

SWORDFISH (XIPHIAS GLADIUS L.) CATCHES COMPOSITION IN ITALIAN DRIFT-NET FISHERY IN 1990

A. Di Natale
 Aquastudio, Via Trapani, 6, Messina, Italy

SUMMARY

A brief report on the swordfish driftnet fishery in Italian western basins (Tyrrhenian and Ligurian Sea) in the year 1990 is herewith presented, with a short description of the new rules adopted by the Italian Government for this fishery.

A preliminary length-class and weight-class analysis has been carried out only on directly measured specimens.

RESUME

Un bref rapport est présenté ici sur la pêche à l'espadon au filet maillant dans les bassins occidentaux italiens (mer Tyrrhénienne et mer Ligure) pendant l'année 1990, ainsi qu'une courte description des nouvelles réglementations adoptées par le gouvernement italien pour cette pêcherie.

Une analyse préliminaire des classes de taille et de poids a été menée exclusivement sur des individus mesurés directement.

RESUMEN

El documento es un breve informe sobre la pesquería con redes de deriva para el pez espada en las cuencas occidentales italianas (mar Tirreno y de Liguria) durante el año 1990 y presenta las nuevas disposiciones del gobierno italiano sobre esta pesquería.

Se ha realizado un análisis preliminar sobre clase de tallas y clase de pesos, si bien únicamente con ejemplares medidos directamente.

THE ITALIAN DRIFT-NET FISHERY IN 1990

The Italian swordfish drift-net fishery, like other foreign drift-net fishery activities, had some interference problems in the past (DI NATALE & MANGANO, 1989; DI NATALE, 1990, DI NATALE *et al.*, 1990b; DI NATALE, in press; FAO, 1990; NOTARBARTOLO DI SCIARA, in press; PODESTA' & MAGNAGHI, in press; SCIALABBA, in press), but a lot of rules have been changed in the last months.

The Italian drift-net fishery in 1990 has been carried out with a different regulation from the past year and the catches have been seriously affected by this situation. A brief history of the last months is here reported, with the purpose to provide more detailed information.

On July 20th, 1989, a decree by the Ministry of Merchant Marine established a temporary ban of drift-nets from October 1, 1989; a successive decree (D.M. 25/10/89) defined the temporary ban of drift-nets from October 1 to March 30, 1990, in which period a new regulation of this fishery activity should be enforced.

On October 11, 1989, the Minister of Merchant Marine assigned three research projects on drift-net (law no. 41/82): the first (carried out by the ICRAP in Rome) was on technological methods to be adopted to reduce the impact on protected species and interference on navigation; the second (carried out by the IRPEM-CNR in Ancona) was on active and passive compulsory marking of the net to avoid entanglement of dolphins; a third research (carried out by AQUASTUDIO in Messina) was on a direct control of the fishery, with an observers programme, sampling on board and at landing points, with the purpose to obtain a drift-net general impact analysis (also under a socio-economic point of view).

The great number of Italian drift-net boats of various size (a fleet of over 900) started the 1990 fishery season on April 1, after the decree of the Ministry of Merchant Marine (D.M. 25/10/89), after freezing the number of licences at 1989 level.

Another decree (D.M. 30/3/90) established new rules for the fishery, regulating the gear (minimum mesh size of 320 mm for swordfish, maximum depth of 35 m, and

maximum length of 2.8 km for coastal fishing and 9.3 km for offshore fishing, minimum distance of 1.5 miles between each set, net-free passages (having a width from 1 to 2 miles) in front of the harbours, minimum distance from the coast for setting coastal drift-nets (900 m. in April May, June and September; 3 miles in July and August), light marking of the net, buoys with the name of the boat, etc.). Fishing boats were also obliged to carry scientific observers on board.

On June 22, 1990, the judge of Imperia (Ligurian Sea) banned the drift-net fishery activity in the area, because it has been considered as a potential hazard for protected species (whales and dolphins); on July 3, the Court of Imperia rejected the decision of the judge and driftnetting started again on the same day.

On July 18, 1990, the Ministry of Merchant Marine suspended the Italian driftnetting activity till July 28, after a sentence of the Regional Administrative Court of Lazio (TAR, July 10, 1990) in which it was concluded that the use of swordfish and albacore drift-nets was illegal, because the gear is non-selective.

With two other different decrees, on July 18, the Ministry of Merchant Marine banned driftnetting in the Ligurian Sea to protect cetacean stock in this area, creating an offshore sanctuary; at the same time, a strictly controlled scientific drift-net activity was allowed for 18 boats based in the Ligurian Sea, under the control of the Harbour Police and the scientific supervision of Aquastudio.

On July 28, the State Council confirmed the decision of the TAR and, consequently, the Ministry of Merchant Marine, with a new decree on July 30, banned albacore and swordfish driftnetting activity (including scientific driftnetting).

As a matter of fact, Italian swordfish driftnetting activity in 1990 has been carried out for less than 60 days (exact data are still to be calculated).

METHODS

Continuous sampling has been carried out in three different areas: southern Tyrrhenian Sea, central Tyrrhenian Sea and Ligurian Sea; sampling points have been established in selected landing harbours: S. Agata Militello, Milazzo and Lipari in the southern Tyrrhenian Sea, the isle of Ponza in the central Tyrrhenian Sea, Imperia and Chiavari in the Ligurian Sea.

Swordfishes have been measured (LJFL and UJFL) and weighted (GW) at landing, but sometimes it was possible to collect only one parameter (weight or length) for a variable percentage of catches.

Sampling on board of several fishing vessels has been carried out by observers; in such cases, all the collected data were complete.

Offshore drift-nets sampled in the area had various mesh sizes, from 42 to 36 cm, with a depth between 28 and 32 m; other parameters are still to be processed.

Flexible metallic meters and commercial platform scales have been used for sampling; data have been reported on several different special forms prepared by Aquastudio, stored in a computer data bank based on Apple Macintosh system network and processed by Word 4.0, Excel 2.2, and Cricket Graph software.

LENGTH FREQUENCY

Length frequency (LJFL) distribution of swordfish (*Xiphias gladius* Linnaeus) are shown in Figures 1 to 4 and in Table I, for all the catches obtained by Italian drift-net fleet in the western basins during 1990 fishery season.

Peaks occurred at 120 cm in the southern Tyrrhenian Sea, at 110, 120 and 125 cm in the central Tyrrhenian Sea and at 120 cm in the Ligurian Sea. The peak in the western basins area (Tyrrhenian and Ligurian Sea together) occurs at 120 cm.

The shape of the graphs of the distribution has not varied much in the different areas; only in the central Tyrrhenian Sea the graph shows a more concentrated frequency around 120 cm, but it could be due to the reduced number of specimens in the sample.

Measured mean lengths are as follows:

Area	s. Tyrrhenian	c. Tyrrhenian	Ligurian Sea	western basins
No. in sample	534	121	187	842
mean length	122.7	124.6	118.9	122.1

Mean length in the southern Tyrrhenian Sea is not so far from the mean length (123.8 cm) reported in 1989 for catches obtained by all the gears in the same area and it is quite more close to the mean length (122.9 cm) obtained in 1988 (DI NATALE, in press).

WEIGHT FREQUENCY

Weight (GW) frequency distribution of swordfish is shown in Figures 5 to 8 and in Table II, for all the catches obtained by Italian drift-net fleet in the western basins during 1990 fishery season.

The total number of weighted specimens in the sample is higher than in the length sample, because it was much easier to obtain single weights at the landing points and from the wholesalers, instead of the length, which requires much more time to be measured and which could cause a certain hindrance to the fishermen.

Peaks occurred between 20 and 24.9 kg in the southern Tyrrhenian Sea and in the central Tyrrhenian Sea, between 15 and 19.9 kg in the Ligurian Sea and, consequently, between 20 and 24.9 kg in the western basins.

The shape of the graphs of the distribution has not varied much in the different areas; only in the Ligurian Sea the graph shows a more concentrated frequency and a high number of juvenile specimens, but the shape of the graph could be affected by the reduced number of specimens in the sample.

Mean weights are as follows:

Area	s. Tyrrhenian	c. Tyrrhenian	Ligurian Sea	western basins
No. in sample	466	1152	179	1797
mean weight	26.1	26.7	24.3	26.3

CONCLUSIONS

The Italian drift-net fishery in 1990 has been seriously affected by the troubles in establishing new rules and by the banning of swordfish and albacore drift-nets as a consequence of the enforcement of the Berne Convention, even if the last GFCM Expert Consultation tried to suggest a more strict regulation of the fishing effort instead of an indiscriminate moratoria on the use of drift-nets (FAO/GFCM-ICCAT, in press), which could cause heavy socio-economic repercussions and an increase in the fishing effort for swordfish with the long-line.

The total amount of Italian drift-net catches is still to be estimated on the ongoing research carried out by Aquastudio (with the grant of Ministry of Merchant Marine) and a better information on the stock composition will be available in the next months, after a complete processing of the collected data.

Anyway, length frequency and weight frequency analysis clearly shows a fishing effort concentrated on the first three year classes, with a very low percentage of bigger specimens, which could be valued as a first alarm of oncoming overfishing in the area.

The strong reduction of drift-net effort in 1990 (just during the spawning season) should have a certain positive effect on the swordfish stock, which might be partially depleted by a notable increase in the fishing effort with long-line (with an increased number of juvenile swordfish catches).

ACKNOWLEDGMENTS

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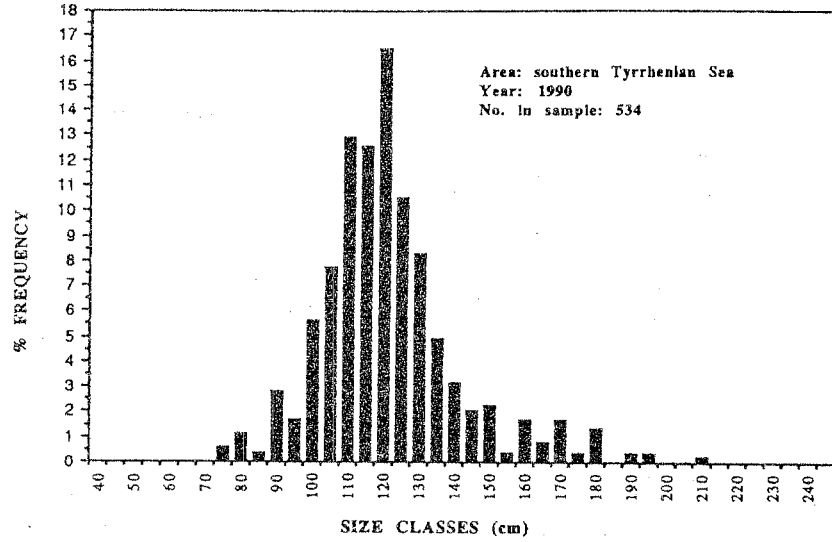


Fig. 1 - Length frequency distribution of swordfish catches in Italian drift-net fishery in the southern Tyrrhenian Sea in 1990

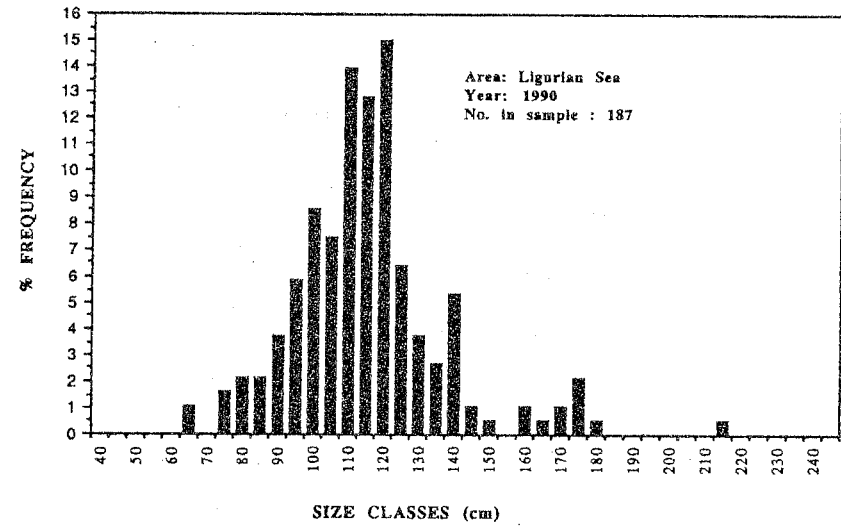


Fig. 3 - Length frequency distribution of swordfish catches in Italian drift-net fishery in the Ligurian Sea in 1990

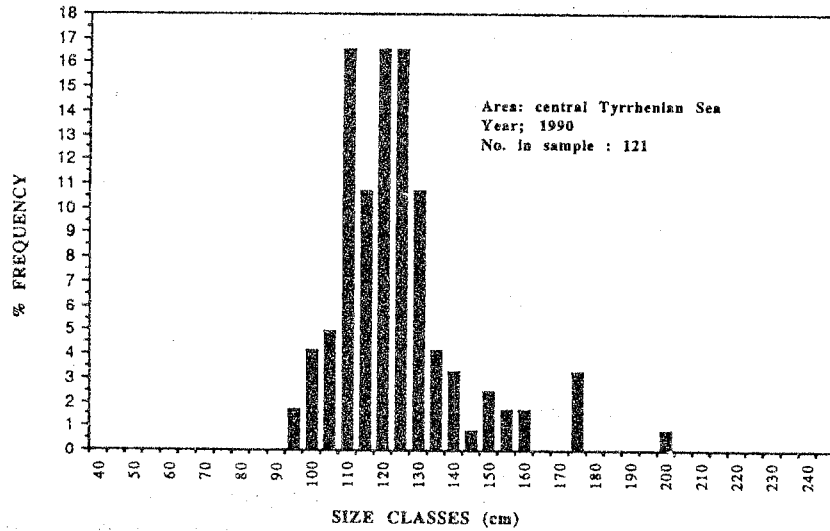


Fig. 2 - Length frequency distribution of swordfish catches in Italian drift-net fishery in the central Tyrrhenian Sea in 1990

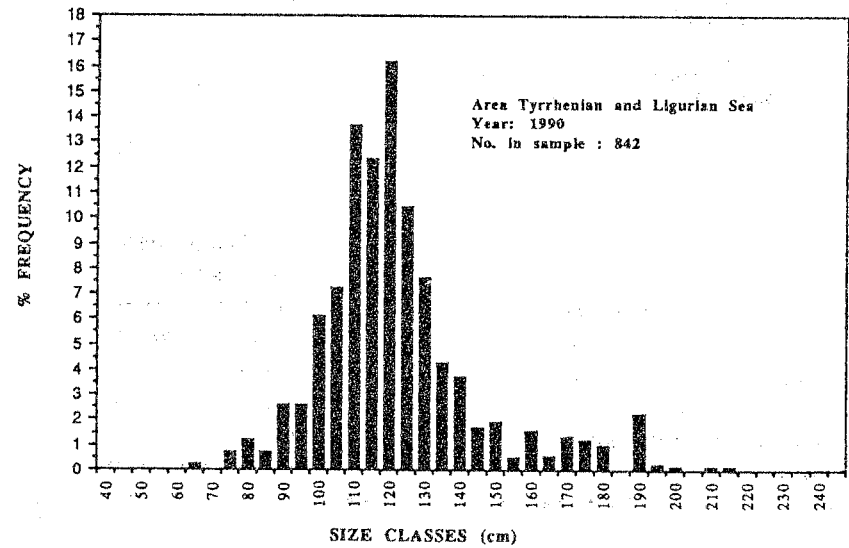


Fig. 4 - Length frequency distribution of swordfish catches in Italian drift-net fishery in the Tyrrhenian and Ligurian Sea in 1990

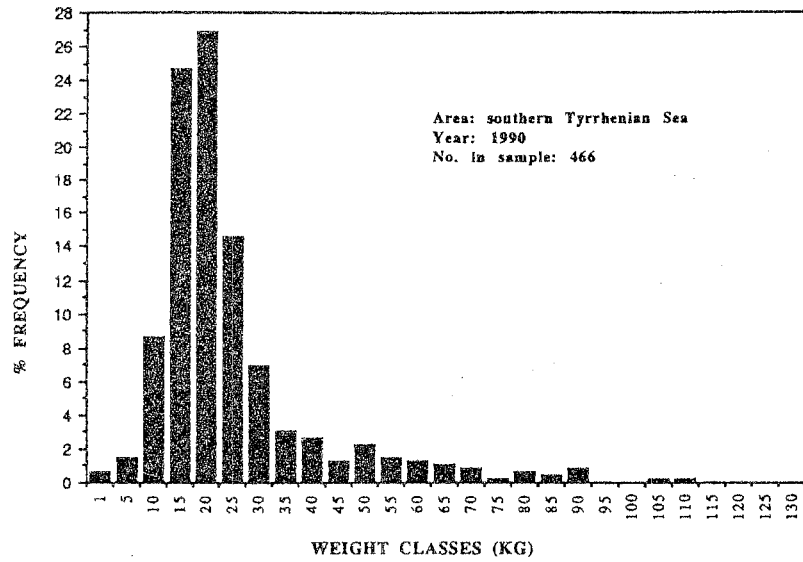


Fig. 5 - Weight frequency distribution of swordfish catches in Italian drift-net fishery in 1990 (southern Tyrrhenian Sea).

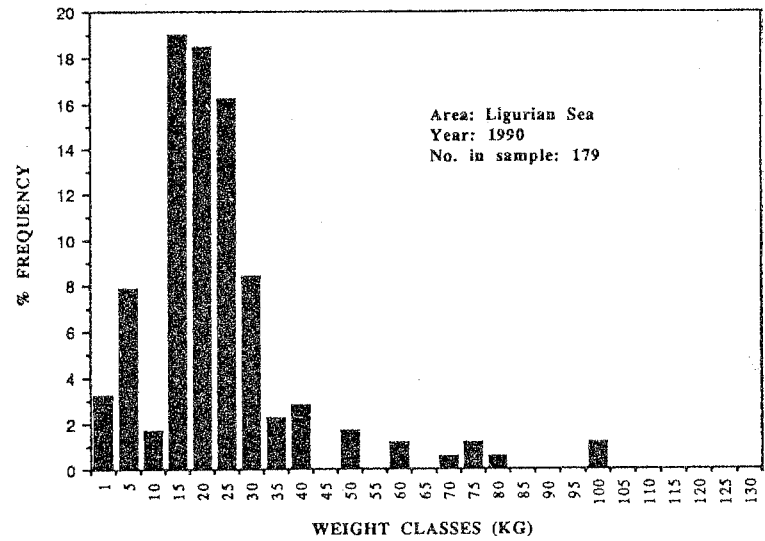


Fig. 7 - Weight frequency distribution of swordfish catches in Italian drift-net fishery in 1990 (Ligurian Sea)

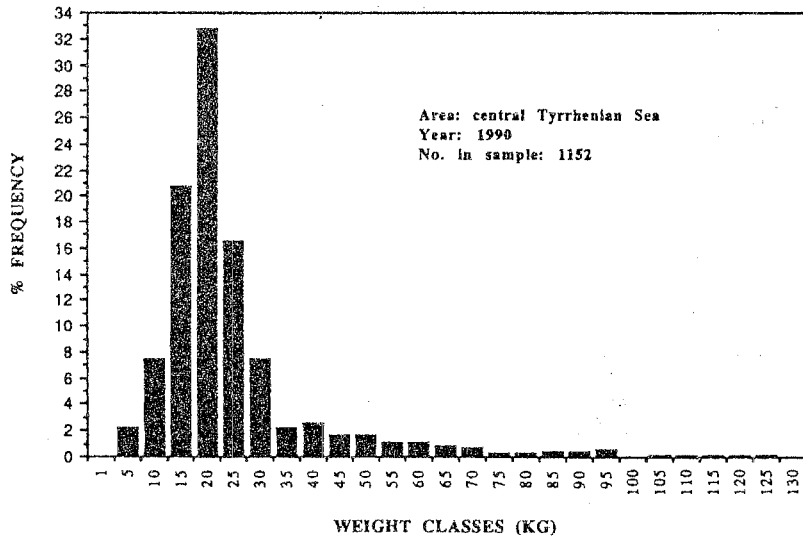


Fig. 6 - Weight frequency distribution of swordfish catches in Italian drift-net fishery in 1990 (central Tyrrhenian Sea)

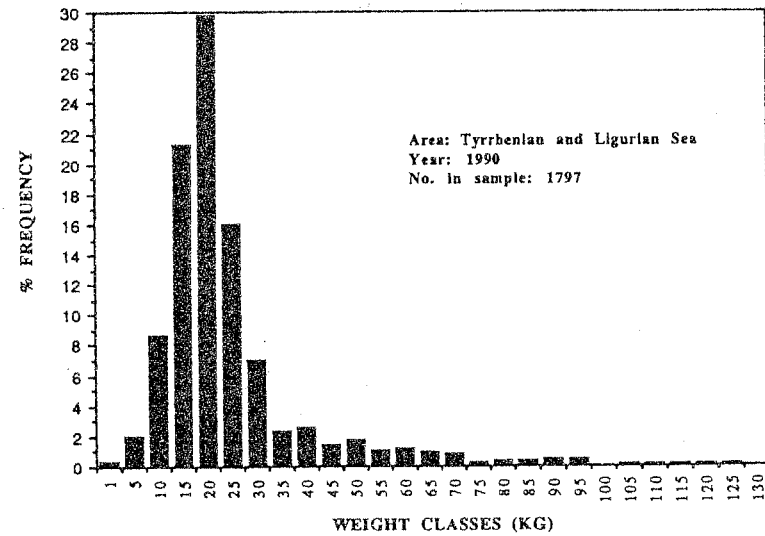


Fig. 8 - Weight frequency distribution of swordfish catches in Italian drift-net fishery in 1990 (Tyrrhenian Sea and Ligurian Sea)

Table I - Length frequency classes of swordfish (*Xiphias gladius*) catches in Italian drift-net fishery in 1990.

AREA: western Italian basin (Mediterranean) BIL 95
 SPECIES: SWORDFISH (*Xiphias gladius*) SWO
 GEAR: surface drif net GILL

LENGTH CLASSES cm	SOUTHERN TYRRHENIAN		CENTRAL TYRRHENIAN		LIGURIAN SEA		TOTAL 1990	
	no.	%	no.	%	no.	%	no.	%
40-44,9	0	0	0	0	0	0	0	0
45-49,9	0	0	0	0	0	0	0	0
50-54,9	0	0	0	0	0	0	0	0
55-59,9	0	0	0	0	0	0	0	0
60-64,9	0	0	0	0	0	0	0	0
65-69,9	0	0	0	0	2	1,07	2	0,24
70-74,9	0	0	0	0	0	0	0	0
75-79,9	3	0,56	0	0	3	1,60	6	0,71
80-84,9	6	1,12	0	0	4	2,14	10	1,19
85-89,9	2	0,37	0	0	4	3,74	6	0,71
90-94,9	15	2,81	0	0	7	3,76	22	2,61
95-99,9	9	1,68	2	1,65	11	5,88	22	2,61
100-104,9	30	5,62	5	4,13	16	8,56	51	6,06
105-109,9	41	7,68	6	4,96	14	7,49	61	7,24
110-114,9	69	12,92	20	16,53	26	13,90	115	13,66
115-119,9	67	12,55	13	10,74	24	12,83	104	12,35
120-124,9	88	16,48	20	16,53	28	14,97	136	16,15
125-129,9	56	10,49	20	16,53	12	6,42	88	10,45
130-134,9	44	8,24	13	10,74	7	3,74	64	7,60
135-139,9	26	4,87	5	4,13	5	2,67	36	4,28
140-144,9	17	3,18	4	3,31	10	5,35	31	3,68
145-149,9	11	2,06	1	0,83	2	1,07	14	1,66
150-154,9	12	2,25	3	2,48	1	0,53	16	1,90
155-159,9	2	0,37	2	1,65	0	0	4	0,48
160-164,9	9	1,68	2	1,65	2	1,07	13	1,54
165-169,9	4	0,75	0	0	1	0,53	5	0,59
170-174,9	9	1,68	0	0	2	1,07	11	1,31
175-179,9	2	0,37	4	3,31	4	2,14	10	1,19
180-184,9	7	1,31	0	0	1	0,53	8	0,96
185-189,9	0	0	0	0	0	0	0	0
190-194,9	2	0,37	0	0	0	0	2	0,24
195-199,9	2	0,37	0	0	0	0	2	0,24
200-204,9	0	0	1	0,83	0	0	1	0,12
205-209,9	0	0	0	0	0	0	0	0
210-214,9	1	0,19	0	0	0	0	1	0,12
215-219,9	0	0	0	0	1	0,53	1	0,12
220-224,9	0	0	0	0	0	0	0	0
225-229,9	0	0	0	0	0	0	0	0
230-234,9	0	0	0	0	0	0	0	0
235-239,9	0	0	0	0	0	0	0	0
240-244,9	0	0	0	0	0	0	0	0
245-249,9	0	0	0	0	0	0	0	0
total no.	534		121		187		842	

Table II - Weight frequency classes of swordfish (*Xiphias gladius*) catches in Italian drift-net fishery in 1990.

AREA: western Italian basin (Mediterranean) BIL 95
 SPECIES: SWORDFISH (*Xiphias gladius*) SWD
 GEAR: surface drif net GILL

WEIGHT CLASSES kg	SOUTHERN TYRRHENIAN		CENTRAL TYRRHENIAN		LIGURIAN SEA		TOTAL 1990	
	no.	%	no.	%	no.	%	no.	%
0,1-4,9	3	0,64	0	0	4	3,24	7	0,39
5,0-9,9	7	1,50	14	2,22	14	7,82	35	1,95
10,0-14,9	40	8,58	85	7,39	30	1,68	155	8,63
15,0-19,9	115	24,68	239	20,75	34	18,99	388	21,59
20,0-24,9	125	26,82	377	32,73	33	18,44	535	29,77
25,0-29,9	68	14,59	191	16,58	29	16,20	288	16,03
30,0-34,9	32	6,87	86	7,47	15	8,38	133	7,40
35,0-39,9	14	3,00	25	2,17	4	2,23	43	2,39
40,0-44,9	12	2,58	29	2,52	5	2,79	46	2,56
45,0-49,9	6	1,29	19	1,65	0	0	25	1,39
50,0-54,9	10	2,15	18	1,56	3	1,68	31	1,73
55,0-59,9	7	1,50	12	1,04	0	0	19	1,06
60,0-64,9	6	1,29	12	1,04	2	1,12	20	1,11
65,0-69,9	5	1,07	10	0,87	1	0,56	16	0,89
70,0-74,9	4	0,86	8	0,69	2	1,12	14	0,78
75,0-79,9	1	0,21	3	0,26	1	0,56	5	0,28
80,0-84,9	3	0,64	3	0,26	0	0	6	0,33
85,0-89,9	2	0,43	4	0,35	0	0	6	0,33
90,0-94,9	4	0,86	5	0,43	0	0	9	0,50
95,0-99,9	0	0	6	0,52	2	1,12	8	0,45
100,0-104,9	0	0	0	0	0	0	0	0
105,0-109,9	1	0,21	1	0,09	0	0	2	0,11
110,0-114,9	1	0,21	1	0,09	0	0	2	0,11
115,0-119,9	0	0	1	0,09	0	0	1	0,06
120,0-124,9	0	0	1	0,09	0	0	1	0,06
125,0-129,9	0	0	2	0,17	0	0	2	0,11
130,0-134,9	0	0	0	0	0	0	0	0
135,0-139,9	0	0	0	0	0	0	0	0
140,0-144,9	0	0	0	0	0	0	0	0
145,0-149,9	0	0	0	0	0	0	0	0
150,0-154,9	0	0	0	0	0	0	0	0
155,0-159,9	0	0	0	0	0	0	0	0
160,0-164,9	0	0	0	0	0	0	0	0
165,0-169,9	0	0	0	0	0	0	0	0
170,0-174,9	0	0	0	0	0	0	0	0
175,0-179,9	0	0	0	0	0	0	0	0
180,0-184,9	0	0	0	0	0	0	0	0
185,0-189,9	0	0	0	0	0	0	0	0
190,0-194,9	0	0	0	0	0	0	0	0
195,0-199,9	0	0	0	0	0	0	0	0
200,0-204,9	0	0	0	0	0	0	0	0
205,0-209,9	0	0	0	0	0	0	0	0
total no.	466		1152		179		1797	