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Spanish Research Report for 1992

by

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Subarea 3

Status of the Fisheries

During 1992 three Spanish fleets fished in NAFO Convention area: pair-trawlers, fishing mainly for cod and partially for Greenland halibut, small freezers, fishing traditionally for flatfish but fishing mainly for Greenland halibut in 1992, and large freezers, fishing for Greenland halibut in deep water of Divisions 3LM.

Pair-trawl fishery for cod

There were 18 pair-trawlers fishing in NAFO area during 1992. The fleet left the area in June when the cod quotas were already caught. One observer was on board a pair-trawler. Sampling intensity of cod catch was:

Division:	3L	3M	3N
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Samples	9	28	
Fish measured	2612	5066	
Otoliths aged	304	451	
Catch (t)	3822	4216	1927
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Cod length and age frequency in those months with sampling are presented in Tables 1 and 2. In these tables SAMPLED CATCH means the catches from which samples were taken; frequencies are referred to the sample size. SAMPLED WEIGHT means the weight of all samples taken from the catch to make length measurements. Samples were not weighed on board; their weights were calculated with a length-weight relationship. SAMPLES means the number of samples taken, and MEAN WEIGHT is the quotient between Sampled Catch and Total (frequency).

Mean weights at age in the catch were also calculated with the same length-weight relationship. Results are presented in Table 3. In Table 2 SOP means Sum Of Products and it is a later calculation of sampled catch using age frequencies and weight at age data (Table 3). Under the headline "%" the quotient between SOP and Sampling catch is presented and expressed in percent. This figure means the proportion of Sampling catch covered by the sampling process. When the value is less than 100 it means that the same portion of the length range was not covered by otolith sampling.

As in previous reports, length and age frequencies presented in this report came from the bulk of the catch, including discards.

During 1992 some pair-trawlers, those with freezing capacity, moved occasionally to deep waters to fish Greenland halibut. The geographic area belongs mainly to statistical Division 3M, but the fishery was carried out on the Grand Bank side of the Flemish Pass. We use in tables the denomination 3LM for that zone of deep waters.

Groundfish fishery of small freezers

Thirteen small freezers, those traditionally fishing for flatfish, were fishing in NAFO area during 1992. Most of them moved to deep waters during the first half of the year to fish Greenland halibut in the same area described for pair-trawlers. One observer was on board at this time. Greenland halibut and witch flounder length frequencies are presented in Tables 4 and 5, respectively. Length frequencies are referred to the catch figure under SAMPLED CATCH in the table. Sampled catch was divided by sex using length frequencies and a length-weight relationship, and mean weight by sex was calculated after that. Under the headline "%" the quotient between SOP by sex and catch sampled is presented and expressed in percent.

During the second half of the year all vessels were fishing for Greenland halibut and each vessel had an observer on board. American plaice, cod and Greenland halibut length frequencies in the catch are presented in Tables 6, 7 and 8, respectively.

Greenland halibut fishery of large freezers

Twenty three bottom trawlers fished on Greenland halibut in the zone described of Divisions 3LM. Fishing was conducted in 700-1,500 meters depth, and Greenland halibut comprised the bulk of the catch. One of each three vessels had an observer on board sampling the catch. The length distribution of the catch is presented in Tables 9, 10 and 11, for Divisions 3L, 3M and 3N, respectively.

Special Research Studies

During 1992 we co-operated in the EEC survey of Flemish Cap, carried out in July. The survey had a bottom trawl stratified random design and 117 valid tows were made up to a depth of 720 meters (400 f.). Results of the survey are presented in the report (SCR Doc. 93/) and it includes age compositions for cod, American plaice, redfish (the three species of Sebastes sp) and Greenland halibut stocks.

Table 1 - Length composition of pair-trawler cod catches.

Division Month	3L				3M			
	APR	MAY	FEB	MAR	APR	MAY	MAY	MAY
Length								
21-23:	8			37	4			
24-26:	16			139	2			
27-29:	70		1	407	76			
30-32:	299		1	567	73	1		
33-35:	440	14	1	628	63	1		
36-38:	959	127	4	425	66	13		
39-41:	1974	580	7	516	66	13		
42-44:	3771	1193	3	331	87	33		
45-47:	6920	1465	16	605	234	30		
48-50:	7309	1671	18	888	462	84		
51-53:	8864	1384	22	709	667	73		
54-56:	7288	697	10	381	412	68		
57-59:	3702	593	9	163	522	88		
60-62:	1920	303	7	135	407	102		
63-65:	985	194	2	56	397	86		
66-68:	484	17	1	42	187	53		
69-71:	188	12	3	32	118	32		
72-74:	12	11	3	17	78	23		
75-77:			1	9	80	16		
78-80:			2	1	24	6		
81-83:			2	3	33	3		
84-86:	8		1	7	21	4		
87-89:				2	14	3		
90-92:				4	1	1		
93-95:			1	3	2	1		
96-98:			1	1	2	1		
99-01:			1	1	1	1		
102-04:				3				
105-07:								
108-10:								
111-13:								
114-16:								
117-19:								
120-22:								
123-25:								
Total	45216	8262	116	6115	4099	735		
Sampled catch Kg	58030	9812	213	5582	7392	1487		
Samples	6	3	2	14	10	2		
Fish meas.	1761	851	103	2684	1819	460		
Sampled weight Kg	1714	998	195	2906	2809	1023		
Mean weight	1.283	1.188	1.828	0.913	1.803	2.024		

Table 2 - Age composition of pair-trawler cod catches.

Division Month	--3L--			3M		
	APR	MAY	FEB	MAR	APR	MAY
AGE						
1	24			180	85	
2	344	3	4	1444	152	6
3	957	195	10	1137	250	46
4	8685	1851	35	1629	1462	224
5	16839	3112	38	1308	1168	234
6	14847	2520	13	272	588	160
7	2679	444	6	103	245	55
8	448	77	11	14	2	
9	366	50	3	13	23	3
10			1			
11						
12+						
Total	45189	8252	110	6097	4087	730
Otoliths	304	304	248	248	203	203
Sampled	58030	9813	213	5583	7393	1488
catch Kg	57918	9767	177	5444	7357	1456
SOP	100	100	83	98	100	98

Table 3 - Mean weight (gr) at age of pair-trawler cod catches.

Division Month	--3L--			3M		
	APR	MAY	FEB	MAR	APR	MAY
AGE						
1	163			161	220	365
2	284	365	416	311	340	433
3	531	614	551	486	1012	925
4	967	930	1099	1050	1286	1260
5	1245	1150	1428	1348	1964	2074
6	1402	1301	2310	2054	2592	2650
7	1873	1679	3057	2783	3524	3468
8	2559	2513	2501	4433	5929	5929
9	2642	2537	4771	3718	5499	5604
10			9722			
11						
12+						

Table 4 - Greenland halibut length composition in small freezers catches in Divisions 3LM combined. Sampling data.

Division Month	3LM					
	JAN			FEB		
Sex	I	M	F	I	M	F
Length						
30-31:						24
32-33:					72	100
34-35:		21	7		180	273
36-37:		7	7		806	964
38-39:		14	14		1378	2166
40-41:		82	48		2434	3629
42-43:		124	69		2382	4373
44-45:		103	151		2176	4045
46-47:		131	62		1415	3222
48-49:		96	69		1016	2408
50-51:		76	55		435	1770
52-53:		41	48		376	924
54-55:		14	27		123	539
56-57:		14	14		123	561
58-59:					61	580
60-61:			14		24	244
62-63:					26	256
64-65:					13	285
66-67:						113
68-69:					7	130
70-71:						84
72-73:						84
74-75:						84
76-77:						58
78-79:						10
80-81:						74
82-83:						36
84-85:						25
Total		722	584		13048	27062
Sampled						
catch Kg		0	1129		33808	
by sex		0	603		0	9384
Samples			1			22
Fish meas.			190			3140
Sampled						
weight Kg			164			2627
Mean weight		0.835	0.901		0.719	0.902

Table 5 - Witch flounder length frequency in small freezers catch. Sampling data.

Division Month	3LM FRB		
	I	M	F
Sex			
length			
32-33:	.	7	.
34-35:	.	7	7
36-37:	.	22	7
38-39:	.	7	.
40-41:	.	59	7
42-43:	.	88	29
44-45:	.	125	51
46-47:	.	66	132
48-49:	.	44	139
50-51:	.	7	132
52-53:	.	.	59
54-55:	.	.	66
56-57:	.	.	7
58-59:	.	.	29
Total	433	667	
Sampled catch (t)			996
by sex	0	294	702
Samples			1
Fish meas.			150
Sampled weight Kg			136
Mean weight	0.679	1.052	

Table 6 - American plaice length frequency in small freezers catch. (Absolute frequencies / 1000)

Division Month	3M				...	total	3MO			...	total
	JUL	AUG	SEP	OCT			SEP	OCT	NOV		
length											
14-15:								1			1
16-17:											1
18-19:								1			2
20-21:			1	1		4	3		1		6
22-23:						1	5				9
24-25:						1	6	1	3		11
26-27:		1	1	1		5	8	1	4		16
28-29:	1	2	4	4		16	7	2	5		18
30-31:	1	3	4	7		22	4	3	5		15
32-33:	1	3	4	7		21	3	3	5		13
34-35:	1	4	5	8		27	2	3	5		13
36-37:	1	6	9	12		44	1	3	3		8
38-39:	1	8	14	14		59	1	3	3		8
40-41:	1	7	11	15		51	1	2	2		6
42-43:		5	7	7		30	1	2	1		4
44-45:		4	5	7		26		1	1		3
46-47:		4	5	12		32		1	1		3
48-49:	1	4	6	12		36		1	1		2
50-51:		3	5	8		25		1	1		2
52-53:		1	3	5		15					1
54-55:		1	1	1		5					1
56-57:				2		4					
58-59:						1					
60-61:											
Total	9	58	85	125		425	43	30	44		145
Catch (t)	5	42	60	97	111	316	10	16	18	11	55
Fish meas.	127	1708	306	267		2408	335	1079	3201		4615
Samples	1	9	5	7		22	2	8	18		28

Table 7 - Cod length frequency in small freezers catch. Sampling data.

Division Month	3M			total
	SEP	OCT	...	
length				
21-23:	1	1		2
24-26:	1	1		1
27-29:	3			3
30-32:	12	8		20
33-35:	23	17		40
36-38:	22	27		48
39-41:	10	19		29
42-44:	3	11		14
45-47:	2	7		9
48-50:	1	4		5
51-53:	1	1		2
54-56:	1	1		2
57-59:		2		2
60-62:		1		1
63-65:				
66-68:		1		2
69-71:		1		1
72-74:				
75-77:		1		1
Total	82	102		183
Catch (t)	43	71	1	116
Fish meas.	1548	162		1710

Table 8 - Greenland halibut length composition in small freezers catches. (Absolute frequencies / 1000)

Division Month	3L			3M			3N			total				
	JUL	AUG	SEP	OCT	NOV	DEC	AUG	SEP	OCT		NOV	DEC		
length														
24-25:														1
26-27:														1
28-29:														5
30-31:														12
32-33:														23
34-35:														31
36-37:														56
38-39:														84
40-41:														117
42-43:														154
44-45:														186
46-47:														178
48-49:														184
50-51:														157
52-53:														123
54-55:														90
56-57:														63
58-59:														54
60-61:														35
62-63:														33
64-65:														25
66-67:														19
68-69:														15
70-71:														16
72-73:														9
74-75:														5
76-77:														3
78-79:														4
80-81:														1
82-83:														1
84-85:														1
86-87:														1
88-89:														1
90-91:														1
92-93:														1
94-95:														1
Total	362	89	248	56	80	289	4890	71	69	46	23	13	1021	1690
Catch (t)	430	113	285	73	112	274	4633	93	92	54	28	12	1283	2036
measur.	5705	7448	7548	2620	591	4283	28195	3018	4616	2165	1146	1432	12377	37844
Samples	28	33	43	16	4	23	147	16	21	11	7	9	64	195

Table 9 - Greenland halibut length composition in large freezers catches in Division 3L. (Absolute frequencies / 1000)

Division Month	3L												total
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
length													
22-23:												1	1
24-25:												3	4
26-27:					1		1	1			1	4	9
28-29:					2	2	1	4	1	1	1	6	17
30-31:	1	2		1	8	5	3	9	5	7	3	12	56
32-33:	3	7	2	4	17	9	9	15	15	19	13	29	142
34-35:	5	14	7	13	38	24	21	23	38	49	38	47	317
36-37:	12	32	19	36	81	45	45	41	70	87	63	70	598
38-39:	23	69	42	77	143	76	78	58	101	136	106	102	1009
40-41:	39	118	80	155	238	130	106	78	141	175	137	108	1506
42-43:	54	152	117	221	308	160	142	95	174	197	125	103	1856
44-45:	62	155	131	261	345	193	146	98	195	201	126	99	2010
46-47:	60	145	123	256	338	178	125	89	196	180	117	76	1884
48-49:	50	116	109	229	298	153	110	89	184	145	104	50	1638
50-51:	35	89	83	183	244	124	82	85	174	120	79	31	1329
52-53:	22	61	59	145	199	96	61	71	123	80	70	19	1005
54-55:	17	42	43	111	154	76	49	59	91	59	53	13	768
56-57:	11	29	34	83	118	61	38	51	60	39	38	9	572
58-59:	8	21	26	61	87	45	29	37	39	24	26	6	409
60-61:	6	19	20	46	66	37	24	32	32	16	19	4	322
62-63:	4	12	14	34	48	28	18	24	21	10	15	2	231
64-65:	4	10	11	25	35	22	15	18	15	7	12	3	176
66-67:	3	8	8	19	24	17	10	14	12	6	7	2	131
68-69:	2	8	7	14	19	14	9	11	9	4	6	2	105
70-71:	2	4	6	11	14	10	9	7	6	3	5	1	79
72-73:	1	4	5	9	12	7	8	6	6	2	4		65
74-75:	1	3	3	6	10	6	6	5	5	1	4		51
76-77:	1	3	3	5	7	5	5	3	4	2	3	1	43
78-79:	1	2	3	5	6	4	4	2	4	1	2	1	34
80-81:	1	2	2	5	5	3	3	2	2	1	2		28
82-83:	1	1	2	4	4	3	2	1	3	1	1		23
84-85:	1	1	1	2	3	2	2	1	2	1	1		17
86-87:	1	1	1	2	3	2	1	1	1	1	1	1	14
88-89:		1	1	2	2	1	1	1			1		11
90-91:				1	1	1							5
92-93:				1	1	1							5
94-95:					1								3
96-97:													1
98-99:													1
Total	431	1131	963	2028	2881	1550	1165	1029	1729	1575	1185	808	16476
Catch (t)	433	1112	1036	2234	3086	1691	1235	1144	1756	1375	1139	587	16828
measur.	8199	30911	31251	74360	102690	71775	12496	12813	20758	22624	9277	4093	401247
Samples	30	104	97	230	316	224	46	43	64	68	33	10	1264

Table 10 - Greenland halibut length composition in large freezers catches in Division 3M. (Absolute frequencies / 1000)

Division Month	3M												total
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
length													
22-23:													1
24-25:													5
26-27:													16
28-29:													42
30-31:						1							1
32-33:					1	1							5
34-35:	1	2	1	1	3	3	2	3					16
36-37:	2	7	6	2	8	6	3	5				1	42
38-39:	6	23	18	8	17	15	8	10	1		1	2	109
40-41:	14	52	47	19	29	26	16	17	1	1	3		224
42-43:	26	81	79	35	40	34	21	26	1	3	4		351
44-45:	37	106	108	49	46	37	24	29	2	3	5		446
46-47:	42	121	123	59	49	35	22	25	2	3	5		486
48-49:	42	120	125	63	48	30	18	20	2	3	5		478
50-51:	35	108	115	62	46	27	15	16	2	5	3		434
52-53:	29	82	96	59	41	24	14	13	1	4	3		366
54-55:	22	69	82	55	36	20	12	10	2	4	3		314
56-57:	18	53	68	46	30	18	10	12	2	3	3		362
58-59:	14	42	52	36	24	14	8	8	3	1	2		206
60-61:	12	33	40	30	20	11	8	9	2	1	1		168
62-63:	8	25	29	22	14	10	7	7	1	1	1		125
64-65:	6	19	21	16	11	7	7	6	2	1	1		98
66-67:	5	16	16	13	8	6	6	6	2	1	1		79
68-69:	4	11	13	10	6	4	4	4	2		1		59
70-71:	4	9	11	8	5	3	4	3	1				48
72-73:	3	7	9	7	4	4	3	2	1			1	41
74-75:	3	6	8	6	3	3	2	3	2		1	1	37
76-77:	2	5	7	5	2	2	3	2	1				30
78-79:	2	5	5	4	2	1	2	2	2				25
80-81:	2	4	5	4	2	1	2	1	1				22
82-83:	2	3	4	3	2	1	1	1	1				18
84-85:	1	3	3	2	1	1	1	1	1			1	14
86-87:	1	2	2	1	1	1	1	1	1			1	11
88-89:	1	2	2	1		1	1		2				9
90-91:		1	1	1									5
92-93:		1	1					1					4
94-95:													2
96-97:													1
98-99:													1
Total	344	1018	1100	627	501	348	225	242	43	2	36	50	4536
Catch (t)	454	1305	1464	907	643	437	320	319	106	3	49	70	6077
measur.	15551	50737	69726	41956	27199	21287	4533	3534	270	278	219	737	236027
Samples	58	188	251	138	91	74	22	15	2	1	2	3	845

Table 11 - Greenland halibut length composition in large freezers catches in Division 3N. (Absolute frequencies / 1000)

Division Month	3N					total
	JUL	AUG	SEP	OCT	NOV	
<u>length</u>						
20-21:			1			1
22-23:			2			2
24-25:		1	3			5
26-27:		1	2			4
28-29:		2	2			5
30-31:		7	8			16
32-33:	1	11	12	1		26
34-35:	1	22	18	2		43
36-37:	1	39	34	2		77
38-39:	3	57	37	7	1	105
40-41:	4	88	55	13	1	161
42-43:	5	91	53	10	1	161
44-45:	5	84	62	19	1	172
46-47:	5	78	51	16	1	152
48-49:	5	71	45	16	2	138
50-51:	3	58	29	15	1	107
52-53:	4	46	23	13	1	87
54-55:	4	29	15	9	1	59
56-57:	1	21	8	10	1	42
58-59:		9	7	7	1	24
60-61:		7	6	7	1	21
62-63:		6	4	6		16
64-65:	1	6	4	4	1	16
66-67:	1	3	3	2		9
68-69:	1	3	3	3		10
70-71:		3	3	3		9
72-73:		1	2	2		5
74-75:			2	2		5
76-77:				1		2
78-79:			1	1		2
80-81:				1		2
82-83:				1		2
84-85:				1		1
86-87:						1
88-89:						
90-91:						
92-93:						
94-95:						
96-97:						
98-99:						
Total	46	747	501	175	18	1488
Catch (t)	47	655	440	232	28	1405
measur.	240	4998	3134	793	905	11475
Samples	1	17	10	3	3	10104