ICES WGCEPH Report 2007

ICES Living Resources Committee ICES CM 2007/LRC:15 Ref. ACFM, ACE

Report of the Working Group on Cephalopod Fisheries and Life History (WGCEPH)

By Correspondence



International Council for the Exploration of the Sea

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International Council for the Exploration of the Sea Conseil International pour l'Exploration de la Mer

H. C. Andersens Boulevard 44–46 DK-1553 Copenhagen V Denmark Telephone (+45) 33 38 67 00 Telefax (+45) 33 93 42 15 www.ices.dk info@ices.dk

Recommended format for purposes of citation:

ICES. 2007. Report of the Working Group on Cephalopod Fisheries and Life History (WGCEPH), By Correspondence. ICES CM 2007/LRC:15. 41 pp. For permission to reproduce material from this publication, please apply to the General Secretary. https://doi.org/10.17895/ices.pub.9816

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1 Introduction

For the fourth consecutive year, the Working Group on Cephalopod Fisheries and Life History (WGCEPH) worked by correspondence, as a consequence of the lack of transnational research projects that can support cooperative research and travelling opportunities. Again this resulted in little progress as compared to years when transnational research projects are in progress.

As is previous years, meeting by correspondence was the possible alternative format to the annual meetings, but the format does not generate as much commitment and momentum in the production of WGCEPH result. The first priority in cephalopod research continues to be the development of another international research action and this year at least a large proposal has been submitted, the outcome of which is pending revision.

The lack of new research projects and the continued scarcity of national funding for cephalopod research and in particular for travelling of researchers to international meetings thus is once more a concern of WGCEPH.

The importance of cephalopod resources to coastal European nations during 2005 has continued to show that this group of organisms plays a supporting role in amidst many declining fisheries and requires continued research. Some crises in the sector in depending regions were reported, notably in the Galician region of Spain, where in the first part of the year a general shortage of octopus resulted in an institutional effort to reverse the situation, showing the possible consequences of a decline in the abundance of these organisms.

WGCEPH continue to consider that the importance of the resources amply justify greater dedicated research funding opportunities and consider that national research institutions and funding agencies in the area do not devote the attention to the group that landings appear to justify.

1.1 Terms of Reference

The Working Group on Cephalopod Fisheries and Life History [WGCEPH] (Chair: Joao Pereira, Portugal) worked by correspondence in 2006/2007 to:

- a) update and evaluate landing statistics across the ICES area;
- b) report on innovative cephalopod research results in the ICES area;
- c) finalize production of the *ICES Cooperative Research Report* and submit for publication.

2 ToR a) – update and explore landing statistics across the ICES area

2.1 Update of landing statistics

The present report updates landing statistics for 2005 and reports on tendencies since 1973, for cephalopod groups caught in the ICES area (Tables 2.1 to 2.6 and Figures 2.1 to 2.3). The data originate from the ICES STATLANT database and from additional national information supplied by Working Group members. The data compiled in this report represent the most precise information on cephalopod landings within the ICES area that can be obtained to date.

It is still difficult to be certain of the degree of comparability of current versus older data, since the identification of species is not very precise within national landing statistics and no assurance can be obtained that the classification used in any one year being the same as that used in another. Different squid species and families in particular are frequently lumped with each other in the landing statistics. For the purpose of estimating tendencies, the two groups have been summed.

Tables 2.1 to 2.4 give information on annual catch statistics (1997–2005) per cephalopod group in each ICES division or subarea, separately for each nation:

- Table 2.1. groups species of cuttlefish and bobtail squid (families Sepiidae and Sepiolidae). The majority of landings summarised in this table are catches of *Sepia officinalis*, the common cuttlefish, plus smaller amounts of *S. elegans* and *S. orbignyana* and various species of bobtail squid (Sepiolidae) in a few instances, possibly only in the southernmost regions. The most significant landings of these two families occur in the southern and central areas, sub-Areas VIII, IX and particularly VII;
- Table 2.2. groups species of common squid (including the long-finned squids *Loligo forbesi*, *L. vulgaris* and *Alloteuthis subulata*). The majority of common squid landings are *L. forbesi* more important in the north and in Subarea X and *L.vulgaris*, more important in central and southern regions. Overall, long-finned squid landings concentrate in sub-Area VII, and particularly divisions VIId and e. It is possible that some short-finned squid are presently grouped in this category;
- Table 2.3. groups species of short-finned squid (*Illex coindetii* and *Todaropsis* eblanae), European Flying squid (*Todarodes sagittatus*), Neon Flying squid (*Ommastrephes bartrami*) and occasionally a variety of species belonging to different Decapod families. This is the least important grouping of the four defined, and landings are most important in sub-Areas VII and VIII, particularly as a result of Spanish catches.
- Table 2.4. groups species of octopus (including *Eledone cirrhosa, E. moschata* and *Octopus vulgaris*, mostly, as well as other locally and temporally abundant shallow-water species). The most significant portion of the landings in this group, by far, is believed to be of the common octopus *Octopus vulgaris*, which is particularly prevalent in divisions VIII and IX, notably as a result of Portuguese and Spanish catches.

Table 2.5 summarises total annual cephalopod landings in the whole ICES area for major cephalopod groups. During the period in analysis (1997 to 2005), landings have been variable around the annual average of roughly 50000 tons: 2001-2003 were lower landing years (mean approx. 43500 tons), 1999-2000 and 2004 were higher landing years (mean approx. 57000 tons) and 1997-1998 and 2005 were average landing years (mean approx. 50500 tons). Total cephalopod landings in 2005 were supported by a significant increase in the octopods, slightly improving the best ever landings for the group, which had been observed in 1996 (11 658 as compared to 17 906 in 2005), having been less significant than in the previous year for all the other groups. Cuttlefish, traditionally providing the most significant landings, returned to values in the order of 20000 tons, after an exceptional 2004.

Table 2.6 provides information of total annual cephalopod landings in the whole ICES area for major cephalopod groups, per fishing nation. Annual fluctuations of landings per nation do not generally cause major changes in relative importance, each nation generally taking a proportional share of the total annual landings (Figure 2.1.). During 2005 no changes in the relative ranking of the most important nations could be observed, which indicates that both the abundance exploitation patterns remained unchanged.

If species landings are grouped into three groups, cuttlefish, squid (shortfinned and longfinned) and octopus, each group can be seen to be exploited by a few nations, and this situation does also not change significantly over the years. Figure 2.2., shows that in the case of cuttlefish, France has always landed the largest proportion of the total in the ICES area and generally only Spain and Portugal have landed to any comparable degree. In the case of this group of organisms, the U.K. also began to land from 1989. This seems to indicate additional effort directed at the species in the group, since the global amount of the French, Portuguese and Spanish landings did not decrease and neither did the small shares of the remaining nations. The four largest landing nations in this group have always accounted for over 95% of all cuttlefish landings in the ICES area. In the case of squid, landings have also been shared mostly among France, Portugal and Spain, the largest of the shares similarly belonging to France. In this group Norway also played a significant role from 1979 to 1985 and again to a lesser degree in 1987 and 1988, as availability of *Todarodes sagittatus* changed dramatically. Between 1979 and 1985, the most important landings were those of Norway. The group is also exploited to an important degree by a combination of other nations, among which the England, Wales and Northern Ireland on the one part and Scotland on the other, share the lead. In the group of octopus landings, more than 95% are shared by two nations, Portugal and Spain. The shares of the two nations have changes slightly over the years, Spain having had initially the largest, which is now taken by Portugal. It is important to note that in spite of the continued fishing pressure, cephalopod resources in the ICES area have tended to yield increasingly throughout the 32 years of recorded data. Figure 2.3., displays the total yearly landings for each of the same three groups of cephalopod species, cuttlefish, squid and octopus. Cuttlefish landings display a strong significant (n=33, p<0.01) tendency to increase, whereas those of octopus a less significant similar trend (n=33, p<0.05) and only those of squid have been stationary, which appears to be at least partially due to the large fluctuations in the landings of Todarodes sagittatus.

Table 2.1. Landings	(in tonnes) of	Cuttlefish (Sepiidae)) and Bobtail Squid	(Sepiolidae).
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Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
ICES Division IIIa (Skagerrak and K	Kattegat)							
Denmark					2	6	18	21	29
ICES Division IVa (Northern North	Sea)								
Denmark					2	3	7	10	7
France									1
Scotland								1	
ICES Division IVb (Central North Se	ea)								
Belgium	2	3	3	7	11.8	12	4.1	5	1
France			1.4	0.4	0.1	0.1	0.4		
Denmark					1	13	35	36	13
England, Wales & Northern Ireland					0.1	3.1	0.4	1	1
Netherlands	+	+	+	2		10.8	6	3	1
Scotland								1	
ICES Division IVc (Southern North S	Sea)								
Belgium	4	4	5	12		205.9	64.4	103	57
England, Wales & Northern Ireland	22	28	22	14	4.7	4.2	2.3	2	3
France	135	140	231.4	419.8	184.2	217.2	119.8	120	116
Netherlands	+	+	+	97	118	363.3	229	352	146
Scotland								2	1
ICES Division Vb (Faroe Grounds)									
France								5	2
ICES Division VIa,b (NW coast of Se	cotland	and Nor	th Irelan	d, Rockal	<i>l</i>)				
England, Wales & Northern Ireland		+					0.2		
France	1		5.3	0.6	0.4	0.2			1
Scotland					4.8				
Spain	14	16		1					
ICES Division VIIa (Irish Sea)									
Belgium	1	1	1	1	2	4.7	1	1	1
England, Wales & Northern Ireland	1	1	1	1	0.1		0.8		
France			0.1	0.9	0.7	7.1	0.5		1
ICES Divisions VIIb, c (West of Ireld	and and	Porcup	ine Bank)					
England, Wales & Northern Ireland		4	3	·			0.02		
France			0.2		0.2	0.3	2.3	10	1
Spain	13	14		3	17	3	4.6	9.9	11.5
ICES Divisions VIId, e (English Cha	nnel)								
Belgium	6	15	9	35	223.7	497.1	472.6	607	501
	~	-+	-			., , , , ,	.,		

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
Channel Islands	8	20	22	26	8	11.3	9.4	12	7
England, Wales & Northern Ireland	1634	2449	2014	2910	2607.8	3406.7	4581.3	4858	2821
France	5742	7530	8342.9	11220.4	7242	11596.6	9124.6	13463	8656
Netherlands	+	+	+	2	2.6	6.4	14	33	27
ICES Division VIIf (Bristol Channel))								
Belgium	1	+	1	1	11.7	3.8	7	38	16
England, Wales & Northern Ireland	44	39	9	12	6.9	18.8	39.2	28	11
France	29	36	23	22	27	62	56	52	39
ICES Divisions VIIg-k (Celtic Sea an	ıd SW of	f Ireland)						
Belgium	3	3	4	2	3.1	5.6	15	55	20
England, Wales & Northern Ireland	464	220	206	139	80.2	101.8	325.2	135	153
France	21	946	886.2	986	759.9	609.1	843.8	1168	674
Ireland									3
Netherlands						0.1	1		
Spain	57	181	122	13	6		1.4	25	0.5
ICES Subarea VIII (Bay of Biscay)									
Belgium			1	1	7.3	11.7	4	10	3
England, Wales & Northern Ireland	37	19	4				28.9	18	19
France	5118	4363	4434.4	4322.8	4179.4	2939.1	1155.9	6685	4643
Netherlands					41				
Portugal	8	11	5	8	9.6	6.2	18	21	32
Spain	368	593	829	683	365	302	288.1	493.6	407
ICES Subarea IX									
Portugal	1415	1723	1156	1357	1338.3	1361.6	1186.1	1706	1825
Spain	1504	1916	1868	1454	765	820	992.0	889.4	1112
ICES Subarea X									
France								8	2
Portugal									
Spain									
Grand Total	16652	20275	20210	23754	18034	22614	19659	30988	21365

Table 2.2. Landings (in tonnes) of Common Squid (includes *Loligo forbesi, L. vulgaris* and *Alloteuthis subulata*).

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
ICES Division IIIa (Skagerrak and Kattegat)									
Denmark	6	8	6	7					
Sweden*	1	1	1	+			1	5	3
ICES Division IVa (Northern North Sea)									
Denmark	2	5	3	3					
England, Wales & Northern Ireland		3	2	3	2.1	1.3	1.2	1	1
France	1		0.2	0.1		0.3	0.7		
Germany*	+	+	+	+				1	
Scotland*	453	844	712	547	348.9	687.9	1428	1442	344
ICES Division IVb (Central North Sea)									
Belgium	7	11	16	24	3.2	14	22.1	16	8
Denmark	9	3	18	10					
England, Wales & Northern Ireland	39	144	65	29	35.5	70.4	159.3	162	161
Germany*	3	5	5	3			58	33	23
Netherlands*	+	+	+	4			27	22	27
Scotland*	66	214	144	87	112.1	218.3	323	358	214
ICES Division IVc (Southern North Sea)									
Belgium	39	36	72	121	20.2	40	17.2	12	10
England, Wales & Northern Ireland	3	2	2	4	11.8	4.7	2.2	2	3
France	123	93	150.9	164.8	236.9	660.2	426.1	246	146
Germany*	1	6	1	2			4	4	1
Netherlands*	+	+	+	758			104	93	38
Scotland*							1		1

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Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
ICES Division Vb (Faroe Grounds)									
England, Wales & Northern Ireland		+	+	+	0.2		0.1		
Faroe Islands	5	32	23	+					
Scotland*	1	1	2	2			5	1	
ICES Division VIa (NW coast of Sociard and North Instand)									
England Wales & Northern Iraland	40	7	2	<u> </u>	28	2.4	14	1	
	40	126	01.8	<u></u>	2.0	3.4	14		
France	82 140	130	94.8	20	8.4	27.0	22.0	24	<u> </u>
Carefund*	201	99	224	38	101.0	106.2	267	221	49
Scotland*	301	285	334	210	191.0	196.2	30/	321	12
Spain	+	/	8	3		3	9.6	1.6	
ICES Division VIb (Rockall)									
England, Wales & Northern Ireland	5	14	1	+	0.3	0.6	2.6		
Ireland*	1	2	2	3			4+1	1	8
Scotland*	5	27	13	5	34.3	58.8	86	23	
Spain	76	49	2	+		2			
ICES Division VIIa (Irish Sea)									
Belgium	2	5	3	3	2.3	9.4	2.3	1	3
England, Wales & Northern Ireland	125	173	40	31	102.6	116.3	96.3	50	24
France	5	17	11.4	11.8	21.8	37.1	5.8	2	8
Ireland*	6	22	13	5		2	2+7	6	4
Isle of Man	2	2	2	+	0.8	0.4			
Scotland*	3	2	2	2			13	8	1
ICES Divisions VIIb, c (West of Ireland and Porcupine Bank)									
England, Wales & Northern Ireland	228	162	59	40	34.8	22	10.1	12	23
France	80	60	35.2	74.9	6.8	6.3	20.1	42	28
Ireland*	42	34	40	26	2	1	31+53	39	29

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
Netherlands									1
Scotland*	45	71	34	27		19.2	14	19	2
Spain	69	51		17	18	29	35	30.7	12
ICES Divisions VIId, e (English Channel)									
Belgium	77	133	113	254	22	59.3	72.4	55	36
Channel Islands	6	5	11	9	1	2.3	1	1	
England, Wales & Northern Ireland*	496	419	641	449	438.5	553.1	434.6	481	321
France	2518	2689	3416.9	3217.8	2659.3	3980.1	4211.9	4234	3264
Netherlands*	+	+	+	11			13+62	123	110
ICES Division VIIf (Bristol Channel)									
Belgium	6	6	6	8	0.5	4.8	9.5	15	9
England, Wales & Northern Ireland	77	29	68	16	55	113.9	56.2	17	172
France	193	126	147	88			145	125	276
Ireland									2
ICES Divisions VIIg-k (Celtic Sea and SW of Ireland)									
Belgium	10	13	9	5	2.6	7.9	7.4	6	6
England, Wales & Northern Ireland	924	505	377	202	166.4	116.1	35.4	134	51
France	69	325	546.9	346.7	467.6	737.6	520.2	374	309
Ireland*	168	158	123	67	12	37	51+113	127	172
Scotland*	127	128	109	100			75	70	57
Spain	302	225	352	77	14	3	1.9	2	2
ICES Sub-area VIII (Bay of Biscay)									
Belgium	14	49	3	48		1.8	0.9	1	1
England, Wales & Northern Ireland	68	8	3	+			18.2	18	6
France	1489	829	1351.8	1041.8	842.2	514.2	316	1245	1497
Portugal	2	2	1	1	1.1	0.6		1	

1997	1998	1999	2000	2001	2002	2003	2004	2005
							1	61
505	811	826	767	614	253	329.7	371.9	306
+	+	4	42					
848	1011	329	619	897.6	686	328	1264	601
1301	1043	540	507	843	637	542.0	580.8	552
303	98	45	58	137	196	536	261	272
9632	11519	11245	11049	10253	8371	10135	12562	9414
	1997 505 + 848 1301 303 9632	1997 1998 505 811 505 811 + + 848 1011 1301 1043 303 98 9632 11519	1997 1998 1999 505 811 826 505 811 826 + + 4 848 1011 329 1301 1043 540 303 98 45 9632 11519 11245	1997 1998 1999 2000 505 811 826 767 + + 4 42 848 1011 329 619 1301 1043 540 507 303 98 45 58 9632 11519 11245 11049	1997 1998 1999 2000 2001 505 811 826 767 614 + + 4 42 848 1011 329 619 897.6 1301 1043 540 507 843 303 98 45 58 137 9632 11519 11245 11049 10253	1997 1998 1999 2000 2001 2002 505 811 826 767 614 253 + + 4 42	1997 1998 1999 2000 2001 2002 2003 505 811 826 767 614 253 329.7 + + 4 42	1997 1998 1999 2000 2001 2002 2003 2004 1 505 811 826 767 614 253 329.7 371.9 + + 4 42

Country* - These countries report undifferentiated landings of Loliginids and Ommastrephids that were grouped here. If 2 or more figures listed, the last one is the compound Loliginidae + Ommastrephidae.

Table 2.3. Landings (in tonnes) of Short-finned Squid (*Illex coindetii* and *Todaropsis eblanae*), European Flying Squid (*Todarodes sagittatus*), Neon Flying Squid (*Ommastrephes bartrami*) and other less frequent families and species of Decapod cephalopods.

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
ICES Sub-area I + II (Barents Sea and Norwegian Sea)									
Norway	190	2	+	+					
ICES Division IIIa (Skagerrak and Kattegat)									
Denmark									
Norway								1	
Sweden*							+	+	
ICES Division Wa (Northam North Sog)									
Cermony*									
Norway								+ 	
Scotland*								+	
ICES Division IVb (Central North Sea)									
Germany*								+	
Netherlands*								+	
ICES Division IVc (Southern North Sea)									
Germany*								+	
Netherlands*								+	
Scotland*								+	
ICES Division Va (Iceland Grounds)									
Iceland	5	4	3	1		0.1		1	
ICES Division Vb (Faroe Grounds)									

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COUNTRY	1997	1998	1999	2000	2001	2002	2003	2004	2005	
Faroe Islands							16	17	1	
Scotland*							+	+		
ICES Division VIa, b (NW coast of Scotland and North Ireland, Rock	all)									
England, Wales & Northern Ireland	+	3	5	+	0.6	1.1	13	1	1	
France			2.7	0.4	0.1	0.2				
Ireland*	+	+		+			32+	5	2	
Scotland*							+	+		
Spain	112	177	3	+		11		0.3		
ICES Division VIIa (Irish Sea)										
England, Wales & Northern Ireland				+						
France			0.2	0.2						
Ireland*	+	+					6+	5	7	
Scotland*							+	+		
ICES Divisions VIIb, c (West of Ireland and Porcupine Bank)										
England, Wales & Northern Ireland	8	39	18	35	18.7	24.5	16	26	1	
France			1.3	28	5.7	2.4	16.7	10		
Ireland*	+	52	+	29	75	63	27+	30	8	
Scotland*							+	+		
Spain	97	150	69	148	233	411	216.6	284.6	951	
ICES Divisions VIId, e (English Channel)										
England, Wales & Northern Ireland*	1						0.7			
France	1	1	1.8	3.4	3.8	13	1.8	13		
Netherlands*							+			
ICES Divisions VIIg-k (Celtic Sea and SW of Ireland)										
England, Wales & Northern Ireland	14	251	181	151	173.2	143.7	85	+	18	

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Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
France	2	49	72.1	66	51.1	91.6	31.7	58	
Ireland*	+	295	9	83	60	91	49+	37	19
Scotland*								+	
Spain	427	658	873	710	339	87	35.4	35	52
ICES Sub-area VIII (Bay of Biscay)									
England, Wales & Northern Ireland	3								
France	372	166	211.3	168.2	67.2	250.4	44	154	
Portugal	11	5	1	2			1		
Scotland*								+	
Spain	2013	1806	1453	1400	868	584	474.2	495.1	634
ICES Sub-area IX									
Portugal	353	383	313	321	232	205	118	321	
Spain	2536	1800	4476	2461	2133	592	438.3	655.8	386
Grand Total	6145	5841	7693	5607	4260	2571	1508	2150	2080

Country* - These countries report undifferentiated landings of Loliginids and Ommastrephids that were grouped in Table 2.2. Here they are listed as "+".

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
ICES Division IVa (Northern North Sea)									
Scotland	6	13	17	15	6	1.3	11	5	2
ICES Division IVb (Central North Sea)									
Belgium	+	2	5	5	5.5	1.5	2	2	2
England, Wales & Northern Ireland		1	1	1	1.7	0.6	0.52	1	1
Netherlands					0.5				
Scotland		1	1	+	0.1				
ICES Division IVc (Southern North Sea)									
Belgium	2	+	2	1	0.6	1.2	1		
England, Wales & Northern Ireland	1	+	+	+			0.03		
Netherlands					0.1		1		1
ICES Division VIa, b (NW coast of Scotland and North Irela	und, Rocka	11)							
Belgium	1	1	+	+					
England, Wales & Northern Ireland		2		+			2.1	2	
Ireland	+		1	1					
Scotland	1		+						
Spain	35	42		+					
ICFS Division VIIa (Irish Sea)									
Belgium	18	26	1	5	10.9	31.1	20	5	1
England Wales & Northern Ireland	1	+			0.4	0.1	0.3	5	1
Ireland	1		Т	т 1	U. T	1	1		
		1		+		1	1		
ICES Divisions VIIb. c (West of Ireland and Porcupine Ban	k)								

Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
England, Wales & Northern Ireland	3	5	3	4	20.2	2.5	6	15	4
France	0	0	0	8.1	0.6	0.2	0		2
Ireland	4	0	2	4	5	1	6	2	1
Scotland					1.7		1		
Spain	33	41	34	44	276	741	429.6	341.9	417
ICES Divisions VIId. e (English Channel)									
Belgium	1	+	+	+	0.3	2	2	3	1
Channel Islands	-		+	+	010	_	3		-
England, Wales & Northern Ireland	37	17	9	22	15.2	19.5	20.6	14	21
France	7	3	8.1	13.2	5.1	7.3	5.3	6	9
ICES Division VIIf (Bristol Channel)									
Belgium	6	3	3	13	0.5	8.6	13	24	10
England, Wales & Northern Ireland	9	3	4	10	4.2	13	7.7	9	10
France	1	0	+	+					1
Spain						2			
ICES Divisions VIIg-k (Celtic Sea and SW of Ireland)									
Belgium	13	11	10	16	6	12	13	12	5
England, Wales & Northern Ireland	66	58	16	78	105.2	140.8	99.2	113	131
France	1	9	8	32.3	19.3	17.6	11.1	14	15
Ireland	3	2	7	7	9	11	17	11	29
Scotland	1	9	1	5	9.5	1.3	6		7
Spain	145	179	348	518	156	111	27.6	29.2	32
ICES Sub-area VIII (Bay of Biscay)									
Belgium	4	4	17	4	4.9	13.4	1	5	3
England, Wales & Northern Ireland	23	1	+	0			0.5	29	8
France	84	78	199.5	151.3	72.8	56.1	16.3	201	127

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Country	1997	1998	1999	2000	2001	2002	2003	2004	2005
Netherlands					4.8				
Portugal	75	57	156	250	69.5	69.7	98	67	102
Spain	2448	2787	1261	1057	1272	1329	1144.4	1723.5	1572
ICES Sub-area IX									
Portugal	9078	6350	9098	9019	7203.2	7287.9	10038	8758	11372
Spain	3630	3298	4490	5205	2163	2936	2804.4	2787.3	4010
ICES Sub-area X (Azores Grounds)									
Portugal	64	39	12	9	14	16	16	15	10
Grand Total	15801	13043	15718	16498	11464	12836	14826	13083	17906

CEPHALOPOD GROUP	1997	1998	1999	2000	2001	2002	2003	2004	2005
Cuttlefish	16652	20275	20210	23754	18034	22614	19492	30988	21371
Common squid	11519	11245	11049	10253	8234	9939	7527	12562	9420
Short-finned squid	6145	5841	7693	5607	4260	2571	1348	2149	2080
Octopods	15801	13043	15718	16500	11461	12831	12191	14195	17906
Total	50117	50404	54670	56114	41989	47955	40557	59894	50777

Table 2.5. Total annual cephalopod landings (in tonnes) in the whole ICES area separated into major cephalopod species groups.

COUNTRY	1997	1998	1999	2000	2001	2002	2003	2004	2005
(a) Cuttlefish (Sepiidae)									
Belgium	17	26	24	59	260	741	541	819	599
Channel Islands	8	20	22	26	8	11	9	12	7
Denmark	0	0	27	20	5	22	60	67	49
England, Wales & Northern Ireland	2202	2760	2259	3076	2700	3535	4978	5042	3008
France	11046	13015	13925	16973	12394	15432	11247	21511	14142
Ireland	0	0	0	0	0	0	0	0	3
Netherlands	0	0	0	101	162	381	249	388	174
Portugal	1423	1734	1161	1365	1348	1368	1186	1727	1857
Scotland	0	0	0	0	5	0	0	4	1
Spain	1956	2720	2819	2154	1153	1125	1281	1418	1531
Total	16652	20275	20237	23774	18035	22615	19551	30988	21371
(b) Common Squid (Loligin	idae)								
Belgium	155	253	222	463	51	137	132	106	73
Channel Islands	6	5	11	9	1	2		1	0
Denmark	17	16	27	20	0	0	0	0	0
England, Wales & Northern Ireland	2005	1466	1261	776	850	1002	830	881	762
Faroe Islands	5	32	23	+				0	0
France	4560	4275	5759	5039	4243	5963	5523	6292	5621
Germany	4	11	6	5	0	0	58	38	24
Ireland	217	216	178	101	14	40	0	245	264
Isle of Man	2	2	2	+	1	0		0	0
Netherlands	0	0	0	773	0	0	0	238	176
Portugal	1153	1111	375	678	899	687	236	1526	873
Scotland	1001	1572	1350	980	687	1180	0	2243	752
Spain	2253	2186	1728	1371	1489	927	748	987	872
Sweden	1	1	1	+				5	3
Total	11379	11146	10943	10215	8234	9939	7527	12562	9420
(c) Short-finned Squid (Om	mastreph	nidae)							
Denmark	0	0	0	0	0	0	0	0	0
England, Wales & Northern Ireland	26	293	204	186	193	169	1	27	20
Faroe Islands	0	0	0	0	0	0	16	17	1
France	375	216	289	266	128	358	94	235	0
Germany	0	0	0	0	0	0	0	0	0
Iceland	5	4	3	1	0	0	0	1	0
Ireland	0	347	9	112	135	154	0	77	36
Netherlands	0	0	0	0	0	0	0	0	0
Norway	190	2	+	+	0	0	0	1	0
Portugal	364	388	314	323	232	205	119	321	0
Scotland	0	0	0	0	0	0	0	0	0
Spain	5185	4591	6874	4719	3573	1685	1253	1471	2023
Sweden	0	0	0	0	0	0	0	0	0

Table 2.6. Total	annual	cephalopod	landings (in	1 tonnes)	in w	vhole	ICES	area	by	country	and
separated into ma	ajor cepl	halopod spec	ies groups.								

COUNTRY	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	6145	5841	7693	5607	4260	2571	1348	11151	2080
(d) Octopods (Octopodidae)									
Belgium	45	47	41	44	29	70	0	51	22
Channel Islands	0	0	+	+	0	0	3	0	0
England, Wales & Northern Ireland	140	87	33	115	147	177	137	183	175
France	93	90	216	205	98	81	33	221	154
Ireland	7	3	10	12	14	13	0	13	30
Netherlands	0	0	0	0	5	0	0	0	1
Portugal	9217	6446	9266	9280	7284	7369	7550	8840	11484
Scotland	8	23	19	20	17	3	0	5	9
Spain	6291	6347	6133	6824	3867	5119	4471	4882	6031
Total	15801	13043	15718	16500	11461	12831	12191	14195	17906



Figure 2.1. Yearly evolution of ranking cephalopod landings per ICES nation.



Figure 2.2. Exploitation shares by nation in the ICES area: a) cuttlefish, b) squid (longfinned and shortfinned), c) octopus.



Figure 2.3. Thirty-three year landings of cephalopods in the ICES area. a) cuttlefish, b) squid, c) octopus.

3 ToR b) report on innovative cephalopod research results in the ICES area

The members of WGCEPH did not report being involved in cephalopod dedicated research projects in the period.

This ToR was devised in the expectation that 2006 would bring about new research funding opportunities, which was not the case.

We expect and hope that the situation will change during the next reporting period, as the outcome of new international project proposal submissions is known.

4 ToR c) prepare material from EU project CEPHSTOCK and WG reports for CRR on the state of the art in cephalopod fisheries biology

The preparation of material for a Cooperative Research Report arising both from the concerted action CEPHSTOCK and previous WG Reports was already well underway in the previous year, pending concerted decisions by members of the group, particularly concerning the destination of some of the material collected (whether this is to be in the CRR or otherwise). Is was expected that final decisions could have been reached and the material delivered for publication during 2007, but up until the time of the production of this report, no funding could be made available for a workshop that could bring together all the groups involved.

The structure of the manuscript continues to be the same as reported in 2006: Chapter 1 – Cephalopod species commercially exploited in Europe (biology and ecology in relation to exploitation pattern and geographic incidence of exploitation); Chapter 2 – European Cephalopod Fisheries and Aquaculture (species and métiers, evolution of the fisheries in terms of fishing pressure, techniques and targets; aquaculture progress and species involved); Chapter 3 – Assessment and Management (experimental and practical assessment, management in theory and in practice); Chapter 4 – The future of Cephalopod Fisheries in Europe (fisheries versus aquaculture, sustainable fisheries: socio-economic concerns, management SWOT analysis). There is however a possibility that the CRR will not contain the material that would make up chapter 1.

5 Research priorities

As in previous years, WGCEPH consider that research priorities that have been previously indicated remain valid. An important priority is to set up a new international collaborative research project that can help solve outstanding issues:

- It is important to include cephalopods in the minimum sampling programme of the EU within each country's national fisheries sampling programmes, with samples schemes adapted to these species; maintain the sampling programmes in place where they exist;
- Make decisive progress towards stock assessments of the main stocks;
- Since most studies of environmental factors affecting cephalopod abundance have underlined that recruitment variations were the most important, ecological studies of early life stages should be encouraged;
- Explore the role of cephalopods as ecosystem components, and their relationships with other fished resources;
- Continue to improve ageing techniques;
- Monitor the socio-economics of small cephalopod fisheries, particularly in southern European countries;

- Continue to improve the understanding on the role of cephalopods as indicators of marine pollution and as routes of transfer of toxic elements, hydrocarbons, and other contaminants to higher trophic levels;
- Setup a follow-up international research project that can continue to add outstanding information to the scientific knowledge base, specifically aimed at addressing the previous issues and in particular the lack of knowledge concerning early life stages and the environmental influences on their survival and abundance.

To these ends a research proposal was submitted to the EU in early 2007, grouping 22 partners from seven nations, containing the following objectives:

- 1) To improve understanding of the growth and survival of paralarvae, the least well-understood life-stage; specifically to investigate effects of temperature, food supply and ocean acidity;
- 2) To develop biomarkers for individual condition;
- 3) To develop genetic barcoding for identification of cephalopod paralarvae;
- 4) To review existing age determination methodology based on statolith reading and evaluate alternative approaches, to provide the age data needed to underpin understanding of the life cycle;
- 5) To develop interpretation of growth increments of the squid gladius to provide data on daily growth rates;
- 6) To review, update and synthesise data on cephalopod reproduction, with particular focus on spatial and temporal variation;
- 7) To investigate movement patterns and barriers to movement through:
 - a. targeted tagging experiments,
 - b. interpretation of stable isotope and trace element data from recording structures,
 - c. molecular genetic studies;
- 8) To consolidate and update information on cephalopod distribution and abundance;
- 9) To identify essential cephalopod habitats for all life stages of the main fished species and to use these results to infer movement patterns and migration corridors;
- 10) To improve understanding of the trophic role of cephalopods as predators and prey, based on new investigations diet and interpretation of isotope and trace element data;
- 11) To generate new recommendations for assessment and management;
- 12) To develop a "cephalopod-oriented" modelling and management system within the "Fisheries Library in R" framework (FLR) and thus provide a quantitative basis for the integration of cephalopod populations into multi-species/ecosystem management applications.

6 The future programme of WGCEPH and recommendations

6.1 Terms of Reference

WGCEPH considers that, broadly speaking; the terms of reference that have been identified in previous years continue to be relevant. However, research opportunities have decreased since there is as yet no transnational funding in place. Therefore, even though the working group wishes to continue to gather expertise on European cephalopod fisheries and to make it available to ICES Advisory Commission for Fisheries Management, particularly in what regards any progress in stock assessments, all progress will have to rely on presently unknown authors and results, as opportunities for research may present themselves within the ICES countries participating to WGCEPH. The working group still considers that progress in the understanding of cephalopod life history and of the role of cephalopod populations in changing ecosystems should be of interest to the Advisory Commission for Environmental Management. The terms of reference proposed for 2007, less specific and demanding than those that have been proposed in previous years, will be maintained for 2008 in the expectation that then they may be expanded as new opportunities for collaborative research arise:

- a) update and explore landing statistics across the ICES area;
- b) report on innovative cephalopod research results in the ICES area;
- c) finalize CRR and submit for publication.

6.2 WGCEPH working

It has been underlined, but is worth remembering as the situation has not improved, that WGCEPH, more than most ICES Working Groups, relies on participation from a wide range of scientists working often in universities where no funding is available for participation in ICES activities. Furthermore, budget cuts in many European nations, designed to slim down national deficits have taken strong tolls on travel and subsistence budgets even in fisheries research institutes, so that participation in ICES activities may never be taken for granted. Presently there is no EU transnational research programme in place from which synergies with the ICES WHCEPH can be gained to create meeting opportunities. During the next year (2007-2008) WGCEPH proposes to continue to work by correspondence in as much as that can be made possible. The group hopes to improve communication by correspondence and quickly regain research momentum to increase the opportunities for collaborative research.

6.3 WGCEPH Chair

Following the end of the third year of the term of Dr. João Pereira as Chair of WGCEPH, the group proposes that a new Chair be nominated.

Consultation is underway by e-mail and the new Chair will be proposed during the LRC meeting at the 2007 ICES ASC.

Annex 1: The Basque cephalopod fishery in the northeastern Atlantic waters during the period 1994–2006

Annex 1

Working Document for the ICES Working Group on Cephalopod biology and Life History

THE BASQUE CEPHALOPOD FISHERY IN THE NORTHEASTERN ATLANTIC WATERS DURING THE PERIOD 1994-2006

by

A. Iriondo1; M. Santurtún; and I. Artetxe

INTRODUCTION

During 2006, AZTI has continued monitored Cephalopod monthly landings and fishing effort by sea area and gear of the Basque Country. In this way, compilation and updating of the cephalopods catches made by the Spanish and Basque fleets landed at the Basque Country ports is updated every year.

Cephalopod catches are considered as by-catches of other directed demersal fisheries operated by the Basque fleet, targeting Hake, Anglerfish and Megrim. These demersal fisheries operate in different sea areas – ICES Sub-areas VI, VII and Divisions VIIIa,b,d (Bay of Biscay) and VIIIc (eastern Cantabrian Sea)- and different gears: bottom trawl, pair-trawlers, longliners, purse-seiners, nets, artisanal hook and lines and traps or pots. However, cephalopods obtained in mixed fisheries ("Baka" Otter trawls) are becoming more important in relation to the species composition of the catch.

In this document, data for the Basque Country cephalopod landings since 1994 to 2006 are presented. Landings are not presented by species. Thus, as in previous years catch data

¹ FUNDACIÓN AZTI FUNDAZIOA. Instituto Tecnológico, Pesquero y Alimentario (Food and Fish Technological Institute). Txatxarramendi ugartea z/g. 48395 Sukarrieta, Basque Country. Spain. (Phone: + 34 94 602 9400, fax: + 34 94 687 0006). Email: <u>airiondo@suk.azti.es;</u>

correspond to groups of similar species comprising more than two or three species, with similar commercial appreciation.

Thus species groups comprised the following species:

- Squid: mainly Loligo vulgaris and also, L. forbesi, Alloteuthis media and A. subulata
- Cuttlefish: mainly Sepia officinalis and also S. elegans and S. orbignyana
- Short-finned squid: mainly *Illex coindetii* and also *Todaropsis eblanae*, and European flying squid: *Todarodes sagitattus*,
- Octopus: mainly *Eledone cirrhosa* and also Octopus vulgaris

RESULTS

Most of the large trawlers of the Basque Country catch cephalopods mainly in the Bay of Biscay (Div. VIIIa,b,d), but also in Sub-area VII (Celtic Sea and Porcupine Bank) and in Sub-area VI (both in the western part of Scotland and around Rockall Bank). Estimated distribution of catches is shown from 2003 to 2006 in Map. 1, 2, 3 and 4. Local trawls, artisanal longliners and some pots or trap vessels work usually in the eastern Cantabrian Sea (Div. VIIIc).

The target species are usually mixed demersal fish, mainly Hake, Megrim or Anglerfish, but together with those, variable quantities of cephalopods are caught. The proportion of these catches varies in relation to the sea area, the gear used and the distinct seasonality of these species.

Landings of cephalopods in Sub-areas VI, VII and Divisions VIIIa,b,d and VIIIc.

During 2006 and in Div. VIIIa,b,d, the largest landings of squids were recorded from October to January and for cuttlefish during November. Squid landings reached 24 t in January while cuttlefish landings reached a peak of around 50 t in November. Short-finned squid maxima landings occurred in May being around 27 t. in Div. VIIJ. Landings of octopus were higher in Div. VIIIa,b,d during December, reaching around 80 t (Figure 1)

In Figure 2 percentage of landings by species groups and sea area in 2006 are presented. Landings in Div. VIIIa,b,d comprise 95% of the total landings for squids and 99% for cuttlefish. However, for short-finned squid and octopus landings in Div. VIIIa,b,d involve 57% and 79% of the total landings.

For 2006, octopus contributed around 35% to the total cephalopod catches and squid, cuttlefish and short finned squid around 20% each one. Eighty-one percent of the landings in 2006 came from Div. VIIIa,b,d. (Figure 3).

Looking at the catch evolution of squid and cuttlefish during the period 1994-2006, the most remarkable feature is the outstanding seasonality of the landings. The largest landings occur from October to February, also a marked alternate of years of rather high and low landings is observed. For all data series, no cuttlefish landings were registered in Sub-area VI. The great fishery *reservoir* for both species groups appears to be the sea area comprises within Div. VIIIa,b,d.

Catches evolution of short-finned squid does not present the marked seasonality described for the other species groups, however maxima landings are registered from April till June. Octopus landings from Sub-area VII and Div. VIIIa,b,d are very similar in quantities. However the apparent different seasonality of the maxima landings from March till September in Sub-area VII and from December till March in Div. VIIIa,b,d is caused by the absence of the Basque fleet in Sub-area VII during winter months (November-February). Then maximum landings are registered during spring and summer months in Sub-area VII and in autumn and winter months in Div. VIIIa,b,d.

In Figure 4, summary graphs of the landings evolution of the total cephalopod amount along the period studied are presented by species groups.



Map 1. Estimated distribution of the Squid annual catches of the "Baka" Otter Trawl fleet, landed in the Basque (Spanish) ports from 2003 to 2006.



Map 2. Estimated distribution of the Cuttlefish annual catches of the "Baka" Otter Trawl fleet, landed in the Basque (Spanish) ports from 2003 to 2006.



Map 3. Estimated distribution of the Short-finned Squid annual catches of the "Baka" Otter Trawl fleet, landed in the Basque (Spanish) ports from 2003 to 2006.



Map 4. Estimated distribution of the Octopus annual catches of the "Baka" Otter Trawl fleet, landed in the Basque (Spanish) ports from 2003 to 2006.









Figure 1. Monthly distribution of the Basque Country Catches (landings) (in kg) Of Squid, Cuttlefish, Short-finned squid and Octopus, by sea area, in 2006.









Figure 2. Percentage of the Basque Country Catches (landings) of Squid, Cuttlefish, Short-finned squid and Octopus, by sea area, in 2006.





Figure 3. Total composition (in %) of the Basque Country Catches (landings). Above: By species group. Below: By sea area for 2006.









Figure 4. Cephalopods catches evolution (in kg) of the Basque Country by species group considering all Areas and Divisions together (VI, VII, VIIIa,b,d and VIIIc) for the total period 1994-2006.

Annex 2: WGCEPH Terms of Reference for the next meeting

The Working Group on Cephalopod Fisheries and Life History [WGCEPH] (Chair: Graham Pierce,*

UK) will work by correspondence in 2008 to:

- a) update and explore landing statistics across the ICES area;
- b) report on innovative cephalopod research results in the ICES area;
- c) finalize production of *CRR* and submit for publication.

WGCEPH will report by 1 July 2008 for the attention of the Living Resources Committee, ACOM.

Supporting Information

PRIORITY:	High. The work of the Group is of high priority to ICES because cephalopods are an important component of marine ecosystems.
SCIENTIFIC JUSTIFICATION AND RELATION TO ACTION PLAN:	Cephalopods support important fisheries in the ICES area. However, they remain outside the scope of the European Community's Common Fisheries Policy and understanding of stock dynamics, particularly in European coastal waters, remains heterogeneous: although population assessments and fishery diagnostics are developed in some areas, time series of recruitment estimates are still too short to analyse stock/recruitment relationships.
	Specific comments to the Terms of Reference are: ToR a) This activity remains fundamental to the work of the Group. The past broadening of the remit to include effort, discard, and survey data was useful but improved data, and improved access to data, are needed before the collection of the same may be resumed. [Action
	Number 1.2.2] ToR b) With the current uncertainty on the level of financing that may be obtained to proceed research on cephalopods in european waters, it is to a large degree difficult to predict what the direction of the research will be. Thus not being able to be pro-active on the research, we consider that being reactive will help maintain the interest and demonstrate the advantages of the work that can be carried out, while submitting results and analyses that will be directly applicable to the ICES action plan. It is expected that several new research projects will be developed on a local basis, which will be relevant to several action plan points [e.g. assessment in the U.K. to action number 1.2.1] ToR c) The final ToR aims to disperse the findings of the CEPHSTOCK project to the wider community. A CRR aimed manuscript is to a large degree compiled but actual production and presentation for publication requires aditional work to be carried out and important decisions to be reached by a large number of CEPHSTOCK participants during 2007, since this was not possible during 2006 due to lack of meeting opportunities [Action Number 10.4].
RESOURCE REQUIREMENTS:	WGCEPH, more than most ICES Working Groups, relies on participation from a wide range of scientists working outside the traditional government fisheries laboratories in ICES countries and has, indeed, benefited enormously over the last 10-15 years from the input of other scientists working often in universities where no funding is available for participation in ICES activities. This must be taken into account in the organisation of WGCEPH meetings. In particular, the opportunity to use project funding must be seized when they present themselves. Without this source of funding, the group must resort to meeting by correspondance and such has been the case for the past 3 years. New cooperative project proposals have been submited to several funding agencies in order that much needed research can be continued.
PARTICIPANTS:	In addition to European Atlantic Scientists involved in CEPHSTOCK, input from scientists in the USA and Canada (where some cephalopod fisheries are routinely assessed and managed) is useful.

SECRETARIAT FACILITIES:	None
FINANCIAL:	None
LINKAGES TO ADVISORY COMMITTEES:	Terms of Reference a) and b) are set up to provide ACOM with the information required to respond to requests for advice/information from NEAFC and EC DG Fish.
LINKAGES TO OTHER COMMITTEES OR GROUPS:	None
LINKAGES TO OTHER ORGANISATIONS:	None