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SCIENTIFIC COUNCIL MEETING – JUNE 2009**Spanish Research Report for 2008**

by

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All effort and catch information in this Report are based on information from NAFO observers on board. In 2008 information from 1384 days was available while total effort of the Spanish fleet in NAFO Regulatory Area was 1406 days (98% coverage). Estimates from NAFO observers of Spanish catches by species and Division in 2008 are presented in Table 1. The split by species of grenadiers were calculated based upon the percentage observed by the IEO scientific observers.

In addition to NAFO observers, IEO scientific observers were on board. All length, age and biological information presented in this paper are based on sampling carried out by IEO observers: in 2008, 315 samples were taken, with 45 698 individuals of different species examined. These samples were made in 290 working days that it means 20.6 % of the Spanish total effort.

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

There was not Spanish fishing activity in these Subareas during 2008.

SUBAREA 3**A. Status of the fisheries**

A total of 14 Spanish trawlers operated in NAFO Regulatory Area, Div. 3LMNO, during 2008, amounting to 1 406 days (21 408 hours) of fishing effort. This implies a decrease of 80 % in 2008 effort compared to 2003 effort (Table 2). Total catches (Table 1) for all species combined in Div. 3LMNO were 17 364 tons in 2008, compared to 14 044 tons in 2007.

Table 3 shows the effort (hours) by quarter and Division and their percentage. Table 4 presents the percentage of the effort by Division and mesh size and Figure 1 shows the holes position made with the different mesh sizes.

These tables and figure illustrate that the Spanish fleet has, at least, four different fisheries in NAFO Subarea 3 characterized by different mesh size, target species, depth and fishing area. The Spanish fleet effort in NAFO area is mainly directed to Greenland halibut (mostly in Div. 3LM), alternating with the skate fishery in the second half of

the year (Div. 3NO), shrimp fishery (Div. 3LM), and in less degree redfish (Div. 3O and Div. 3M). 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 at more than 700 m depth targeting Greenland halibut and in less degree at less than 700 m depth targeting redfish. The 15% of the fishing effort was carried out using 40 mm cod-end mesh size directed to the shrimp fishery. In Div. 3N and during the first quarter of the year, fishing was performed using 135 and 280 mm cod-end mesh size, which indicates that the fleet targeted Greenland halibut in depth more than 700 m. and skate in depth less than 200 m. in similar proportion. However, during the others quarters most part of the effort moved to depths less than 200 m where the skate fishery took place using 280 mm mesh size. Fishing effort in Div. 3O was limited (3%) and targeted redfish, using mainly 135 mm mesh size.

In addition to NAFO observers (NAFO Observers Program), 6 IEO scientific observers were onboard the Spanish vessels, comprising a total of 290 observed fishing days, around 21% coverage of the total Spanish effort. Besides recording catches, discards, and effort, these observers carried out biological sampling of the main species taken in the catch. For Greenland halibut, roughhead grenadier and American plaice this includes recording weight at length, sex-ratio, maturity stages, performing stomach contents analyses, and collecting material for reproductive studies. Otoliths of these three species were also taken for age determination. In 2008, 315 length samples were taken, with 45 024 individuals of different species examined to obtain the length distributions (Table 5). 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 6.

The Spanish activity en NAFO Regulatory Area (NRA) Subarea 3 in 2008 stock by stock was the following:

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

Main part of the catches of this species were taken as by-catch in the skate fishery and Greenland halibut fishery in Div. 3N. Few catches were taken in Div. 3LMO.

Table 7 shows the catch length distribution for Div. 3NO cod. All samples were taken in Division 3N. There is not available length distributions for Division 3M.

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

Most of the catches in Div. 3LN were taken as by-catch in the Greenland halibut fishery. In Div. 3M the redfish catches in 2008 have been 1247 tons. In this Division 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 mostly in the second half of this year. Catches have reached 968 ton in this Division.

Table 8 shows the length distribution for Div. 3LN. Catches length distribution for Div. 3M and 3O are presented in Table 9 and Table 10, respectively.

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

Most catches were taken in Div. 3LNO as by-catch of the skate and Greenland halibut fisheries. Catches in Div. 3M only amounted 26 tons and were taken as by-catch of the Greenland halibut fishery.

Length distributions for Div. 3LNO are presented in Table 11, all samples were taken in Division 3N. There is not available length distributions for Division 3M.

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

This species is taken as by-catch in the Greenland halibut fishery in Divisions 3LMNO. This year, there was only length distribution samples for Witch flounder Division 3NO (Table 12).

Yellowtail flounder (Div. 3LNO)

Most of the catches were taken in Div. 3N as by-catch in the skate fishery. Length distributions for Yellowtail flounder Div. 3LNO are presented in Table 13, all samples were taken in Division 3N.

Greenland halibut (Subareas 2 and 3)

Greenland halibut continues to be the main target species for the Spanish fleet in NAFO area. A great reduction of effort in this fishery has been carried out in the last years to adapt to the NAFO Greenland halibut recovery plan. Most of the catches have been taken in the Flemish Pass area (Div. 3LM) at depths more than 700 meters. The mesh size used for this fishery was equal to or greater than 130 mm. Tables 14, 15 show length distributions of Spanish catches by Division and Table 16 shows the total length distributions of Spanish catches in Divisions 3LMNO. The commercial Spanish Age Length Key (ALK) for 2008 was not available for NAFO Scientific Council June meeting.

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

Commercial catches of skates comprise a mix of skate species (*Raja radiata*, *Bathyraja spinicauda*, *Raja hyperborean*, *Raja senta*, etc). Thus the catch of skate in Table 1 refers to *Raja* spp. However, thorny skate dominates, comprising about 95% of the skate taken in the Spanish catches. Most of the catches were taken in Div. 3N at depths 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).

Table 17 shows the total catches length distributions of Div. 3LNO, all samples were taken in Division 3NO. There is not available length distributions for Division 3M.

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 2008 catches were taken in Div. 3LM. Individuals were measured from tip of snout to base of first anal-fin ray (AFL). Tables 18 show the AFL length distributions, in 1 cm intervals, of Spanish catches for Div. 3LMNO. Age distributions based in the Spanish Age Length Key (ALK), mean weight and mean length (AFL) at age of the total catch for Div. 3LMNO are presented in Table 19. Most of the Roughhead grenadier catches in 2008 were based on ages 6 to 9.

White hake (Div. 3LMNO)

Catches in the last years are in the same level as before 2000. Catches of this species in 2008 were a small by-catch of different fisheries. In Div. 3LMN they are by-catch of the Greenland halibut fishery and by-catch of the redfish fishery in Div. 3O. There were not length distribution samplings available in 2008.

(B) Research studies

The Spanish bottom trawl survey in NAFO Regulatory area Div. 3NO was conducted in May and June 2008 on board R/V Vizconde de Eza using Campelen gear with a stratified design. A total of 123 hauls were carried out up to a depth of 1 446 m, one of which was null. The results of the Spanish 3NO bottom trawl survey, including biomass indices with their errors and length distributions, as well as the calculated biomass based on conversion of length frequencies for Greenland halibut and American plaice; Atlantic cod and yellowtail flounder; Thorny skate, white hake and roughhead grenadier are presented as Scientific Council Research documents. As in the years 1995 and 1996 few deeper strata were surveyed, the data obtained in those surveys are not representative for most of the species, so the data is presented since 1997 to 2008 for all the species, except for Yellowtail flounder, whose data are presented for the whole period, and for White hake, presented for the period 2001-2008 because before 2001 there are no data available.

Feeding studies on the main species continued to be conducted. Material for histology and aging (Cod, American plaice and Greenland halibut) studies were taken.

One hundred twenty two hydrographic profile samplings were made in a depth range of 33 - 1420 m.

In 2003 it was decided to extend the Spanish 3NO survey toward Div. 3L (Flemish Pass). In 2008, the bottom trawl survey in Flemish Pass (Div. 3L) was carry out on board R/V Vizconde de Eza using the usual survey gear (Campelen 1800) from July 24th to August 11th. The area surveyed was Flemish Pass to depths up 800 fathoms (1463 m) following the same procedure as in previous years. The number of hauls was 103 and 3 of them were nulls. Survey results including abundance indices and length distributions of the main commercial species are presented as Scientific Council Research documents. Survey results for Div. 3LNO of the northern shrimp (*Pandalus borealis*) were presented in SCR 08/66.

Feeding studies on Greenland halibut and American plaice continued to be performed and samples for histological (Greenland halibut, American plaice) and aging (Greenland halibut, American plaice and cod) studies were taken. One hundred one hydrographic profile samplings were made in a depth range of 95-1411 m.

In 2007 the Spanish administration obtained a license from Canadian Authorities to carry out a research survey inside of the Canadian waters in 3L Division. In 2008 this survey was made by the R/V Vizconde de Eza, covering 14 strata in the north of Div. 3L, using a Campelen survey gear up to 1420 meters depth and following the same procedures as in 3NO survey. Initial plan could not be completed neither, due to the bad meteorological conditions and the travels to pick up and drop off the Canadian participants and 33 valid fishing operations instead of the 44 initially planned were carried out. Total biomass, calculated by swept area method, for the main species is shown in the Table 20. Due to the low number of hauls these results should be considered with caution. Eight hydrographic profile samplings were made in a depth range of 343-1070 m.

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 June 18th to July 22th 2008. 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 176 and nine of them were nulls. Survey results including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice, roughhead grenadier and Greenland halibut are presented as Scientific Council Research documents. Flemish Cap survey results for northern shrimp (*Pandalus borealis*) were presented in SCR 08/68.

Samples for histological assessment of sexual maturity of cod, redfish, Greenland halibut and Roughhead grenadier were taken.

Oceanography studies continued to take place.

REFERENCES

Casas, J.M. Northern shrimp (*Pandalus borealis*) on Flemish Cap Survey 2008. NAFO SCR Doc. 08/68

Casas, J.M., E. Román¹ and J. Teruel. Northern shrimp (*Pandalus borealis*, Krøyer) from Spanish bottom trawl survey 2008 in NAFO Divisions 3LNO. NAFO SCR Doc. 08/66

Table 1. Spanish Catches (ton) in NAFO Area in 2008 by Division, based on NAFO Observers information.

Code	English_name	Scientific_name	Division				Total Catch (ton)
			3L	3M	3N	3O	
SKA	Raja rays nei	Raja spp	56	70	5685	109	5920
GHL	Greenland halibut	Reinhardtius hippoglossoides	3172	1273	358	17	4820
RED	Atlantic redfishes nei	Sebastes spp	139	1247	14	968	2368
PRA	Northern prawn	Pandalus borealis	277	408			685
PLA	Amer. Plaice	Hippoglossoides platessoides	54	26	478	83	641
YEL	Yellowtail flounder	Limanda ferruginea	5		494	99	598
RHG	Roughhead grenadier	Macrourus berglax	341	478	76	3	897
RNG	Roundnose grenadier	Coryphaenoides rupestris	19	86	12	0	117
COD	Atlantic cod	Gadus morhua	36	60	310	30	435
WIT	Witch flounder	Glyptocephalus cynoglossus	40	29	70	27	166
CAT	Wolffishes	Anarhichas spp	90	24	31	7	152
HKR	Red hake	Urophycis chuss	66	73	1		140
DGX	Dogfish sharks nei	Squalidae	101	20	14	1	137
HKW	White hake	Urophycis tenuis	32	14	27	19	92
CAS	Spotted wolffish	Anarhichas minor	0	1	40		42
ANT	Blue antimora	Antimora rostrata	13	17	1		30
ANG	American angler	Lophius americanus	0		29	0	30
GDE	Shore rockling	Gaidropsarus ensis	23	1	3	1	27
HAL	Atlantic halibut	Hippoglossus hippoglossus	13	3	7	2	25
CAA	Atlantic wolffish	Anarhichas lupus	0	0	18	0	19
GSK	Greenland shark	Somniosus microcephalus	3	3	1		6
GRV	Grenadiers nei	Macrourus spp	1		0	0	2
ELZ	Eelpouts	Lycodes spp	1	0	1		2
GAM	Mouse catshark	Galeus murinus		1			1
NZB	Marlin-spike grenadier	Nezumia bairdi	1		0		1
SHL	Lanternsharks nei	Etmopterus spp	0	1			1
XXX	Unknow	Unknow	0	1			1
SKX	Sharks, rays, skates nei	Elasmobranchii	1				1
HAD	Haddock	Melanogrammus aeglefinus			1	0	1
MNZ	Monkfishes nei	Lophius spp			0	0	1
CFB	Black dogfish	Centroscyllium fabricii	0	0	0		1
COE	European conger	Conger conger	0	0	0		1
	Others	35 species	1	2	2	0	5
	Total Catches	(ton)	4486	3836	7674	1367	17364

Table 2. Fishing effort (hours) of the Spanish fleet in 2008 in Divisions 3LMNO by year, as well as percentage of effort reduction compare with 2003.

3LMNO	2003	2004	2005	2006	2007	2008
Effort (Hours)	106821	76028	60128	44044	25163	21408
Effort reduction	0%	29%	44%	59%	76%	80%

Table 3. Fishing effort (hours) of the Spanish fleet in 2008, by quarter and Division, as well as percentage of effort by quarter and Division.

Division	units	1st Q	2nd Q	3rd Q	4th Q	Total	%
3L	Hours	3125	1199	4431	190	8946	42%
3M	Hours	1907	1942	1701	0	5550	26%
3N	Hours	662	641	1722	3333	6358	30%
3O	Hours	31	84	178	261	553	3%
	Total Hours	5724	3867	8033	3784	21408	100%
	%	27%	18%	38%	18%	100%	

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	4%	0%	8%	0%	6%
	100-200 mm	96%	100%	92%	100%	94%
	>200 mm					
3M	<90 mm	4%	8%	35%		15%
	100-200 mm	96%	92%	65%		85%
	>200 mm					
3N	<90 mm					
	100-200 mm	56%	18%	39%	0%	18%
	>200 mm	44%	82%	61%	100%	82%
3O	<90 mm					
	100-200 mm	58%	94%	93%	85%	87%
	>200 mm	42%	6%	7%	15%	13%

Table 5. Length distribution samples and individuals sampled by Division, species and gear (mesh size) in 2008 .

Species	Division	Gear	Samples	Ind. Sampled
Greenland halibut	3L	135 mm	83	14553
Greenland halibut	3M	135 mm	34	5020
Greenland halibut	3N	135 mm	12	2881
Greenland halibut	3O	135 mm	1	197
Redfish	3L	135 mm	9	278
Redfish	3M	135 mm	5	872
Redfish	3N	135 mm	4	908
Redfish	3O	135 mm	4	745
Roughhead grenadier	3L	135 mm	36	4550
Roughhead grenadier	3M	135 mm	2	181
Roughhead grenadier	3N	135 mm	1	163
American plaice	3L	135 mm	2	473
Which flounder	3N	135 mm	3	559
Cod	3N	135 mm	2	283
Shore rockling	3L	135 mm	22	1752
Shore rockling	3M	135 mm	1	60
Blue antimora	3L	135 mm	1	84
Atlantic wolffish	3L	135 mm	1	4
Northern wolffish	3L	135 mm	3	17
Spotted wolffish	3L	135 mm	4	23
American plaice	3N	280 mm	24	3078
Cod	3N	280 mm	3	125
Yellowtail flounder	3N	280 mm	7	1188
Skates	3N	280 mm	48	7441
Skates	3O	280 mm	1	220
American angler	3N	280 mm	2	43
Total			315	45698

Table 6. Parameters of the length-weight relationship ($W(g) = a \cdot L(cm)^b$) 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 7. Length distribution of 3NO Spanish cod catches.

Cod Length (cm)	Division 3NO			Total
	Males	Females	Ind.	
18	0	0	11	11
19	0	0	0	0
20	0	0	0	0
21	0	0	0	0
22	0	0	22	22
23	0	0	66	66
24	0	0	44	44
25	0	0	131	131
26	0	0	164	164
27	0	0	175	175
28	0	0	121	121
29	0	0	55	55
30	0	0	88	88
31	0	0	0	0
32	0	0	11	11
33	0	1151	431	1581
34	0	409	22	431
35	0	0	861	861
36	0	0	22	22
37	0	0	33	33
38	0	0	518	518
39	0	0	66	66
40	0	0	131	131
41	0	0	153	153
42	409	0	142	552
43	409	409	110	928
44	0	0	153	153
45	0	0	66	66
46	1151	1151	99	2400
47	2301	5421	55	7776
48	2301	1560	22	3883
49	2301	4602	33	6936
50	1151	5011	485	6647
51	2710	2710	463	5884
52	3861	3529	33	7423
53	3861	6162	452	10475
54	5421	5011	44	10476
55	2301	5830	77	8208
56	2301	5753	22	8076
57	4270	2710	22	7002
58	1560	2301	0	3861
59	0	1151	0	1151
60	0	3861	0	3861
61	5011	3861	0	8872
62	1560	0	0	1560
63	0	0	11	11

64	1151	409	0	1560
65	3861	0	0	3861
66	2710	409	0	3120
67	1151	409	0	1560
68	1151	409	0	1560
69	1151	409	0	1560
70	0	0	0	0
71	409	0	0	409
72	0	0	441	441
73	0	409	0	409
74	416	0	0	416
75	409	1234	0	1643
76	0	0	0	0
77	1234	0	0	1234
78	818	825	0	1643
79	0	1969	0	1969
80	825	409	0	1234
81	0	409	0	409
82	409	409	0	818
83	0	0	0	0
84	0	409	0	409
85	0	416	0	416
86	409	0	0	409
87	0	0	0	0
88	416	409	0	825
89	0	416	0	416
90	0	0	0	0
91	0	416	0	416
92	0	409	0	409
93	0	0	0	0
94	825	0	0	825
95	416	1241	0	1656
96	0	0	0	0
97	416	0	0	416
98	0	825	11	836
99	0	0	0	0
100	0	0	0	0
101	0	0	0	0
102	0	0	0	0
103	0	0	0	0
104	416	0	0	416
105	0	0	0	0
106	0	0	0	0
107	416	0	0	416
108	0	416	0	416
109	0	0	0	0
110	0	409	0	409
111	0	416	0	416
112	0	416	0	416
113	416	0	0	416

114	0	0	0	0
115	0	0	0	0
116	0	0	0	0
117	0	0	0	0
118	0	0	0	0
119	0	0	0	0
120	0	0	0	0
121	416	0	0	416
122	0	0	0	0
123	0	416	0	416
124	0	0	0	0
125	416	0	0	416
126	0	0	0	0
127	0	0	0	0
128	0	416	0	416
129	416	0	0	416
Total	63549	77332	5866	146747

Ind. Sampled	408
Samples	5
Catch (ton)	340

Table 8. Length distribution of 3LN Spanish redfish catches by Division.

Redfish Length (cm)	3LN			Total
	Males	Females	Ind.	
15	915	0	0	915
16	2959	2247	0	5206
17	22292	8169	0	30461
18	24169	15436	0	39605
19	17405	19417	0	36822
20	9118	7199	0	16318
21	34628	16450	0	51078
22	73239	18318	0	91557
23	73701	42432	0	116133
24	68150	28946	0	97096
25	53375	32445	0	85820
26	25840	27046	0	52886
27	16984	13743	0	30727
28	629	10955	0	11583
29	1726	13264	0	14990
30	780	14265	0	15045
31	1570	2084	0	3654
32	2500	1444	0	3943
33	4807	1928	0	6735
34	2322	7991	0	10314
35	2501	4240	0	6741
36	2219	1904	0	4123
37	1157	2239	0	3397
38	1023	173	0	1196
39	426	470	0	895
40	87	0	0	87
41	0	87	0	87
42	0	0	0	0
43	343	0	0	343
44	0	0	0	0
45	117	0	0	117
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	87	0	0	87
TOTAL	445068	292893	0	737961
Ind. Sampled				1186
Samples				13
Catch (ton)				153

Table 9. Redfish 3M stock Spanish catches length distribution.

Redfish Length (cm)	3M			Total
	Males	Females	Ind.	
12	6177	0	0	6177
13	0	6177	0	6177
14	0	0	0	0
15	0	10034	0	10034
16	30103	10034	0	40138
17	50172	24005	0	74178
18	74392	24102	0	98494
19	149719	140177	0	289895
20	386923	208572	0	595495
21	350558	381362	0	731921
22	317207	326965	0	644172
23	146124	213296	0	359421
24	129642	156527	0	286169
25	234402	113895	0	348297
26	148472	136560	0	285032
27	109543	127791	0	237334
28	147583	164592	0	312175
29	163651	75639	0	239290
30	174757	106801	0	281558
31	65343	145410	0	210753
32	38223	128165	0	166387
33	9723	115075	0	124797
34	3664	44699	0	48363
35	14186	23228	0	37414
36	7890	8009	0	15899
37	0	19445	0	19445
38	3664	6058	0	9723
39	0	3664	0	3664
40	1832	0	0	1832
41	0	0	0	0
42	0	0	0	0
43	0	0	0	0
44	0	1832	0	1832
45	0	0	0	0
46	0	1832	0	1832
47	0	1832	0	1832
48	0	1832	0	1832
49	0	0	0	0
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
53	0	10034	0	10034
TOTAL	2763951	2737648	0	5501599
Ind. Sampled				872
Samples				5
Catch (ton)				1247

Table 10. Redfish 30 stock Spanish catches length distribution.

Redfish Length (cm)	30			Total
	Males	Females	Ind.	
15				
16	15019	45058	0	60077
17	122549	46149	0	168698
18	132420	136265	0	268685
19	127962	137515	0	265477
20	57642	32221	0	89863
21	96822	107477	0	204299
22	514369	93867	0	608236
23	333437	162379	0	495816
24	433936	188947	0	622883
25	226098	164600	0	390698
26	212861	68870	0	281731
27	89515	107168	0	196683
28	65438	156280	0	221717
29	40335	246691	0	287026
30	0	189261	0	189261
31	0	90753	0	90753
32	0	40335	0	40335
33	10084	25103	0	35187
34	0	40335	0	40335
35	0	0	0	0
36	0	10084	0	10084
37				
38				
39				
40				
TOTAL	2478487	2089355	0	4567843
Ind. Sampled				745
Samples				4
Catch (ton)				968

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

American Plaice Length (cm)	Division 3LNO			Total
	Males	Females	Ind.	
10				
11	0	0	40	40
12	0	0	0	0
13	0	0	0	0
14	0	0	38	38
15	0	0	38	38
16	0	0	76	76
17	0	0	0	0
18	0	0	1167	1167
19	0	0	0	0
20	38	0	0	38
21	0	458	0	458
22	38	73	0	111
23	316	84	0	400
24	465	557	38	1060
25	596	691	0	1287
26	2456	1367	0	3824
27	1078	1538	0	2616
28	1279	2946	0	4225
29	1069	2268	0	3337
30	4709	11905	0	16614
31	2953	11236	0	14189
32	4189	8508	0	12697
33	4183	8185	0	12368
34	3780	11701	0	15481
35	3946	11570	0	15516
36	5919	9201	0	15120
37	3749	11470	0	15219
38	3569	10454	0	14023
39	1013	15531	0	16544
40	2785	17731	0	20516
41	761	27487	0	28248
42	3121	20838	0	23959
43	1280	25777	0	27057
44	1202	33808	0	35009
45	921	28038	0	28958
46	447	26113	0	26561
47	362	17620	0	17982
48	0	13006	0	13006
49	362	11546	0	11908
50	0	15194	0	15194
51	0	17897	0	17897
52	0	21110	0	21110
53	0	21771	0	21771
54	0	12875	0	12875
55	0	19293	0	19293

56	0	19331	0	19331
57	0	18788	0	18788
58	0	22957	0	22957
59	0	11216	0	11216
60	0	8501	0	8501
61	0	5741	0	5741
62	0	4746	0	4746
63	0	1088	0	1088
64	0	2598	0	2598
65	0	618	0	618
66	0	1404	0	1404
67	0	2	0	2
68	0	1023	0	1023
69	0	364	0	364
70	0	38	0	38
71	0	244	0	244
72	0	3	0	3
73	0	0	0	0
74	0	0	0	0
75	0	0	0	0
76	0	674	0	674
Total	56586	549181	1398	607165

Ind. Sampled	3551
Samples	26
Catch (ton)	615

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

Witch flounder Length (cm)	3NO			Total
	Males	Females	Ind.	
24	0	0	626	626
25	0	0	0	0
26	0	0	0	0
27	0	0	626	626
28	277	63	0	340
29	0	277	0	277
30	0	0	626	626
31	277	63	0	340
32	277	0	0	277
33	0	63	0	63
34	126	340	4384	4850
35	0	679	7516	8195
36	893	528	16285	17706
37	893	1761	15033	17686
38	1848	3458	19417	24724
39	528	4753	16912	22193
40	1082	4778	11901	17760
41	553	2012	10648	13214
42	0	4753	11901	16654
43	0	5821	1879	7700
44	277	4564	4384	9226
45	0	4162	2505	6667
46	0	3483	1879	5362
47	0	2716	1879	4595
48	0	3973	1253	5226
49	0	3508	0	3508
50	0	1295	0	1295
51	0	1446	626	2072
52	0	616	0	616
53	0	679	0	679
54	0	340	0	340
55	0	830	0	830
56	0	0	0	0
57	0	0	0	0
58	0	277	0	277
59	0	277	0	277
60	0	277	0	277
TOTAL	7029	57791	130282	195102
Ind. Sampled				559
Samples				3
Catch (ton)				98

Table 13. Yellowtail flounder Spanish catches length distribution for Div. 3LNO.

Yellowtail flounder Length (cm)	3LNO			Total
	Males	Females	Ind.	
15	8408	0	0	8408
16	8408	0	0	8408
17	0	0	0	0
18	8408	16816	0	25223
19	16816	25223	0	42039
20	8408	8408	0	16816
21	4216	16940	0	21156
22	1405	8538	0	9943
23	19626	32887	0	52514
24	2609	11732	22	14363
25	9899	38416	22	48337
26	5395	16401	22	21819
27	13653	16454	22	30129
28	8135	25791	0	33926
29	34777	35917	0	70693
30	49016	73745	0	122761
31	19810	32585	0	52395
32	68965	50256	0	119222
33	41286	30282	0	71569
34	69294	51991	0	121285
35	40893	73028	0	113921
36	22270	38917	0	61187
37	18833	21287	0	40121
38	2509	26238	0	28747
39	990	16498	0	17488
40	9909	44287	0	54196
41	807	22355	0	23162
42	20664	7109	0	27773
43	5253	20607	0	25860
44	13293	27048	0	40341
45	8064	14672	0	22736
46	23106	17144	0	40250
47	9813	9469	0	19282
48	15066	9541	0	24607
49	2443	4143	0	6586
50	19584	20622	0	40206
51	15066	6291	0	21357
52	1405	19258	0	20664
53	3848	13661	0	17509
54	11218	6291	0	17509
55	1405	12256	0	13661
56	2811	15066	0	17877
57	1405	0	0	1405
58	1405	8408	0	9813

59	0	2811	0	2811
60	0	1405	0	1405
61	0	0	0	0
62	0	2443	0	2443
63	0	1405	0	1405
Total	612032	865347	89	1477468
Ind. Sampled				1188
Samples				7
Catch (ton)				598

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
25	0	1346	0	1346	0	0	0	
26	0	0	240	240	0	0	0	
27	0	1158	0	1158	0	0	0	
28	0	0	0	0	0	0	0	
29	851	0	0	851	0	0	0	0
30	780	836	0	1616	0	0	0	0
31	1532	3292	0	4824	0	0	0	0
32	3920	3548	0	7467	0	0	0	0
33	8820	8781	0	17602	0	0	0	0
34	10134	8929	0	19063	0	161	0	161
35	16139	14575	0	30713	201	0	0	201
36	20355	17707	0	38062	0	634	0	634
37	28813	22590	0	51402	944	924	0	1868
38	30395	31664	0	62059	1031	2026	0	3057
39	45195	49473	0	94668	3763	3822	0	7585
40	63351	63513	0	126864	4818	10212	0	15029
41	84443	87807	0	172250	9075	11294	0	20369
42	97015	121502	0	218517	20640	23616	0	44256
43	127736	142888	0	270623	16606	25554	0	42160
44	136701	165588	0	302289	27388	35444	0	62831
45	146424	209025	0	355449	33141	39237	0	72378
46	138913	216946	0	355859	37918	41528	0	79446
47	108345	200704	0	309049	43333	50672	0	94005
48	114798	204787	0	319585	40350	59895	0	100246
49	87038	198245	0	285283	37992	56570	0	94562
50	74385	173095	0	247480	27062	47722	0	74785
51	54116	145787	0	199903	26249	50972	0	77221
52	34427	140176	0	174603	19856	56246	0	76102
53	25590	107931	0	133521	13278	46221	0	59500
54	17301	79189	0	96490	15666	47729	0	63396
55	12456	58996	0	71453	11902	34861	0	46763
56	7054	48378	0	55432	8102	28647	0	36749
57	4395	35839	0	40234	5652	25582	0	31234
58	2522	29178	0	31700	2917	21972	0	24889
59	850	17186	0	18036	1459	17319	0	18778
60	1483	12123	0	13606	1604	11150	0	12754
61	420	11516	0	11936	496	12873	0	13369
62	131	7235	0	7366	295	6559	0	6855
63	0	4871	0	4871	667	6939	0	7606
64	0	4091	0	4091	0	3260	0	3260
65	0	3977	0	3977	298	3179	0	3477
66	222	2090	0	2312	376	1415	0	1792
67	229	1546	0	1775	0	1313	0	1313
68	0	1980	0	1980	0	4038	0	4038
69	0	1278	0	1278	0	1208	0	1208

70	352	879	0	1231	0	1518	0	1518
71	0	897	0	897	0	571	0	571
72	0	1634	0	1634	0	1303	0	1303
73	0	840	0	840	0	1945	0	1945
74	0	489	0	489	0	406	0	406
75	0	430	0	430	0	0	0	0
76	0	314	0	314	0	316	0	316
77	0	523	0	523	0	250	0	250
78	0	181	0	181	0	188	0	188
79	0	590	0	590	0	423	0	423
80	0	596	0	596	0	0	0	0
81	0	131	0	131	0	0	0	0
82	0	0	0	0	0	749	0	749
83	0	314	0	314	0	363	0	363
84	0	0	0	0	0	209	0	209
85	0	0	0	0	0	847	0	847
86	0	0	0	0	0	179	0	179
87	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0
89	0	107	0	107	0	0	0	0
90	0	0	0	0	0	0	0	0
91	0	125	0	125	0	0	0	0
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0
Total	1507631	2666909	0	4174540	413077	800062	0	1213139
Ind. Sampled				14553				5020
Samples				83				34
Catch (ton)				3172				1273

Table 15. Greenland halibut Spanish catches length distribution for Div. NO

Greenland halibut Length (cm)	3N				3O			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total
25	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0
29	153	127	0	280	0	0	0	0
30	138	0	0	138	0	0	0	0
31	138	293	0	430	0	0	0	0
32	144	166	0	310	0	0	0	0
33	98	0	0	98	0	0	0	0
34	465	632	0	1097	0	0	0	0
35	775	1300	0	2075	0	0	0	0
36	2692	2066	0	4758	0	0	0	0
37	3232	3105	0	6337	0	0	0	0
38	3374	5091	0	8465	161	80	0	241
39	4233	5327	0	9560	80	80	0	161
40	4762	10336	0	15098	0	321	0	321
41	7304	13021	0	20325	161	402	0	562
42	7068	16221	0	23289	161	321	0	482
43	9818	14270	0	24087	80	482	0	562
44	8376	20952	0	29328	482	803	0	1285
45	11004	21181	0	32185	321	964	0	1285
46	8617	18807	0	27423	482	402	0	884
47	5326	18809	0	24135	241	964	0	1205
48	6276	20541	0	26816	402	1044	0	1446
49	5272	22060	0	27332	482	1366	0	1847
50	3403	13859	0	17262	0	562	0	562
51	3534	12860	0	16393	161	723	0	884
52	2331	11700	0	14031	241	562	0	803
53	1569	7814	0	9382	80	643	0	723
54	1430	8997	0	10427	80	161	0	241
55	1510	6617	0	8127	0	241	0	241
56	98	4377	0	4474	0	321	0	321
57	507	3649	0	4156	0	0	0	0
58	509	4005	0	4515	0	0	0	0
59	0	2550	0	2550	80	321	0	402
60	212	1300	0	1511	0	80	0	80
61	183	2314	0	2497	0	0	0	0
62	230	1301	0	1531	80	0	0	80
63	230	669	0	898	80	241	0	321
64	207	496	0	703	0	161	0	161
65	127	1110	0	1236	0	80	0	80
66	0	1110	0	1110	0	161	0	161
67	0	413	0	413	0	0	0	0
68	0	500	0	500	0	0	0	0
69	0	560	0	560	0	0	0	0
70	0	773	0	773	0	0	0	0

71	0	395	0	395	0	80	0	80
72	0	538	0	538	0	0	0	0
73	0	127	0	127	0	0	0	0
74	0	527	0	527	0	0	0	0
75	0	127	0	127	0	0	0	0
76	0	363	0	363	0	161	0	161
77	0	0	0	0	0	0	0	0
78	0	0	0	0	0	161	0	161
79	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0
81	0	133	0	133	0	0	0	0
82	0	0	0	0	0	0	0	0
83	0	0	0	0	0	80	0	80
84	0	327	0	327	0	0	0	0
85	0	0	0	0	0	0	0	0
86	0	138	0	138	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
91	0	133	0	133	0	0	0	0
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	171	0	171	0	0	0	0
95	0	0	0	0	0	0	0	0
Total	105344	284252	0	389597	3856	11968	0	15824
Ind. Sampled				2881				197
Samples				12				1
Catch (ton)				358				17

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

Greenland halibut Length (cm)	3LMNO			Total
	Males	Females	Ind.	
25	0	1346	0	1346
26	0	0	240	240
27	0	1158	0	1158
28	0	0	0	0
29	1004	127	0	1131
30	918	836	0	1754
31	1670	3585	0	5254
32	4064	3714	0	7777
33	8918	8781	0	17700
34	10599	9723	0	20322
35	17115	15874	0	32989
36	23048	20406	0	43454
37	32988	26619	0	59608
38	34961	38861	0	73822
39	53271	58702	0	111974
40	72930	84382	0	157312
41	100983	112523	0	213507
42	124883	161660	0	286544
43	154240	183193	0	337433
44	172947	222786	0	395733
45	190890	270407	0	461296
46	185929	277683	0	463612
47	157245	271149	0	428394
48	161826	286267	0	448093
49	130784	278241	0	409025
50	104850	235239	0	340089
51	84059	210341	0	294401
52	56855	208685	0	265539
53	40517	162608	0	203126
54	34478	136075	0	170553
55	25869	100715	0	126583
56	15254	81723	0	96976
57	10554	65070	0	75624
58	5948	55155	0	61104
59	2389	37376	0	39765
60	3299	24653	0	27952
61	1100	26702	0	27802
62	736	15096	0	15832
63	977	12720	0	13696
64	207	8007	0	8214
65	424	8346	0	8771
66	598	4777	0	5375
67	229	3272	0	3501
68	0	6517	0	6517
69	0	3046	0	3046
70	352	3170	0	3522

71	0	1944	0	1944
72	0	3475	0	3475
73	0	2912	0	2912
74	0	1421	0	1421
75	0	556	0	556
76	0	1153	0	1153
77	0	773	0	773
78	0	530	0	530
79	0	1014	0	1014
80	0	596	0	596
81	0	264	0	264
82	0	749	0	749
83	0	758	0	758
84	0	536	0	536
85	0	847	0	847
86	0	317	0	317
87	0	0	0	0
88	0	0	0	0
89	0	107	0	107
90	0	0	0	0
91	0	258	0	258
92	0	0	0	0
93	0	0	0	0
94	0	171	0	171
95	0	0	0	0
Total	2029908	3763192	0	5793100

Ind. Sampled	22651
Samples	130
Catch (ton)	4820

Table 17. Skates Spanish catches length distribution for Div. 3LNO.

Skates Length (cm)	3LNO			Total
	Males	Females	Ind.	
21	0	388	0	388
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	248	0	248
26	0	121	0	121
27	388	355	0	743
28	931	0	0	931
29	898	175	0	1072
30	1480	631	0	2111
31	2322	4535	0	6857
32	4798	3242	0	8040
33	6397	3234	0	9630
34	6384	3802	0	10186
35	6067	2800	0	8868
36	4437	12339	0	16777
37	14068	12425	0	26493
38	12128	13298	0	25426
39	9023	7030	0	16053
40	60346	36040	0	96385
41	36739	61253	0	97992
42	45071	77929	0	123000
43	54931	36713	0	91644
44	81193	49822	0	131015
45	90933	28064	0	118997
46	110092	162020	0	272112
47	136643	107535	0	244178
48	197622	131559	0	329182
49	111495	111295	0	222790
50	23922	86589	0	110511
51	38507	46623	0	85130
52	31784	84271	0	116055
53	61693	108448	0	170142
54	41782	42165	0	83947
55	63083	35204	0	98287
56	58243	17124	0	75367
57	44682	29154	0	73837
58	24377	47987	0	72364
59	21308	55484	0	76792
60	14798	42496	0	57294
61	22270	29085	0	51355
62	30036	33992	0	64027
63	24736	25380	0	50116
64	14401	33094	0	47494
65	24990	33591	0	58580
66	25324	13752	0	39075
67	16040	26379	0	42419

68	18162	18297	0	36459
69	38605	12814	0	51419
70	13497	25828	0	39325
71	13362	12605	0	25967
72	14459	27507	0	41966
73	29623	15030	0	44653
74	12075	6475	0	18550
75	14119	21802	0	35921
76	19537	4927	0	24464
77	29162	8705	0	37867
78	27740	1920	0	29660
79	17175	1994	0	19169
80	10768	1188	0	11955
81	14321	1373	0	15694
82	8408	488	0	8896
83	12153	536	0	12690
84	4930	141	0	5072
85	3542	163	0	3705
86	3586	40	0	3626
87	2224	0	0	2224
88	2174	0	0	2174
89	476	0	0	476
90	747	689	0	1436
91	231	0	0	231
92	1078	0	0	0
93	0	0	0	0
94	0	0	0	0
95	143	0	0	0
Total	1888660	1820189	0	3707628

Ind. Sampled	7661
Samples	49
Catch (ton)	5850

Table 18. Roughhead grenadier Spanish catches length distribution measured as preanal fin lengths (AFL) for Divisions 3LMNO.

Roughhead G. Length (cm)	3LMNO			Total
	Males	Females	Ind.	
7	1184	437	0	1621
8	3384	925	0	4309
9	10336	3457	0	13793
10	20989	7883	0	28871
11	51283	19774	0	71056
12	110915	47389	0	158304
13	93643	63644	0	157286
14	113085	79302	0	192387
15	141443	80388	0	221831
16	155206	86349	0	241555
17	137548	96646	0	234195
18	84267	58623	0	142891
19	36860	63944	0	100804
20	37685	42431	0	80116
21	3511	21008	0	24519
22	9153	12660	0	21813
23	843	9746	0	10589
24	700	14034	0	14735
25	0	2840	0	2840
26	700	6366	0	7066
27	700	15305	0	16005
28	700	5428	0	6128
29	0	1413	0	1413
30	0	817	0	817
31	0	737	0	737
32	0	4959	0	4959
33	0	529	0	529
34	0	71	0	71
35	0	345	0	345
36	0	985	0	985
37	0	0	0	0
38	0	0	0	0
39	0	700	0	700
40				
Total	1014137	749136	0	1763272
Ind. Sampled				4894
Samples				39
Catch (ton)				898

Table 19. Roughhead grenadier Div. 3LMNO Spanish catches ages distribution, mean weight (g) and mean length (AFL cm) by age.

Age	Abundance			Total	Age	Mean Weight (gr)			Total
	Males	Females	Ind.			Males	Females	Ind.	
3	896	787		1682	3	45	59	52	
4	6717	8285		15002	4	71	103	88	
5	45141	5876		51017	5	149	131	147	
6	99472	88157		187629	6	188	238	212	
7	161638	105208		266846	7	298	316	305	
8	95032	50651		145684	8	399	465	422	
9	74343	48619		122962	9	457	542	491	
10	48898	50363		99261	10	462	558	510	
11	23473	22338		45811	11	665	633	649	
12	13926	14600		28527	12	656	910	786	
13	2745	12049		14794	13	1083	1361	1310	
14	2828	9028		11856	14	736	1272	1144	
15	10401	3277		13678	15	503	1480	737	
16	67	4798		4865	16	1837	1793	1794	
17	67	3905		3972	17	1837	1900	1899	
18	0	2537		2537	18		1727	1727	
19	0	187		187	19		3009	3009	
20	0	1488		1488	20		2225	2225	
21	0	66		66	21		3467	3467	
22	0	392		392	22		4255	4255	

Age	Mean Length (cm)			Total
	Males	Females	Ind.	
3	7.9	8.6		8.2
4	9.2	10.5		9.9
5	11.9	11.4		11.8
6	12.9	13.9		13.4
7	15.1	15.4		15.2
8	16.8	17.6		17.1
9	17.5	18.6		17.9
10	17.4	18.7		18.1
11	20.0	19.6		19.8
12	19.9	22.2		21.1
13	23.6	25.6		25.2
14	20.7	24.6		23.7
15	18.0	26.1		19.9
16	28.5	27.8		27.8
17	28.5	28.7		28.6
18		26.6		26.6
19		33.7		33.7
20		29.8		29.8
21		35.5		35.5
22		38.0		38.0

Table 20. Total biomass (t.) of the Spanish 3L Survey (inside Canadian Waters) in 2008, calculated by the swept area method, by species and stratum. (R/V “*Vizconde de Eza*”).

Stratum	Area (sq. Miles)	Area inside EEZ	Greenland Halibut	Redfish	Roughhead Grenadier	Witch Flounder	American Plaice	Cod	Thorny Skate	Northern Shrimp
368	334	334	1405	22696	1620	19	22	305	1091	4448
387	718	462	2888	21578	1187	101	128	577	915	22543
733	468	234	1266	43978	900	130	0	8	513	6296
734	228	75	620	269	296	5	0	0	0	6
735	272	272	1860	5102	343	198	0	0	786	338
736	175	175	2403	88	819	471	0	0	0	11
737	227	227	1223	0	378	0	0	0	28	0
738	221	221	343	0	401	0	0	0	0	0
739	254	254	416	0	1168	0	0	0	0	0
740	264	264	445	0	381	0	0	0	0	0
741	223	123	550	5	1258	0	0	0	0	3
742	206	142	528	0	708	0	0	0	0	0
743	211	160	632	0	609	0	0	0	0	0
744	280	214	550	0	1212	0	0	0	0	0
Total	4081	3157	15130	93716	11280	924	150	890	3332	33647

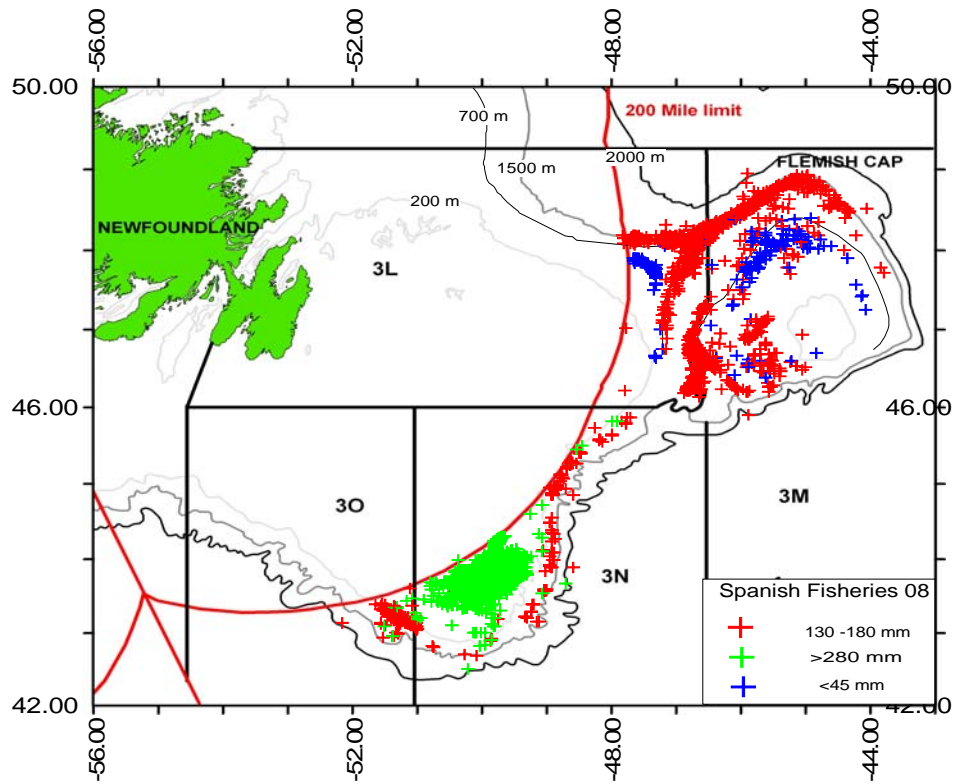


Figure 1. Spanish Fishery 2008 footprint by mesh size based in NAFO Observers data.