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SCIENTIFIC COUNCIL MEETING – JUNE 2006**Spanish Research Report for 2005**

by

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All effort and catch information in this Report are based on information from NAFO observers on board. In 2005 information from 3 806 days was available while total effort of the Spanish fleet in NAFO Regulatory Area was 4 015 days (95 % coverage). Estimates from NAFO observers of Spanish catches by species and Division in 2005 are presented in Table 1. The split by species of grenadiers and wol fishes were calculated based upon the percentage observed by the IEO scientific observers and in the survey information (EU Flemish Cap, Spanish 3NO and 3L surveys), respectively.

In addition to NAFO observers, IEO scientific observers were on board. All length, age and biological information presented in this paper is based on sampling carried out by IEO observers: in 2005, more than 680 samples were taken, with more the 110 000 individuals of different species examined

SUBAREA 1 and 2**A. Status of the Fisheries**

A total of 10 Spanish pelagic trawlers operated in NAFO Subarea 1 and 2 (Div. 1F and 2J) during 2005, amounting 124 days of fishing effort which part of them was carried out within the EEZ of Greenland. Catches in Div. 1F and 2J were 1005 tons of pelagic red fish (*Sebastes mentella*). Table 2 shows effort and catches by quarter and Division for this fishery.

More complete information about this fishery can be found in ICES North-Western Working Group Reports

B. Research Studies

Experimental fishing was carried out with one commercial Spanish pelagic trawler vessel from May to October in 2005 in Greenland waters of both NAFO (Div. 1 DEF) and ICES (Div. XII and XIV). The main objective was to study the pelagic *Sebastes mentella* distribution inside Greenland territorial waters. During the experimental fishing a scientific observer was on board, with the task of collecting catch and effort data by haul and taking length distribution samples of the main species in the catches.

The main results of the experimental fishing are the following. Total catches were 384 tons, of which 98% were pelagic *Sebastes mentella*. In the study area this species is more abundant in the third quarter of the year and is specially concentrated in strata of less than 500 meters of depth. The spatial distributions are different between the depth strata. In deeper strata the geographical distribution of this species is wider than in strata less than 500 meters deep. Length distributions differ between Divisions, increasing from North west to North east. The female sex ratio obtained in the experimental fishing shows a certain decreasing trend from North west to North east of Greenland.

More complete information about this experimental fishing is available in ICES NWWG Working Paper No. 14.

SUBAREA 3

A. Status of the Fisheries

A total of 29 Spanish trawlers operated in NAFO Regulatory Area, Div. 3LMNO, during 2005, amounting to 3 837 days (63 237 hours) of fishing effort. This implies a decrease in 2005 of 25 % compared to 2004 and a decrease of 45% compared to 2003. Total catches (Table 1) for all species combined in Div. 3LMNO were 18 855 tons in 2005, compared to 23 371 tons in 2004.

In 2005 we had catch and effort information from 3 628 days while total effort was 3837 days (95% coverage). Table 3 shows the effort (hours) by quarter and Division and the total effort in days, catch information and percentage by quarter of the effort where catch information was available. Table 4 presents the percentage of the effort by Division and mesh size.

These tables show that the Spanish fleet in NAFO Subarea 3 has three different fisheries characterized by different mesh size, target species, depth and fishing area. The Spanish fleet effort in NAFO area is mainly directed to Greenland halibut (mainly in Div. 3LM), alternating with the skate fishery in the second half of the year (Div. 3NO), shrimp fishery (Div. 3LM), and redfish (Div. 3NO). In Div. 3L, most of the effort was performed using cod-end mesh size of 135 mm, indicating that the fleet targeted Greenland halibut. In the first half of the year a small part of the effort was directed to the shrimp fishery. Regarding Div. 3M, most of the effort was carried out using 135 mm cod-end mesh size, targeting Greenland halibut, and the fishing effort carried out using 40 mm cod-end mesh size was directed to the shrimp fishery. In this fishery, by-catch yield of redfish was 3.8 kg/h and of Greenland halibut 0.01 Kg/h. In Div. 3LM effort decreased substantially in the fourth quarter of 2005, due to the Greenland halibut fishery being closed to the Spanish fleet. In Div. 3N and during the first half of the year, fishing was performed using 135 mm cod-end mesh size, which indicates that the fleet targeted Greenland halibut. However, since July a part of the fleet using 280 mm mesh size moved to depths of less than 200 m, where the skate fishery took place. Fishing effort in Div. 3O was limited (4%) and targeted redfish, using mainly 135 mm mesh size.

In addition to NAFO observers (NAFO Scientific Observers Program), 10 IEO scientific observers were onboard vessels, comprising a total of 613 observed fishing days, around 15% coverage of the total effort. Besides recording catches, discards, and effort, these observers carried out biological sampling of the main species taken in the catch. This includes recording weight at length, sex-ratio, maturity stages, performing stomach contents analyses, and collecting material for reproductive studies about Greenland halibut, roughhead grenadier and American plaice. Otoliths of these three species were also taken for age determination. Length and age distributions presented in this paper are based on sampling carried out by these observers. Parameters used for the length-weight relationships are shown by species in Table 5.

Cod (Div. 3NO; Div. 3M)

Main catches of this species were taken as by-catch in the Greenland halibut fishery and skate fishery in Div. 3N. Very few catches were taken in Div. 3L and 3O. In Div. 3M there was no catch in 2005.

There are only one length distribution samplings in Div. 3N with a few measured fish. Table 6 shows the results.

Redfish (Div. 3LN; Div. 3M; Div. 3O)

Most of the catches in Div. 3LN and 3M were taken as by-catch in the Greenland halibut fishery. In Div. 3M a small part of the catches were taken as by-catch in the Shrimp fishery. A directed fishery for this species took place in Div. 3O in the second half of this year. Catches have reached 2174 ton in this Division. The great increase in catches with respect to earlier years can be explained by the increase of effort directed to redfish in Div. 3O as a consequence of the closure of the Greenland halibut fishery to the Spanish fleet in the fourth quarter.

Length distribution for Div. 3LN are shown in Table 7, those for Div. 3M and 3O are presented in Table 8 and Table 9, respectively.

American plaice (Div. 3LNO; Div. 3M)

Most catches were taken in Div. 3LNO as by-catch of the Greenland halibut and skate fisheries. Catches in Div. 3M only amounted 36 tons and were taken as by-catch of the Greenland halibut fishery. Only two length distribution samples were available.

Length distributions for Div. 3M and 3LNO are presented in Tables 10 and 11, respectively.

Witch flounder (Div. 2J and 3KL; Div. 3NO; Div. 3M)

This species is taken as by-catch in the Greenland halibut fishery. Length distribution for Div. 3NO are shown in Table 12. This year there were two length distribution samples in Div. 3M.

Yellowtail flounder (Div. 3LNO)

Most of the catches were taken in Div. 3N, as by-catch in the skate fishery. Catches length distributions for Div. 3NO are presented in Table 13, all samples were taken in Div. 3N.

Greenland halibut (Subareas 2 and 3)

Greenland halibut is the main target species of the Spanish fleet in NAFO area, with most of the catches taken in the Flemish Pass area (Div. 3LM). The mesh size used for this fishery was equal to or greater than 135 mm. Tables 14, 15 and 16 show length distributions of Spanish total catches by Division. Total age composition, mean weight and mean length at age for Div. 3LMNO are presented in Table 17. Most of the Greenland halibut catches correspond to ages 4 to 8, this range is similar to those in previous years.

Thorny skate (Div. 3LNO; Div. 3M)

Catches comprise many species of skate, thus the catch of skate in Table 6 refers to *Raja spp.* The percentages of different skate species observed during the 2005 Spanish survey in Div. 3NO and the Flemish Cap survey, as well as those calculated from the Spanish scientific observers information in Div. 3LMNO, are presented in Table 18.

Most of the catches were taken in Div. 3N at depths of less than 200 meters, where a fishery directed to thorny skate took place mainly in the second semester of the year, using 280 mm mesh size. Skate catches in Div. 3LM were smaller than those in Div. 3NO and they were by-catch of the Greenland halibut fishery (135 mm cod-end).

Length distributions of Spanish catches by Division are presented in Table 19. Table 20 shows the total catches length distributions of Div. 3LNO.

Roughhead grenadier (Subarea 2 and 3)

Roughhead grenadier is the main species taken as by-catch in the Greenland halibut fishery, and most of the 2005 catches were taken in Div. 3LM. Table 21 shows length distributions of Spanish total catch by Division and Table 22 length distributions of Spanish total catch. Age distributions, mean weight and mean length at age of the total catch for Div. 3LMNO are presented in Table 23. Most of the Roughhead grenadier catches in 2005 are based on ages 6 to 13.

White hake (Div. 3LMNO)

Catches have decreased in 2005 compared to 2004 and are now in the same level as before 2000. Catches of this species in 2005 are by-catch of different fisheries. In Div. 3LM they are by-catch of the Greenland halibut fishery and by-catch of the redfish fishery in Div. 3O. There are no length samplings this year.

B. Research Studies

The Spanish bottom trawl survey in NAFO Regulatory area Div. 3NO was conducted in June 2005 on board R/V *Vizconde de Eza* using Campelen gear with a stratified design. A total of 122 hauls were carried out up to a depth of

1 450 m, two of which were nulls. The results of the Spanish 3NO bottom trawl survey for all the period studied (1995-2005), including biomass indices with their errors and length distributions, as well as the calculated biomass based on conversion of length frequencies are presented in SCR Doc. 06/12, SCR Doc. 06/13 and SCR Doc. 06/14 for Greenland halibut and American plaice; Atlantic cod and yellowtail flounder; Thorny skate, white hake and roughhead grenadier.

Feeding studies on the main species continued to be conducted and SCR 06/ presents the results of these studies for the period 2002-2005.

The EU bottom trawl survey in Flemish Cap (Div. 3M) was carried out on board R/V *Vizconde de Eza* using the usual survey gear (Lofoten) from July 1st to August 21st 2005. The area surveyed was Flemish Cap Bank to depths up to 800 fathoms (1 400 m) following the same procedure as in previous years. The number of hauls was 180 and four of them were nulls. Survey results including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice and Greenland halibut are presented in SCR Doc. 06/16. For shrimp some errors were found in the catches recorded in the EU survey last year and, therefore, they were corrected and presented in the previous SCR Document. The roughhead grenadier of Flemish Cap survey are presented in SCR Doc. 06/7.

Feeding studies on the main species continued to be performed, and samples for histological assessment of sexual maturity of cod, redfish, Greenland halibut and Roughhead grenadier were also taken.

Oceanography studies continued to take place. The sampling plan changed last year, going of a sampling plan by fishing to a sampling plan by grill.

SUBAREA 6

A. Status of the Fisheries

A total of 3 Spanish trawlers operated in NAFO Subarea 6, Div. 6G and 6H, in 2005, amounting to 29 days of fishing effort. Most of this effort (26 days) was carried out by one vessel in January in Div. 6G. The most important species in the catches were *Beryx spp.*, *Polyprion americanus* and *Aphanopus carbo* in this order. There were not scientific observer on board and, therefore, biological sampling was not available.

REFERENCES

- ICES NWWG Report. 2006. ICES Advisory Committee on Fishery Management. *ICES C.M. Doc.*, No. 2006/ACFM:26
- Casas, J. M., J. L. del Río, J. Teruel, and A. Alonso. 2005. Northern shrimp (*Pandalus borealis*) on Flemish Cap Survey 2005. *NAFO SCR Doc.*, No. 78.
- F. González, J. L. del Rio, and A. Gago. Results of the 2005 Spanish Experimental Fishing in Greenland Waters. *ICES 2006 NWWG Working Doc.*, No. 14.
- González-Troncoso, D., E. Román, and X. Paz. 2006. Results for Greenland halibut and American plaice of the Spanish survey in NAFO Div. 3NO: biomass, length distribution and age distribution for the period 1997-2005. *NAFO SCR Doc.*, No. 12, Serial No. N5227, 44 p.
- González-Troncoso, D., C. González, and X. Paz. 2006. Atlantic cod and Yellowtail flounder indices from the Spanish Survey conducted in Divisions 3NO of the NAFO Regulatory Area. *NAFO SCR Doc.*, No.13, Serial No. N5228, 31 p.
- González-Troncoso, D., F. González, and X. Paz. 2006. Biomass and length distribution for Roughhead grenadier, Thorny skate and White hake from the surveys conducted by Spain in NAFO 3NO. *NAFO SCR Doc.*, No.14, Serial No. N5229, 42 p.

González Troncoso, D., J. M. Casas, and F. Saborido-Rey. 2006. Results from Bottom Trawl Survey on Flemish Cap of July-August 2005. *NAFO SCR Doc.*, No. 16, Serial No. N5231, 40 p.

González, C., X. Paz, E. Roman, and M. Hermida. 2006. Feeding Habits of Fish Species Distributed on the Grand Bank (NAFO Div. 3NO, 2002-2005). *NAFO SCR Doc.*, No. 31, Serial No. N5251, 21 p.

Murua, H., and F. Gonzalez. 2006. A Review on Roughhead Grenadier (*Macrourus berglax*) Biology and Population Structure on Flemish Cap (NAFO Div. 3M), 1991-2005 based on EU Flemish Cap Bottom Survey Data. *NAFO SCR Doc.*, No. 7, Serial No. N5219, 18 p.

Table 1. Spanish Catches (ton) in NAFO Area in 2005 by Division, based on NAFO Observers information.

Code	English name	Scientific name	Division							Total	
			1F	2J	3L	3M	3N	3O	6G		6H
GHL	Greenland halibut	<i>Reinhardtius hippoglossoides</i>			3377	1552	709	8			5645
SKA	Raja rays nei	<i>Raja</i> spp			348	316	2985	138			3788
RED	Atlantic redfishes nei	<i>Sebastes</i> spp			148	538	82	2174	5	2	2950
RHG	Roughhead grenadier	<i>Macrourus berglax</i>			815	881	233	9			1938
BYS	Splendid alfonso	<i>Beryx</i> spp							1187	0	1187
REB	Beaked redfish	<i>Sebastes mentella</i>	961	44							1005
PRA	Northern prawn	<i>Pandalus borealis</i>			145	725	0	0			869
RNG	Roundnose grenadier	<i>Coryphaenoides rupestris</i>			333	278	169	3			782
HKR	Red hake	<i>Urophycis chuss</i>			342	256	62	2			662
PLA	American plaice	<i>Hippoglossoides platessoides</i>			136	36	219	55			447
WIT	Witch flounder	<i>Glyptocephalus cynoglossus</i>			140	166	90	35			431
HKW	White hake	<i>Urophycis tenuis</i>			29	111	18	95			253
DGX	Dogfish sharks nei	Squalidae			117	39	81	4	0		251
CAB	Northern wolffish	<i>Anarhichas denticulatus</i>			86	135	7	0			228
YEL	Yellowtail flounder	<i>Limanda ferruginea</i>			12		136	28			177
CAA	Atlantic wolffish	<i>Anarhichas lupus</i>			57	6	36	2			101
COD	Atlantic cod	<i>Gadus morhua</i>			0		48	9			58
GRO	Groundfishes nei	Osteichthyes			14	25	15	1	0		55
HAL	Atlantic halibut	<i>Hippoglossus hippoglossus</i>			12	3	31	4			50
GSK	Greenland shark	<i>Somniosus microcephalus</i>			23	11	5				40
CAS	Spotted wolffish	<i>Anarhichas minor</i>			27	4	2	0			34
WRF	Wreckfish	<i>Polyprion americanus</i>							26		26
ANT	Blue antimora	<i>Antimora rostrata</i>			12	7	2				20
JEL	Jellyfishes	<i>Rhopilema</i> spp	6	12	0	0	0	0			18
NZB	Marlin-spike grenadier	<i>Nezumia bairdi</i>			9	2	5				17
INV	Aquatic invertebrates nei	Invertebrata			1	0	11	0			12
BSF	Black scabbardfish	<i>Aphanopus carbo</i>			0	0			9	1	10
ANG	American angler	<i>Lophius americanus</i>			0	0	6	3			10
CFB	Black dogfish	<i>Centroscyllium fabricii</i>			1	2	0				3
DGS	Picked dogfish	<i>Squalus acanthias</i>					0	0			0
	Others	74 Species	1	3	9	14	24	2	16		68
	Total		968	59	6191	5109	4978	2574	1243	3	21135

Table 2. Fishing effort (days) of the Spanish fleet, by quarter and Division and redfish catches (tons) by quarter and Division in NAFO SA 1 and 2.

Div.	Effort (days)				Total
	1st Q	2nd Q	3rd Q	4th Q	
1F			119		119
2J			5		5

Div.	Redfish Catches (tons)				Total
	1st Q	2nd Q	3rd Q	4th Q	
1F			961		961
2J			44		44

Table 3. Fishing effort (hours) of the Spanish fleet in 2005, by quarter and Division, as well as total effort, effort with catch information and percentage of effort with catch information by quarter.

Div.	units	1st Q	2nd Q	3rd Q	4th Q	Total	%
3L	Hours	12643	6529	8557	1047	28776	46%
3M	Hours	11473	5416	3816	557	21262	34%
3N	Hours	2162	664	5967	2154	10947	17%
3O	Hours	88	29	1118	1016	2251	4%
	Total Hours	26366	12638	19458	4774	63236	100%
	Total Days	1532	672	1232	401	3837	
	Observed Days	1439	637	1199	353	3628	
	Observed/Total	94%	95%	97%	88%	95%	

Table 4-. Percentage of the effort in SA 3 by mesh size, quarter and Division.

Div.	Mesh Size	1st Q	2nd Q	3rd Q	4th Q	Total
3L	<90 mm	1%	1%	0%	0%	1%
	100-200 mm	99%	99%	100%	100%	99%
	>200 mm	0%	0%	0%	0%	0%
3M	<90 mm	6%	6%	11%	83%	9%
	100-200 mm	94%	94%	89%	17%	91%
	>200 mm	0%	0%	0%	0%	0%
3N	<90 mm	0%	0%	0%	0%	0%
	100-200 mm	92%	95%	47%	11%	51%
	>200 mm	8%	5%	53%	89%	49%
3O	<90 mm	0%	0%	0%	0%	0%
	100-200 mm	94%	100%	97%	84%	91%
	>200 mm	6%	0%	3%	16%	9%

Table 5. Length-weight parameters by species.

Species	a	b
Greenland halibut	0.00740	3.0310
Redfish	0.01900	2.9060
Roughhead grenadier	0.11390	2.8921
Witch flounder	0.00220	3.2995
American plaice	0.00600	3.1127
Cod	0.00800	3.0400
Roundnose grenadier	0.20400	2.9636
Yellowtail Flounder	0.00710	3.0903
Skate	0.01115	2.9471
<i>S. mentella</i>	0.02473	2.8376
White Hake	0.00540	3.0938

Table 6. Length distribution of Spanish cod catches in Div. 3NO.

Cod Length (cm)	3NO Total
66	320
67	160
68	160
69	0
70	0
71	0
72	639
73	479
74	320
75	320
76	799
77	320
78	320
79	639
80	639
81	160
82	639
83	799
84	160
85	799
86	160
87	160
88	479
89	160
90	320
91	0
92	0
93	160
94	0
95	0
96	0
97	0
98	0
99	0
100	799
102	320
105	160
110	160
111	160
112	160
120	160
127	160
TOTAL	11184
Ind Sampled	70
Samples	1
Catch (ton)	58

Table 7. Length distribution of Spanish redfish catches by Division.

Redfish Length (cm)	3L				3N				3LN			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total	Males	Females	Ind.	Total
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	7	0	0	7	0	0	0	0	7	0	0	7
19	16	0	0	16	0	0	0	0	16	0	0	16
20	488	7	0	495	0	0	0	0	488	7	0	495
21	10	7	0	17	0	0	0	0	10	7	0	17
22	35	34	0	69	0	0	0	0	35	34	0	69
23	47	0	0	47	0	0	0	0	47	0	0	47
24	672	555	87	1314	0	0	0	0	672	555	87	1314
25	3299	2708	155	6162	0	0	0	0	3299	2708	155	6162
26	5611	5721	56	11388	0	0	0	0	5611	5721	56	11388
27	8090	7052	594	15736	0	0	0	0	8090	7052	594	15736
28	14481	15378	566	30425	1534	0	0	1534	16015	15378	566	31959
29	20399	24774	1630	46802	1534	0	0	1534	21933	24774	1630	48336
30	18328	17171	259	35758	1534	6136	0	7670	19862	23307	259	43428
31	17852	17515	510	35877	4602	0	0	4602	22454	17515	510	40479
32	12789	11780	933	25502	10737	4602	0	15339	23527	16381	933	40841
33	12878	12054	319	25250	10737	7670	0	18407	23615	19723	319	43658
34	6747	11453	503	18704	12271	16873	0	29145	19019	28327	503	47849
35	12640	15101	142	27883	15339	15339	0	30678	27979	30440	142	58561
36	7395	6475	23	13893	9204	9204	0	18407	16599	15679	23	32300
37	3910	5966	0	9876	4602	6136	0	10737	8512	12101	0	20613
38	2864	3611	0	6475	0	1534	0	1534	2864	5145	0	8009
39	2324	3092	0	5417	1534	1534	0	3068	3858	4626	0	8484
40	1201	1857	0	3058	0	1534	0	1534	1201	3391	0	4592
41	679	552	0	1231	0	0	0	0	679	552	0	1231
42	1295	1213	0	2508	0	0	0	0	1295	1213	0	2508
43	0	7	0	7	0	0	0	0	0	7	0	7
44	0	581	0	581	0	0	0	0	0	581	0	581
45	0	480	0	480	0	0	0	0	0	480	0	480
TOTAL	154059	165142	5778	324979	73628	70561	0	144189	227687	235703	5778	469168
Ind. Sampled	2087	2041	75	4203	48	46	0	94	2135	2087	75	4297
Samples				24				1				25
Catch (ton)				148				82				231

Table 8. Redfish 3M stock Spanish catches length distribution.

Redfish Length (cm)	3M			Total
	Males	Females	Ind.	
8	0	0	0	0
9	0	0	0	0
10	0	0	0	0
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	27	0	27
20	243	219	0	462
21	1366	768	50	2184
22	4364	1226	0	5590
23	3980	3367	1749	9097
24	13302	8588	263	22152
25	32276	29665	2487	64428
26	60441	35210	3309	98959
27	70940	62333	1669	134943
28	85169	75617	1403	162189
29	87263	83150	3102	173516
30	58703	60062	2687	121452
31	56129	64736	1060	121925
32	41606	36069	4201	81876
33	39084	41680	3697	84461
34	42910	39354	0	82264
35	36552	44846	2759	84157
36	28298	34867	2593	65758
37	7997	8189	874	17061
38	149	3918	0	4067
39	153	3878	0	4031
40	1034	38	0	1072
41	1697	3754	0	5451
42	47	0	0	47
43	38	25	0	63
44	38	0	0	38
45	0	0	0	0
TOTAL	673779	641587	31904	1347270
Ind. Sampled	1939	1942	81	3962
Samples				21
Catch (ton)				538

Table 9. Redfish 30 stock Spanish catches length distribution.

Redfish Length (cm)	30			Total
	Males	Females	Ind.	
8	0	0	654	654
9	0	0	1308	1308
10	0	0	4577	4577
11	0	0	5885	5885
12	0	0	6539	6539
13	0	0	7847	7847
14	0	0	3923	3923
15	0	0	5403	5403
16	654	0	6103	6757
17	654	0	3018	3672
18	13919	4903	12906	31729
19	61141	12453	8959	82552
20	222312	112714	13281	348307
21	426759	249327	15256	691342
22	763542	427699	13915	1205156
23	924892	558450	15496	1498839
24	1038785	634175	4502	1677462
25	752444	698969	4930	1456343
26	414261	749073	0	1163334
27	137604	590920	0	728524
28	67980	479294	0	547274
29	28352	271818	0	300170
30	6619	162429	0	169048
31	5783	82016	1017	88816
32	1977	42326	0	44303
33	1196	23767	0	24963
34	805	8386	0	9191
35	535	5233	0	5769
36	1079	4897	0	5977
37	2406	100	0	2506
38	0	6669	0	6669
39	535	3406	0	3941
40	535	535	0	1071
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	0	0	0
45	0	0	0	0
TOTAL	4874772	5129560	135520	10139851
Ind. Sampled	4244	4546	135	8925
Samples				48
Catch (ton)				2174

Table 10. American plaice 3M stock Spanish catches length distribution.

American plaice Length (cm)	3M			Total
	Males	Females	Ind.	
25	0	0	0	0
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	0	0	0
30	0	0	0	0
31	0	0	0	0
32	0	0	0	0
33	0	0	0	0
34	0	0	0	0
35	0	181	0	181
36	0	0	0	0
37	360	0	0	360
38	360	0	0	360
39	722	0	0	722
40	1262	180	0	1443
41	1264	180	0	1444
42	1085	360	0	1445
43	1081	180	0	1262
44	541	180	0	721
45	181	181	0	362
46	180	361	180	541
47	361	904	0	1265
48	0	1445	0	1445
49	0	2525	0	2525
50	0	3068	0	3068
51	0	2887	0	2887
52	0	2166	0	2166
53	0	2707	0	2707
54	0	1622	0	1622
55	0	903	0	903
56	0	180	0	180
57	0	180	0	180
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0
TOTAL	7398	20391	180	27789
Ind. Sampled				155
Samples				2
Catch (ton)				36

Table 11. American plaice 3LNO stock Spanish catches length distribution by Division.

American plaice Length (cm)	3LNO			Total
	Males	Females	Ind.	
15	0	0	16	16
16	0	0	405	405
17	20	0	1320	1340
18	0	0	2365	2365
19	0	0	2033	2033
20	0	0	1845	1845
21	0	0	185	185
22	225	184	101	509
23	21	0	48	69
24	64	0	0	64
25	184	64	0	248
26	19	0	0	19
27	326	44	0	370
28	1296	224	0	1520
29	1103	337	0	1440
30	1835	923	0	2758
31	5490	2148	0	7639
32	3260	1261	68	4589
33	3687	3644	36	7367
34	2285	4022	0	6307
35	3780	8203	267	12250
36	3713	15095	0	18809
37	4088	24849	0	28937
38	3933	15585	0	19518
39	3011	31117	0	34128
40	2438	33016	0	35455
41	785	25146	0	25930
42	1998	25698	36	27732
43	3374	19017	775	23166
44	257	18282	36	18575
45	43	15189	0	15232
46	397	12610	0	13006
47	87	12435	36	12557
48	24	13636	0	13660
49	182	10653	0	10834
50	124	8520	0	8643
51	92	4712	0	4804
52	136	7074	0	7210
53	36	8219	0	8255
54	0	6469	0	6469
55	30	5825	0	5856
56	0	6907	0	6907
57	22	6168	0	6190
58	0	4441	0	4441
59	0	3948	0	3948
60	0	2920	0	2920
61	0	3563	0	3563
62	0	2153	0	2153
63	0	1764	0	1764
64	0	1340	0	1340
65	0	1153	0	1153
66	0	423	0	423
67	0	601	0	601
68	0	874	0	874
69	0	0	0	0
70	0	164	0	164
71	0	85	0	85
72	0	0	0	0
73	0	39	0	39
TOTAL	48364	370745	9571	428680
Ind. Sampled	797	3645	160	4602
Samples				28
Catch (ton)				411

Table 12. Witch flounder Spanish catches length distribution for Div. 3NO.

Whitch flounder Length (cm)	3NO			Total
	Males	Females	Ind.	
18	0	134	0	134
19	0	93	0	93
28	0	2995	141	3136
29	3181	5991	141	9312
30	533	6230	0	6763
31	18694	15856	54	34604
32	9529	15810	800	26139
33	13407	16627	54	30088
34	12814	16922	611	30346
35	14234	21525	329	36088
36	7378	26061	0	33439
37	10680	5902	0	16582
38	9981	25114	0	35096
39	8020	8402	0	16422
40	7638	4257	0	11895
41	3845	6741	0	10585
42	3069	11565	0	14633
43	1972	9998	0	11970
44	530	8576	0	9105
45	1316	2879	0	4195
46	940	5799	0	6739
47	766	1616	0	2382
48	194	931	0	1126
49	329	1442	0	1771
50	0	905	0	905
51	0	389	0	389
52	0	335	0	335
53	0	107	0	107
54	0	530	0	530
55	0	54	0	54
56	0	141	0	141
57	0	215	0	215
58	0	0	0	0
59	0	107	0	107
60	0	0	0	0
TOTAL	129051	224246	2129	355426
Ind. Sampled	386	512	11	909
Samples				9
Catch (ton)				126

Table 13. Yellowtail flounder Spanish catches length distribution for Div. 3NO.

Yellowtail flounder	3NO			
Length (cm)	Males	Females	Ind.	Total
17	0	329	0	329
18	0	0	658	658
19	0	0	406	406
20	465	0	76	542
21	0	443	38	481
22	877	0	0	877
23	108	604	76	789
24	587	351	0	939
25	281	664	313	1258
26	243	114	0	357
27	114	983	313	1410
28	4371	1002	978	6351
29	3589	2175	428	6192
30	14233	4377	1407	20018
31	11697	11889	0	23587
32	15669	14179	939	30788
33	13198	27919	0	41117
34	6931	23894	0	30825
35	9815	37109	0	46924
36	5684	29682	0	35366
37	1550	30185	0	31735
38	568	32765	0	33333
39	472	12780	38	13290
40	66	25833	0	25899
41	2815	17548	0	20363
42	0	9451	0	9451
43	281	7029	0	7310
44	0	6717	0	6717
45	0	3905	0	3905
46	6	3738	0	3744
47	0	292	0	292
48	243	454	0	697
49	0	3425	0	3425
50	0	2007	0	2007
51	0	0	0	0
52	0	38	0	38
53	0	0	0	0
54	0	43	0	43
TOTAL	93864	311927	5671	411462
Ind Sampled				1376
Samples				12
Catch (ton)				177

Table 14. Greenland halibut Spanish catches length distribution for Div. 3L and 3M.

Greenland halibut Length (cm)	3L				3M			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total
19	0	0	0	0	0	0	0	0
23	98	0	0	98	0	0	0	0
24	0	0	0	0	0	0	0	0
25	0	0	0	0	102	0	0	102
26	551	193	0	745	0	102	0	102
27	636	868	97	1601	0	0	335	335
28	2056	360	0	2416	0	0	0	0
29	1079	914	0	1993	0	542	0	542
30	2353	5850	0	8203	22	0	0	22
31	9920	5385	1160	16465	152	610	116	879
32	13459	10818	178	24455	907	677	0	1584
33	39865	30337	1421	71624	3442	3662	0	7104
34	41075	51785	2298	95158	6377	4557	233	11166
35	52011	55180	2084	109276	9067	7831	574	17472
36	75099	64790	1724	141614	10083	11279	800	22162
37	95528	102271	576	198376	14110	14168	484	28762
38	124130	144698	1180	270009	19190	22349	2626	44164
39	112639	148106	3311	264056	23340	29961	2060	55360
40	116357	156622	6876	279855	31789	35146	4393	71328
41	113775	170044	7713	291532	37026	40341	3173	80539
42	122429	172140	3596	298165	43217	49178	5145	97539
43	110154	154852	10453	275459	41547	50631	4190	96368
44	100590	163621	9559	273770	45756	53146	3561	102463
45	89827	157441	1109	248377	36592	63136	1726	101454
46	70105	131021	1208	202335	39253	58147	1411	98811
47	63562	121605	148	185315	38060	52242	0	90303
48	55500	114442	1607	171549	36155	53563	0	89719
49	42405	89105	228	131739	28735	48478	90	77303
50	40685	75460	343	116488	25861	46906	43	72810
51	24889	70487	467	95843	21389	44847	0	66236
52	24479	57051	471	82001	22425	50534	132	73092
53	19262	47420	82	66763	14947	36594	0	51542
54	13878	49292	172	63341	12630	33751	43	46424
55	14996	38079	343	53418	11860	29296	396	41552
56	11902	37954	150	50006	9424	28311	0	37735
57	8083	28559	0	36642	7640	21970	0	29610
58	8341	20919	300	29561	6570	20375	90	27034
59	5843	15191	0	21034	3601	15746	169	19516
60	2640	11502	0	14141	3062	10410	0	13472
61	2803	5758	0	8561	1630	10144	0	11774
62	236	6256	0	6492	949	9757	0	10706
63	686	3880	0	4566	1629	7873	0	9501
64	647	6945	0	7593	1057	5586	0	6643
65	679	2114	0	2792	769	4036	0	4805
66	784	1584	0	2368	1352	4017	0	5369
67	148	1486	0	1635	646	2977	0	3623
68	148	2133	0	2281	412	1582	0	1994
69	0	1417	0	1417	0	1668	0	1668
70	494	781	204	1480	0	2611	0	2611
71	0	603	0	603	226	1897	0	2123
72	0	203	0	203	0	1038	0	1038
73	0	1817	0	1817	226	1208	0	1434
74	0	643	0	643	0	675	0	675
75	0	147	0	147	96	543	0	640
76	0	1015	0	1015	0	489	0	489
77	0	469	0	469	0	804	0	804
78	0	973	0	973	0	581	0	581
79	0	938	0	938	0	199	0	199
80	0	0	0	0	0	464	0	464
81	129	540	0	669	0	424	0	424
82	0	0	0	0	0	214	0	214
83	0	956	0	956	0	402	0	402
84	0	0	0	0	0	515	0	515
85	0	133	0	133	0	119	0	119
86	0	121	0	121	0	164	0	164
87	0	579	0	579	0	160	0	160
88	0	494	0	494	0	33	0	33
89	0	0	0	0	0	64	0	64
90+	0	136	0	136	0	854	0	854
TOTAL	1636953	2546483	59060	4242496	613321	999585	31787	1644694
Ind Sampled				24348				23995
Samples				137				126
Catch (ton)				3377				1552

Table 15. Greenland halibut Spanish catches length distribution for Div. 3N and 3O.

Greenland halibut Length (cm)	3N				3O			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total
19	670	0	0	670	0	0	0	0
23	0	0	0	0	0	0	0	0
24	0	243	0	243	0	0	0	0
25	0	0	0	0	0	0	0	0
26	340	0	0	340	0	0	0	0
27	196	0	0	196	0	0	0	0
28	0	0	0	0	0	0	0	0
29	1339	0	0	1339	0	0	0	0
30	1026	1582	0	2608	0	0	0	0
31	913	2009	0	2922	0	0	0	0
32	1861	636	0	2498	0	0	0	0
33	4380	3371	0	7751	0	0	0	0
34	4742	4028	0	8770	0	0	0	0
35	4046	6923	0	10968	27	0	0	27
36	6244	11148	0	17393	0	0	0	0
37	7980	11476	0	19456	55	0	0	55
38	15007	16767	0	31774	64	0	0	64
39	15642	17885	0	33527	64	55	0	119
40	9817	24900	0	34718	147	0	0	147
41	20715	27118	0	47833	55	0	0	55
42	22892	34616	0	57508	119	92	0	211
43	17287	29400	0	46687	119	55	0	174
44	18276	27842	0	46118	193	211	0	405
45	16152	24876	0	41028	111	64	0	175
46	14532	30871	0	45403	55	203	0	258
47	13398	18876	0	32274	101	193	0	295
48	11882	28255	0	40137	212	203	0	415
49	7784	16017	0	23801	27	212	0	240
50	6555	15371	0	21926	129	341	0	470
51	8442	19167	0	27609	248	156	0	405
52	6489	18048	0	24536	64	295	0	359
53	3900	9700	0	13601	37	377	0	414
54	3622	12675	0	16296	129	184	0	313
55	1815	7625	0	9440	119	211	0	331
56	4927	6560	0	11486	55	212	0	267
57	1238	6783	0	8021	0	55	0	55
58	1631	6806	0	8437	27	156	0	184
59	1182	3274	0	4457	27	166	0	193
60	782	3540	0	4322	101	203	0	304
61	869	4128	0	4997	0	101	0	101
62	1330	3035	0	4365	0	37	0	37
63	838	3264	0	4102	0	27	0	27
64	0	1186	0	1186	27	27	0	55
65	125	1089	0	1214	0	37	0	37
66	0	944	0	944	0	55	0	55
67	0	2676	0	2676	0	0	0	0
68	0	1204	0	1204	0	27	0	27
69	0	418	0	418	0	27	0	27
70	0	795	0	795	0	27	0	27
71	0	772	0	772	0	37	0	37
72	0	963	0	963	0	0	0	0
73	0	264	0	264	0	0	0	0
74	0	571	0	571	0	27	0	27
75	0	0	0	0	0	0	0	0
76	0	190	0	190	0	0	0	0
77	0	730	0	730	0	0	0	0
78	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
81	0	322	0	322	0	0	0	0
82	0	588	0	588	0	0	0	0
83	0	0	0	0	0	0	0	0
84	0	0	0	0	0	37	0	37
85	0	96	0	96	0	0	0	0
86	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0
90+	0	0	0	0	0	0	0	0
TOTAL	260866	471627	0	732493	2317	4114	0	6431
Ind Sampled				2963				202
Samples				23				2
Catch (ton)				709				8

Table 16. Greenland halibut Subarea 2 Div. 3LMNO stock Spanish catches length distribution.

Greenland halibut Length (cm)	3LMNO			Total
	Males	Females	Ind.	
19	670	0	0	670
23	98	0	0	98
24	0	243	0	243
25	102	0	0	102
26	891	295	0	1187
27	831	868	432	2131
28	2056	360	0	2416
29	2418	1456	0	3874
30	3400	7433	0	10833
31	10986	8004	1276	20266
32	16227	12132	178	28536
33	47687	37370	1421	86478
34	52194	60369	2531	115094
35	65152	69934	2658	137744
36	91426	87218	2524	181168
37	117672	127915	1061	246648
38	158392	183814	3806	346012
39	151685	196007	5371	353063
40	158110	216669	11269	386048
41	171571	237504	10885	419960
42	188656	256026	8741	453423
43	169108	234938	14643	418689
44	164816	244820	13120	422755
45	142682	245517	2835	391034
46	123945	220242	2619	346807
47	115122	192917	148	308187
48	103750	196463	1607	301820
49	78952	153813	318	233083
50	73229	138079	386	211694
51	54968	134658	467	190093
52	53457	125927	604	179988
53	38146	94092	82	132319
54	30258	95901	214	126374
55	28790	75211	739	104740
56	26308	73037	150	99495
57	16962	57367	0	74328
58	16571	48256	389	65216
59	10654	34377	169	45200
60	6585	25655	0	32240
61	5302	20132	0	25433
62	2515	19086	0	21600
63	3152	15044	0	18196
64	1732	13745	0	15477
65	1573	7276	0	8849
66	2136	6601	0	8736
67	794	7139	0	7933
68	560	4946	0	5506
69	0	3530	0	3530
70	494	4215	204	4913
71	226	3309	0	3535
72	0	2204	0	2204
73	226	3289	0	3514
74	0	1916	0	1916
75	96	690	0	786
76	0	1694	0	1694
77	0	2004	0	2004
78	0	1554	0	1554
79	0	1137	0	1137
80	0	464	0	464
81	129	1285	0	1414
82	0	802	0	802
83	0	1358	0	1358
84	0	552	0	552
85	0	348	0	348
86	0	285	0	285
87	0	739	0	739
88	0	527	0	527
89	0	64	0	64
90+	0	989	0	989
TOTAL	2513458	4021808	90848	6626114
Ind Sampled				51508
Samples				288
Catch (ton)				5645

Table 17. Greenland halibut Subarea 2 Div. 3LMNO stock Spanish catches ages distribution, mean weight (g) and mean length (cm) by age.

Ages	Abundance				Ages	Mean Weight (gr)			
	Males	Females	Ind.	Total		Males	Females	Ind.	Total
1	335	0	0	335	1	60			60
2	355	0	0	355	2	64			64
3	9231	3563	297	13091	3	227	232	201	228
4	57763	62227	2680	122670	4	309	320	298	315
5	527752	662479	20927	1211158	5	476	499	505	489
6	1087394	1662737	50950	2801081	6	650	690	639	674
7	594302	1043292	13763	1651357	7	925	996	773	968
8	167963	319086	1501	488550	8	1227	1364	1285	1317
9	33063	104210	403	137675	9	1542	1592	1577	1580
10	21611	48247	105	69963	10	1826	1869	1704	1855
11	6821	43370	18	50209	11	2139	2056	1769	2067
12	2957	22996	31	25985	12	2195	2341	2959	2325
13	2460	13942	63	16465	13	2509	2711	2959	2682
14	908	15925	47	16880	14	2958	2952	2959	2952
15	349	10072	47	10469	15	3182	3471	2959	3459
16	141	5132	16	5289	16	3549	4046	2959	4030
17	52	3097	0	3149	17	4591	5289		5278
18	0	1030	0	1030	18		5472		5472
19	0	101	0	101	19		6592		6592
20	0	301	0	301	20		7667		7667

Ages	Mean Length (cm)			
	Males	Females	Ind.	Total
1	19.5			19.5
2	19.8			19.8
3	30.1	30.3	28.9	30.1
4	33.4	33.8	32.9	33.6
5	38.4	38.9	39.1	38.7
6	42.5	43.4	42.4	43.0
7	47.7	48.9	45.0	48.5
8	52.5	54.5	53.3	53.8
9	56.8	57.4	57.2	57.2
10	60.0	60.5	58.8	60.4
11	63.3	62.5	59.5	62.6
12	63.9	65.2	70.5	65.0
13	66.7	68.4	70.5	68.1
14	70.3	70.1	70.5	70.1
15	72.2	74.0	70.5	73.9
16	74.7	77.9	70.5	77.8
17	81.5	85.1		85.0
18		86.3		86.3
19		91.8		91.8
20		96.2		96.2

Table 18. Percentage of different skate species in Spanish (3NO) and EU (3M) surveys catches and in Spanish commercial catches.

Surveys			
Code	Scientific name	3M	3NO
RJR	<i>Raja radiata</i>	52%	95%
RJQ	<i>Bathyraja spinicauda</i>	23%	1%
RJG	<i>Raja hyperborea</i>	25%	3%
RJS	<i>Raja senta</i>	0%	0%

IEO Observers					
Code	Scientific name	3L	3M	3N	3O
RJR	<i>Raja radiata</i>	75%	36%	100%	100%
RJQ	<i>Bathyraja spinicauda</i>	21%	38%	0%	0%
RJG	<i>Raja hyperborea</i>	2%	15%	0%	0%
RJS	<i>Raja senta</i>	0%	0%	0%	0%

Table 19. Skates Spanish catches length distribution for Div. 3L, 3N and 3O.

Skates Length (cm)	3L				3N				3O			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total	Males	Females	Ind.	Total
23	0	0	0	0	0	64	0	64	0	0	0	0
26	0	0	0	0	64	0	0	64	0	0	0	0
27	0	338	0	338	0	0	0	0	0	0	0	0
29	0	0	0	0	64	103	0	167	0	0	0	0
30	253	0	169	253	0	797	0	797	0	0	0	0
31	0	0	0	0	502	1703	0	2205	0	0	0	0
32	0	0	0	0	666	1326	0	1992	0	0	0	0
33	253	507	0	760	3506	1247	0	4753	85	55	0	141
34	0	0	0	0	681	1261	0	1942	166	111	0	277
35	0	1895	558	1895	2412	1249	0	3661	55	190	0	245
36	0	0	0	0	3588	1775	0	5363	360	222	0	582
37	0	3349	0	3349	3783	1555	0	5338	190	190	0	380
38	338	5193	169	5530	9041	2791	0	11832	245	0	0	245
39	0	3349	0	3349	6745	5624	0	12369	55	55	0	111
40	338	5108	169	5446	11318	11526	0	22844	275	337	0	612
41	338	1421	0	1759	13926	8961	0	22887	222	386	0	608
42	3349	5666	0	9016	15365	15072	0	30437	269	560	0	829
43	338	6225	0	6562	16520	15317	0	31837	589	226	0	814
44	3687	5582	0	9269	7799	21004	0	28803	245	553	0	798
45	5582	7003	84	12586	15040	17479	0	32519	341	507	0	848
46	1759	4608	0	6368	13043	25160	0	38203	1211	750	0	1962
47	5508	4682	200	10190	19545	23212	0	42757	226	799	0	1025
48	738	3765	200	4503	16874	31885	0	48759	546	924	0	1470
49	300	1685	200	1986	39883	29682	0	69564	560	623	0	1183
50	400	5508	3790	5908	28087	31923	0	60010	580	1199	0	1779
51	3665	6246	0	9911	19333	19251	0	38584	331	659	0	989
52	7209	4091	200	11299	25538	32815	0	58352	744	1232	0	1976
53	2175	3091	0	5266	20204	18021	0	38225	435	606	0	1041
54	8767	3323	0	12089	40715	32532	0	73248	511	708	0	1219
55	6956	3022	200	9978	16327	16097	0	32424	190	459	0	649
56	3223	3970	0	7192	27071	46622	0	73693	1096	220	0	1316
57	4070	6735	200	10805	17258	21381	0	38639	55	331	0	386
58	5898	5845	0	11742	20063	27064	0	47127	770	392	0	1162
59	2869	1722	200	4591	13074	19316	0	32390	170	623	0	793
60	1485	653	0	2139	32177	24891	0	57067	507	727	0	1234
61	1685	3649	0	5335	17805	22853	0	40659	439	390	0	829
62	4887	400	200	5287	20298	21399	0	41697	196	1068	0	1264
63	6472	738	0	7209	14934	15818	0	30752	574	284	0	857
64	400	500	200	900	24215	19827	0	44043	426	1304	0	1730
65	2717	1822	0	4539	23167	13316	0	36483	950	900	0	1850
66	5271	2733	200	8004	29641	27493	0	57134	475	948	0	1424
67	1621	100	300	1722	9084	13234	0	22317	85	748	0	833
68	422	3687	0	4109	16424	26513	0	42937	226	2066	0	2292
69	4771	0	0	4771	10576	19691	0	30267	256	714	0	970
70	1201	169	0	1370	22034	14485	0	36519	416	1846	0	2262
71	2843	169	0	3012	13136	11208	0	24344	475	2029	0	2504
72	3349	0	0	3349	26673	12377	0	39049	1062	1195	0	2257
73	0	0	0	0	10658	8281	0	18939	495	494	0	989
74	0	0	0	0	13634	6083	0	19717	1170	1064	0	2234
75	0	0	0	0	14332	7120	0	21452	1382	1421	0	2803
76	1675	0	0	1675	10614	9149	0	19762	426	1577	0	2003
77	0	0	0	0	10283	3277	0	13560	332	211	0	543
78	0	0	0	0	9593	8206	0	17799	680	529	0	1209
79	0	0	0	0	10640	705	0	11344	369	94	0	462
80	0	0	0	0	5879	549	0	6428	220	503	0	723
81	0	0	0	0	3406	1608	0	5014	220	0	0	220
82	0	0	0	0	2876	3474	0	6350	1077	360	0	1437
83	0	0	0	0	2149	407	0	2556	55	0	0	55
84	0	0	0	0	2244	915	0	3159	439	85	0	524
85	0	0	0	0	1394	626	0	2020	134	0	0	134
86	0	0	0	0	2579	198	0	2777	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	341	0	0	341	0	0	0	0
89	0	0	0	0	149	0	0	149	0	0	0	0
90+	0	0	0	0	0	0	0	0	134	0	0	134
TOTAL	106810	118549	7240	225359	788972	777513	0	1566485	23746	33474	0	57220
Ind Sampled				721				5261				652
Samples				4				37				4
Catch (ton)				348				2985				138

Table 20. Skates Spanish catches length distribution for Div. 3LNO.

Skates Length (cm)	3LNO		Ind.	Total
	Males	Females		
23	0	64	0	64
26	64	0	0	64
27	0	338	0	338
29	64	103	0	167
30	253	797	169	1219
31	502	1703	0	2205
32	666	1326	0	1992
33	3844	1809	0	5653
34	848	1372	0	2220
35	2467	3334	558	6360
36	3948	1997	0	5945
37	3973	5094	0	9067
38	9624	7984	169	17776
39	6800	9029	0	15829
40	11931	16971	169	29071
41	14486	10769	0	25255
42	18983	21299	0	40282
43	17447	21767	0	39214
44	11732	27138	0	38870
45	20963	24989	84	46037
46	16013	30519	0	46532
47	25279	28693	200	54172
48	18158	36574	200	54932
49	40743	31990	200	72933
50	29067	38630	3790	71487
51	23328	26156	0	49484
52	33491	38138	200	71828
53	22814	21718	0	44532
54	49993	36563	0	86556
55	23473	19578	200	43251
56	31390	50812	0	82201
57	21384	28446	200	50030
58	26731	33301	0	60031
59	16114	21660	200	37974
60	34169	26271	0	60440
61	19930	26892	0	46822
62	25381	22868	200	48449
63	21979	16840	0	38818
64	25042	21632	200	46874
65	26835	16037	0	42873
66	35387	31174	200	66761
67	10790	14082	300	25172
68	17072	32265	0	49337
69	15603	20405	0	36007
70	23651	16499	0	40150
71	16454	13406	0	29860
72	31084	13572	0	44656
73	11153	8775	0	19928
74	14804	7147	0	21951
75	15714	8541	0	24255
76	12714	10726	0	23440
77	10615	3487	0	14102
78	10273	8735	0	19008
79	11008	799	0	11807
80	6098	1052	0	7151
81	3626	1608	0	5234
82	3953	3835	0	7787
83	2205	407	0	2612
84	2684	1000	0	3683
85	1529	626	0	2155
86	2579	198	0	2777
87	0	0	0	0
88	341	0	0	341
89	149	0	0	149
90+	134	0	0	134
TOTAL	919529	929536	7240	1856305
Ind Sampled				6634
Samples				45
Catch (ton)				3472

Table 21. Roughhead grenadier Spanish catches length distribution by Division.

Roughhead grenadier Length (cm)	3L				3M				3NO			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total	Males	Females	Ind.	Total
3	0	0	96	96	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	191	0	0	191	194	0	0	194	0	0	0	0
8	329	424	0	753	119	288	3672	4078	0	0	0	0
9	1077	285	0	1361	4188	1590	1836	7614	1048	0	0	1048
10	3008	3691	285	6984	6973	4813	0	11786	0	0	0	0
11	9858	2425	334	12617	7622	7391	2029	17042	4052	0	0	4052
12	17400	8660	0	26060	16256	12495	108	28858	2606	1272	0	3877
13	21169	19303	127	40598	26811	19268	108	46187	3130	3766	0	6896
14	39715	19757	250	59722	30320	27163	425	57908	7218	7406	0	14623
15	47488	22770	1459	71718	51040	34894	108	86043	20542	9198	0	29740
16	66427	33645	998	101071	76473	40986	425	117884	29674	14121	0	43795
17	112295	59722	667	172684	83891	53652	0	137542	31977	16552	0	48529
18	84534	57847	462	142843	85507	53055	1836	140399	25669	7778	0	33448
19	82957	51903	127	134986	65642	57971	0	123614	11221	14782	0	26004
20	51551	57332	462	109345	54377	56844	167	111388	7057	9709	0	16765
21	37896	44128	360	82383	34295	47203	0	81498	8064	7890	0	15955
22	19039	32495	357	51892	12495	42174	0	54669	1072	2741	0	3813
23	10705	29647	357	40709	2145	34279	0	36423	524	6444	0	6968
24	10838	29686	0	40524	561	36553	0	37113	524	7452	0	7976
25	5495	21574	0	27069	5516	26276	0	31791	548	3464	0	4012
26	2756	11713	0	14469	2182	18616	0	20798	0	2741	0	2741
27	618	9499	0	10117	1836	17455	0	19291	548	11611	0	12160
28	955	5442	0	6397	1836	10474	0	12310	0	5906	0	5906
29	1212	6300	0	7512	1836	9429	0	11265	723	2082	0	2805
30	0	7046	0	7046	0	5867	0	5867	0	0	0	0
31	0	3250	0	3250	0	6796	0	6796	0	3067	0	3067
32	1212	5044	0	6256	727	5141	0	5869	0	4687	0	4687
33	0	5692	0	5692	0	6291	0	6291	0	2805	0	2805
34	1046	2191	0	3237	0	2463	0	2463	0	723	0	723
35	0	4669	0	4669	0	2541	0	2541	0	2082	0	2082
36	0	1777	0	1777	0	5708	0	5708	0	0	0	0
37	0	3330	0	3330	0	1570	0	1570	0	5411	0	5411
38	0	494	0	494	1455	2260	0	3714	0	0	0	0
39	0	0	0	0	0	3806	0	3806	0	0	0	0
40	0	0	0	0	0	449	0	449	0	0	0	0
41	0	0	0	0	0	150	0	150	0	0	0	0
42	0	0	0	0	0	134	0	134	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	135	0	135	0	0	0	0
TOTAL	629770	561742	6339	1197852	574297	656181	10714	1241191	156198	153689	0	309887
Ind Sampled	1806	1610	36	3452	3203	4034	14	7237	187	175	0	362
Samples				22				38				5
Catch (ton)				815				881				242

Table 22. Roughhead grenadier Spanish catches length distribution for Div. 3LMNO.

Roughhead grenadier Length (cm)	3LMNO			Total
	Males	Females	Ind.	
3	0	0	96	96
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	385	0	0	385
8	448	712	3672	4832
9	6313	1875	1836	10024
10	9981	8504	285	18769
11	21533	9816	2362	33711
12	36261	22427	108	58796
13	51109	42338	235	93681
14	77253	54325	675	132253
15	119071	66862	1567	187500
16	172574	88753	1423	262750
17	228164	129925	667	358755
18	195710	118681	2298	316689
19	159820	124656	127	284603
20	112984	123885	629	237499
21	80256	99221	360	179836
22	32606	77410	357	110374
23	13374	70370	357	84101
24	11922	73691	0	85613
25	11558	51314	0	62872
26	4939	33069	0	38008
27	3002	38566	0	41568
28	2791	21822	0	24613
29	3771	17811	0	21582
30	0	12913	0	12913
31	0	13113	0	13113
32	1939	14872	0	16811
33	0	14787	0	14787
34	1046	5378	0	6424
35	0	9291	0	9291
36	0	7485	0	7485
37	0	10311	0	10311
38	1455	2754	0	4208
39	0	3806	0	3806
40	0	449	0	449
41	0	150	0	150
42	0	134	0	134
43	0	0	0	0
44	0	0	0	0
45	0	135	0	135
TOTAL	1360265	1371612	17053	2748930
Ind Sampled	5196	5819	50	11051
Samples				65
Catch (ton)				1938

Table 23. Roughhead grenadier Div. 3LMNO Spanish catches ages distribution, mean weight (g) and mean length (cm) by age.

Abundance					Mean Weight (gr)				
Ages	Males	Females	Ind.	Total	Ages	Males	Females	Ind.	Total
1	0	0	78	78	1			4	4
2	154	0	17	172	2	39		4	35
3	3322	686	2493	6501	3	80	61	59	70
4	8762	10218	2932	21912	4	94	98	68	92
5	27553	8597	1348	37498	5	140	167	119	145
6	50864	52552	1717	105133	6	187	212	153	199
7	126523	114264	1334	242121	7	285	299	301	292
8	215139	142650	1886	359676	8	364	398	363	378
9	358445	231258	2270	591973	9	466	528	481	490
10	312960	237713	1656	552329	10	586	692	565	632
11	125687	124909	638	251234	11	740	827	800	783
12	81642	146430	456	228528	12	830	1036	855	962
13	24743	104258	161	129162	13	982	1251	924	1199
14	11563	54083	57	65703	14	1096	1457	951	1393
15	4695	42085	9	46789	15	1507	1757	927	1731
16	4453	12047	0	16500	16	2315	2164		2205
17	3758	28500	0	32258	17	3264	2713		2777
18	0	24732	0	24732	18		2898		2898
19	0	19212	0	19212	19		3949		3949
20	0	8947	0	8947	20		3249		3249
21	0	7737	0	7737	21		3303		3303
22	0	90	0	90	22		5075		5075
23	0	180	0	180	23		5075		5075
24	0	465	0	465	24		5786		5786

Mean Length (cm)				
Ages	Males	Females	Ind.	Total
1			3.5	3.5
2	7.5		3.5	7.1
3	9.6	8.8	8.6	9.1
4	10.2	10.3	9.1	10.1
5	11.6	12.4	11.0	11.8
6	12.9	13.4	12.0	13.1
7	14.9	15.1	15.2	15.0
8	16.2	16.7	16.2	16.4
9	17.6	18.4	17.8	17.9
10	19.0	20.2	18.8	19.5
11	20.7	21.5	21.3	21.1
12	21.5	23.2	21.8	22.6
13	22.7	24.8	22.4	24.4
14	23.7	26.2	22.7	25.7
15	26.5	27.9	22.5	27.8
16	30.8	30.0		30.2
17	34.4	32.6		32.8
18		33.1		33.1
19		37.0		37.0
20		34.7		34.7
21		34.9		34.9
22		40.5		40.5
23		40.5		40.5
24		42.3		42.3