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Description of the Spanish Pelagic Fishery of Oceanic Redfish (*Sebastes mentella* Travin) in the North Atlantic (2000-2004)

by

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Abstract

The period analyzed in this paper is 2000-2004. Data from the Spanish commercial fishery (hauls, positions, CPUE and length distributions) were recorded on board by scientific observers of the national sampling network. The effort data come from the Fisheries National Administration (SGPM).

The Spanish pelagic redfish fishery in ICES areas XII and XIV and in the NAFO Div. 1F and 2J showed a significant seasonal pattern in terms of its geographical and depth distribution. The fishing season occurs mainly during the 2nd and 3rd quarter of every year.

In the second quarter the fleet works in area XIV, between the Greenland and Iceland EEZs, in depths deeper than 500 m capturing fish of great size. Proportion of females in the catches is greater than the males. The catches length distributions present two modes that move along the time.

In third quarter the fleet moves toward the south west to ICES Division XII and NAFO Div. 1F and 2J and depth of hauls is less than 500 m. The length distributions of the catches are smaller than those of the second quarter and show only one mode rather stable in time. Proportion of the males in the catches is bigger than the females. The yields in these Divisions are smaller than in Division XIV.

The fishery in NAFO area 1F and 2J is quite similar to that one carry out in ICES Division XII, particularly in the characteristics of the hauls (depth, season) and in the catches (distributions of sizes, sex ratio, etc).

Introduction

The reason of this document is to provide a historical vision of the exploitation of the redfish (*Sebastes mentella*) in ICES areas XIV and XII and NAFO Div. 1F and 2J by the Spanish fleet that allows to understand better the changes that are taking place in the fishery. This document try to extend the information presented in the ICES NWWG 2002 Working Paper Nº 4. The examined period in 2002 was 1995-2001 and now the period analyzed in this paper is 2000-2004. Information is reported on the characteristics of the fleet, effort distribution, CPUE and catches length distributions.

Material and Methods

Data from the Spanish commercial fishery (hauls, positions, CPUE and length distributions) were recorded on board by scientific observers of the national sampling network. Data records were characterised by the vessel, date, depth and division and they were available in tow-by-tow basis. The analysed CPUE data were not standardised. The effort data come from the Fisheries National Administration (SGPM).

It must be noted that the scientific observer coverage is not the 100% of the fishing effort. The percentage coverage by the sampling network varies every year (Table 1). Despite the level of sampling coverage, the data are thought to be representative of the whole fleet.

Results

Effort

Table 1 shows the total effort, the percentage of the total effort and the observed effort by quarter. The total effort and their distribution by quarters is more or less constant between 2000 and 2003. In this period total effort is about 500 fishing days each year and the distribution by quarters is 75% in the second quarter and 25% en the third quarter. The effort in the first and fourth quarter is occasional and very low. Effort in 2004 increase in more than 150 fishing days, and most of this increase was carried out inside of the Greenland ZEE in the third quarter.

Table 2 shows the effort distribution by Division, year and depth stratum, practically all the effort in Division XIV was carried out deeper than 500 m. in all year analyzed and in Divisions XII, 1F and 2J the effort was carried out less than 500 m.

Table 3 presents the percentage of the effort by year, quarter and Division, we can observe, for all years, that effort in the first half of the year is carry out in ICES Division XIV and in the second, the effort is distributed in all Divisions (1F, 2J, XII and XIV). The effort distribution by Divisions is more or less constant for the period 2002-2002, about 75% of the effort was carried out in Div XIV and 25% in Division XII and less than 5% in NAFO Div 1F and 2J. In 2003 the effort in Div XII was low (5%) and in NAFO area increased (10%). In 2004 the effort carried out in NAFO Div 1F was increased until 21%, most of this increase was carried out inside of the Greenland ZEE (Div. 1F).

Summarizing, in the period 2000-2004, the effort distribution showed a significant seasonal pattern in terms of its geographical and depth distribution. Most of the effort is usually carried out during the second and third quarter of every year. During the second quarter, the effort is carried out in international waters of ICES Division XIV between the Greenland and Iceland EEZs in depth deeper than 500 m. In third quarter the fleet moves toward the south west to the ICES Division XII and NAFO Div. 1F and 2J where depth of hauls is less than 500 m.

Fleet

The Spanish fleet began to exploit this resource with three vessels in the second semester of 1995. In 1996 the same boats fished during the whole year, in 1997 the fishing was concentrated on the second and third trimester and 4 vessels operated in the area, from 1998 until 2002, 6 boats fished in this area . In 2003 were 7 boats and in 2004 they were incorporated 3 more vessels as show Table 4.

The technical characteristics of the ships that have fished in this area can be observed in Table 5. All are large freezers with less than 15 years old and with great freezing capacity and most of the vessels were equipped with Gloria-type pelagic trawls with a vertical opening of 90-120 m and a mesh size of 100 mm. in the cod end. The new boats that they were incorporated to the fishery last year are smaller than the vessels that traditionally have been worked in this zone.

CPUE

Table 6 presents the CPUE by year and Division for the period analyzed. We don’t have information for all divisions and years because the sampling coverage is not complete. The major yields are obtained every year in the

Division XIV, in last year the CPUE in this Division has decreased, from 1 388 in 2003 to 1083 kg/hour in 2004. In Division XII the CPUEs always is smaller than in Division XIV and the smaller yields for this period have been obtained in the last year where the yield dropped from 875 kg/hour in 2002 to 575 in 2004. The Division where smaller yields are obtained are 1F and 2J, but in the last year the yield increased from 280 kg/hour in 2002 to 330 in 2004.

Catches

Table 7 shows the Spanish best estimate catches by Division and year. To calculate the catches we use the CPUE observed by Division and raise this CPUE to the total Division effort. In the cases that we don't have Spanish CPUE information we have taken the German CPUE. The reason for taking the German CPUE is that the fleet characteristics and the fishing grounds of the Spanish and German fleet are similar. The Spanish catches before 2004 hang around 10 500 tons. In 2004 catches was increased till 11 674 tons due to the effort increase.

Discards

Discard of *Sebastes mentella* are composed often of parasite fish by *Sphyrion lumpi*. The discards quantities vary annually, existing years in those that practically anything is not discarded and other where the discards it can represent 6% of total catches (2003) as it is show in Table 8. This variability can also be observed by Division in 2004 the discarded percentage is much larger in the Divisions XII, 1F and 2J.

In Division XIV, this variability can be due to that the percentage of discards does not depend directly on parasite fish by *Sphyrion lumpi*, but it is related with the haul catch. When the haul catch is very much the fish is discarded under worse conditions by the lack of time to elaborate the whole catch. When the catches are between the standard values there is enough time to elaborate the whole fish, even the one infected, and there is not discards. In Divisions XII, 1F and 2J the discards rates are more related with parasite fish.

Catches Length Distributions

The catches length distributions in percentage by sex and total, Division and year are presented in Fig. 1 and Fig. 2. Table 9 shows the number of samples and the individuals measured by year and Division. We can observe that length distributions by sex in Division XIV are quite stable by year but is very different by sex, males present one mode around 39-43 cm, while the females length distribution have two modes, the first between 36-39 cm. and the second around 42-44 cm. For Divisions XII and 1F, females and males only have one mode around 35 cm., the female mode used to be one cm. more than the males. In Div. 2J the modes are less clear than in the others Divisions, this could be a problem of the sampling level. In 2004 the length distributions for males and females in Divisions XII, 1F and 2J are shifted two cm. less.

The total length distributions by Division and year present a clear difference between Division XIV and XII, 1F and 2J. The length range of the catches in Division XIV is 30-48 cm. and have one mode around 41-43 cm while in Divisions XII, 1F and 2J the range is 24-41 cm. and have one mode around 34-35 cm.

Sex Ratio

Figure 3 shows the female sex ratio by Division and year. In Division XIV we can observe that the sex ratio is around 50% for all years except 2004 where the sex ratio is about 63%. In Division XII we can see a decrease trend between 2000 and 2004 in the sex ratio, in 2000 the value was 39% and in 2004 was 23%. In Div. 1F and 2J the sex ratio is very similar and constant between years and the value is about 40%.

Conclusions

The Spanish pelagic fishery of redfish in the ICES areas XII and XIV and in the NAFO Div. 1F and 2J between 2000 and 2004 showed a significant seasonal pattern in terms of its geographical and depth distribution. The fishing season is occurs mainly during the 2nd and 3rd quarter of every year.

In the second quarter the fleet operates in the area XIV, between the Greenland and Iceland EEZs, in depths greater than 500 m capturing fish of more size. Proportion of females in the catches is greater than the males, the female catches length distributions present two clear modes. The yields obtained in this quarter are larger.

In the third quarter the fleet move toward the south west to the ICES Division XII and NAFO Division 1F and 2J and depth of hauls is less than 500 m. The length distributions of the catches are smaller than those of the second quarter and show only one mode. Proportion of the males in the catches is larger than the females. The yields are smaller than those of the second quarter.

The fishery in NAFO area 1F and 2J is more similar to that one carry out in ICES Division XII than fishery in Division XIV, in particularly in the characteristics of the catches (distributions of sizes, sex ratios, yield, etc) and season.

References

Fernando González , Guadalupe Ramilo and Isabel Loureiro "Description of the Spanish pelagic fishery of oceanic redfish (*Sebastes mentella* Travin) in the North Atlantic (1995-2001)." 2002 NWWG WP Nº 4.

Hans-Joachim Rätz, Jens Ulleweit and Kay Panten "On the German Fishery and Biological Characteristics of Pelagic Redfish (Sebastes mentella Travin) 1991-2003." 2004 NWWG WP Nº 5.

Table 1- Spanish effort (total and percentage) in fishing days and observed effort by year and quarter.

		Fishing days	% by Quarter	Days Observed	% Observed
2000	**Q-1**				
	Q-2	424	81,3%	107	25%
	Q-3	87	16,7%	55	63%
	Q-4	10	2,0%		0%
	Total	521	100,0%	162	31,1%
2001	**Q-1**				
	Q-2	391	72,9%	88	23%
	Q-3	144	26,9%	63	44%
	Q-4	1	0,2%	1	100%
	Total	536	100,0%	152	28,4%
2002	**Q-1**				
	Q-2	328	66,3%	71	22%
	Q-3	116	23,4%	24	21%
	Q-4	51	10,3%	11	22%
	Total	495	100,0%	106	21,4%
2003	**Q-1**				
	Q-2	339	71,8%	81	24%
	Q-3	133	28,2%	4	3%
	Q-4				
	Total	472	100,0%	85	18,0%
2004	**Q-1**	11	1,6%		0%
	Q-2	369	55,0%	51	14%
	Q-3	270	40,2%	17	6%
	Q-4	21	3,1%		0%
	Total	671	100,0%	68	10,1%

Table 2- Percentage of the Spanish effort by year, Division and depth stratum.

	XIV		XII		1F		2J	
	<500	>500	<500	>500	<500	>500	<500	>500
2000	4%	96%	100%		100%			
2001	4%	96%	100%		100%		100%	
2002	2%	98%	100%					
2003	0%	100%						
2004	0%	100%	100%		100%		100%	

Table 3- Percentage of the Spanish effort by year, quarter and Division.

		XIV	**XII**	**1F**	**2J**
2000	**Q-1**				
	Q-2	100,0%			
	Q-3	5,0%	95,0%		
	Q-4			100,0%	
	% by Division	79,4%	18,6%	2,0%	
2001	**Q-1**				
	Q-2	100,0%			
	Q-3	34,0%	64,5%	1,0%	0,5%
	Q-4		100,0%		
	% by Division	72,2%	27,1%	0,6%	0,2%
2002	**Q-1**				
	Q-2	100,0%			
	Q-3	52,0%	48,0%		
	Q-4		100,0%		
	% by Division	78,0%	22,0%		
2003	**Q-1**				
	Q-2	100,0%			
	Q-3	43,0%	17,0%	23,0%	17,0%
	Q-4				
	% by Division	83,9%	4,9%	6,6%	4,7%
2004	**Q-1**	100,0%			
	Q-2	100,0%			
	Q-3	27,0%	21,0%	48,0%	0,0%
	Q-4		38,0%	62,0%	
	% by Division	67,7%	9,7%	21,2%	1,5%

Table 4- Number of the Spanish vessels in the redfish fishery by year.

Number of vessels per year

Vessels	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
V1	X	X	X	X	X	X	X	X	X	X
V2			X	X	X	X	X	X	X	X
V3				X	X	X	X	X	X	X
V4	X	X	X	X	X	X	X	X	X	
V5				X	X	X	X	X	X	X
V6	X	X	X	X	X	X	X	X	X	X
V7									X	X
V8										X
V9										X
V10										X
V11										X

Table 5- Technical characteristics of the Spanish fleet in the redfish fishery.

Vessels	HP	GRT	Built	Length (m)	Freezing Capacity (tons/day)
V1	2000	1866	1987	84	45
V2	2000	703	1988	67	30
V3	1950	1075	1988	68	30
V4	2000	995	1987	74	50
V5	2000	1236	1986	64	25
V6	1950	1393	1986	68	40
V7	700	400	2001	51	20
V8	1223	461	2001	58	42
V9	1645	505	2004	51	42
V10	800	755	1999	51	24
V11	1644	1319	2001	61	35

Table 6- Redfish Spanish CPUE (Kg/hour) by year and Division

Spanish CPUE (kg/h) by División (2000-2004)

Year	XIV	XII	1F	2J
2000	1273	814	181	
2001	1082	821	289	282
2002	1142	875		
2003	1388			
2004	1053	575	330	331

Table 7- Redfish Spanish catches (ton) by year and Division

Pelagic Redfish Spanish catches (ton)

Year	XIV	XII	1F	2J	Total ICES	Total NAFO	TOTAL
2000	10146	716	32		10862	32	10894
2001	9009	1052	16	5	10062	22	10083
2002	7553	1397	0	0	8950	0	8950
2003	9374	383	767	311	9756	1078	10834
2004	9996	794	829	56	10790	885	11674

Table 8- Redfish discards percentage of the total catches of the Spanish fleet by year and Division.

	XIV	**XII**	**1F**	**2J**	**Total**
2000	0,03%	0,00%	0,00%		0,03%
2001	0,00%	1,14%	0,00%	0,00%	0,33%
2002	0,23%	0,00%			0,22%
2003	6,39%				6,39%
2004	0,25%	10,38%	8,29%	7,75%	1,36%

Table 9- Samples and sampled individuals of the Spanish length distributions by year and Division.

		Division				
Year		XIVb	XII	1F	2J	Total
2000	Num Length Samples	112	30	4		146
	Sampled Individuals	19249	4945	421		24615
2001	Num Length Samples	78	48	3	1	130
	Sampled Individuals	14417	9534	620	206	24777
2002	Num Length Samples	48	9			57
	Sampled Individuals	9587	1675			11262
2003	Num Length Samples	75				75
	Sampled Individuals	15135				15135
2004	Num Length Samples	59	2	6	3	70
	Sampled Individuals	12156	349	1016	589	14110

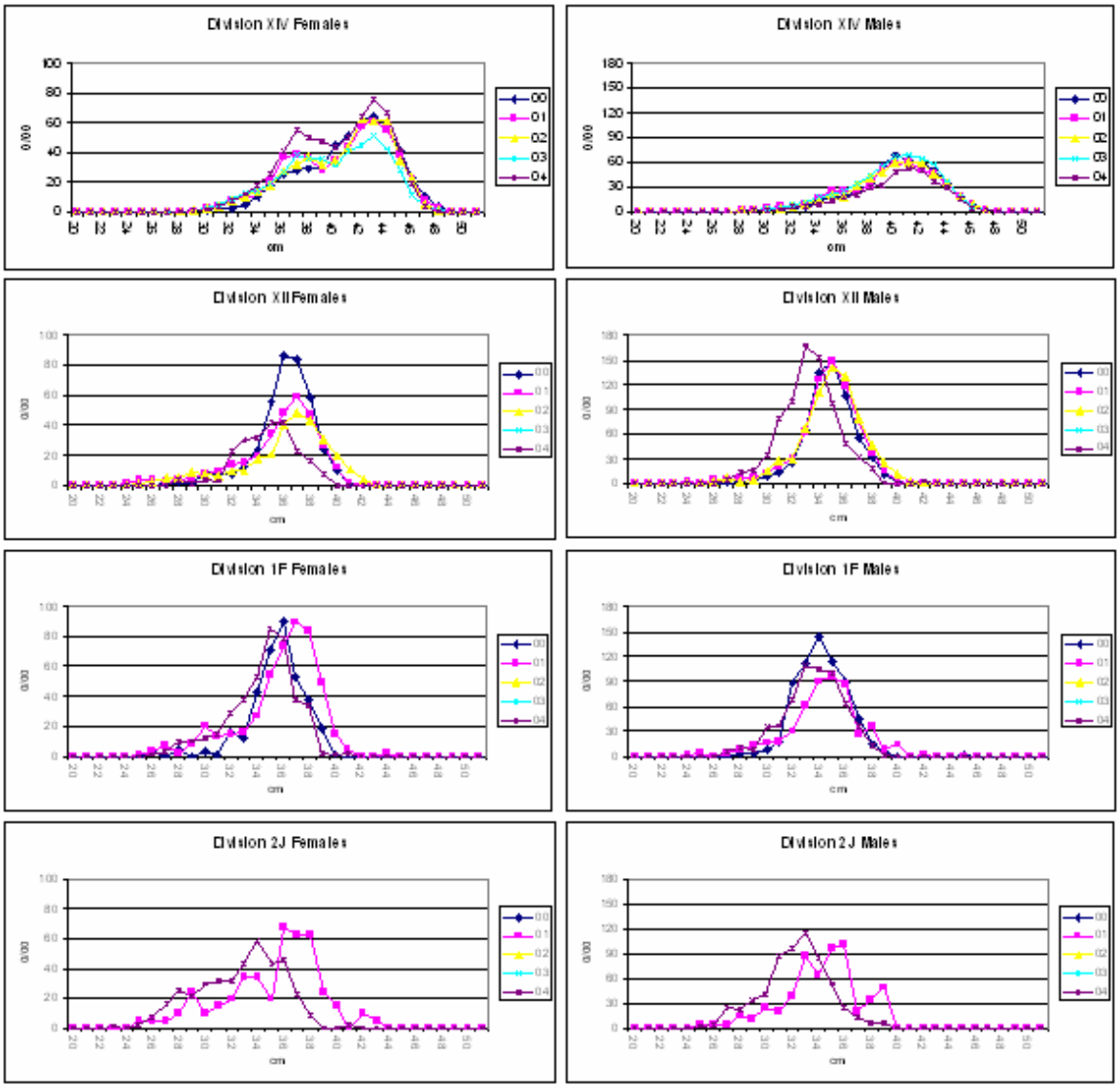

Fig. 1- Redfish Spanish length distributions by year, Division and sex.

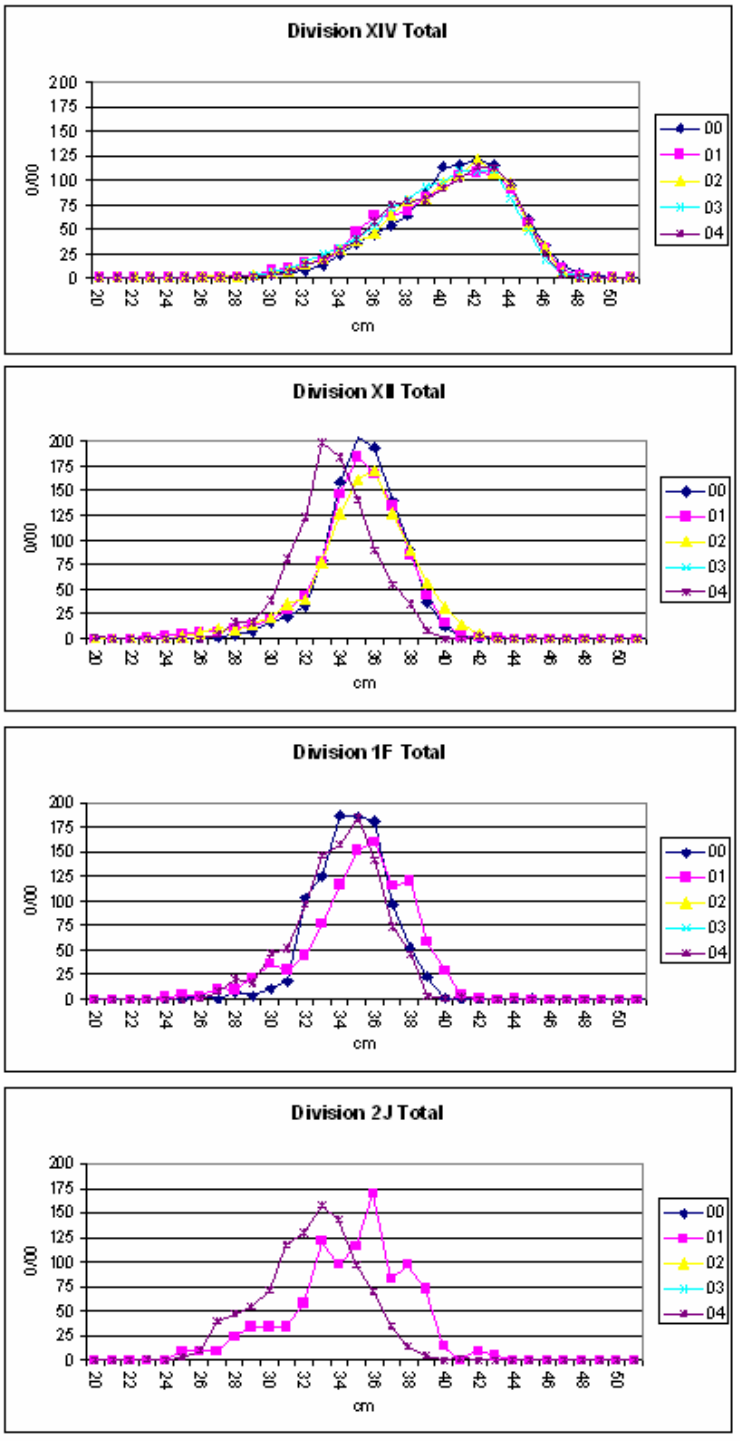

Fig. 2- Redfish Spanish Total length distribution by year and Division.

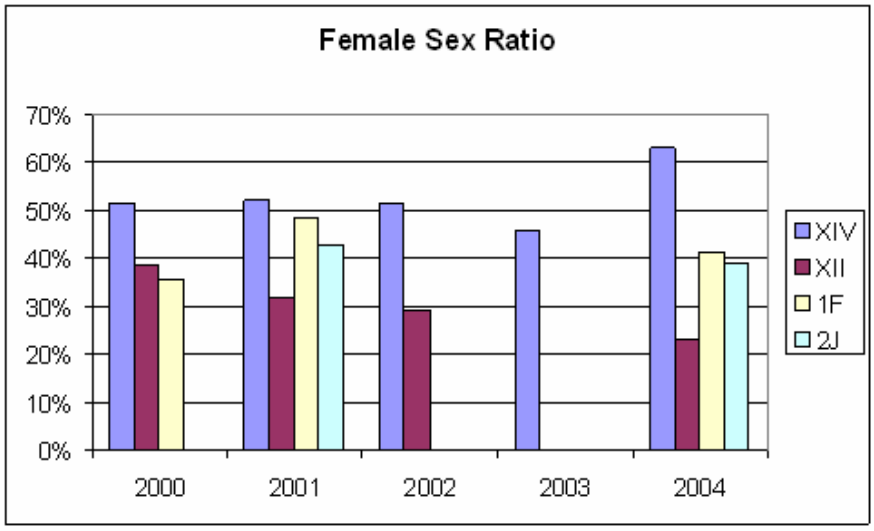

Fig. 3- Spanish catches females sex ratio by Division and year.