.*

### RESUMEN.

*Se proporcionan detalles sobre los procedimientos utilizados por la Secretaría de ICCAT para preparar las estadísticas de capturas totales y captura por talla para el pez espada (*Xiphias gladius*) en el océano atlántico. Estos datos se utilizaron en la evaluación del stock de 2002.*

### KEYWORDS

*Tuna fisheries, fishery statistics*

## 1. INTRODUCTION

As outlined in the Swordfish Workplan for the year 2002, the deadline for data submission was 23 August 2002. **Table 1** (attached) shows data submitted and the dates data was received from the various parties, entities and fishing entities. Unless otherwise stated, this refers to data for 2001, and does not necessarily imply the submission of complete series.

Trade data for some years up to 2000 were submitted by Japan and USA, but did not indicate the area or Ocean in which the catch was made. Therefore, as no conclusion could be drawn as to which, if any, of the data should be included, no estimates of unreported catches were made from these trade data.

### 1.1. North Atlantic Swordfish

New catch data series were submitted by Trinidad & Tobago in 2001. The SCRS accepted the new data for national vessels at its meeting in 2001, but it was agreed that further research was needed to ensure that there was no double reporting of the historical data from foreign-flagged vessels operating in Trinidad & Tobago 1993-1999 (shown as LLF on the table below). The Secretariat clarified that these data were not previously reported by the flag-states of the vessels, and the data were entered in the data base as Trinidad & Tobago catches.

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### Revised swordfish catches, Trinidad & Tobago, 1993-1999

	1994	1995	1996	1997	1998	1999
LL	56.5	105.6	68.2	43.0	74.5	82.1
LLF	123.4	44.4	89.5	66.8	55.4	55.6
TOTAL	180.0	150.0	157.7	109.8	129.9	137.7

Catch-at-size was submitted before the deadline, up to 2001, by Canada and the United States, and up to 2000 by EC-Spain. Japan submitted catch-at-size (1975-2001) on 6 September 2002. Actual size frequency data were submitted by EC-Portugal (1999-2001), Morocco (1999 and 2001), Mexico (2001), Venezuela (1999 and 2001).

**Appendix 1** shows substitutions made by the Secretariat for 1999 and 2000. Substitutions were made for 11.7% of the total north Atlantic catch in 1999 and 10.4% in 2000.

**Appendix 2** shows the substitutions made for new data prior to 1999, and the re-raising carried out for historical data where changes to Task I had been introduced or where, in accordance with the decisions taken by the swordfish Species Group in 1999, discrepancies of more than 5% existed, except in cases where catch-at-size was created and submitted by national scientists, for reasons enumerated in SCRS/99/6<sup>2</sup>.

Given the poor availability of size data for some years, in some cases very minor catches were substituted with size data from major fisheries, resulting in discrepancies between the catch and estimated weight from the catch-at-size file for the smaller fisheries.

The catch-at-size data base was updated only until 2000, as it was considered that there were insufficient data, both for Task 1 and size frequency, to create reliable catch-at-size for 2001.

#### 1.2.South Atlantic Swordfish

Catch-at-size was submitted before the deadline by EC-Spain (up to 2000) and USA (up to 2001), and well after the deadline by Japan (1994-2001). Actual size frequency data were submitted by Brazil (1999-2001), EC-Portugal (1999-2000), Ghana (1999), Namibia (2001) and South Africa (1999 and 2001).

Brazilian data were originally submitted in opercule to keel length (O-K), and were converted to Lower Jaw - Fork Length (LJFL) using the equation submitted by Brazilian scientists:

$$O-K = 0.64 \times LJFL^{0.98}$$

**Appendix 3** shows substitutions made by the Secretariat for 1999 and 2000. Substitutions were made for 42% of the total south Atlantic catch in 1999 and 39.4% in 2000.

Re-raising carried out for historical data, following the same criteria applied to north Atlantic swordfish, is shown in **Appendix 4**, together with substitutions made for new data prior to 1999.

As in the case of north Atlantic swordfish, the catch-at-size data base was updated only until 2000, as it was considered that there were insufficient data, both for Task 1 and size frequency, to create reliable catch-at-size for 2001.

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<sup>2</sup>ICCAT Collective Volume of Scientific Papers, Vol LI (4), pp 1282-1291.

**Table 1.** Atlantic swordfish data submitted in 2002

<i>FLAG</i>	<i>DATA</i>	<i>DATE</i>	<i>SWO</i>	<i>REMARKS</i>
ARGENTINA	TASK I	5.iii.2002	TRAW	
BARBADOS	TASK I	8.viii.2002	LL	
BRAZIL	TASK I	30.vii.2002	LL	and revisions 2000
CANADA	TASK I	30.iv.2002	LL,GILL,HARP, LLD	
CHINA, P. REP	TASK I	20.viii.2002	LL	
CHINESE TAIPEI	TASK I	8.viii.2002	LL	
EC-ESPAÑA	TASK I	06.ix.2002	LL	
EC-FRANCE	TASK I	02.iv.2002	UNCL	
EC-PORTUGAL	AZORES	TASKI	09.vii.2002	LL
EC-PORTUGAL	MAINLAND	TASK I	09.vii.2002	TRP,SRF,PS,LL
EC-PORTUGAL	MADEIRA	TASK I	09.vii.2002	LL
JP.OB.SH	TASKI	17.iv.2002	LL	
MEXICO	TASKI	19.vii.2002	LL	
NAMIBIA	TASK I	22.viii.2002	LL,BB	
PHILIPPINES	TASK I	03.iv.2002	LL	
SEYCHELLES	TASKI	24.vii.2002	LL	Data for 2000 & 2002
SOUTH AFRICA	TASK I	8.viii.2002	LL	
St. VINCENT	TASKI	various	LL	
TP.OB.SH	TASKI	17.iv.2002	LL	
TRINID. & TOB.	TASK I	29.vii.2002	LL	
U.S.A.	TASK I	18.vii.2002	All gears	
UK - OT	STA HELENA	TASKI	17.iv.2002	LL
VENEZUELA	TASK I	8.viii.2002	LL,GILL	
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BRAZIL	SIZE	30.vii.2002	LL	
CANADA	SIZE	31.v.2002	LLD	
CANADA	SIZE	24. vii.2002	LL,HARP	
EC-ESPAÑA	SIZE		LL	Data submitted last year up to 2000.
EC-PORTUGAL	MAINLAND	SIZE	09.vii.2002	LL
MAROC	SIZE	16.iv.2002	GILL	
MEXICO	SIZE	19.vii.2002	LL	
NAMIBIA	SIZE	22.viii.2002	LL,BB	
SOUTH AFRICA	SIZE	8.viii.2002	LL	
U.S.A.	SIZE	13.viii.2002	All gears	
VENEZUELA	SIZE	8.viii.2002	LL,GILL	
<hr/>				
BRAZIL	C&E	30.vii.2002	LL	
CANADA	C&E	30.iv.2002	LL,GILL,HARP	
CHINA, P. REP	C&E	20.viii.2002	LL	
CHINESE TAIPEI	C&E	8.viii.2002	LL	1999 data
EC-ESPAÑA	C&E		LL	Data submitted last year up to 2000.
EC-PORTUGAL	AZORES	C&E	09.vii.2002	LL
EC-PORTUGAL	MAINLAND	C&E	09.vii.2002	TRP,SRF,PS,LL
JP.OB.SH	C&E	17.iv.2002	LL	
MAROC	C&E	16.iv.2002	GILL	
MEXICO	C&E	19.vii.2002	LL	
NAMIBIA	C&E	22.viii.2002	LL,BB	
PHILIPPINES	C&E	03.iv.2002	LL	

<b>FLAG</b>	<b>DATA</b>	<b>DATE</b>	<b>SWO</b>	<b>REMARKS</b>
<b>SOUTH AFRICA</b>	C&E	8.viii.2002	LL	
<b>TP.OB.SH</b>	C&E	17.iv.2002	LL	
<b>U.S.A.</b>	C&E	13.viii.2002	All gears	
<b>UK - OT</b>	<i>STA HELENA</i> C&E	17.iv.2002	LL	
<b>CANADA</b>	C-A-S	24. vii.2002	LL, HARP	Complete up to 2001
<b>EC-ESPAÑA</b>	C-A-S	30.iv.2002	LL	Data submitted last year up to 2000.
<b>U.S.A.</b>	C-A-S	13.viii.2002	All gears	Complete up to 2001
<b>JAPAN</b>	C-A-S	06.ix.2002	LL, LLD	1975-2001 north, 1994-2001 south

**Appendix 1.** Substitutions and raising for north Atlantic swordfish, 1999-2000

CATCH DATA BY FLEET/GEAR					REMARKS	SUBSTITUTIONS/ SIZE DATA USED						
Year	C_C	Flag	C_G	Gear		Task I	Raising Factor	Flag	Gear	Year	Area S.W. (MT)	
1999	4	CANADA	1	LL	1101	C.A.S. Submitted	1.00000	4	1	1999	2+14	1456.57
1999	4	CANADA	18	HARP	18	C.A.S. Submitted	1.00000	4	18	1999	2+14	23.557
1999	4	CANADA	33	LLD	35	reraise	13.19261	4	33	1999	2+14	2.653
1999	5	CHI.TAIP	1	LL	285	use japan ll	0.22668	12	1	1999	1	1257.3
1999	5	CHI.TAIP	1	LL	285	use japan ll	0.22668	12	1	1999	2	1257.3
1999	5	CHI.TAIP	1	LL	285	use japan ll	0.22668	12	1	1999	3	1257.3
1999	5	CHI.TAIP	1	LL	285	use japan ll	0.22668	12	1	1999	14	1257.3
1999	5	CHI.TAIP	1	LL	285	use japan ll	0.22668	12	1	1999	24	1257.3
1999	6	CUBA	13	UNCL	7	use ven gill 1999	0.39588	29	24	1999	3	17.682
1999	8	FRANCE	6	PS	28	use spain ll area 94B	0.01264	21	1	1999	24	2216.002
1999	8	FRANCE	24	GILL	76	use spain ll area 94B	0.03430	21	1	1999	24	2216.002
1999	12	JAPAN	1	LL	1212	C.A.S. Submitted	1.00000	12	1	1999		
1999	16	MAROC	1	LL	35	use maroc gill med	0.01807	16	24	1999	5	1936.835
1999	16	MAROC	6	PS	11	use maroc gill med	0.00568	16	24	1999	5	1936.835
1999	16	MAROC	10	TRAP	13	use maroc gill med	0.00671	16	24	1999	5	1936.835
1999	16	MAROC	24	GILL	60	use maroc gill med	0.03098	16	24	1999	5	1936.835
1999	19	PORTUGAL	1	LL	536	SIZE available	7.02131	19	4	1999	24	76.339
1999	19	PORTUGAL	6	PS	1	use portugal ll	0.01310	19	4	1999	24	76.339
1999	19	PORTUGAL	11	SURF	217	use portugal ll	2.84258	19	4	1999	24	76.339
1999	154	MADEIRA	1	LL	23	SIZE available	122.99465	154	1	1999	24	0.187
1999	21	ESPANA	1	LL	3993	C.A.S. Submitted	1.00000	21	1	1999	14+24	
1999	25	USA	1	LL	2874		1.00000	25	4	1999	1,2,3,14	2888.648
1999	25	USA	14	TRAW	8		1.00000					
1999	25	USA	19	HAND	5	C.A.S. Submitted	1.00000	25	19	1999	2	1.487
1999	25	USA	22	R R	21		1.00000	25	9	1999	2	6.781
1999	25	USA	33	LLD	490		1.00000	25	33	1999	north	541.579
1999	25	USA	39	OTHD	4		1.00000	25	39	1999	2	4.087
1999	28	PANAMA	1	LL	17	use japan ll	0.01352	12	1	1999	1	1257.3
1999	28	PANAMA	1	LL	17	use japan ll	0.01352	12	1	1999	2	1257.3
1999	28	PANAMA	1	LL	17	use japan ll	0.01352	12	1	1999	3	1257.3
1999	28	PANAMA	1	LL	17	use japan ll	0.01352	12	1	1999	14	1257.3
1999	28	PANAMA	1	LL	17	use japan ll	0.01352	12	1	1999	24	1257.3
1999	29	VENEZUEL	1	LL	9	use ven gill 1999	0.50899	29	24	1999	3	17.682
1999	29	VENEZUEL	24	GILL	21	SIZE available	1.18765	29	24	1999	3	17.682
1999	30	GRENADA	13	UNCL	42	use ven gill 1999	2.37530	29	24	1999	3	17.682
1999	31	MEXICO	1	LL	24	use mexico ll 2001	1.01223	31	1	2001	1	23.71
1999	41	TRINIDAD	1	LL	138	use ven gill 1999	7.80455	29	24	1999	3	17.682
1999	63	BARBADOS	1	LL	12	use ven gill 1999	0.67866	29	24	1999	3	17.682
1999	66	IRELAND	9	TROL	2	use spain ll area 94B	0.00090	21	1	1999	24	2216.002
1999	66	IRELAND	23	MWT	6	use spain ll area 94B	0.00271	21	1	1999	24	2216.002
1999	66	IRELAND	24	GILL	61	use spain ll area 94B	0.02753	21	1	1999	24	2216.002
1999	66	IRELAND	34	MWTD	12	use spain ll area 94B	0.00542	21	1	1999	24	2216.002
1999	83	BERMUDA	1	LL	3	use usa ll area 92	0.00204	25	4	1999	2	1467.295
1999	111	ST.VINC.	13	UNCL	1	use ven gill 1999	0.05655	29	24	1999	3	17.682
1999	112	U.K.	24	GILL	2	use spain ll area 94B	0.00090	21	1	1999	24	2216.002
1999	118	CHINA.PR	1	LL	304	use japan ll	0.24179	12	1	1999	1	1257.3

CATCH DATA BY FLEET/GEAR				REMARKS	SUBSTITUTIONS/ SIZE DATA USED				
1999	118 CHINA.PR	1 LL	304	use japan ll	0.24179	12	1 1999	2	1257.3
1999	118 CHINA.PR	1 LL	304	use japan ll	0.24179	12	1 1999	3	1257.3
1999	118 CHINA.PR	1 LL	304	use japan ll	0.24179	12	1 1999	14	1257.3
1999	118 CHINA.PR	1 LL	304	use japan ll	0.24179	12	1 1999	24	1257.3
1999	156 ICELAND	1 LL	1	use japan ll area 94B	0.00112	12	1 1999	24	896.8
1999	164 FAROE.IS	1 LL	5	use japan ll area 94B	0.00558	12	1 1999	24	896.8
2000	3 BRASIL	1 LL	21	use brasil ll south	0.14643	3	1 2000	6	143.417
2000	75 BRAS.ESP	1 LL	24	use spain ll area 96	0.00538	21	1 2000	6	4457
2000	100 BRA.TAI	1 LL	25	use brasil ll south	0.17432	3	1 2000	6	143.417
2000	138 BRAS-USA	1 LL	10	use usa ll area 96	0.15894	25	4 2000	6	62.917
2000	151 BRAS-PAN	1 LL	12	use brasil ll south	0.08367	3	1 2000	6	143.417
2000	155 BRAS-URU	1 LL	2	use brasil ll south	0.01395	3	1 2000	6	143.417
2000	168 BRAS-STV	1 LL	5	use brasil ll south	0.03486	3	1 2000	6	143.417
2000	169 BRAS-EQG	1 LL	19	use brasil ll south	0.13248	3	1 2000	6	143.417
2000	4 CANADA	1 LL	873	C.A.S. Submitted	1.00000	4	1 2000	1+14	1132.725
2000	4 CANADA	18 HARP	95	C.A.S. Submitted	1.00000	4	18 2000	2	99.863
2000	4 CANADA	33 LLD	50	reraise	12.35788	4	33 2000	1+14	4.046
2000	5 CHI.TAIP	1 LL	347	use japan ll	2.03998	12	1 2000	1	170.1
2000	5 CHI.TAIP	1 LL	347	use japan ll	2.03998	12	1 2000	2	170.1
2000	5 CHI.TAIP	1 LL	347	use japan ll	2.03998	12	1 2000	3	170.1
2000	5 CHI.TAIP	1 LL	347	use japan ll	2.03998	12	1 2000	14	170.1
2000	5 CHI.TAIP	1 LL	347	use japan ll	2.03998	12	1 2000	24	170.1
2000	8 FRANCE	17 BB	2	use spain ll area 94B	0.00077	21	1 2000	24	2604.449
2000	8 FRANCE	23 MWT	60	use spain ll area 94B	0.02304	21	1 2000	24	2604.449
2000	8 FRANCE	24 GILL	61	use spain ll area 94B	0.02342	21	1 2000	24	2604.449
2000	12 JAPAN	1 LL	179	C.A.S. Submitted	1.00000	12	2000		
2000	12 JAPAN	33 LLD	592	C.A.S. Submitted	1.00000	12	2000		
2000	16 MAROC	1 LL	38	use spain ll med	3.25761	21	3 2000	5	11.665
2000	16 MAROC	6 PS	22	use spain ll med	1.88598	21	3 2000	5	11.665
2000	16 MAROC	10 TRAP	3	use spain ll med	0.25718	21	3 2000	5	11.665
2000	16 MAROC	24 GILL	51	use spain ll med	4.37205	21	3 2000	5	11.665
2000	19 PORTUGAL	1 LL	512	SIZE available	3.50047	19	4 2000	14+24	146.266
2000	19 PORTUGAL	11 SURF	194	use portugal ll	1.33054	19	4 2000	24	145.806
2000	154 MADEIRA	1 LL	24	SIZE available	15.66580	154	1 2000	24	1.532
2000	21 ESPANA	1 LL	4581	C.A.S. Submitted	1.00000	21	1 2000	14,24	
2000	21 ESPANA	10 TRAP	2	SIZE available	0.89286	21	10 2000	24	2.24
2000	21 ESPANA	17 BB	12	use spain ll area 94B	0.00461	21	1 2000	24	2604.449
2000	25 USA	1 LL	2827		1.00000	25	4 2000	1,2,3,14	2876.457
2000	25 USA	14 TRAW	11		1.00000	25	9 2000	2	10.497
2000	25 USA	19 HAND	9	C.A.S. Submitted	1.00000	25	19 2000	2	4.208
2000	25 USA	22 R R	16		1.00000	25	18 2000	2	0.561
2000	25 USA	33 LLD	489		1.00000	25	33 2000	2	554.021
2000	25 USA	39 OTHD	1		1.00000	25	39 2000	2	1.485
2000	29 VENEZUEL	1 LL	30	use ven gill 1999	1.69664	29	24 1999	3	17.682
2000	30 GRENADA	13 UNCL	84	use ven gill 1999	4.75059	29	24 1999	3	17.682
2000	31 MEXICO	1 LL	37	use mexico ll 2001	1.56052	31	1 2001	1	23.71
2000	40 S.I.LEONE	1 LL	2	use USA ll area 97	0.02408	25	4 2000	7	83.045
2000	41 TRINIDAD	1 LL	41	use ven gill 1999	2.31874	29	24 1999	3	17.682
2000	63 BARBADOS	1 LL	13	use ven gill 1999	0.73521	29	24 1999	3	17.682

CATCH DATA BY FLEET/GEAR				REMARKS	SUBSTITUTIONS/ SIZE DATA USED					
2000	66 IRELAND	24 GILL	36	use spain ll area 94B	0.01382	21	1	2000	24	2604.449
2000	83 BERMUDA	1 LL	3	use USA ll area 92	0.00238	25	4	2000	2	1261.852
2000	118 CHINA.PR	1 LL	22	use japan ll	0.12934	12	1	2000	1	170.1
2000	118 CHINA.PR	1 LL	22	use japan ll	0.12934	12	1	2000	2	170.1
2000	118 CHINA.PR	1 LL	22	use japan ll	0.12934	12	1	2000	3	170.1
2000	118 CHINA.PR	1 LL	22	use japan ll	0.12934	12	1	2000	14	170.1
2000	118 CHINA.PR	1 LL	22	use japan ll	0.12934	12	1	2000	24	170.1
2000	164 FAROE.IS	1 LL	4	use japan ll area 94B	0.02909	12	1	2000	24	137.5
2000	179 SEYCHLLS	1 LL	10	use japan ll area 94B	0.07273	12	1	2000	24	137.5

## Appendix 2. Substitutions and rearing for north Atlantic swordfish, 1978-1998

Year	Flag-code	flag	gear code	Gear	Task I	C.A.S (mt)	Raising factor	Area	Flag	Gear	Year	S.W.
<b>SUBSTITUTIONS</b>												
1989	21	ESPANA	10 TRAP	2	0	1.08108	use Morocco trap	24	16	10	1989	1.850
1989	21	ESPANA	17 BB	1	0	0.00030	use Spain LL area 24	24	21	4	1989	3308.181
1990	30	GRENADA	13 UNCL	1	0	0.25038	use venezuela LL	3	29	1	1990	3.994
1991	30	GRENADA	13 UNCL	2	0	0.02741	use venezuela LL	3	29	1	1991	72.961
1992	21	ESPANA	17 BB	2	0	0.00634	use Spain uncl area 24	24	21	13	1992	315.553
1993	21	ESPANA	17 BB	3	0	333.33333	use Spain bb area 24	24	21	17	1993	0.009
1994	21	ESPANA	17 BB	5	0	0.03347	use Spain uncl area 24	24	21	13	1994	149.368
1994	41	TRINIDAD	1 LL	180	0	3.02847	use venezuela LL	3	29	1	1994	59.436
1995	21	ESPANA	10 TRAP	1	0	0.09091	use Morocco trap	24	16	10	1995	11.000
1995	41	TRINIDAD	1 LL	150	0	3.30834	use venezuela LL	3	29	1	1995	45.340
1995	83	BERMUDA	1 LL	1	0	0.00098	use USA ll area 92	2	25	1	1995	1016.491
1996	21	ESPANA	10 TRAP	1	0	0.01030	use France uncl	24	8	13	1996	97.114
1996	21	ESPANA	13 UNCL	20	0	0.20594	use France uncl	24	8	13	1996	97.114
1996	21	ESPANA	17 BB	7	0	0.07208	use France uncl	24	8	13	1996	97.114
1996	63	BARBADOS	1 LL	33	0	0.43568	use venezuela LL	3	29	1	1996	75.743
1996	83	BERMUDA	1 LL	1	0	0.00101	use USA ll area 92	2	25	1	1996	994.142
1997	21	ESPANA	10 TRAP	3	0	0.62867	use Morocco trap	24	16	10	1997	4.772
1997	21	ESPANA	17 BB	4	0	0.00102	use Spain LL area 24	24	21	4	1997	3940.046
1997	29	VENEZUEL	24 GILL	9	0	2.25734	size available	3	29	24	1997	3.987
1997	63	BARBADOS	1 LL	16	0	1.51630	use venezuela LL	3	29	1	1997	10.552
1997	112	U.K.	24 GILL	2	0	0.00051	use spain LL area 24	24	21	4	1997	3940.005
1998	6	CUBA	13 UNCL	7	0	1.04167	use venezuela LL area 3	3	29	1	1998	6.720
1998	29	VENEZUEL	24 GILL	30	0	1.43982	size available	3	29	24	1998	20.836
1998	63	BARBADOS	1 LL	16	0	2.38095	use venezuela LL area 3	3	29	1	1998	6.720
1998	66	IRELAND	1 LL	9	0	0.00332	use spain LL area 24	24	21	1	1998	2713.744
1998	66	IRELAND	23 MWT	4	0	0.00147	use spain LL area 24	24	21	1	1998	2713.744
<b>RERAISED</b>												
1978	5	CHI.TAIP	1 LL	164	154	1.06494						
1978	11	ITALY	14 TRAW	8	21	0.38095						
1978	13	KOREA	1 LL	634	685	0.92555						
1978	18	POLAND	13 UNCL	6	5	1.20000						
1978	19	PORTUGAL	17 BB	17	15	1.13333						
1978	21	ESPANA	14 TRAW	11	9	1.22222						
1978	28	PANAMA	1 LL	76	82	0.92683						
1978	29	VENEZUEL	1 LL	46	47	0.97872						

<i>Year</i>	<i>Flag-code</i>	<i>flag</i>	<i>gear code</i>	<i>Gear</i>	<i>Task 1</i>	<i>C.A.S (mt)</i>	<i>Raising factor</i>
1978	31	MEXICO	13 UNCL	2	1	2.00000	
1980	8	FRANCE	13 UNCL	5	3	1.66667	
1980	35	USSR	1 LL	21	25	0.84000	
1981	6	CUBA	1 LL	227	245	0.92653	
1981	103	NEI2	13 UNCL	12	6	2.00000	
1981	5	CHI.TAIP	1 LL	182	88	2.06818	
1982	5	CHI.TAIP	1 LL	260	123	2.11382	
1982	6	CUBA	1 LL	254	268	0.94776	
1982	12	JAPAN	1 LL	1755	1674	1.04839	
1982	19	PORTUGAL	17 BB	7	5	1.40000	
1982	19	PORTUGAL	13 UNCL	4	2	2.00000	
1982	35	USSR	1 LL	69	73	0.94521	
1983	16	MAROC	1 LL	125	114	1.09649	
1983	41	TRINIDAD	1 LL	21	13	1.61538	
1984	5	CHI.TAIP	1 LL	164	155	1.05806	
1984	13	KOREA	1 LL	32	27	1.18519	
1984	16	MAROC	1 LL	79	73	1.08219	
1985	16	MAROC	1 LL	137	69	1.98551	
1985	19	PORTUGAL	1 LL	15	10	1.50000	
1985	19	PORTUGAL	19 HAND	6	3	2.00000	
1985	41	TRINIDAD	1 LL	6	4	1.50000	
1986	8	FRANCE	13 UNCL	4	2	2.00000	
1986	16	MAROC	1 LL	178	167	1.06587	
1986	16	MAROC	10 TRAP	3	1	3.00000	
1986	19	PORTUGAL	1 LL	448	409	1.09535	
1986	19	PORTUGAL	19 HAND	7	4	1.75000	
1986	35	USSR	1 LL	18	14	1.28571	
1986	41	TRINIDAD	1 LL	45	39	1.15385	
1986	51	LIBERIA	13 UNCL	16	13	1.23077	
1986	103	NEI2	13 UNCL	14	10	1.40000	
1987	13	KOREA	1 LL	60	47	1.27660	
1987	16	MAROC	10 TRAP	5	12	0.41667	
1988	16	MAROC	10 TRAP	1	87	0.01149	
1989	21	ESPANA	24 GILL	949	797	1.19072	
1989	51	LIBERIA	13 UNCL	35	27	1.29630	
1989	73	NEI	1 LL	112	103	1.08738	
1990	5	CHI.TAIP	1 LL	269	286	0.94056	
1990	8	FRANCE	13 UNCL	75	64	1.17188	
1990	16	MAROC	24 GILL	19	17	1.11765	
1990	16	MAROC	6 PS	14	12	1.16667	
1990	16	MAROC	10 TRAP	34	29	1.17241	
1990	16	MAROC	1 LL	24	15	1.60000	
1990	21	ESPANA	24 GILL	646	546	1.18315	
1990	51	LIBERIA	13 UNCL	3	1	3.00000	
1991	16	MAROC	1 LL	92	38	2.42105	
1991	19	PORTUGAL	19 HAND	15	8	1.87500	
1991	53	SENEGAL	19 HAND	6	2	3.00000	
1992	6	CUBA	13 UNCL	27	16	1.68750	
1992	8	FRANCE	13 UNCL	75	55	1.36364	
1992	16	MAROC	6 PS	3	17	0.17647	
1992	16	MAROC	24 GILL	4	18	0.22222	
1992	16	MAROC	10 TRAP	21	18	1.16667	
1992	16	MAROC	1 LL	41	23	1.78261	



<i>Year</i>	<i>Flag-code</i>	<i>flag</i>	<i>gear code</i>	<i>Gear</i>	<i>Task 1</i>	<i>C.A.S (mt)</i>	<i>Raising factor</i>
1992	19	PORTUGAL	1 LL	497	500	0.99400	
1992	21	ESPANA	13 UNCL	316	253	1.24901	
1992	30	GRENADA	13 UNCL	3	27	0.11111	
1992	51	LIBERIA	13 UNCL	7	3	2.33333	
1992	53	SENEGAL	19 HAND	6	3	2.00000	
1992	111	ST.VINC.	13 UNCL	3	2	1.50000	
1993	6	CUBA	13 UNCL	16	13	1.23077	
1993	8	FRANCE	13 UNCL	95	65	1.46154	
1993	13	KOREA	1 LL	19	15	1.26667	
1993	19	PORTUGAL	1 LL	1950	1915	1.01828	
1993	21	ESPANA	13 UNCL	202	156	1.29487	
1993	30	GRENADA	13 UNCL	13	9	1.44444	
1993	41	TRINIDAD	1 LL	11	125	0.08800	
1993	51	LIBERIA	13 UNCL	0	8	0.00000	
1993	111	ST.VINC.	13 UNCL	23	20	1.15000	
1993	112	U.K.	24 GILL	2	5	0.40000	
1994	6	CUBA	13 UNCL	50	43	1.16279	
1994	8	FRANCE	24 GILL	33	25	1.32000	
1994	8	FRANCE	23 MWT	13	9	1.44444	
1994	13	KOREA	1 LL	16	13	1.23077	
1994	19	PORTUGAL	19 HAND	20	14	1.42857	
1994	19	PORTUGAL	13 UNCL	6	3	2.00000	
1994	21	ESPANA	13 UNCL	150	143	1.04895	
1994	51	LIBERIA	13 UNCL	0	20	0.00000	
1994	77	ST.LUCIA	19 HAND	1	6	0.16667	
1995	6	CUBA	13 UNCL	86	72	1.19444	
1995	8	FRANCE	13 UNCL	38	247	0.15385	
1995	8	FRANCE	24 GILL	33	23	1.43478	
1995	8	FRANCE	23 MWT	13	8	1.62500	
1995	13	KOREA	1 LL	16	12	1.33333	
1995	16	MAROC	24 GILL	32	28	1.14286	
1995	16	MAROC	1 LL	28	21	1.33333	
1995	16	MAROC	6 PS	7	5	1.40000	
1995	16	MAROC	10 TRAP	12	7	1.71429	
1995	19	PORTUGAL	6 PS	1	3	0.33333	
1995	19	PORTUGAL	1 LL	1593	1721	0.92562	
1995	21	ESPANA	17 BB	4	1	4.00000	
1995	30	GRENADA	1 LL	1	71	0.01408	
1995	51	LIBERIA	13 UNCL	0	29	0.00000	
1995	112	U.K.	24 GILL	1	3	0.33333	
1996	5	CHI.TAIP	1 LL	521	542	0.96125	
1996	6	CUBA	13 UNCL	7	8	0.87500	
1996	8	FRANCE	13 UNCL	97	266	0.36466	
1996	19	PORTUGAL	1 LL	1702	1657	1.02716	
1996	30	GRENADA	13 UNCL	4	2	2.00000	
1996	41	TRINIDAD	1 LL	158	38	4.15789	
1996	51	LIBERIA	13 UNCL	0	29	0.00000	
1996	66	IRELAND	24 GILL	15	17	0.88235	
1996	111	ST.VINC.	13 UNCL	3	14	0.21429	
1996	112	U.K.	24 GILL	5	6	0.83333	
1997	6	CUBA	13 UNCL	7	44	0.15909	
1997	13	KOREA	1 LL	15	38	0.39474	
1997	29	VENEZUEL	1 LL	11	74	0.14865	

Year	Flag-code	flag	gear code	Gear	Task I	C.A.S (mt)	Raising factor
1997	41	TRINIDAD	1 LL	110	14	7.85714	
1997	51	LIBERIA	13 UNCL	0	29	0.00000	
1997	63	BARBADOS	13 UNCL	0	12	0.00000	
1997	79	SAO TOME	13 UNCL	0	52	0.00000	
1997	154	MADEIRA	1 LL	0	16	0.00000	
1998	16	MAROC	1 LL	0	239	0.00000	
1998	16	MAROC	10 TRAP	2	5	0.40000	
1998	16	MAROC	24 GILL	179	13	13.76923	
1998	19	PORTUGAL	11 SURF	1	6	0.16667	
1998	29	VENEZUEL	1 LL	7	74	0.09459	
1998	41	TRINIDAD	1 LL	130	15	8.66667	
1998	51	LIBERIA	13 UNCL	0	28	0.00000	
1998	63	BARBADOS	13 UNCL	0	12	0.00000	
1998	66	IRELAND	24 GILL	119	27	4.40741	
1998	79	SAO TOME	13 UNCL	0	22	0.00000	
1998	112	U.K.	1 LL	0	29	0.00000	
1998	112	U.K.	24 GILL	0	29	0.00000	
1998	118	CHINA.PR	1 LL	337	264	1.27652	
1998	154	MADEIRA	1 LL	0	7	0.00000	

### Appendix 3. Substitutions and raising for south Atlantic swordfish 1999-2000

CATCH DATA BY FLEET/GEAR				REMARKS	SUBSTITUTIONS/ SIZE DATA USED							
Year	C_C	Flag	C_G	Gear	Task I	Raising Factor	Flag	Gear	Year	Area	S.W. (MT)	
1999	3	BRASIL	1	LL	1942	SIZE available	28.97642	3	2	1999	6	67.02
1999	75	BRAS.ESP	1	LL	2051	use spain LL area 96	0.65540	21	1	1999	6	3129.4
1999	100	BRA.TAI	1	LL	73	use Brazil LL	1.08923	3	2	1999	6	67.02
1999	102	BRA-HON.	1	LL	92	use Brazil LL	1.37272	3	2	1999	6	67.02
1999	135	BRAS.POR	1	LL	14	use Brazil LL	0.20889	3	2	1999	6	67.02
1999	138	BRAS-USA	1	LL	135	Use USA area 96	0.54348	25	4	1999	6	248.4
1999	151	BRAS-PAN	1	LL	103	use Brazil LL	1.53685	3	2	1999	6	67.02
1999	155	BRAS-URU	1	LL	119	use Brazil LL	1.77559	3	2	1999	6	67.02
1999	168	BRAS-STV	1	LL	18	use Brazil LL	0.26858	3	2	1999	6	67.02
1999	169	BRAS-EQG	1	LL	155	use Brazil LL	2.31274	3	2	1999	6	67.02
1999	170	BRAS-BZE	1	LL	19	use Brazil LL	0.28350	3	2	1999	6	67.02
1999	5	CHI.TAIP	1	LL	1168	use Japan II	1.42006	12	1	1999	6	822.5
1999	5	CHI.TAIP	1	LL	1168	use Japan II	1.42006	12	1	1999	7	822.5
1999	12	JAPAN	1	LL	815	C.A.S. Submitted	1.00000	12	1	1999	6,7	
1999	19	PORTUGAL	1	LL	381	use Spain area 97	0.13503	21	1	1999	7	2821.587
1999	20	S.AFRICA	1	LL	76	SIZE available	0.21997	20	1	1999	7	345.506
1999	21	ESPANA	1	LL	5758	C.A.S. Submitted	1.00000	21	1	1999	6	3129.427
1999	21	ESPANA	1	LL	-----	C.A.S. Submitted	1.00000	21	1	1999	7	2821.587
1999	25	USA	1	LL	179	C.A.S. Submitted	0.72034	25	4	1999	6	248.493
1999	25	USA	33	LLD	6	C.A.S. Submitted	0.88132	25	33	1999	6	6.808
1999	27	GHANA	11	SURF	121	SIZE available	0.60028	27	11	1999	7	201.572
1999	28	PANAMA	1	LL	105	Use Japan II	0.12766	12	1	1999	6	822.5
1999	28	PANAMA	1	LL	105	Use Japan II	0.12766	12	1	1999	7	822.5
1999	42	URUGUAY	1	LL	650	Use Uruguay 1998	0.73116	42	1	1998	6	889
1999	50	C.IVOIRE	11	SURF	26	Use Ghana surf 99	0.12899	27	11	1999	7	201.572
1999	51	LIBERIA	13	UNCL	28	Use Ghana surf 99	0.13891	27	11	1999	7	201.572
1999	67	BENIN	24	GILL	3.4	Use Ghana surf 99	0.01687	27	11	1999	7	201.572
1999	79	SAO TOME	13	UNCL	14	Use Ghana surf 99	0.06945	27	11	1999	7	201.572
1999	108	HO-SH-OB	1	LL	8	use Japan II	0.01204	12	1	1999	7	664.7

CATCH DATA BY FLEET/GEAR				REMARKS	SUBSTITUTIONS/ SIZE DATA USED						
1999	113	NAMIBIA	1 LL	374	use Namibia 2001	4.42363	113	1	2001	7	84.546
1999	113	NAMIBIA	17 BB	356	use Namibia 2001	164.73855	113	17	2001	7	2.161
1999	118	CHINA.PR	1 LL	534	use Japan II	0.64924	12	1	1999	6	822.5
1999	118	CHINA.PR	1 LL	534	use Japan II	0.64924	12	1	1999	7	822.5
1999	137	BZ-SH-OB	1 LL	17	use Japan II area 97	0.02558	12	1	1999	7	664.7
1999	166	NEI-166 (Cambodia)	1 LL	6	use Japan II area 97	0.00903	12	1	1999	7	664.7
2000	3	BRASIL	1 LL	2070	SIZE available	14.43413	3	1	2000	6	143.417
2000	75	BRAS.ESP	1 LL	1997	use spain II area 96	0.44797	21	1	2000	6	4457
2000	100	BRA.TAI	1 LL	68.9	use brasil II 2000	0.48042	3	1	2000	6	143.417
2000	102	BRA-HON.	1 LL	102.1	use brasil II 2000	0.71191	3	1	2000	6	143.417
2000	135	BRAS.POR	1 LL	17	use brasil II 2000	0.11854	3	1	2000	6	143.417
2000	138	BRAS-USA	1 LL	59.1	use usa II area 96	0.93933	25	4	2000	6	62.917
2000	151	BRAS-PAN	1 LL	38.4	use brasil II 2000	0.26775	3	1	2000	6	143.417
2000	155	BRAS-URU	1 LL	64.5	use brasil II 2000	0.44974	3	1	2000	6	143.417
2000	168	BRAS-STV	1 LL	31.1	use brasil II 2000	0.21685	3	1	2000	6	143.417
2000	169	BRAS-EQG	1 LL	131.5	use brasil II 2000	0.91691	3	1	2000	6	143.417
2000	5	CHI.TAIP	1 LL	1303	use japan	1.69838	12	1	2000	6	767.2
2000	5	CHI.TAIP	1 LL	1303	use japan	1.69838	12	1	2000	7	767.2
2000	12	JAPAN	1 LL	807	C.A.S. Submitted	1.00000	12	1	2000	6,7	
2000	13	KOREA	1 LL	9.6	use japan	0.01251	12	1	2000	6	767.2
2000	13	KOREA	1 LL	9.6	use japan	0.01251	12	1	2000	7	767.2
2000	19	PORTUGAL	1 LL	391.8	use spain II area 97	0.18849	21	1	2000	7	2078.62
2000	20	S.AFRICA	1 LL	229	use s.africa II 2001	1.10227	20	1	2001	7	207.754
2000	20	S.AFRICA	17 BB	1	use s.africa II 2001	0.00481	20	1	2001	7	207.754
2000	21	ESPANA	1 LL	6388	C.A.S. Submitted	1.00000	21	1	2000	6	4457.024
2000	21	ESPANA	1 LL	----		1.00000	21	1	2000	7	2078.62
2000	25	USA	1 LL	142.4		1.00000	25	4	2000	6	62.918
2000	25	USA	1 LL	-----	C.A.S. Submitted	1.00000	25	4	2000	7	83.045
2000	25	USA	33 LLD	1.4		1.00000	25	33	2000	6	1.4
2000	27	GHANA	11 SURF	116.5	use ghana surf 1999	0.57796	27	11	1999	7	201.572
2000	42	URUGUAY	1 LL	713	Use Uruguay 1998	0.80202	42	1	1998	6	889
2000	50	C.IVOIRE	11 SURF	20	use spain II area 97	0.00962	21	1	2000	7	2078.62
2000	59	FRA-ESP.	6 PS	3.8	use spain II area 97	0.00183	21	1	2000	7	2078.62
2000	113	NAMIBIA	1 LL	451.7	use namibia 2001	5.34265	113	1	2001	7	84.546
2000	113	NAMIBIA	17 BB	17	use namibia 2001	7.86673	113	17	2001	7	2.161
2000	118	CHINA.PR	1 LL	344	use japan	0.44838	12	1	2000	6	767.2
2000	118	CHINA.PR	1 LL	344	use japan	0.44838	12	1	2000	7	767.2
2000	137	BZ-SH-OB	1 LL	8.2	use japan area 97	0.01549	12	1	2000	7	529.4

**Appendix 4. Substitutions and raising south Atlantic swordfish, 1987- 199**

<i>Flag</i>	<i>Gear</i>	<i>Fleet code</i>	<i>Gear code</i>	<i>Year</i>	<i>TASK</i>	<i>1 CAS</i>	<i>Raising Factor</i>	<i>Area</i>	<i>Flag</i>	<i>Gear</i>	<i>Year</i>	<i>Sample wgt.</i>
<b>SUBSTITUTIONS</b>												
KOREA	LL	13	1	1998	7	0	0.06328	use japan ll	6	12	1 1998	110.6
KOREA	LL	13	1	1998	7	0	0.00742	use japan ll	7	12	1 1998	943.3
GHANA	SURF	27	11	1993	121	0	0.04645	use spain ll area 7	7	21	4 1993	2604.9
GHANA	SURF	27	11	1994	51	0	0.01716	use spain ll area 7	7	21	4 1994	2972.1
GHANA	SURF	27	11	1995	103	0	0.02344	use spain ll area 7	7	21	4 1995	4395.1
GHANA	SURF	27	11	1997	44	0	0.01020	use spain ll area 7	7	21	4 1997	4313.9
C.IVOIRE	SURF	50	11	1996	26	0	0.00399	use spain ll area 7	7	21	4 1996	6524.2
C.IVOIRE	SURF	50	11	1997	18	0	0.00417	use spain ll area 7	7	21	4 1997	4313.9
C.IVOIRE	SURF	50	11	1998	25	0	0.00867	use spain ll area 7	7	21	1 1998	2883.7
LIBERIA	UNCL	51	13	1993	14	0	0.00537	use spain ll area 7	7	21	4 1993	2604.9
LIBERIA	UNCL	51	13	1994	26	0	0.00875	use spain ll area 7	7	21	4 1994	2972.1
LIBERIA	UNCL	51	13	1995	28	0	0.00637	use spain ll area 7	7	21	4 1995	4395.1
LIBERIA	UNCL	51	13	1996	28	0	0.00429	use spain ll area 7	7	21	4 1996	6524.2
LIBERIA	UNCL	51	13	1997	28	0	0.00649	use spain ll area 7	7	21	4 1997	4313.9
LIBERIA	UNCL	51	13	1998	28	0	0.00971	use spain ll area 7	7	21	1 1998	2883.7
BENIN	GILL	67	24	1993	28	0	0.01075	use spain ll area 7	7	21	4 1993	2604.9
SAO TOME	UNCL	79	13	1997	14	0	0.00325	use spain ll area 7	7	21	4 1997	4313.9
SAO TOME	UNCL	79	13	1998	14	0	0.00485	use spain ll area 7	7	21	1 1998	2883.7
HO-SH-OB	LL	108	1	1997	5	0	0.00990	use chi-tai ll 97 area 7	7	5	1 1997	504.8
HO-SH-OB	LL	108	1	1998	2	0	0.00177	use chi-tai ll 98 area 7	7	5	1 1998	1127.5
<b>RE-RAISED</b>												
CUBA	LL	6	1	1987	173	163.5	1.05810					
CUBA	UNCL	6	13	1993	192	173.5	1.10663					
KOREA	LL	13	1	1996	7	15.6	0.44872					
ESPANA	LL	21	1	1989	7725	6945.3	1.11226					
ESPANA	LL	21	1	1992	5651	6010.1	0.94025					
GHANA	SURF	27	11	1986	13	16.5	0.78788					
GHANA	SURF	27	11	1989	156	211	0.73934					
GHANA	SURF	27	11	1990	146	235.5	0.61996					
GHANA	SURF	27	11	1991	73	237	0.30802					
GHANA	SURF	27	11	1992	69	232.6	0.29665					
URUGUAY	LL	42	1	1998	889	791	1.12389					
C.IVOIRE	SURF	50	11	1993	14	18.5	0.75676					
C.IVOIRE	SURF	50	11	1994	20	23.5	0.85106					
C.IVOIRE	SURF	50	11	1995	19	23.3	0.81545					
BENIN	GILL	67	24	1997	10.3	23.2	0.44397					
JP-SH-OB	LL	97	1	1994	0	55.6	0.00000					
BRA.TAIW	LL	100	1	1995	542	311	1.74277					
CHINA.PR	LL	118	1	1997	40	30	1.33333					
CHINA.PR	LL	118	1	1998	29	24	1.20833					
CHINA.PR	UNCL	118	13	1993	73	55	1.32727					
CHINA.PR	UNCL	118	13	1994	86	65	1.32308					
CHINA.PR	UNCL	118	13	1995	104	79	1.31646					
CHINA.PR	UNCL	118	13	1996	132	100	1.32000					