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A Vision for European Fisheries

2012 Reform of the EU Common Fisheries Policy
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1 Introduction

In September 2008, European Commissioner for Maritime Affairs and Fisheries Joe Borg announced that discussions for the reform of the Common Fisheries Policy (CFP) would start immediately, with a broad-base consultation planned in 2009 following the publication of the Green Paper on the reform to be released early this year.

The Common Fisheries Policy was formally established in 1983, and has since then been subject to revision every ten years. The last review was in 2002 and resulted in the adoption by the European Union of a reformed Common Fisheries Policy (CFP) from 1 January 2003. This was preceded by a period of consultation in which it was recognised that the then existing CFP (1992) had not contributed to greater sustainability of fish stocks nor socioeconomic security for fishermen. The primary causes of its failure to deliver sustainability were stated by the Commission in its aspirational Green Paper on the Future of the Common Fisheries Policy (COM(2001) 135) to be, inter alia:

- A failure to address overcapacity in the fishing fleet,
- fragmented and ineffective monitoring enforcement and control policy,
- a systematic tendency for Council to set TACs higher than scientific advice,
- an over-dependence on output control (e.g total allowable catch),
- ignoring the ecosystem effects of fishing
- poor governance[1], lack of political will and engagement with stakeholders

A number of solutions were suggested in the Green Paper, including a new set of CFP objectives. Some of these initiatives were in put in place in the 2002 CFP[2].

- A commitment to implement recovery plans for stocks outside safe biological limits and multi-annual management plans for all stocks irrespective of status
- Provisions for the rapid implementation, by the Commission or Member States, of emergency measures in the event of there being serious or unforeseen threats to the conservation of marine resources
- Allowance for Member States to implement conservation and management measures in their 12nm zone
- New rules aimed at reducing fishing capacity beyond reference levels set at MAGP IV levels

[1] Fisheries governance is the sum of the legal, social, economic and political arrangements used to manage fisheries. It has international, national and local dimensions and includes legally binding rules as well as customary social arrangements.

[2] Council Regulation (EC) No 2371/2002 of 26 December 2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.

- New requirements for Member State enforcement and control, and provision for the future deduction of quota from Member States who exceed their quota in any year.
- The establishment of Regional Advisory Councils comprised of fishing industry and other stakeholders to be consulted on Commission conservation measures

The central planks of the CFP – annual decision making by the Council of Ministers, management by output control, relative stability (essentially fixed quota proportions allocated to Member State), and subsidiarity (the responsibility for implementing decisions, including control and enforcement, lies with Member States not the Commission) – remained.

Six years after the new regulation came into effect, it is becoming increasingly obvious that the revised Common Fisheries Policy (2002) has, as yet, been ineffective in creating better conservation of stocks or in increasing profitability of the fisheries sector. The upcoming reform, will be likely to focus on the conservation and structural policy which are subject to mandatory review by 2012 at the latest. Reforms in other areas of the CFP such as the control policy have already been proposed by the European Commission.

This paper examines the reasons for this failure and suggests changes that should be made in the upcoming round of revisions. To research the paper an extensive literature review was supplemented by interviews with a variety of governmental and non-governmental stakeholders.

2 The situation of European fisheries

European fisheries are widely acknowledged to be in a poor state. Stock sizes and landings have declined over the past 25 years. If the observed trends continue, many stocks in the Community could face biological collapse and subsequently commercial failure.

The European Commission has calculated that more than 80% of stocks commercially exploited in EU waters are subject to overfishing. This compares with a global average of 25%, and the current world best performing fisheries in New Zealand in which only 15% are subject to overfishing[3]. Only 13% of EU stocks are within biological limits; 28% are outside biological limits, and for 55% of them the state of the stock is not known. With the exception of the percentage of stocks that are subject to overfishing, which has declined slightly, there appears to have been effectively no change in these percentages over the 6 years of the revised CFP (Figure 1).This means that fishing levels are greater than those required to deliver the maximum sustainable yield. Therefore these stocks are not producing the

[3] J.R. Beddington, D.J. Agnew and C.W. Clark, 'Current Problems in the Management of Marine Fisheries', Science, Vol. 316, 2007, pp. 1713 – 1716.

maximum that they could produce. The Commission has however, recently adopted maximum sustainable yield as a target for European fish stocks[4].

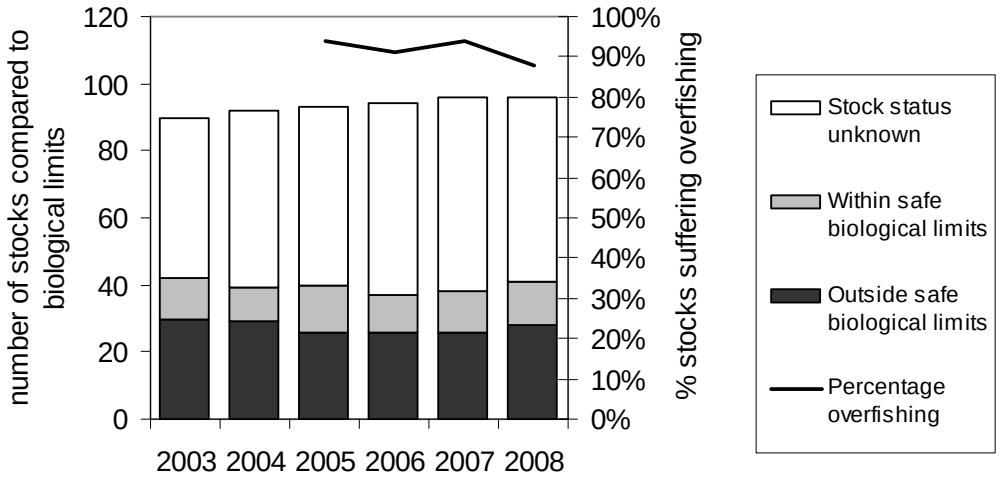

Figure 1 Status of EU stocks over the period of operation of the revised Common fisheries Policy. Source: European Commission[5].

Overall, the capacity of the EU fleet remains far greater than the available fishing opportunities – by a factor of 2-3. The number of vessels, gross tonnage and fleet power have remained around the same levels since 2004 (

[4] Communication from the Commission to the Council and the European Parliament: Implementing sustainability in EU fisheries through maximum sustainable yield. COM(2006) 360 final

[5] European Commission, Fishing Opportunities for 2009: Policy Statement from the European Commission, COM(2008) 331 final (Brussels, 30.5.2008).

Table 1). There is widespread acknowledgement that overcapacity in the fleet continues, and is one of the fundamental barriers to effective recovery of fish stocks and efficient economic performance of the fleet[6]. Rising fuel prices over the last few years have affected the profit margins of the European fleet. Fuel costs contribute to a major part of operational costs which varies depending on the type of vessel and fishing method. Fishing methods, such as trawling, which is considered one of the most damaging to the environment is also one of the most fuel-intensive. Over the whole of the EU, profits are only 4% of landings value (

[6] House of Lords, The Progress of the Common Fisheries Policy. Volume I: Report. European Union Committee, 21st Report of Session 2007–08 (London: The Stationery Office, 2008).

Table 1, Table 5).

Table 1 General characteristics of the European fishing fleet 2004-2006. Source: STECF, 2008[7]. Note: Data is missing for several Member States and several years.

	2003	2004	2005	2006	Total
Volume of landings (1000t)	4,457	5,053	5,140	4,820	19,470
Value of landings (million EUR)	8,174	5,084	6,206	6,490	25,954
Income (million EUR)	10,099	7,666	7,335	6,422	31,522
Effort (days x 1000)	7,878	7,445	7,533	7,352	30,208

Table 2 General characteristics of the European fishing fleet 2004-2006. Source: STECF, 2008[8]. Note: Data is missing for several Member States and several years.

	2003	2004	2005	2006	Average
Number of vessels in fleet	82,584	82,096	83,690	80,422	82,198
Employment (total)	183,204	141,771	118,013	94,996	134,496
Fleet Gross Tonnage (x 1000)	2,047	2,105	2,174	2,125	2,112.8
Fleetpower kW (x 1000)	7,613	7,623	7,672	7,439	7,586.8
Average Gross Tonnage of a vessel	25	26	26	26	25.8
Average power kW of a vessel	92	93	92	92	92.3
Average age of a vessel	19	19	14	15	16.8

The European fishing industry has a high social and economic value, particularly in terms of employment (

[7] Annual Economic Report. SGECA 08-02 working group report. Evaluated by STECF 7-11 July 2008
[8] Annual Economic Report. SGECA 08-02 working group report. Evaluated by STECF 7-11 July 2008

Table 3), not least because of the importance of coastal communities, particularly in the Mediterranean. The gross value added by fishing related activities (i.e. earnings and processing value) provides approximately an additional 50% of the landings value (

Table 4). The gross added value for all fleets is positive, even though vessel profits may be negative. However, these gross figures disguise significant regional differences. In 2006, 52% of the European fishing fleet was made up of Greek, Spanish and Italian vessels[9]. Fishermen from these Member States accounted for 60% of those employed in the catch sector (in 2002-2003), followed by France and Portugal each representing a further 10%[10]. Statistics for employment in the fisheries sector vary greatly depending on the source and the method of calculation but the overall trends remain the same.

[9] Eurostat Pocketbook, 2007.Data 1990-2006. Fishery Statistics.

[10] Salz, P. Buisman, E; Smit, J.; de Vos, B. 2006. Employment in the fisheries sector: current situation. LEI BV Framian BV.

Table 3 Employment in the fisheries sector in the European Member States between 2003-2006.[11]

	2003	2004	2005	2006	total
Belgium	578	533	570	562	561
Cyprus	N/A	N/A	N/A	N/A	N/A
Denmark	3,643	3,315	2,950	2,667	3,144
Estonia	2,011*	2,174**	998	920	1,526
Finland	462	618	408	420	477
France	13,960	13,402	13,648	13,462	13,618
Germany	2,473*	2,133	1,923	1,712	2,060
Greece	30,208*	N/A	N/A	N/A	30,208
Ireland	4,509	4,288	4,035	3,994	4,207
Italy	38,062	35,195	32,174	26,030	32,865
Latvia	979	951	N/A	N/A	965
Lithuania	N/A	612	470	526	402
Malta	N/A	N/A	N/A	N/A	N/A
Netherlands	2,187	2,463	2,093	1,893	2,159
Poland	4,800*	3,795	3,079	2,715	3,597
Portugal	19,765	14,862	14,750	14,445	15,956
Slovenia	N/A	N/A	N/A	53	53
Spain	44,712	44,212	N/A	N/A	22,231
Sweden	2,172	1,656	2,078	2,142	2,012
UK	8,088	8,292	7,909	7,973	8,066
Total	178,609	138,501	87,085	79,514	144,107

* Anon, Economic Performance of Selected European Fishing Fleets. Annual Report 2004 (December 2004). ** Anon, *Economic Performance of Selected European Fishing Fleets. Annual Report 2005* (March 2006).

[11] FTE: full time equivalent. Note that methodologies to calculate 1 FTE varies between the countries. http://www.fiskeriverket.se/download/18.1e7cbf241100bb6ff0b80001799/economic-perf-2005_all.pdf,

Table 4 Value added in the European fishing fleet (€millions). 2003-2006.

	2003	2004	2005	2006	Average 2003-2006
Belgium	40.1	34.5	25.5	20.5	30
Cyprus	N/A	N/A	N/A	N/A	N/A
Denmark	211	189	223	261	221
Estonia	N/A	N/A	9.91	8.43	9
Finland	9.9	10.8	10.5	11.8	10
France	691	672	679	672	678
Germany	N/A	148.1	163.2	155.2	155
Greece	N/A	N/A	N/A	N/A	N/A
Ireland	N/A	118.52	107.36	126.1	117
Italy	976	815	873	964	907
Latvia	N/A	8	N/A	N/A	8
Lithuania	N/A	3.2	2.8	2.6	2.9
Malta	N/A	N/A	N/A	N/A	N/A
Netherlands	180	155	152	149	159
Poland	N/A	14.4	13.4	19.1	15
Portugal	N/A	N/A	N/A	N/A	N/A
Slovenia	N/A	N/A	N/A	N/A	N/A
Spain	54.7	35.99	N/A	N/A	45
Sweden	54.1	43.6	31.1	33.2	40
UK	N/A	N/A	445	353	400
Total	2217.71	2241.14	2737.44	2777.23	

For all regions except the Mediterranean and the Baltic, fleets as a whole were running at a loss in 2004[12]. In 2006, the fleets with the largest losses were the Netherlands, Belgium and Estonia (Table 5). This compares poorly with the situation in 2000 when these regions had profits. In the loss-making regions, such as the North Sea where the overall net loss is 10% of landings value, some fleets continue to make an overall profit but many make even larger losses[13].

[12] Anon, Economic Performance of Selected European Fishing Fleets. Annual Report 2005 (March 2006). Available from http://www.fiskeriverket.se/download/18.1e7cbf241100bb6ff0b80001799/economic-perf-2005_all.pdf, accessed December 2008. See also European Commission, Economic analysis by EU fishing regions. Powerpoint presentation (Available at: http://ec.europa.eu/fisheries/meetings_events/events/archives/events_2007/140507/mastracchio_ppt_en.pdf, accessed December 2008).

[13] EAFE, The Potential Economic Impact on Selected Fishing Fleet Segments of TACs Proposed by ACFM for 2002 (EIAA-model calculations). A Report of the European Association of Fisheries Economists Advisory Committee. (Available at http://66.102.9.104/search?q=cache:VGeyVXQgxeAJ:www.eafe-fish.org/notices/eafe-ac-eiaafinal.doc+The+Potential+Economic+Impact+on+Selected+Fishing+Fleet+Segments&hl=en&ct=clnk&cd=1&gl=uk, accessed December 2008)

Table 5 Profit[14] in the fleet by Member State for 2003-2006, million Euro. Source: STECF, 2008[15]. Note: Data is missing for several Member States and several years.

	2003	2004	2005	2006	Average 2003-2006
Belgium	-1.4	-6	-14.4	-23.5	-11
Cyprus	N/A	N/A	N/A	N/A	N/A
Denmark	-43	-59	-13	18	-24
Estonia	N/A	N/A	-5.91	-2.61	-4.3
Finland	0.6	0.5	2.9	2.5	1.6
France	56.58	46.79	63.4	37.14	51
Germany	N/A	116.9	122.5	105.9	115
Greece	N/A	-3.3	-5.1	12.3	1.3
Ireland	N/A	368	N/A	314	341
Italy	N/A	-2	N/A	N/A	-2
Latvia	N/A	1.9	0.9	1.2	1.3
Lithuania	N/A	N/A	N/A	N/A	N/A
Malta	-3	-15	-15	-7	-10
Netherlands	N/A	0.7	-2.4	6.9	1.7
Poland	N/A	N/A	N/A	N/A	N/A
Portugal	N/A	N/A	N/A	N/A	N/A
Slovenia	N/A	N/A	N/A	N/A	N/A
Spain	N/A	N/A	N/A	N/A	N/A
Sweden	26.0	12.2	10.6	7.4	14
UK	-	-	64.1	79.4	72
Total	35.8	95.7	208.6	237.5	

Almost all the woes of the European fleet can be linked to overcapacity. Overcapacity leads to there being more fishermen than fishing opportunities, which in turn reduces the profitability of individual fleets. Reduced profitability leads to an increased incentive to take more fish than is allowed for in the quota. This leads to overfishing and even fewer returns to fishermen, so reducing profits again. Nevertheless, for all Member States value added is positive because of the employment generated by fishing, and it remains an important sector of the economy employing some 140,000 people across the EU.

The next section presents an introduction to the remaining problems in European fisheries management since the 2002 CFP reform and provides a brief description of what measures have been taken to tackle the issues and how successful these have been.

[14] Profit is defined as: Income minus all costs, including capital costs: income – (fuelcost + crewcost + repcost +varcost + fixedcost + capitalcost)

[15] Annual Economic Report. SGECA 08-02 working group report. Evaluated by STECF 7-11 July 2008

3 Current problems and their causes

Problem 1: Overcapacity and subsidy

Although fishing capacity has been reduced, the rate of reduction is small – 3% per year from 2002-2003 declining to 2% per year 2005-2006 (Figure 2). Overall, between 1999 and 2006, a 5% reduction in fishing power (kW) was achieved. Over this period, the Netherlands, Spain and Denmark reduced their fishing power the most, by about 20%, whereas Belgium, France, Germany and Portugal merely reduced their fishing power by between 3 and 5%. Ireland was the only country to have increased its fishing power by 3% during this same period. However, even in the cases where the number of boats and fishing power has been reduced, reductions in fishing effort and fishing mortality may not necessarily follow. For instance, studies have[16] estimated that for trawlers annual increases in fishing power associated with technological developments may be between 3 and 4%. This leads us to the possible conclusion that the effective fishing power of the EU fleet has not been reduced since 2002.

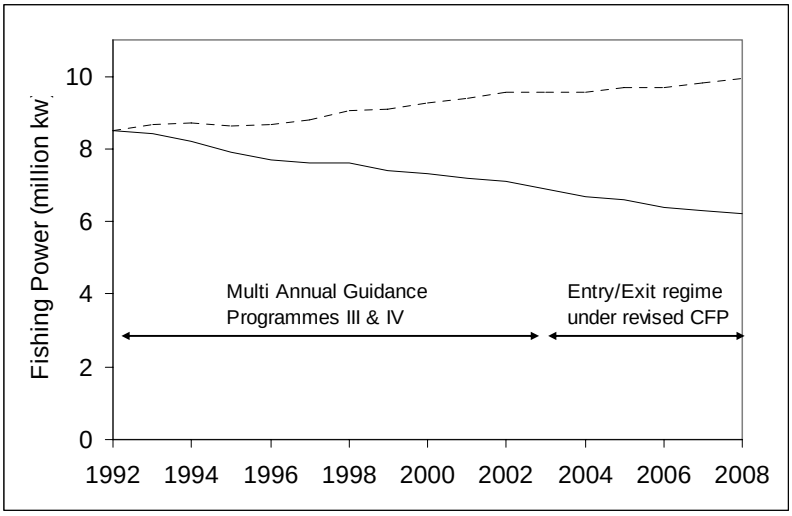

Figure 2 Capacity reduction in Euro 12 Member States. Solid line is actual capacity, dotted line is potential real capacity relative to 1992 with a technologically induced 3% increase in effective fishing power per year. Source: European Commission[17].

Although the extent varies, state aid to the fisheries sector continues in all European Member States and allows uneconomical fisheries to continue fishing. The disparity between the fishing capacity and the fishing opportunities available is regarded to be one of the most fundamental issues in need of change. Subsidies do not allow market forces to regulate the number of fishermen active in the fleet according to the available fishing opportunities. The political pressure for state aid is high in the

[16] J. Fitzpatrick, 'Technology and Fisheries Legislation', in Precautionary approach to fisheries Part 2: Scientific papers (Rome: FAO, 1996), FAO Fisheries Technical Paper 350/2, pp. 191-199.

[17] European Commission, *Commission Working Document: Reflections on further reform of the Common Fisheries Policy,* (Available at http://ec.europa.eu/fisheries/publications/factsheets/legal_texts/reflection_cfp_08_en.pdf, accessed December 2008).

European Union and in particular for some Member States. State aid is taken for granted and expected to continue year on year. Significant cultural changes are likely to be necessary in order for any policy changes with regards to subsidies to be accepted by the industry.

In general subsidies and state aid in any form whatsoever is incompatible with the common market and the Treaty of the European Community, as it may distort competition. Fisheries are and agriculture are however exempted from the notification procedure[18]. In November 2001, negotiations to draft rules to reduce sustainable fisheries subsidies started at the World Trade Organisation (WTO) as part of the Doha round of trade talks. Whilst the overall trade negotiations appear to be in limbo, technical discussions on types of subsidy programmes to prohibit or to allow (subject to certain conditions) are ongoing in Geneva. This may affect the future of the structural policy of the CFP especially if the timing of a WTO reform coincides with the CFP reform.

The Financial Instrument for Fisheries Guidance (FIFG[19]) was set up in 1999 and ran until 2006. It was replaced by the European Fisheries Fund (EFF), which will operate over the period 2007-2013[20,21]. The funding objectives and measures are set out by Axis (Table 6). New measures added to the EFF included measures to accompany the implementation of recovery plans, the encouragement of selective fishing methods and the financing of local strategies in support of the sustainable development of fisheries areas as well as a greater emphasis on inland fishing and environmentally-acceptable aquaculture.

Under the EFF each Member State is required to establish a national strategic plan for their fisheries sector as a whole. In doing so, they must also identify priorities, targets and the public resources needed to achieve their objectives. Member States are obliged to notify all measures prior to their implementation to the Commission, unless they are covered by a block exemption regulation or the "*de minimis*" regulation[22,23]. The *de minimis* ceiling for the fisheries sector is set at EUR 30 000 per three-year period and per beneficiary. A recent review has recommended that these

[18] Commission Regulation (EC) No 1860/2004 of 6 October 2004 on the application of Articles 87 and 88 of the EC Treaty to de minimis aid in the agriculture and fisheries sectors

[19] Financial Instrument for Fisheries Guidance: Council Regulation (EC) No 1263/1999 of 21 June 1999 on the FIFG

[20] Council Regulation (EC) No 179/2002 of 28 January 2002 amending Regulation (EC) No 2792/1999 laying down the detailed rules and arrangements regarding Community structural assistance in the fisheries sector

[21] Council Regulation (EC) No 1421/2004 of 19 July 2004 amending Regulation (EC) No 2792/1999 laying down the detailed rules and arrangements regarding Community structural assistance in the fisheries sector.

[22] Commission Regulation (EC) No 875/2007 of 24 July 2007 on the application of Articles 87 and 88 of the EC Treaty to de minimis aid in the fisheries sector and amending Regulation (EC) No 1860/2004.

[23] "The *de minimis* ceiling for the fisheries sector is set at EUR 30 000 per three-year period and per beneficiary, on condition that the total amount of such aid granted to undertakings is below 2.5% of the national annual production of the sector."

rules not be changed[24]. Aid provided cannot exceed the threshold of a total amount of aid of € 1 million or a total amount of eligible costs per project of € 2 million.

Table 6 Summary of funding objectives under the European Fisheries Fund 2007-2013.

Funding Axis	General objective and measures
Axis 1: measures for the adaptation for the Community fishing fleet	**Overall objective:** promote a sustainable balance between resources and the fishing capacity of the Community fishing fleet **Measures:** aid for permanent cessation, temporary cessation, investments on board fishing vessels, young fishermen small-scale coastal fishing, socio-economic compensation
Axis 2: measures relating to aquaculture, inland fishing, processing and marketing of fishery and aquaculture products)	**Overall objective:** promote a sustainable development of inland fishing **Measures:** support of productive investments in aquaculture, Aqua-environmental measures, Public health measures, Animal health measures, Processing and marketing of fishery and aquaculture products, Inland fishing
Axis 3: measures of common interest (e.g. collective actions, protection and development of aquatic fauna and flora; fishing ports; development of new markets; etc)	**Overall objective:** foster the protection and the enhancement of the environment and natural resources where related to the fisheries sector **Measures:** Collective actions, Protection and development of aquatic flora and fauna, Equipping of fishing ports, landing sites and shelters, Development of new markets, Promotional campaigns, Modification of fishing vessels for other uses, Pilot projects (innovative actions),
Axis 4: Sustainable development of fisheries areas	**Overall objective:** strengthen the competitiveness of the operating structures and the development of economically viable enterprises in the fisheries sector **Measures:** Funding for local projects for sustainable development and improvement of the quality of life
Axis 5: Technical assistance to facilitate delivery of the EFF	**Overall objective:** support the common fisheries policy so as to ensure exploitation of living aquatic resources and support aquaculture to ensure durability **Measures:** to finance the work of public services that manage the funds made available by the EFF

[24] Framian BV, 2009. Economic analysis of raising *de minimis* aid for fisheries.

Table 7 European Fisheries Fund (2007-2013) total allocations (Member State and European Union contributions), million Euros.

	Axis 1	Axis 2	Axis 3	Total	%
Belgium	15	10	19	44	1.2%
Bulgaria	8	36	20	64	1.8%
Cyprus	2	3	13	18	0.5%
Denmark	21	47	46	115	3.2%
Estonia	15	25	21	61	1.7%
Finland	3	17	15	35	1.0%
France	60	63	85	208	5.7%
Germany	8	58	69	134	3.7%
Greece	77	60	32	169	4.7%
Ireland	46	13	7	66	1.8%
Italy	165	106	108	380	10.5%
Latvia	21	46	24	91	2.5%
Lithuania	14	22	9	45	1.2%
Malta	3	2	5	11	0.3%
Netherlands	17	7	17	41	1.1%
Poland	225	196	196	617	17.0%
Portugal	53	78	90	221	6.1%
Romania	10	105	30	145	4.0%
Spain	403	344	317	1064	29.3%
Sweden	14	11	19	44	1.2%
United Kingdom	11	19	23	53	1.4%
Total	**1,191**	**1,268**	**1,165**	**3,625**	**100%**

Source: Compiled from the Operational programmes of Member States adopted by the European Commission.

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Table 8 Funding awarded through the FIFG between 2000-2006. Contributions by coastal EU Member States and the European Union are shown. Source: 'Facts and Figures on the CFP. Basic data on the Common Fisheries Policy. 2008 Edition. European Commission.

	Scrapping		Construction of new vessels*		Modernising of existing vessels		Aquaculture		Fishing port facilities		processing and marketing		Socio-economic measures		Others		Total aid allocated through FIFG		
	EU	National	EU	National	EU	National	EU	National	EU	National	EU	National	EU	National	EU	National	EU	National	Total
Belgium	6,986	6,986	-	-	1,950	1,950	635	720	550	550	3,347	1,327	100	100	11,129	11,100	24,697	22,733	47,430
Denmark	39,100	39,100	8,000	2,667	18,033	6,011	5,100	1,700	38,200	35,867	37,098	12,366	-	-	43,652	41,052	189,183	138,763	327,946
Germany	3,844	3,833	1,166	723	9,425	1,892	17,187	5,527	45,883	13,610	54,416	15,836	321	347	37,695	22,789	169,937	64,557	234,494
Estonia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12,469	6,282	12,469	6,282	18,751
Ireland	6,580	2,380	-	-	15,580	3,280	25,680	5,354	-	-	-	-	-	-	17,660	5,890	65,500	16,904	82,404
Greece	81,190	18,898	7,831	1,119	8,343	1,192	31,521	9,010	14,533	3,433	42,308	18,076	11,048	3,683	26,837	8,226	223,611	63,637	287,248
Spain	124,474	42,918	361,150	100,221	67,205	24,811	186,698	70,271	129,206	46,688	376,434	182,573	10,176	3,638	532,182	179,625	1,787,525	650,745	2,438,270
France	37,510	37,442	31,131	51,770	28,855	35,979	20,806	13,784	39,118	37,266	29,203	23,376	5,915	5,915	85,105	77,108	277,643	282,640	560,283
Italy	109,387	109,387	18,270	8,156	38,509	15,194	9,588	16,546	7,754	10,039	12,395	20,655	200	200	215,024	212,687	411,127	392,864	803,991
Cyprus	953	953	-	-	102	170	746	1,241	675	675	513	855	-	-	430	430	3,419	4,324	7,743
Latvia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24,335	9,020	24,335	9,020	33,355
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12,117	5,071	12,117	5,071	17,188
Malta	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,838	781	2,838	781	3,619
Netherlands	1,872	1,872	-	-	2,591	2,591	974	1,623	-	-	-	-	852	852	33,491	35,900	39,780	42,838	82,618
Poland	80,121	26,707	4,747	678	16,276	2,374	10,738	5,651	17,957	10,766	17,067	2,487	19,441	19,441	35,485	12,009	201,832	80,113	281,945
Portugal	20,028	6,673	47,486	8,297	7,076	1,358	21,319	3,714	22,705	6,547	26,636	6,718	5,351	1,777	87,234	33,116	237,835	68,200	306,035
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,781	594	1,781	594	2,375
Finland	2,066	2,066	805	1,708	1,435	2,222	1,269	2,092	6,437	7,697	7,951	11,901	84	84	22,337	23,394	42,384	51,164	93,548
Sweden	7,081	7,081	903	298	4,003	1,337	1,107	369	5,316	4,678	12,292	4,146	111	111	35,586	26,235	66,399	44,255	110,654
United Kingdom	32,434	31,901	-	-	7,626	8,932	14,522	5,616	17,913	8,439	39,388	11,733	50	91	97,800	37,377	209,733	104,089	313,822
Total	**553,626**	**338,197**	**481,489**	**175,637**	**227,009**	**109,293**	**347,890**	**143,218**	**346,247**	**186,255**	**659,048**	**312,049**	**53,649**	**36,239**	**1,335,187**	**748,686**	**4,004,145**	**2,049,574**	**6,053,719**

Although the focus of EFF objectives has moved more to conservation and direct, vessel construction, subsidies were prohibited from 2006, considerable sums of money are still available, and still spent, on core subsidies to the fishing industry, such as decommissioning. The total amount of State aid awarded to the fisheries sector was estimated at around € 418 million in 2007. Spain reported the highest amount (€ 184 million), followed by Italy (€ 82 million), Ireland (€ 37 million), Denmark (€ 33 million) and Greece (€ 31 million)[25].

In cases where negative decisions are taken in cases of unlawful aid, the Commission can request that the Member State take all necessary measures to recover the aid from the beneficiary. For example, two recovery decisions involving France were recorded in 2004 (amounts unknown) and 3 recovery decisions involving the United Kingdom were recorded in 2007 (total amount less than €1 million although a proportion was *de minimis* aid and did not need to be recovered)[26]. Decisions on state aid by the European Commission are available on the website of the European Commission[27].

Since 2003 Member States have had the obligation to reduce fishing capacity from their reference level of 1 January 2003 by 3 % on 1 January 2005[28] by managing entries into and exits from their fleet of fishing vessels. The permanent cessation of fishing activities of a fishing vessel can be achieved in several ways: directly by scrapping the fishing vessel; or indirectly through its reassignment, under the flag of a Member State and registered in the Community for activities outside fishing; or its reassignment for the purpose of the creation of artificial reefs.

Between 2000 and 2006, € 553 million were spent on scrapping vessels through FIFG. During the same period, € 481 million were spent on the construction of new vessels. Funds for this stopped in 2006 for the European Community but continued for the outermost regions including La Reunion and the Canaries. Unfortunately as shown in our earlier report, even accompanied by the scrapping subsidy, EU capacity has only been reduced by about 3% per year. Combined with technological creep, the overall capacity of the fleet may even have increased between 1999 and 2006. The need for further capacity reductions is widely acknowledged by the fishing industry (pers. comm., interviews with the NS-RAC), governments and the Commission.

Over the period 2007-2013 1.2 billion Euros was set aside for state aided decommissioning schemes (

[25] http://ec.europa.eu/competition/state_aid/studies_reports/expenditure.html.
[26] State Aid Scoreboard. State Aid Scoreboard - Autumn 2008 Update. COM(2008) 751 final.
[27] http://ec.europa.eu/community_law/state_aids/peche_2008.htm
[28] Commission Regulation (EC) No 1438/2003 of 12 August 2003 laying down implementing rules on the Community Fleet Policy as defined in Chapter III of Council Regulation (EC) No 2371/2002.

Table 7). Although subsidies for vessel construction were prohibited from 2006, under the FIFG between 1994 and 1999 about the same state aid was provided to construction as it was to decommissioning (about €370 million[29]); and between 2000 and 2006 the combined EU and National aid for construction was about €650 million compared to €900 million for scrapping (Table 8).

In response to soaring fuel prices in the summer of 2008, the Council adopted an aid package (Council Regulation 744/2008 of 24 July 2008) that, inter alia, included potential to use public money to reduce fleet capacity through the use of Fleet Adaptation Schemes provided that they resulted in a capacity reduction of the fleets concerned of at least 30% expressed in GT and kW and to increase fuel efficiency through the replacement of old engines with new more efficient ones. We have yet to see if these initiatives have a significant effect on capacity.

A programme which has to supply state aid for generation and removal of capacity clearly makes little sense. It will be important in future to limit the amount of state aid even being provided for decommissioning, and instead to encourage management mechanisms, such as transferable rights based systems, which allow the industry to generate its own entry and exit from the fleet. We will discuss this later in the report.

Problem 2: Enforcement and Compliance

Implementation of the CFP rules is the responsibility of Member States. By and large, and with some notable exceptions, the measures that they have taken since 2002 appear not to have been effective in encouraging the development of higher levels of compliance than before that time.

In all the regional seas covered by the CFP it is possible to find examples where, as the TAC has been reduced the percentage of the catch that is unreported (either landed as 'blackfish' or discarded) has increased (Figure 3). This phenomenon comes about because control is weak, but it also happens because the fleet is over-capacity and only making marginal profits, and therefore the incentive to keep fishing is intense. Member States have apparently not been able to effectively control fishing effort and compliance with TAC requirements in depleted fisheries.

[29] European Commission summary documents, including http://ec.europa.eu/fisheries/structures/pdf/exec_dom_em.pdf

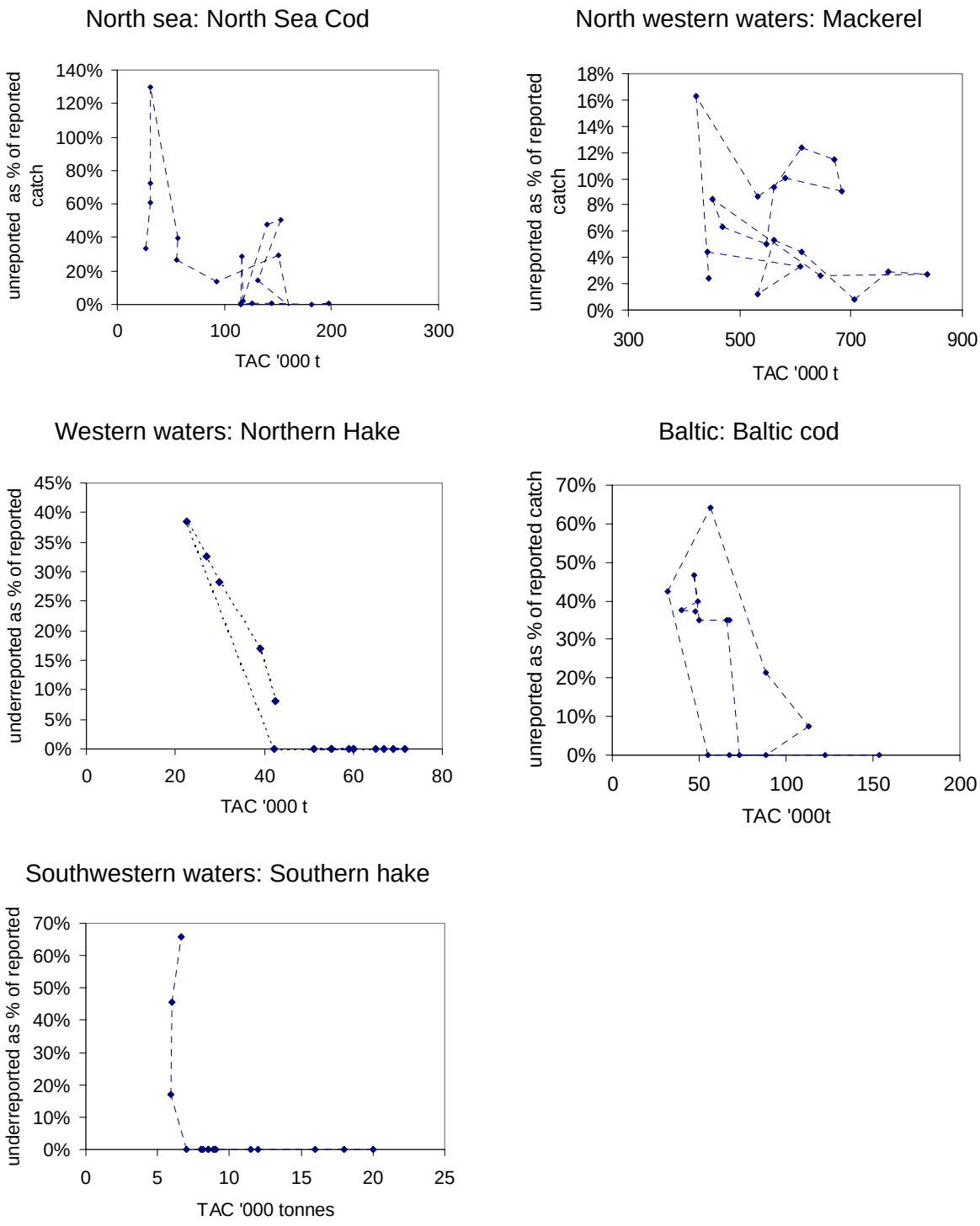

Figure 3 Compliance is poor in all European water. This figure shows the relationship between the level of under-reporting and the TAC in four prominent EU fisheries; as the TAC was reduced, the level of misreporting increased in all these fisheries. Source, ICES ACFM reports, 2008[30].

[30] Source: ICES (ACFM) reports, 2008 (Available from http://www.ices.dk/advice/icesadvice.asp).

In some of the fisheries of most concern in the EU, the level of unreported catches has been extremely high since 2000 (Figure 4), and has only recently shown signs of being brought under control through the actions of Member States.

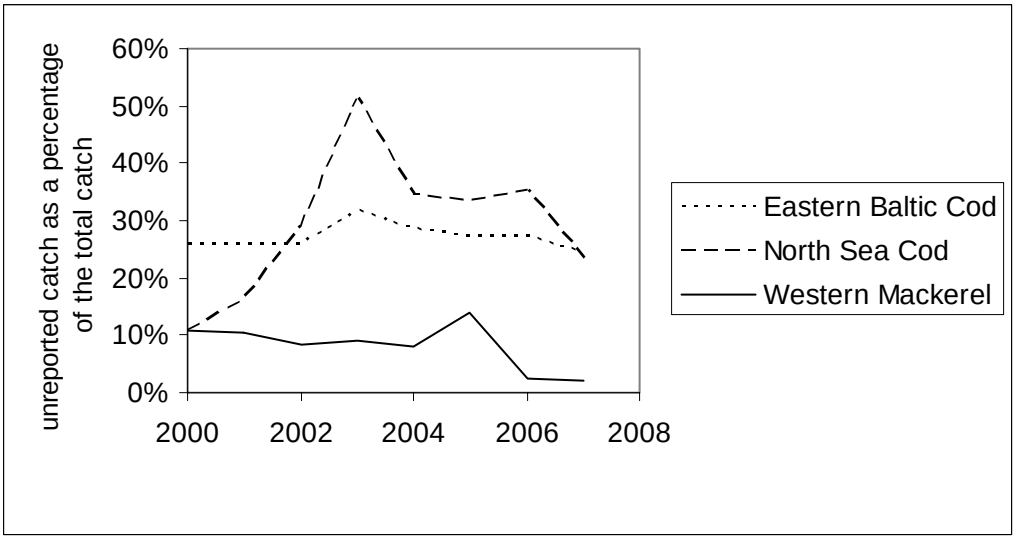

Figure 4 The level of under-reporting in some critical EU stocks. Source, ICES ACFM reports, 2008.

The number of serious infringements detected by Member States, which are reported to the Commission, has hardly changed over the last 5 years. The latest figures available from 2000 – 2006 are presented in Table 9.

Table 9 Number of active vessels and serious infringements per Member State in 2002, 2005 and 2006. Analysis of proportion of infringements and difference between years. Source: COM(2008) 670, COM(2007) 448 final, COM(2006) 387 final, COM(2005) 207 final., COM(2003) 782 final.

	Number of active vessels /year					Number of serious infringements recorded/year					Proportion infringements in relation to number of vessels/year				
Member State	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Belgium	129	126	123	121	107	49	59	32	22	29	37.98%	46.83%	26.02%	18.18%	27.10%
Cyprus	N/A	N/A	897	886	872	N/A	N/A	5	9	88	N/A	N/A	0.56%	1.02%	10.09%
Denmark	3,726	3,552	3,416	3,269	3,136	442	485	258	361	323	11.86%	13.65%	7.55%	11.04%	10.30%
Estonia	N/A	N/A	1,050	1,045	994	N/A	N/A	N/A	19	0	N/A	N/A	N/A	1.82%	0.00%
Finland	3,544	3,420	3,394	3,267	3,196	2	10	5	25	11	0.06%	0.29%	0.15%	0.77%	0.34%
France	8,082	8,047	7,884	7,859	7,698	288	596	492	864	1,360	3.56%	7.41%	6.24%	10.99%	17.67%
Germany	2,240	2,192	2,163	2,121	2,017	118	128	87	96	101	5.27%	5.84%	4.02%	4.53%	5.01%
Greece	19,523	18,979	18,723	18,279	17,878	1,021	766	1,487	377	351	5.23%	4.04%	7.94%	2.06%	1.96%
Ireland	1,437	1,490	1,431	1,415	1,843	26	103	50	109	223	1.81%	6.91%	3.49%	7.70%	12.10%
Italy	16,069	15,639	14,923	14,426	14,093	1,074	2,569	3,398	3,280	3,868	6.68%	16.43%	22.77%	22.74%	27.45%
Latvia	N/A	N/A	942	928	897	N/A	N/A	175	132	94	N/A	N/A	18.58%	14.22%	10.48%
Lithuania	N/A	N/A	303	271	266	N/A	N/A	N/A	3	4	N/A	N/A	N/A	1.11%	1.50%
Malta	N/A	N/A	2,133	1,420	1,413	N/A	N/A	N/A	3	0	N/A	N/A	N/A	0.21%	0.00%
Netherlands	952	949	862	828	831	122	124	141	117	96	12.82%	13.07%	16.36%	14.13%	11.55%
Poland	N/A	N/A	1,248	974	884	N/A	N/A	73	105	129	N/A	N/A	5.85%	10.78%	14.59%
Portugal	10,427	10,313	10,082	9,186	8,715	1,579	1,316	1,729	761	1,352	15.14%	12.76%	17.15%	8.28%	15.51%
Slovenia	N/A	N/A	148	173	179	N/A	N/A	N/A	13	22	N/A	N/A	N/A	7.51%	12.29%
Spain	14,817	14,397	14,053	13,684	13,357	1,785	3,158	3,813	2,949	2,061	12.05%	21.94%	27.13%	21.55%	15.43%
Sweden	1,840	1,692	1,598	1,639	1,567	125	97	94	53	80	6.79%	5.73%	5.88%	3.23%	5.11%
United Kingdom	7,556	7,279	7,034	6,766	6,761	125	91	76	234	170	1.65%	1.25%	1.08%	3.46%	2.51%
TOTAL:	92,344	90,078	94,411	90,562	88,710	8,758	11,505	13,919	11,537	12,368	9.48%	12.77%	14.74%	12.74%	13.94%

Both the total number of infringements and the infringement rate per active vessel is much higher in some Member States than others. France, Italy, Portugal and Spain have the highest number of infringements and the highest infringement rates of all Member States (between 15 and 27 infringements per 100 active vessels). The 6 lowest infringement rates are in Estonia, Finland, Greece, Lithuania, Malta and the UK. The range of these rates may reflect different levels of inspection, but overall show a very uneven pattern in compliance across the EU.

Recognising that the implementation of compliance and control was uneven across the EU, in 2005[31] the Council created a Community Fisheries Control Agency, with its headquarters in Vigo (Spain), "to organise operational coordination of fisheries control and inspection activities by the Member States and to assist them to cooperate so as to comply with the rules of the Common Fisheries Policy in order to ensure its effective and uniform application". Control is still a Member State responsibility but the agency has started to coordinate “joint deployment plans” (one in the North Sea and one in the Baltic) involving groups of Member States, which include patrols across EEZ borders and exchange of inspectors. These were started only in 2007, so it is rather too soon to assess whether they have had an appreciable impact on control. However, they have been successful in increasing the presence of inspections at sea, and in detecting some infringements that were otherwise difficult to detect. For instance the CFCA’s Joint Deployment Plan in the North Sea detected the use of illegal gear attachments (i.e. small mesh blinders in the cod end) on many of their 7 deployments in 2007[32].

Following damning criticism from the European Court of Auditors[33] the Commission has accepted that even with the Control Agency, fisheries control and particularly the accurate monitoring of catches needs to be considerably strengthened across the EU. The new Control Regulation proposed by the European Commission in November 2008[34] will strengthen the ability of the Commission to monitor Member States’ catches, take action to close a fishery to a Member State if it determines that the quota has been exceeded and take punitive action against Member States which do not monitor their catches effectively. It will also require the whole market chain – landing, processing, transport and marketing – to be inspected and monitored, which will be facilitated by the use of electronic monitoring systems including a requirement for electronic logbooks to be used on most vessels greater than 10m in length operating outside territorial waters.

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[31] Council Regulation (EC) No 768/2005 of 26 April 2005 establishing a Community Fisheries Control Agency (OJ L 128, 21.5.2005, p.1).

[32] Community Fisheries Control Agency. Joint Deployment Plan (JDP), North Sea. 2007. http://www.cfca.europa.eu/northsea/index_en.htm

[33] European Court of Auditors, Special Report No 7/2007 (pursuant to Article 248(4) second paragraph, EC) on the control, inspection and sanction systems relating to the rules on conservation of Community fisheries resources (Brussels: European Court of Auditors, 2007).

[34] Council Regulation establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy **(**COM(2008) 721 final).

Finally, there will be attempts to harmonise penalty schemes across the EU, in particular through the introduction of a points based licensing system linking fishing opportunities to compliant behaviour. Current Monitoring Control and Surveillance costs are high (around 5% of gross revenue, € 321million). Enforcement costs must be lowered, and therefore increasing cost effectiveness is a core objective for reform. The core problem is that achieving full compliance requires a high deployment cost in the initial years. The costs of deployment fall as as enforcement becomes more effective and compliance increases. Bio-economic modelling conducted by MRAG suggested that a realistic target is around 5% of gross revenue[35].

Problem 3: Decision making process and scientific advice

In Europe, advice on sustainable catch levels is initially developed by the International Commission for the Exploration of the Sea, ICES, following scientific assessment of the status of stocks and then is the subject of proposals by the Commission to the Council of Ministers. However, there has been a tendency of the Council to set TACs higher than are sustainable or advised by ICES which has contributed to the poor status of European fish stocks[36].

The task of management is to integrate the socio-economic interests such as employment in the fisheries sector with biological sustainability of the stock. But despite there being a clear commitment to a reversal of preference in the objective of the CFP to the effect that 'The objective of the Common Fisheries Policy should be to provide for sustainable exploitation of living aquatic resources taking account of the environmental, economic and social aspects in a balanced manner'[37] the Council has continued to take decisions that are not balanced in favour of the sustainability of fish stocks. Political decisions on fisheries are often taken with a short-term view in mind whereas scientific and environmental assessment adopt a long-term view – therein lies the problem. There has been no significant change in the number of stocks for which the Council sets higher TACs than recommended by the Commission (average over 2003-2008 was 48% of stocks [38]; WWF, 2007) nor in the number of stocks for which the TAC is set at a higher level than scientific advice indicates as sustainable (

[35] MRAG, Ltd. 2008. Studies in the Field of the Common Fisheries policy and Maritime Affairs.. Impact Assessment of a Proposal to Reform and Modernise the Control System applicable to the Common Fisheries Policy.

[36] Daw and Gray, 2005 T. Fisheries science and sustainability in international policy: a study of failure in the European Union's Common policy. Marine Policy. 29: 189-197.

[37] Preambular paragraph 4 of Council Regulation (EC) No 2371/2002.

[38] European Commission, *Fishing Opportunities for 2009*, Policy Statement from the European Commission, Annex 1. COM(2008) 331 final

Table 10).

Table 10 Difference between TACs and sustainable catches

	2003	2004	2005	2006	2007	2008
Excess of TAC over sustainable catch (%)[39]	43%	48%	57%	47%	44%	49%

ICES determines stock status with reference to a number of points: the point at which maximum yields are being obtained; the 'precautionary reference point' (Bpa or Fpa) at which stocks are within safe biological limits; and the 'limit reference point' (Blim or Flim) at which stocks are at such low levels or fishing pressure at such high levels that the number of young fish being produced each year is severely reduced. The European Commission talks about stocks that are within safe biological limits which ICES terms having full reproductive capacity (spawning biomass $\geq$Bpa). However, when the Commission talks about stocks that are outside safe biological limits, this can mean either stocks being defined as being at risk of reduced reproductive capacity (Blim<spawning biomass<Bpa) by ICES if they are above the point where recruitment is impaired, or suffering reduced reproductive capacity (spawning biomass < Blim) if they are below this level. Similarly, the Commission talks about stocks which are harvested inside safe biological limits if fishing pressure is lower than the precautionary level, and being outside safe biological limits if fishing pressure is higher than the precautionary level. ICES once again makes a distinction between those stocks which are 'at risk' of being harvested unsustainably and those that are 'harvested unsustainably'.

The status of the most critical stocks subject to recovery/multiannual plans recovered to sustainable levels has not significantly changed over the last 6 years (

[39] European Commission, COM(2008) 331 final, opp cit..

Table 11). If one looks at these stocks in detail the status of 8 stocks appears to have improved since the 2000s; on the other hand the status of 6 stocks has worsened over this time period.

Table 11 Status of key control stocks, 2002 – 2007.

Species	Stock	Biomass 2002	Biomass 2007	Fishing mortality 2002	Fishing Mortality 2007	Plan date	Trends
cod	N. Sea	<Blim	<Blim	>Flim	>Fpa	2004	better
	W scotland	<Blim	<Blim	>Flim	>Flim	2004	worse
	Irish Sea	<Blim	<Blim	>Flim	>Flim	2004	worse
	Celtic Sea	<Bpa	<Blim	>Flim	<Fpa	2004	better
	eastern Baltic	<Blim	<Blim	>Flim	<Fpa	2007	better
	western Baltic	<Bpa	=Bpa			2007	better
hake	Northern	<Bpa	=Bpa	>Fpa	=Fpa	2004	better
	Southern	<Blim	<Blim	>Flim	>Flim	2005	worse
sole	N. Sea	<Bpa	<Bpa	>Flim	>Flim	2007	better
	Western Channel	>Bpa	<Bpa	>Flim	>Flim	2007	worse
	Bay of Biscay	<Bpa	<Bpa	>Flim	>Fpa	2006	better
plaice	N. Sea	=Bpa	=Bpa	>Fpa	<Fpa	2007	better
Nephrops	Cantabrian Sea					2005	worse
Nephrops	N. Galicia					2005	worse

Source as for Figure 3.

However, a number of these the plans were only implemented in 2004 and 2005. There have been some notable successes, such as the return of Northern Hake stocks to precautionary reference point levels (Bpa) in 2007. However, although in some stocks there are signs that stock size is rising, it is easy to show that, with the recruitment that is known to have occurred over the last 4 years, many of these stocks would already have recovered if catches had been constrained to the levels indicated in recovery plans[40]. Although the recovery plan for Southern Hake[41] stipulates a target of 10% reduction in fishing mortality when fishing mortality is above 0.3, TACs have not been reduced sufficiently and unreported catches have increased to the extent that fishing mortality has actually increased since the implementation of the recovery plan, and is now about 0.6. Despite this, although spawning stock biomass is still below Blim it has been increasing in the last two years (as a result of increasing recruitment, not as a result of management intervention). However, if catches had been constrained to the TACs set, the stock would now be above Blim and would be likely to reach Bpa in 2010.

One of the most significant challenges facing fisheries management across the world is that the cost of scientific assessment of stocks is very high, and the proportion of stocks that are currently assessed is low – typically between 40% and 70% of stocks remain unassessed. The EU does not perform well here (approximately 55% of stocks are unassessed, although for a higher proportion (73%) stock size and fishing

[40] WWF, Mid-Term Review of the EU Common Fisheries Policy (Brussels: World Wide Fund for Nature, 2007).

[41] Council Regulation (EC) No 2166/2005 of 20 December 2005 establishing measures for the recovery of the Southern hake and Norway lobster stocks in the Cantabrian Sea and Western Iberian peninsula and amending Regulation (EC) No 850/98 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organisms

mortality cannot be explicitly determined[42]). This large proportion of unassessed stocks due to inadequate data collection and insufficient knowledge hinders the implementation of Ecosystem Based Management.

It should be noted that the costs of investing in detailed science for these stocks is almost certainly prohibitive, and the EU should be looking at alternative risk based approaches such as those currently being used in Australia[43]. Bioeconomic models have a number of optima which are easier to target stocks.

Box 1 Northern Hake

In 2003 Northern Hake spawning biomass was estimated to be at or below its limit reference point, the point where recruitment would be impaired. The fishery had suffered from high mortality and discarding of juvenile fish in the 1990s. A relatively simple recovery plan was introduced, including a decision rule based on target fishing mortality of 0.25 (Fpa) with TAC adjustments being limited to ±15% in any one year, and a system of prior notification of landing hake at designated landing ports combined with supervised weighting prior to transport. Although it was difficult to determine from assessments at the time, in retrospect it is clear that by 2004 fishing mortality had already dropped to 0.25 and the stock had started to rebuild. Nevertheless, and despite continued allegations of irregularities during transport[44], ICES estimates that discarding has been virtually eliminated as have unreported catches, and as a consequence the stock has now recovered to the target level (140,000 tonnes).

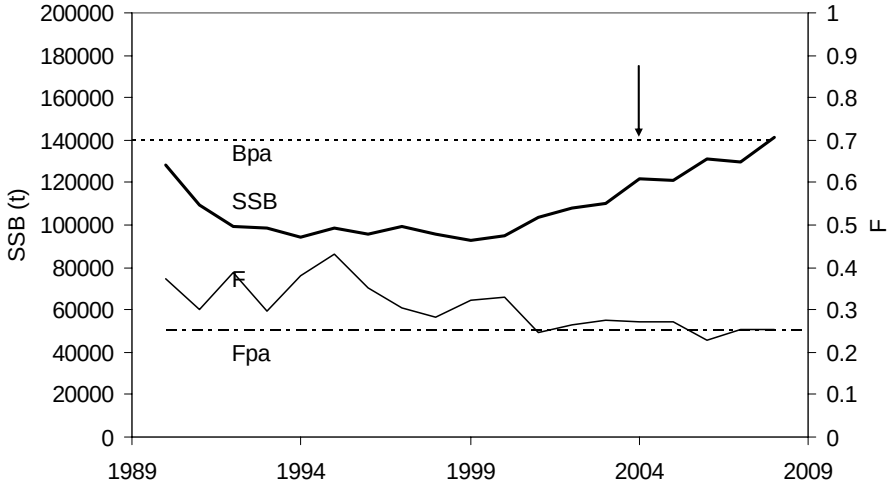

Figure 5 The recovery of Northern hake. SSB = stock (left hand axis) and F = fishing mortality (right hand axis). The recovery plan (Council Regulation 811/2004) was introduced at the point indicated by the arrow. Source: ACFM advice, 2008.

[42] European Commission, Fishing Opportunities for 2009.

[43] A.D.M. Smith, E.J. Fulton, A.J. Hobday, D.C. Smith and P. Shoulder, 'Scientific tools to support practical implementation of ecosystem based fisheries management', ICES Journal of Marine Science, Vol. 64, 2007, pp. 633 - 639.

[44] European Court of Auditors (2007) and MRAG (2008) op. cit.

In an attempt to avoid some of the discussion around the setting of TACs which occurs annually at the December Council, the 2002 revision of the CFP included a more long-term approach, involving the setting of multi-annual recovery plans for stocks outside safe biological limits and of multi-annual management plans for other stocks. These plans, designed specifically for each stock concerned, were to have fixed rules for the setting of catch limits based on the status of the stock and current fishing pressure.

The implementation of recovery plans and multi-annual management plans has been slow. To date there are only a limited number of plans of three types:

- recovery plans for 5 cod stocks (Kattegat, North Sea, west of Scotland, Irish Sea and Celtic Sea; 2004 and 2009), 2 hake stocks (Northern (2004) and Southern (2005)), Norway lobster in the Cantabrian Sea and western Iberian Peninsula (2005), and European eel (2007)[45];
- multiannual plans for sole in the Bay of Biscay (2006), western Channel (2007) and North Sea (2007), North Sea plaice (2007), Baltic Sea cod (2007), European eel (2007), and west of Scotland herring (2008)[46];
- recovery plans for Greenland halibut (2005) and bluefin tuna (2007) implemented in respect of obligations under NAFO and ICCAT

Only 17 out of the 96 EU stocks are covered by these plans. In addition the bilateral agreements between the EU and Norway for the management of 5 additional North Sea stocks - haddock, saithe, whiting, mackerel and herring - include the key elements of multiannual plans which are decision rules on catches and fishing mortality in response to stock status. The Commission states that these plans cover 28% of stocks of pelagic fish and 32% of stocks of demersal fish, but the most have only been developed since 2006 and it remains the case that most of EU stocks lack plans (WWF, 2007; CEC, 2008).

Given the urgent need to develop long-term management plans for all EU stocks, it is particularly pleasing to see some now being developed by the RACs themselves – for instance Herring in the Celtic Sea and Horse Mackerel in the West of Scotland, which were developed through collaboration between stakeholders and scientists in the Pelagic RAC.

Problem 4: Conservation measures and ecosystem effects of fishing

There have been a number of good initiatives (the introduction of a commitment to 'ecosystem based management' in the CFP: the emergency protection of the Darwin Mounds, the requirement for acoustic deterrent devices to reduce incidental cetacean mortality, the international commitment to the protection of vulnerable marine

[45] Council Regulations 423/2004, 811/2004, 2166/2005, 2115/2005, 1100/2007

[46] Council Regulations 388/2006, 509/2007, 676/2007, 1098/2007, 643/2007, 1100/2007 and 1300/2008.

ecosystems in high seas fisheries the recent initiative on IUU fishing[47] and affording protection to coastal sites in the Mediterranean[48]).

However, there is currently little consideration of the need for high biomass levels in EU stocks. If this were to be achieved, through the application of successful recovery plans and the adoption of high biomass target levels such as MSY and above (which is now an EU policy objective) or maximum economic yield, the overall health of Europe's seas would undoubtedly improve. For instance, the mean trophic level in the catch of individual species, such as cod, could rise by 1-2%[49]. This would be a positive step given the estimated worldwide decline in trophic level of landings of about 5% since the 1970s[50].

Evidence from multi-species and ecosystem models suggest that single-species Fmsy targets are unlikely to provide MSY for the species concerned or for an ecosystem once species interactions are taken into account. Application of Fmsy, particularly on lower tropic level species, has been shown to be likely to lead to negative impacts on top predators within an ecosystem[51]. Solutions to this are to adopt higher biomass target reference levels – for instance, the Antarctic krill fishery adopts a biomass reference point of 75% of B_0 (virgin or unexploited biomass), much higher than the assumed norm for Bmsy = 40% of B_0.

It is clear that one of the failings of early recovery plans was that multispecies effects were not taken into account adequately. In the cod recovery plan a larger numbers of days at sea were allowed to smaller mesh fisheries not targeting cod, such as Norway prawn fisheries as an effort limiting method for recovering cod fisheries. This led to a shift in effort to such fisheries, which take a significant bycatch of cod, and a consequent increase in the proportion of bycatch cod taken by them. Much of this bycatch is discarded, particularly the undersized cod. For instance, as total landings of demersal fish in the west of Scotland have fallen, the proportion of landings made by the Norway lobster fishery has risen from 8% to 44%. The proportion of cod discarded in this fishery has also risen, from 30% to 90% over the period 1997 –

[47] Council Regulation (EC) No 1005/2008 of 29 September 2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EEC) No 2847/93, (EC) No 1936/2001 and (EC) No 601/2004 and repealing Regulations (EC) No 1093/94 and (EC) No 1447/1999

[48] Council Regulation (EC) No 1005/2008 establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing and Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea.

[49] MRAG Ltd., Oceanic Développement, Poseidon Aquatic Resource Management Ltd, Lamans s.a., Institute of European studies and IFM, Impact Assessment of a Proposal to Reform and Modernise the Control System applicable to the Common Fisheries Policy (London: MRAG, 2008; Available from the European Commission on request)

[50] D. Pauly, V. Christensen, S. Guénette, T.J. Pitcher, U.R. Sumaila, C.J. Walters, R. Watson and D. Zeller, 'Towards sustainability in world fisheries', Nature, Vol. 418, 2002, pp. 689-695.

[51] Walters, C.J., Christensen V., Martell, S.J., Kitchell, J.F. 2005. Possible ecosystem impacts of applying MSY policies from single-species assessment ICES J. Mar. Sci. 62(3):558-568.

2006[52]. Overall, ICES estimates that discards of the west of Scotland cod are now equal to or greater than retained catch and are significantly contributing to the unsustainably high fishing mortality[53].

In recent years catch and particularly discard data have become so poor that a number of assessments are now conducted without using any fishery-derived data (such as catches or catch per effort). Given the uncertainty in discard estimates, and their very high importance in understanding the impact of management measures on different stocks within what are usually multispecies fisheries in EU waters, there is a pressing need to obtain better information on discards through industry reporting checked by more extensive observer programmes. Discard reduction programmes, developed as joint initiatives of industry, managers and scientists, such as the Scottish Conservation Credit Scheme are also showing promise. There is also a role for the more extensive deployment of emerging technologies, such as the video monitoring schemes being piloted in the North Pacific[54].

Conservation measures such as closures or Marine Protected Areas are often seen as a way to apply the ecosystem approach to fisheries management and have increasingly been implemented recently. For instance the area in and around the Firth of Forth where sandeel fishing has been prohibited since 2000 to protect foraging of locally breeding kittiwakes, and the protection to the Darwin Mounds) can award protection to vulnerable benthic habitats or important breeding, juvenile or feeding areas for fish and their predators.

While it is important to include consideration of spatial management in fisheries, closures are not a panacea, particularly for highly mobile species such as cod, and are not an alternative solution to the need to control fishing capacity and effort. For instance, the spatial closures introduced in the early cod recovery plans, had no appreciable impact on cod recovery since the same fish were simply targeted elsewhere in the North Sea. On the other hand, while the North Sea plaice box does not seem to have increased plaice recruitment (recruitment to the plaice stock in the 10 years after its closure in 1989 was lower than in the 10 years before its closure), it has been concluded that it continues to have a positive impact on the stock, since 70% of the undersized plaice in the North Sea are found in the Plaice Box and Wadden Sea.

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[52] J.W. Andrews, C.J. Chapman, S.J. Lockwood, Certification Report for Stornoway Nephrops Trawl Fishery, (London: Moody Marine Ltd, 2008, Ref: 82033 v3, available from http://www.msc.org/track-a-fishery/in-assessment/north-east-atlantic/stornoway-nephrops-trawl/assessment-downloads-1/2008-12-01-Stornoway-Nephrops-Public-Comment-Draft.pdf, accessed December 2008), p. 19.

[53] ICES 2008, Report of the Working Group on the Assessment of Northern Shelf Demersal Stock (WGNSDS), (Copenhagen: ICES, 2008, CM 2008/ACOM:08).

[54] Ames, R.T., G.H. Williams & S.M. Fitzgerald, 2005. Using digital monitoring systems in fisheries: Application for monitoring compliance of seabird avoidance devices and seabird mortality in the Pacific Halibut longline fisheries. NOAA report NMFS-AFSC-152.

Problem 5: Poor governance and a lack of engagement with stakeholders

The governance and decision-making system in place for administering the CFP has largely been criticized for being too centralised, remote and not engaging with its stakeholders.

One of the most positive developments of the 2002 CFP reform was the creation of the Regional Advisory Councils (RACs). These have successfully given a voice to fishermen and other stakeholders, although the proportion of members is two thirds industry and one third to other stakeholders. The RACs have regularly responded to the Commission on issues of concern such as the debate on solutions to the large bycatch and discard problem in European fisheries.

A possible extension to the RACs is the development of a rights based management, for instance using individual transferrable quotas. These management systems are receiving recognition around the world as the way to create significant change in fisheries, with the potential for creating both more responsible management and more efficient fleets[55]. However, it is important to note that even under rights based systems fishing activities still need to be tightly controlled usually by a government agency, and in many cases small fishing vessels or local communities require protection from aggressive buyouts by large companies [56]. A debate concerning Right Based Management measures is currently on-going in Europe. There are concerns that they may be detrimental to small-scale fishery communities and/or new entries to the fishery. These issues are considered further in a later section of the report.

One of the new requirements under the 2002 reform was the provision for the future deduction of quota from Member States who exceed their quota in any year. While this helps to enforce controls such as TACs, this does not offer much flexibility. It may be difficult for certain fishing fleets to meet the TAC exactly. Offering more flexibility in the quota system (within reason) may lead to higher compliance.

[55] C. Costello, S.D. Gaines, J. Lynham, 'Can Catch Shares Prevent Fisheries Collapse?', *Science*, Vol. 321., 2008, pp. 1678 – 1681.

[56] Beddington et al., 'Current Problems in the Management of Marine Fisheries'.

4 Challenges and opportunities in key policy areas of the reform

4.1 Summary of stakeholder views

Over the last few years, and in anticipation of another review of the CFP, a number of papers and opinion pieces have been published on the need for reform.

Many of the recent proposals by the Commission should significantly assist the development of sustainable management – the adoption of maximum sustainable yield as a target; revision of the cod recovery measure to be based around fishing effort rather than stock status targets, to allow greater interannual changes in TAC and simplify effort management; proposals to reduce bycatch on a fishery by fishery basis; the new IUU regulation; the new Control regulation; and the initiatives taken to protect ecosystem components particularly in high seas fisheries. However, there are fundamental issues in the management and governance of EU fisheries that will continue to hamper efforts towards long-term sustainability unless they are addressed. The two most important are the overcapacity of EU fleets, and the consequent economic inefficiencies that are produced; and the retention of a top-down governance system that encourages micro-management and short-term interventionism.

We found similar views in our review of stakeholder positions (ANNEX 1). Several recurring themes in policy reform were evident: decentralising management, strengthening fisheries science, adopting a more ecosystem based approach, and improved awareness of social and economic factors were issues that multiple stakeholders made reference to:

<u>Ecosystem Based Fisheries Management</u>

- Setting of fishing levels should be guided by an ecosystem and precautionary approach.
- Establish MSY value to apply in multispecies fisheries. Discussions need to take place on how to set this and what to consider in its establishment: profitability, catch, effect on resource?
- Need to improve technical measures for stock conservation such as gear selectivity, catch monitoring, reducing discards and at least a reduction of industrial fisheries in the short term.

<u>Strengthen fisheries science</u>

- Stakeholders should have more direct role in formulating requests for scientific advice
- Stronger dialogue between scientists and fishermen to make the most of real-time observations of fishermen.
- More industry science partnerships should be established to provide additional sources of data

Social and economic factors

- The CFP takes into account social, economic and institutional factors. This will provide incentives for the fishing industry to take responsibility for its own activities.
- All management decisions should be accompanied by a social and economic impact assessment, looking in particular at impacts on the small scale fishing sector.
- Support the small scale fisheries as it represents a major economic activity in some of the most disadvantaged and isolated regions of the EU.

Decentralising management

- Management whereby strategic objectives are set centrally by the European Commission and are delivered through methods devised at a regional level. Stakeholders see the creation of RACs and the multi-annual planning framework a positive step in this direction.
- Where policy decisions affect a particular region, decision-making authority should be devolved to a sub-committee of relevant regional ministers that would agree on approach for formal ratification at Council.

These stakeholder positions echo the conclusions of the report 'Reflections on the Common Fisheries Policy' which was prepared for the General Directorate for Fisheries and Maritime Affairs of the European Commission. The report by Michael Sissenwine and David Symes (2007)[57] concluded that to improve the CFP a number of measures should be implemented, such as:

- an ecosystem approach to fisheries management — the approach needs to be carried out systematically and processes need to be documented. The ecosystem approach includes implementation of the MSY approach, a strategy to reduce bycatch and discards, and movement toward rights-based management
- Strategically consider scientific needs for fisheries management — the Commission should encourage a dialog on a strategy to nurture the scientific enterprise as a whole, form the appropriate linkages, and to clarify roles and responsibilities.
- Reduce dependency on the Council for annual fishery management decision making — options include some form of regionalisation of fisheries management such as empowering RACs to develop management plans, more use of framework plans that can be implemented by the Commission without annual decisions by the Council, or making more use of Commission working groups to more fully negotiate proposals before they reach the Council for approval.

[57] Report to the General Directorate for Fisheries and Maritime Affairs of the European Commission Prepared by Michael Sissenwine David Symes July 2007

- Operationalise the CFP — Guidelines and protocols should be developed to help interpret the CFP (e.g., priority between objectives) and to make its application more consistent in terms of both processes and outcomes.
- Make fishery management processes more transparent — fishery management processes should be well documented and accessible to stakeholders and the public.

The correlation between stakeholder view points provides substantial insight into how the CFP needs to be reformed and what needs to be done to achieve it. It is up to the European Commission to involve stakeholders thoroughly, and consider and incorporate all viewpoints where appropriate.

4.2 The conservation policy

4.2.1 Integration with other marine policy objectives

An ecosystem approach to marine resource management must integrate all economic sectors which impact the marine ecosystem; this includes the fisheries sector. Sustainable fisheries management can therefore contribute to an ecosystem approach.

The concept of 'Ecosystem based management'[58] was introduced in the CFP in 2002. The Commission understands of an ecosystem approach to fisheries management is described in the Communication as "ensuring goods and services from living aquatic resources for present and future generations within meaningful ecological boundaries". This means that benefits from living marine resources are high while the direct and indirect impacts of fishing activities on marine ecosystems are low and not detrimental to their future functioning, diversity and integrity. Some important steps have been taken (see our earlier report), for instance when in 2003 emergency measures for protection were awarded to the cold water corals off the north west coast of Scotland known as the Darwin Mounds. In 2004, permanent protection was established for the area and deep-water bottom trawling was prohibited. But significant further progress is required to protect a wide range of representative habitats in European seas.

Ecosystem management is a holistic concept and therefore it is important that under this approach actions taken in fisheries are consistent with and supportive of actions taken under other EU policies. The Marine Framework Strategy Directive (MFSD) (the marine environmental pillar of the Maritime Policy) entered into force in August 2008 and integrates the ecosystem approach. The MFSD requires the implementation of a cross-sectoral framework for marine management. The CFP can contribute towards this framework by dealing with the ecological and socio-economic impacts of fisheries. The MSFD sets conditions for marine ecosystems and therefore fish stocks and fish habitats to achieve "good environmental status" by 2020. In this

[58] The role of the CFP in implementing an ecosystem approach to marine management. Communication from the Commission to the Council and the European Parliament COM(2008) 187 final.

context, fisheries management measures will be developed and implemented in the CFP as well as other sectoral policies to contribute to achieving good environmental status.

The Habitats Directive provides for the establishment of a network of representative protected areas — Natura 2000 — in the marine environment. These sites are required to be designated for a variety of habitats and species listed (mostly marine mammals) in the Annexes of this Directive. Human activities such as fishing can still occur in Natura 2000 sites, within certain rules and provided the area is not negatively affected.

The Natura designation appears to be on the verge of delivering a network of MPAs throughout European waters, an achievement that appears not to have been possible from within the CFP itself. Strong coordination will still be required – as is anticipated at the March 2009 Galway biogeographical seminar. For instance, in the North Sea, areas of the Dogger bank have been nominated separately by the UK, the Netherlands and Denmark. The acceptance by fishermen of MPA designations in line with Natura 2000 is, at least in the North Sea, substantially a result of the North Sea RAC (NS-RAC) Spatial Planning Working Group. This is another example of the growing strength of the RAC stakeholder framework.

The CFP itself provides instruments required to regulate fisheries so that the objectives of such protected areas are achieved. Marine Reserves — or permanent fishery closures — are also an important tool for protecting sensitive habitats and species within an ecosystem approach and are provided for under the technical measures of the CFP.

4.2.2 Discards

Reducing by-catches and discards is a key objective of the conservation policy in the CFP[59].The issue is extremely emotive. From 2002 data on discards have been collected regularly through the Data Collection Regulation. Discard rates vary between different EU fisheries and in some fisheries can be very high (

[59] Communication from the Commission to the Council and the European Parliament. A policy to reduce unwanted by-catches and eliminate discards in European fisheries. COM(2007) 136 final

Table 12).

Table 12 Discard rates in various maritime regions of the EU. Adapted from the European Commission's Impact Assessment (2007) on a discard policy[60]

Maritime region	Estimated discards (t)	Level of discards	Notes
Northeast Atlantic area	1,332,000	High	The average discards for the area is 13% (weight basis). 19.6% of total worldwide discards for 11% of worldwide landings.
Mediterranean and Black Sea	18,000	Low	The average discards for the area is 4.9% (weight basis)... Low discard rate due to the importance of artisanal fisheries, markets for small sizes of many species and the absence of a quota system which limits discards if high grading is low.
Northern waters		Low	The average discards for the area is 3.9%. Low rate due combination of the discards ban in Norway (and Iceland), low diversity in catch composition and high manufacturing capacity for fishmeal in Iceland, Norway and Denmark.
The Baltic Sea		Low	The average discards for the area is 1.4%. Very low rate due to a small number of commercial species in the area, selective single species target fisheries and a well developed processing industry.
North Sea	500,000 – 880,000	Medium	Beam trawl flatfish fisheries (70% discards rate by weight) and the Nephrops and Crangon trawl fisheries (83%) represent particularly high levels of discards.

A 2001 study commissioned by the EU[61] examined the loss of future income caused by discarding in a selection of EU fisheries: the Dutch flat fish beam trawl fishery, the UK North Sea Whitefish Trawlers and the French Nephrops Fishery. The Dutch beam trawl fishery was estimated to produce a discard level of 0.8 kg fish per kg of fish landed in 1998. The value of discards of marketable species in terms of the foregone revenues from future catches is estimated at about €160 million, or 70% of the annual landings value of the fishery. The study estimated that €75 million worth of cod, haddock and whiting were discarded in 1999 by the UK North Sea Whitefish Trawlers. The French Nephrops fishery showed an average discard rate of 20 to

[60] Communication from the Commission to the Council and the European Parliament. A policy to reduce unwanted by-catches and eliminate discards in European fisheries. Impact Assessment. SEC(2007) 380.

[61] Economic aspects of discarding, prepared by the Agricultural Economics Research Institute (LEI) of The Hague, 2001. Contract reference 97/SE/018

45%, according to the species and the season and other studies have suggested similarly high values for Nephrops fisheries (eg 43% in the English fishery[62]). The value of discards were estimated at €43 million in 1997, close to 100% of the value of Nephrops sold in auctions.

In 2007, the European Commission proposed a policy for the reduction of discards[63]. Although the impact assessment conducted by the Commission concluded that one of the favoured options would be a discard ban, this was acknowledged to carry significant compliance costs (in terms of observer coverage) and was comprehensively rejected by the RACs as being unworkable. Such bans do work elsewhere, for instance in Norway, and there is merit for pursuing them where the multispecies fishery problems are not as great as in some of the EU mixed fisheries like the North Sea. The European Commission, recognising these problems, proposed an approach based on an overall objective for the reduction of unwanted discards, but that specific implementation regulations would then developed on a fishery-by-fishery basis and accompanied by specific impact assessments for these fisheries.

Although this approach may take time, pressure continues to build, and not only from NGOs. During the EU-Norway negotiations in 2008 EU fishermen argued that discarding would be reduced only through raising the quota. Norway agreed to an increase in quota but only with the provision that there be a ban on highgrading of shared stocks in the North Sea.

To follow up on the promise to reduce discarding, Scotland set up the Conservation Credits Scheme in 2008. This provides eligible fishing vessels with additional time at sea as a reward for the adoption of fishing practices that promote conservation. Participation in the 2008 scheme was voluntary, so vessels could opt out. However, following the success of the scheme in 2008, it became mandatory in 2009.

The scheme operates by allocating a minimum number of days at sea to all vessels participating in the fishery, requiring that as a condition of participation in the fishery, vessels comply with a system of Real Time Closures and, for Nephrops trawls, employ square mesh panels. Additional days at sea can be acquired if vessels specify that they will land less than 5% cod, or if additional mitigation measures are used. One of these is the Eliminator trawl, which includes a very large belly mesh and achieves very little bycatch of cod in other whitefish fisheries, was developed by industry and was the winner of the 2007 WWF “smart gear” award. Another is the Orkney cod avoidance trawl, another industry development. The Conservation Credits scheme rewards vessels with a track record of low cod catches. The vessels

[62] Catchpole, TL, CLJ Frid, TS Gray, 2006. Resolving the discard problem – a case study of the English Nephrops fishery. Mar. Policy 30, 821-831.

[63] Communication from the Commission to the Council and the European Parliament. A policy to reduce unwanted by-catches and eliminate discards in European fisheries. COM(2007) 136 final

electing to catch less than 5% cod are subject to random observation by a team of observers, with a system cost of £500,000 (€525,000) over two years.

Acceptance of the scheme has been high primarily because it is reward-based rather than penalty-based, and because it is advised by a steering group consisting of scientists, NGOs and officials. A large number of real-time closures are anticipated in 2009, identified through observation of large catches of cod or juvenile cod (industry and observer participation).

4.2.3 Technical measures

A proposal[64] was put forward by the European Commission in 2008 to simplify the current regulatory framework concerning the conservation of fisheries resources through technical measures. In fact the proposed Regulation only applies to fisheries in the North East Atlantic, the Eastern Central Atlantic and the waters off the coasts of French departments of Guyana, Martinique, Guadalupe and Reunion that come under the sovereignty or jurisdiction of France only, as technical measures for the Baltic Sea and the Mediterranean are established in other regulations[65].

The 2006 – 2008 Action Plan for simplifying and improving the Common Fisheries Policy (the Action Plan) had also emphasised the need for simplification. During this time, the Council, European Parliament, the Economic and Social Committee and the stakeholders (the Advisory Committee for Fisheries and Aquaculture (ACFA) and the RACs) were consulted. A distinction was proposed between the overall technical measures in the conservation policy which apply to all fisheries and the purely technical measures which are specific to regional and local contexts.

The intention is therefore to provide a new Council regulation with a broad range of objectives which would outline a set of common permanent measures for all areas, i.e. the guiding principles, and for purely technical aspects of a regional nature to be implemented separately. It is proposed that technical measures be adapted to the context of the established RACs, reflecting the need to apply different types of measures to the particular regional or local context. These would be implemented through separate Commission Regulations by Management Committee procedure, on the basis of the Council Regulation.

4.2.4 Ecosystem based fishery management and MSY

Many of the objectives that will generate a responsive, ecosystem-based conservation policy into the future have already been outlined by various European organisations. Further efforts are needed to foster trust between the different players

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[64] Proposal for a Council Regulation concerning the conservation of fisheries resources through technical measures COM/2008/324 final

[65] Council Regulation (EC) No 2187/2005 of 21 December 2005 concerning the conservation of fishery resources through technical measures in the Baltic Sea, the Belts and the Sound, amending Regulation (EC) No1434/98 and repealing Regulation (EC) No 88/9820 and in Council Regulation (EC)No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94

in the CFP, and to generate reliable data from both industry and scientific sources, including the requirement for reporting all impacts on the ecosystem including discards and bycatch, validated with scientific observer schemes.

Observer schemes can be expensive – the Scottish Conservation Credits Scheme observer scheme costs €65,000 per observer per year. However, in comparison to the value of the catch this is very cheap. Total observer costs in Scotland – from scientists and the 4 observers which are part of the Conservation Credits Scheme – are about 0.1% of Scottish vessel demersal and shellfish landings. Even though observer data are now part of the data collection regulation overall coverage levels in the EU are very low, probably barely adequate for obtaining good estimates of the interaction of the fishery with the ecosystem. We would continue to encourage more use of observer programmes in the EU.

A risk assessment approach needs to be taken to integrate fisheries management with other marine environmental policy goals, particularly to deal with the large number of stocks that are currently not subject to analytical assessments, and in the development of an effective network of marine protected areas with clear goals that are separated from the need to reduce fishing capacity and effort. There are already a number of EU studies that demonstrate the advantages of non-assessment based decision rules for such species[66] and other jurisdictions have also developed alternative risk-based approaches for data poor fisheries[67].

Currently most stocks are managed only with reference to a limit reference point, Blim/Flim, and the associated precautionary level Bpa/Fpa at which the probability of being at the limit point is low. Bpa/Fpa is therefore not a target reference point, but safety margins on the limit reference point.

In 2006, the Commission proposed the adoption of MSY as a target[68]. There are significant technical problems in estimating true Bmsy/Fmsy, and the Commission has therefore suggested that the constant-recruitment proxy of Fmax, currently calculated using yield-per-recruit analysis, be used in most cases, and is preferable to determining biomass based MSY (Bmsy). It was pointed out repeatedly in the 1980s that $F_{0.1}$ was a more conservative target than Fmax, and furthermore Fmsy will often be lower than Fmax. In the absence of an analytical determination of Fmsy, therefore, it would be more appropriate to use $F_{0.1}$ than Fmax as the target reference point.

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[66] Eg Pomarede M., Hillary R., Kell L., Needle C, Simmonds E. J., McAllister M., 2006. Evaluating the relative merits of fishery dependent and independent data in fisheries management. ICES Symposium on Fisheries Management Strategies, June 27th-30th Galway, Ireland.

[67] A. D. M. Smith, E. J. Fulton, A. J. Hobday, D. C. Smith, and P. Shoulder. Scientific tools to support the practical implementation of ecosystem-based fisheries management. ICES J. Mar. Sci., May 2007; 64: 633 - 639.

[68] Communication from the Commission to the Council and the European Parliament. Implementing sustainability in EU fisheries through maximum sustainable yield {SEC(2006) 868}Brussels, 4.7.2006, COM(2006) 360 final, and the Accompanying Staff Working Document (technical annex)

An alternative reference point which could be used is Bmey, the point at which maximum economic yield (MEY) is realised, which is usually some 10% higher than Bmsy. An exact calculation of Bmey is dependent upon the cost of fishing, which is variable from year to year, and therefore this unfortunately will further complicate the calculation of an appropriate reference point. But a general rule of thumb could be used to set target reference levels which are conservative from a stock point of view without reducing the total catch much at the same time as mostly maximising the economic profitability of fleets.

All the targets referred to above are single-species targets. Evidence from multi-species and ecosystem models suggest that single-species Fmsy targets are unlikely to provide MSY for the species concerned or for an ecosystem once species interactions are taken into account. Application of Fmsy, particularly on lower tropic level species, has been shown to be likely to lead to negative impacts on top predators within an ecosystem[69]. This is an active area of research, but there probably needs to be more consideration of using the precautionary approach to set high biomass (low fishing mortality) target reference points for fisheries on such species (low trophic level or forage species). One well known example of a very low trophic level fishery, that for Antarctic krill, uses a biomass reference point of 75% of unexploited biomass.

Recent modeling, undertaken through science-industry collaboration within the NS-RAC, suggests that because of the complex interactions between cod, haddock and whiting, it is not possible to simultaneously achieve yields corresponding to the MSYs predicted from single species assessments[70]. Similar results are apparent from modelling the cod-herring-sprat complex in the Baltic. Modelling done in 2008 (ICES Workshop on Reference Points in the Baltic Sea (WKREFBAS), 12-14 February 2008) suggested that at current levels of cod recruitment there may be relatively little impact of cod recovery on sprat stocks, but that with very high cod recruitment (for instance that seen in the early 1980s) sprat will be significantly negatively affected. Although Fmsy can be calculated for each stock individually and would be expected, on an individual basis, to generate MSY catches, when models are run taking account of the trophic interactions it appears that these MSY levels are not achievable simultaneously under any decision rule.

These examples lead to two conclusions. Firstly, although a move to MSY or MEY would be desirable from a stock conservation point of view, an understanding of multispecies interactions (both biological and technical) needs to be developed. Secondly, in order for any plan to work social and economic considerations need to be taken into account and all stakeholders consulted to arrive at a mutually acceptable long term management plan. The lessons from the past few years

[69] Walters, C.J., Christensen V., Martell, S.J., Kitchell, J.F. 2005. Possible ecosystem impacts of applying MSY policies from single-species assessment ICES J. Mar. Sci. 62(3):558-568.

[70] S. Mackinson, B. Deas, D. Beveridge, J. Casey. 2009. Mixed-fishery or ecosystem conundrum? Multi-species considerations inform thinking on long-term management of North Sea demersal stocks. ICES J. Mar. Sci. in press.

indicate that no one sector of the fishing system — science, NGOs, government managers or fishermen — can expect to develop management initiatives and have them work without involving other sectors. For instance, the failures of the early cod recovery plans arose from a failure (of science) to predict that once they were implemented the reliability of fishery-dependent data would rapidly decline, and (of management) that fishing effort would be diverted to other gears with high bycatch of cod – both of which arose because fishermen were not included in the original negotiation and testing phase. Recent successes in reducing discarding – such as in Scotland – rely heavily on the interaction of all groups.

These experiences are not restricted to northern countries, however, and may involve conflicts of interest and optimised harvest strategy between sectors of the industry. For instance, in Greece the small scale fishery sector is opposed to the middle scale fishery as they believe that they harm the biodiversity and they use gears which are not selective. They believe that the operating manner of the middle scale fishery creates a survival problem for the small professional fishermen. Two solutions are proposed by Greek stakeholders to address the discard problem: the use of selective gear and cooperation with fishermen setting a timetable which will set quantified targets for progressive reduction of discards; and strengthening and expansion of marine reserves to protect the juveniles and to recover the fisheries resources.

4.2.5 Consideration of climate change impacts

There is a growing realisation that human-induced climate change is occurring and over the past few years the debate surrounding climate change has changed from what is causing it to how we can mitigate it and adapt to it. The changing climate has particular significance to marine ecosystems and fisheries, with the pattern of marine species richness being strongly related to environmental factors (Macpherson, 2002[71]). Unlike most terrestrial animals, aquatic animal species used for human consumption are poikilothermic, meaning their body temperatures vary according to ambient temperatures. Any changes in habitat temperatures significantly influence their metabolism, growth rate, productivity, seasonal reproduction, and susceptibility to diseases and toxins (FAO, 2009[72]). It has also been shown that marine species respond to changes in temperature by shifting their latitudinal range (e.g. Mueter and Litzow 2008[73], Hiddink[74] and Hofstede, 2008) and there is considerable evidence for this already in the NE Atlantic[75]. In a recent study into predicting the impacts of climate change on marine biodiversity, it was found that climate change may lead to numerous local extinction of species in sub-polar regions (i.e. North Atlantic ocean),

[71] Macpherson, E. (2002) Large-scale species-richness gradients in the Atlantic Ocean. Proceedings of the Royal Society of London Series B 269, 1715–1720.

[72] FAO, 2009 http://www.fao.org/newsroom/EN/news/2008/1000876/index.html

[73] Mueter, F.J. and Litzow, M.A. (2008) Sea ice retreat alters the biogeography of the Bering Sea continental shelf. Ecological Applications 18(2), 309–320.

[74] Hiddink, J.G. and Hofstede, R.T. (2008) Climate induced increases in species richness of marine fishes. Global Change Biology 14, 453–460.

[75] Allison L. Perry, Paula J. Low, Jim R. Ellis, John D. Reynolds. Climate Change and Distribution Shifts in Marine Fishes. Science, 308. pp. 1912 – 1915, 2005.

the tropics and semi enclosed seas such as the Mediterranean (Cheung *et al,* 2009). The distribution of species was found to drift towards the polar regions which means the effects of species invasion will be significant to the current high latitude ecosystems. Cheung *et al.*, 2009[76] estimate that the local extinction of species and species invasion in the Arctic and Antarctic regions may result in dramatic species turnovers of over 60% of the present diversity, causing potentially disastrous ecosystem disruption.

Climate change and changes in abundance and distribution of species will in turn have significant impacts on fishing fleets, particularly small scale coastal fisheries. According to a recent study that examined 132 national economies to determine which are the most vulnerable, based on environmental, fisheries, dietary and economic factors, the disruption of fisheries by climate change is likely to affect those countries for which fisheries are important sources of food, employment and export revenue. Most of the countries that are most vulnerable to climate change are also the poorest and classified as Least Developed Countries (Allison *et al*, 2009[77]). The report found that climate change is likely to lead to either increased economic hardship or missed opportunities for development in countries that depend on fisheries but lack the capacity to adapt (Allison *et al*, 2009). Climate change will also impact the economies of more developed countries and building adaptive capacity is vitally important.

The overall message from these studies into environmental and economic impacts of climate change is that the ability to be flexible is essential. A study into climate change in Scottish fisheries concluded that if an industry is to reduce its vulnerability to climate change, it must be allowed to do so by the management regime and that having rigid management plans with no possibility of revision is unwise (Turrell, 2006[78]). Setting targets for exploitation will require an understanding of how the marine ecosystem functions and responds to climate change. This means that biological reference points used by managers should look beyond simple single species considerations and have more awareness of the ecosystem as a whole (Turrell, 2006).

Setting biomass reference limits based on past measurements of fish populations may also not be practical in a changing climate. Species may no longer function the same way under a new regime, and hence model parameters derived under old conditions may not be relevant. There are numerous examples of changed carrying

[76] Cheung, W.W.L., Lam, V.W.Y., Sarmiento, J.L., Kearney, K., Watson, R., and Pauly, D. (2009). Projecting global marine biodiversity impacts under climate change scenarios. Fish and Fisheries

[77] Allison, E.H., Perry, A.L., Badjeck, M-C., Adger, W.N., Brown, K. Conway, D., Halls, A.S.6, Pilling, G.M., John D. Reynolds, J,D., Andrew, N,L., and Dulvy, N.K. (2009). Vulnerability of national economies to the impacts of climate change on fisheries. Fish and Fisheries

[78] Turrell, W. R. 2006. Climate change and Scottish fisheries. Fisheries Research Services Collaborative Report No 12/06 (*Available at* http://www.frs-scotland.gov.uk/FRS.Web/Uploads/Documents/FRS%20SFF%20Climate %20and%20Fisheries.pdf)

capacity and recruitment dynamics of marine ecosystems following regime shift[79]. Fish stock assessment groups need to be aware of the potential for change and should embark on a strategy which includes continual reassessment of such things as stock-recruitment relationships, growth and maturity relationships, and target and limit reference points (Turrell, 2006).

An ecosystem (or a species) under stress, from intensive fishing for example, will be far less resilient to climate change (Hughes *et al.,* 2005[80]). This is a fundamental aspect of the future management of our seas that the fishing industry needs to take on board. Resource managers need to recognise that local populations of species near the limits of their distributional ranges will need additional precautionary measures to protect them from extinction. We may need to reduce harvest of some species in certain areas to enable them to withstand the additional stress.

In conclusion,

- There is an urgent need to develop long term management plans for all EU fisheries;
- Target reference points are required for EU fisheries, to complement the limit reference points Blim/Bpa that are currently in place. The target reference points should be at least as conservative as Fmsy/Bmsy. Safer target reference points, which are accompanied by very little impact on total yields but deliver more economically efficient yields, are 0.9xFmsy or 1.1xBmsy. In the absence of analytically determined MSY reference points, $F_{0.1}$ determined by yield/recruit analysis is more appropriate as a proxy than Fmax.
- Testing of harvest control rules must take into account ecosystem interactions (multispecies modeling), which should be expected to modify MSY targets and reference points, and include social and economic considerations. Total yields from the application of single-species MSY reference points should not be expected to be equal to the sum of individual MSY levels.
- Multispecies modeling should particularly take into account the needs predators dependent upon low trophic level target species (often called forage species), and should adopt higher biomass target reference points where necessary to protect them.
- There is probably no single EU-wide solution to discarding, but successful solutions should clearly be developed with the participation and cooperation of all relevant stakeholders, particularly the fishing industry.
- Similar multi-stakeholder approaches are currently being applied to the problem of discards and area management, and should be encouraged further.

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[79] M. E. Conners, A. B. Hollowed and E. Brown, Retrospective analysis of Bering Sea bottom trawl surveys: regime shift and ecosystem reorganization, Progress In Oceanography Volume 55, Issues 1-2, October 2002, Pages 209-222

[80] TP Hughes, DR Bellwood, C Folke, RS Steneck, Steneck R.S. and J.Wilson. 2005. New paradigms for supporting the resilience of marine ecosystems Trends in Ecology & Evolution. 20(7): 380-386

- In the face of climate change there is a need to maintain monitoring of the distribution and population dynamics of fish and their ecosystems and to reduce fishing pressure so that target species and ecosystems remain resilient to change.

4.3 The structural or 'fleet' policy

4.3.1 Incentives and capacity reduction

The economic incentives for Member States and individual fishermen are still too heavily weighted towards irresponsible short term decisions and behaviour. Capacity is still too high, making the fleet uneconomic and encouraging non-compliance by fishermen and short-term decisions by government. Solutions include significantly increased capacity reduction programmes and industry managed systems including an increase in rights based management such as transferable ITQ systems.

However, the use of public funds for decommissioning carries the potential to artificially support inefficiencies in the fleet, and contribute to over-investment and over-capacity by reducing investment risk and the Commission has noted that currently Member States appear reluctant to use funds effectively to adapt the size of the fleets, preferring to use them to maintain activity and employment at the cost of sustainability[81]. In terms of fishing rights, these ought to be available to fishers as a reward/incentive for responsible fishing performance; there should be the ability to withdraw them from repeat offenders to reward good performers, both at state and individual fisher levels.

To our knowledge there is no comprehensive study of what would be an appropriate EU fleet size to match opportunities. Reports from the Danish industry suggest that their recent 30% reductions have been sufficient to create a reasonable balance between effort and opportunity, but this has been matched by an ITQ system (see Box 2) which has reduced the number of effective vessels even further. Similar reports from the industry in Scotland suggests that some further fleet reductions would be appropriate over and above the roughly 20% reductions undertaken between 2001 and 2004.

Very often, decommissioning schemes have removed only the oldest vessels, with very little effect on overall fishing capacity. The Scottish whitefish decommissioning schemes in 2001/2 and 2003/4 removed active vessels: the first removed 97 older vessels at an average cost of €288,000 each (£2050 per tonne or £3 million per 1% tonnage capacity reduction), and the second removed 66 newer vessels at an average cost of €538,000 (£2558 per tonne or £3.8 million per 1% tonnage capacity reduction). In both schemes the money was provided directly from Scottish Government funds. Since the key aim was to remove as much cod effort from the fleet as possible a sealed bid system was used whereby those vessels offering the best cod effort per removal cost were chosen for decommissioning. A review of the scheme, comparing it to previous decommissioning schemes that other

[81] European Commission, Commission Working Document: Reflections on further reform of the Common Fisheries Policy.

Government's had run noted that this was a very efficient way to target cash and vessels to remove from the fleet.

If one of the requirements for transition to an effective CFP is significant decommissioning, for instance a reduction in EU fleet size by 30%, how much might this cost if it was achieved public-funded decommissioning schemes?

Extrapolating individual decommissioning schemes to the wider EU fleet is problematic, because the type of decommissioning chosen depends upon the objectives of the scheme (eg whether to create a more efficient fleet, to force a reduction in fishing mortality, or to support fishing communities, the size and state of the vessels removed, and local situations and the conditions for removal. For instance, recent decommissioning in France cost about €320,000 per vessel (OECD, 2009)[82], but in Greece the much smaller vessels cost less to decommission (€27,000/vessel for 3117 vessels between 1999 and 2008). By implementing a rights-based system Denmark has been able to achieve very significant effective reductions in fleet for rather small amounts of money (in the region of €26,000 per vessel).

Applying these figures across the EU would suggest that a 30% reduction in fleet size may cost in the region of €1-2 billion if traditional decommissioning schemes were implemented, but that the cost could be considerably lower under ITQ mechanisms. This would be only slightly higher than the scrapping schemes that were implemented between 2000 and 2006 (Table 8), but would have an immediate effect. The effect would, however, only be transient, as the aforementioned technology creep would continue to increase effective capacity in the absence management systems, such as ITQ, which encouraged industry rationalisation.

Another factor which may come into play is that some of the other subsidies currently given to EU fleets – withdrawal price, vessel improvement etc – may be reduced if the fleet was reduced, simply because of the fleet being smaller and more efficient.

[82] OECD. 2009. Reducing Fishing Capacity: Best Practices for Decommissioning Schemes

Box 2 Denmark Case Study

In January 2003, Denmark began using a system of ITQs in the herring fisheries on a trial basis. Based on the positive experiences in terms of fleet economic performance and modernisation, the ITQ system was made permanent from January 2007 and was expanded to include other pelagic species such as mackerel, horse mackerel, sprat, blue whiting and also sandeel. The ITQ fisheries account for 35% of the value of the Danish fish landings.

On 1 January 2007, a vessel transferable quota (VTQ) or quasi-ITQ system was introduced to the polyvalent mixed demersal fishery (cod, saithe, haddock, whiting, sole, plaice, turbot, hake and monkfish) and the nephrops trawl fishery. These fisheries represent around 55% of the value of the Danish fish landings.

The main difference between the ITQ and VTQ systems is that in the former the fish quota can be transferred by the owner independent of the fishing vessel to which it was initially allocated. With the VTQ system, the quotas (allocated based on a three-year historic reference period) are allocated to vessels and there are more restrictions on transferability. Quotas can be transferred to a new owner on sale on the vessel, or they can be transferred between vessels of a single owner[83]. If a vessel is bought by more than one person, the quota allocation can be split among the buyers and transferred proportionately to other vessels in their possession. This possibility to transfer quota from one vessel to another, within the owner's possession, has facilitated the reduction of fleet capacity and increase in economic profitability in the demersal sector. The trade in fishing vessels holding quotas was high during the first year of implementation.

In the VTQ system, vessel owners may establish 'pool groups', within which quota trading between vessels is facilitated. Members of a pool group were free to swap, lease or lend their quotas within the group – in fact they were constrained to so as to ensure that the pool catch remained within quota. If a vessel in a pool group exceeds its quota, it must buy quota from another group member to cover the over-shoot, introducing an element of peer-monitoring in the system. Swaps between pool groups could not be made, but up to 25% of annual quota could be transferred. Pool groups must have by-laws and a chairperson, who must approve swaps and keep track of, and report on group quota utilisation. In 2008 there were 11 pool groups in Denmark comprising 670 fishing vessels (MRAG, 2009).

From January 2009 the VTQ system was transformed into an ITQ system; as such the quotas can now be traded (with few limitations) without any ties to the fishing vessels to which they were initially allocated. The VTQ and pool system represents an interesting interim phase between individual quotas and ITQs, which enabled vessel owners to test out transferability aspects without the risks of implementing a full ITQ-based system from the start.

Both the ITQ and the VTQ system have had significant impacts on rationalisation of the fleet. In the pelagic fleet the number of vessels holding herring quotas has been reduced by 150% since 2003 and now amounts to 34 vessels in total. There has also been a strong structural change towards fewer, larger, newer vessels — some vessels holding large ITQ shares are new and have replaced vessels which were more than 25 years old. The VTQ fleet has been reduced by more than 30 % since January 1st 2007 in terms of the number of active vessels (i.e. vessels making landings) (Directorate of Fisheries, pers. comm.). This is primarily a result of pooling of vessels. But there was also the opportunity for inactive vessels, lacking quota, to apply for permanent withdrawal from the fleet. Only 110 million Kr out of a budget of 240 million Kr has been used for this, equal to about 5% of the withdrawals. The remainder app 25% were withdrawn in connection with private buying up and rationalisisation of the fishery. Thus the new system made it possible to obtain good value for money (about €350,000 per 1%; 509 vessels were permanently withdrawn at an average cost of 26,000 Euros per vessel).

This also has potentially positive impacts on resource sustainability with fewer vessels reducing effort and with fishermen trading and swapping rights to ensure that catches can be landed rather than discarded.

The economic viability of the Danish fishing fleet has improved significantly with the introduction of ITQ and VTQ (Institute of Food and Resource Economics, 2008). For the large pelagic vessels with ITQs (purse seiners) the average profitability since 2004 has been in the range of 25%. For the Danish fleet as a whole the profitability in 2007 was 16%, up from an average of 9% for the years 2004–2006. This

[83] 25% of the annual vessel quota/species (or 25% of value of all VTQs) can be transferred independently of the vessel. The transfer is registered with the Fisheries Directorate.

increase is despite an overall 7% reduction in the quotas of fish for consumption from 2006 to 2007 and a 25% reduction in quotas of fish for fish meal and oil.

ITQ and VTQ have changed the planning horizon of the vessel owners and skippers and reduced the 'race to fish' that existed under the previous ratio- and period-based management systems. The introduction of ITQ and VTQ also marks a move away from public money being allocated for scrapping of vessels (instead leaving it to the market). This has allowed for public funds to be used instead for innovation and investment in improved product quality and new fish products that yield higher prices. The ITQ system has not changed the fact that quota must be fished by a Danish-registered vessel, and Denmark still has national rules requiring nationality, a permanent stay in Denmark of at least two years, or a clear economic link to Denmark to be proven.

Sources:
MRAG, IFM, CEFAS, AZTI Tecnalia & PolEM (2009) *An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU. Parts I & II. London: MRAG.*
Directorate of Fisheries, *pers. comm.:* Mogens Schou, Minister's adviser on fisheries and aquaculture; and Jesper Andersen at Food and Resource Economics.
Institute of Food and Resource Economics (2008) Economic situation of the Danish Fishery 2008. University of Copenhagen, April 2008.

4.3.2 Rights-based management

Rights-based management (RBM) approaches to fisheries have shown potential in several parts of the world, and many EU Member States have already implemented RBM approaches in a range of fisheries across the EU.

MRAG *et al.* (2009)[84] recently carried out a review of existing RBM systems in coastal EU Member States, their features and outcomes. A key driver for many of the RBM systems in Member States has been the need for national implementation of Community-set regulations, such as TACs and quota allocations, capacity limitations on national fleets, and days-at-sea restrictions.

RBM refers to 'any system of allocating fishing rights to fishermen, fishing vessels, enterprises, cooperatives or fishing communities'. As such, it covers a wide range of systems: limited licensing, limited transferable licensing, community catch quotas, individual non-transferable effort quotas, individual transferable effort quotas, individual non-transferable catch quotas (IQ), individual transferable quotas (ITQ), vessel catch limits, vessel transferable quotas (VTQ), and territorial use rights in fisheries (TURF).

There is considerable interest in the potential for RBM systems to improve the outcomes of fisheries management in terms of stock conservation and economic efficiency of fishing fleets. This is in some cases a result of the observed tendency, where rights are transferable, for the rationalisation of fishing capacity and concentration of rights onto fewer, more efficient vessels, resulting in a better match between fleet capacity and available resources. In a number of cases, this reduction in fleet capacity has been brought about by the 'market' acting independently, without the need for expensive publically-funded decommissioning schemes. Denmark's ITQ

[84] MRAG, IFM, CEFAS, AZTI Tecnalia & PolEM (2009) *An analysis of existing Rights Based Management (RBM) instruments in Member States and on setting up best practices in the EU.* Final Report. London: MRAG Ltd. 117 pages.

and VTQ systems in the pelagic and demersal fisheries provide a successful example of this from within the EU (Box 2). This case study demonstrates, that after the introduction of transferability (within the Danish fleet only) of VTQs in the demersal sector, active fleet capacity was reduced by 30 % without the need to allocate public money, good stewardship has been promoted and economic profitability of the fleet as a whole has increased from 9 % to around 16 %. A further potential benefit of transferable rights, particularly in mixed fisheries, is the greater flexibility for vessel owners to obtain the right mix of quota for the areas in which they are fishing, thus reducing the need to discard over-quota fish.

Some Member States are strongly against the concept of tradable rights. However, even in RBM systems in which rights are not officially transferable, where rights are valuable generally the market finds a way of expressing this and a market for rights develops. For example, a non-transferable quota allocation may be linked to a particular vessel, but if the vessel is sold often the quota allocation is sold together with the vessel. This can result in vessels with quota allocations being sold for higher prices than vessels without quota allocations.

Whilst tradable rights can support rationalisation of fleet capacity and reduction of over-quota discards, similar outcomes can also be achieved through state intervention — publically-funded decommissioning schemes and Member State-to-Member State quota swaps to ensure an appropriate species mix — in non-transferable systems, although this requires more input (time and resources) from the central authorities, rather than allowing the market to act.

Rights based systems are often said to improve responsible fishing practices as well as economic efficiency but a recent review has shown that this is only the case where strong regulation is also in place[85]. There are numerous case study examples that have demonstrated the ability of rights based management systems to reduce effort in overcapitalised fisheries[86] and foster greater environmental performance, for instance through reducing discards, if sufficient control remains to generate real incentives for the fleet[87,88,89,90]. However, such management systems are not without problems. Two Icelandic fishermen recently made a complaint to the UN Human Rights Committee declaring that the Icelandic fishing quota system was unfair[91].

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[85] Chu, C. 2008. Thirty years later: the global growth of ITQs and their influence on stock status in marine fisheries. Fish and Fisheries, 2008, 10, 1–14

[86] National Research Council, Sharing the fish: towards a national policy on individual transferable quotas. 1999: Washington, DC.

[87] Arnason, R., On the ITQ fisheries management system in Iceland. Reviews in Fish Biology and Fisheries, 1996. **6**(1): p. 63-90.

[88] Arnason, R., On catch discarding in fisheries. Marine Resource Economics, 1994. **9**: p. 189-207.

[89] Bernal, P.A., et al., New regulations in Chilean Fisheries and Aquaculture: ITQ's and Territorial Users Rights. Ocean & Coastal Management, 1999. **42**(2-4): p. 119-142.

[90] Branch, T.A., K. Rutherford, and R. Hilborn, Replacing trip limits with individual transferable quotas: implications for discarding. Marine Policy, 2006. **30**(3): p. 281-292.

[91] Report of the Human Rights Committee. 2008. General Assembly. Official Records Sixty-third session Supplement No. 40 (A/63/40

Rights based systems represent only one component of a management system and must be implemented within an overall management framework that includes conservation measures, scientific research, technical measures and monitoring and enforcement.

Whilst RBM confers rights on fishers to access a part of the resource, this should also be accompanied by responsibilities. A vital factor in reaping benefits from RBM is an industry that demonstrates a responsibility for stewardship of the resource, and building this into the system should be an integral part of the design process. Indeed, this can have benefits on both sides — the Netherlands has implemented an ITQ system since the 1970s, but it was only after the introduction of a co-management-type approach through the implementation of 'Biesheuval groups' (a system of participation and devolution, and decentralised monitoring and surveillance for the objective of quota management) that positive outcomes started to emerge in the fishery. This emphasises the need to involve the industry not only in the implementation of the system, but also in its design.

Despite the potential positive outcomes of RBM, there are a number of issues that must be taken into account in its implementation:

- With transferability of rights, there is concern that traditional, local, or small-scale fishers may be marginalised or bought-out of the fishery and not able to participate, and new entrants may be restricted from entering the fishery due to the potentially high cost of obtaining rights. As a result, some EU Member States have restricted transferability with the aim of protecting local fishing communities and national interests. However, even with ITQ systems, it is possible to implement schemes for the protection of small-scale interests and to ensure the possibility of new entrants to the fishery, such as allocating a proportion of national quota to the small-scale sector, and reserving a part of the quota for future participants.
- Allocation of rights should be equitable and fair, and based on existing or historical use patterns. If prior resource users are excluded from accessing the fishery, there should be adequate compensation for their loss. However, the allocation of rights should not be seen as a 'resource give-away' and mechanisms for cost-recovery should be considered.
- RBM systems need to be tailored to local circumstances and objectives, and should be implemented in an iterative process that allows opportunities for stakeholder input, implementation, review and modification as the system evolves. As such, governments may want to maintain some control over the rights and the possibility for intervention if the system is not performing as expected.
- If rights are tradable the question of whether Member States will be able to restrict ownership arises, if the fishing rights are considered as 'goods' on the European common market. However, as with current implementation of fisheries

policy, Member States can require an 'economic link' to be demonstrated by individuals or companies fishing against national quota allocations. It may be possible to extend this principle even where rights are more freely tradable.

One of the constraints to the development and success of RBM systems in Europe at present, is that quotas are set at EU level and distributed to Member States. Member States then use various different types of RBM system to manage the distribution and allocation of the quota to the national fleet. This has resulted in a range of RBM systems being implemented in different fleets targeting the same stocks, which may undermine the effectiveness of RBM approaches, as it affects the nature of the right that has been allocated. One option would be to promote the regional coordination of RBM systems among Member States that have fleets targeting the same stocks.

4.4 The Governance structure and decision making process

4.4.1 Complexity

Reform of the governance structure for the CFP is at the heart of making it work more efficiently. The CFP currently works in a top down way, with decisions being made at Council level and implemented at Member State level. This naturally leads to considerable positioning by MS within the Council, and a tendency to create ever-more complex regulations to control fishing. For instance, the days-at-sea scheme to control fishing on cod became more and more detailed, with a large number of derogations for different fleets, in order to accommodate the complexity of fisheries not just on cod but on all other fisheries that take cod as a bycatch. This led to a very unwieldy, and actually ineffective measure, and ultimately to the failure of the plan to generate sufficient reductions in total fishing mortality of cod. Complaints are heard about this level of micro-management from all parties – from the Commission, which feels that it is under-equipped, both legally and operationally, to enforce such detailed regulations; from Member States, which have to implement these complex regulations; and from fishermen, who have to understand them, and to whom they often seem perverse – quota and landing restrictions requiring them to discard both small and marketable fish, for instance.

Added to this complexity is the time it takes to develop new regulations. This is normally about 2 ½ years, from the initial consideration in the Commission, through consultation and testing to a Commission Proposal and then to a Council Decision. This top-down approach will only become more complicated and time-consuming if/when the Lisbon Treaty comes into force, requiring co-decision making for all fisheries management regulations except annual fishing opportunities (TACs and quotas; some doubt remains over whether technical regulations, such as mesh size restrictions, will be exempt from the requirement for co-decision making or not). Clearly there is a need to be able to move more rapidly with issues of immediate conservation concern. Although there is provision for rapid action in 2371/2002 and 721/2008 this is limited to very specific situations. Chronic problems, such as the apparent failure of a recovery plan, still take several years to discuss and solve.

4.4.2 The process of decision making

Decision-making is still focussed too much on short term interests. The Council of Ministers should only be concerned with setting long-term policy and decision rules, and annual decisions should be decided administratively according to those rules. Relative stability of quota allocations will continue to create perverse incentives for Ministers to argue for higher domestic quotas unless such rules are strictly enforced by an impartial arbiter. The decision making process thus needs further significant change in order to change the culture of fisheries management at the highest level.

There are a number of different levels of action that could be taken on governance.

Continued development of the regional advisory system

The RAC are proving to be one of the most successful policy changes of the 2002 CFP reform. They have been very effective so far, as the recent review of RACs has shown[92] and we have given numerous examples above of the effectiveness of RACs in solving problems of ecosystem based management, the development of effective long-term management plans, etc. The issues noted in the EU review should be pursued. In addition, more thought needs to be given to external connectivity of RACs; for instance the pelagic RAC considers that Norway should be a full member. This would be very difficult to achieve constitutionally, but important in generating greater buy-in at Norway–EU meetings.

RACs should be encouraged and further developed to provide a new culture of responsible management. This might be achieved by giving specific pieces of work to the RACs (e.g. Strategic Environmental Assessment of fisheries) so that they can develop their ability to take responsible management actions and increase their understanding of environmental sustainability. The RACs and especially the recently-established Mediterranean RAC might benefit from an interface between itself and the scientific world, and this might be provided by creating a position for specifically appointed scientists whose job is to develop within the RACs a more scientific sound mentality.

Some RACs are still in their infancy. An issue which will create problems for some RACs, for instance the Mediterranean RAC is the wide differentiations among its members, and more specifically the fishermen associations of the small scale fishery and the medium scale fishery. Nevertheless, in the long term they are likely to contribute significantly to the development of accepted and applicable fisheries policy.

Movement away from annual decision making within multiannual plans

There is some evidence that the recovery and multiannual plans are driving the Council of Ministers to alter the Commission's TAC advice less frequently (Table 13) than for stocks not under multiannual plans (Table 19). However, there is still room

[92] Communication from the Commission to the Council and the European Parliament.Review of the functioning of the Regional Advisory Councils. Brussels, 17.6.2008 COM(2008) 364 final

for improvement, and we understand that even at this latest December Council meeting the Commission came under considerable pressure to alter its TACs. Moving to an administrative decision (i.e. the ability to set TACs by Commission Implementing Regulation, ratified of course by the Fisheries Committee, on the basis of scientific advice and pre-agreed harvest control rules) would considerably strengthen the performance of multiannual plans.

Table 13 History of decision making in recovery plans. The table shows the difference between the final Council decision on the TAC and the Commission proposal. Figures in bold are when the recovery plan was in operation. Source: Compiled from Commission Proposals and Council Regulations. Other stock data (Table 19) included in Annex 1.

Species (Common Name)	*Species (Latin Name)*	ICES Fishing Zone	Diff as % of actual (2009)	Diff as % of actual (2008)	Diff as % of actual (2007)	Diff as % of actual (2006)	Diff as % of actual (2005)	Diff as % of actual (2004)	Diff as % of actual (2003)
Herring	*Clupea harengus*	Vb, VIaN (EU waters), VIb	**38.39**	**5.33**	**15**	**n/a**	**n/a**	**0**	**n/a**
Cod	*Gadus morhua*	Skagerrak	**n/a**	**n/a**	**n/a**	**0**	**0**	0	n/a
Cod	*Gadus morhua*	Kattegat	**n/a**	**18.57**	**12.72**	**0**	**10**	0	38.36
Cod	*Gadus morhua*	Vb (EC), VI***	**n/a**	**8.46**	**6.12**	**0**	**0**	0	46.24
Cod	*Gadus morhua*	VIIa	**0**	**8.51**	**6.22**	**0**	**14.98**	0	38.46
Cod	*Gadus morhua*	VIId	**n/a**	**14***	**23.38***	**5.5***	**0***	38.28*	22.09*
Hake	*Merluccius merluccius*	IIIa, IIIbcd (EU waters)	**0**	**0**	**4.16**	**0**	**0**	28.1	n/a
Hake	*Merluccius merluccius*	IIa (EU waters), IV (EU waters)	**0**	**0**	**4.16**	**0**	**0**	28.1	n/a
Hake	*Merluccius merluccius*	Vb (EU waters), VI, VII, XII, XIV	**0**	**0**	**4.14**	**0**	**0**	28.1	41.67
Hake	*Merluccius merluccius*	VIIIc, IX, X, CECAF 34.1.1 (EU waters)	**0**	**0**	**2.17**	**0**	0	39.76	22.86
Norway lobster	*Nephrops norvegicus*	VIIIc	**0**	**0****	**0**	**0**	0	80	0
Norway lobster	*Nephrops norvegicus*	IX, X, CECAF 34.1.1 (EU waters)	**0**	**10.6**	**0**	**0**	0	69.83	33.33
Plaice	*Pleuronectes platessa*	IIa (EU waters), IV	**n/a**	**n/a**	n/a	n/a	0	30.59	n/a
Common sole	*Solea solea*	II, IV (EU waters)	**1.51**	**0**	0	n/a	10.75	20.59	n/a
Common sole	*Solea solea*	VIIe	**0**	**0**	0	0	0	34.33	33.25
Common sole	*Solea solea*	VIIIa, b	**0**	**0**	0	0	0	22.22	47.37
Bluefin tuna	*Thunnus thynnus*	Atlantic Ocean (east of longitude 45° W) and Mediterranean	**n/a**	**n/a**	**n/a**	**n/a**	**0**	**0**	**n/a**

* Stock has not been separated out for these years. It is included as part of VIIb-k, VIII, IX, and X

** Stock has not been separated out for these years. It is included as part of III b,c,d

***Stock has not been separated out. It is included as part of Vb (EC), VI, XII, XIV

Reg 1300_2008 West of Scotland herring (VIa and Vb)
Reg 423_2004 Cod (IIIa, IV, IIa, VIId, VIIa, VIa, Vb)
Reg 811_2004 Northern Hake (IIIa, IV, Vb, VIa, VII, VIII a,b,d,e)
Reg 2166_2005 Southern Hake (VIIc, IXa)
Reg 676_2007 Plaice & Sole (IV)
Reg 509_2007 Sole Western Channel (VIIe)
Reg 388_2006 Sole Bay of Biscay(VIII a,b)

Movement away from centralised decision making

The Commission and stakeholders agree that fisheries management in the EU is still too centralised. Regulations developed in Brussels (by the Commission and the Council) often have been constructed to deal with every small technical eventuality, rather than setting overall guiding policy and leaving technical application to practitioners. This has created unwieldy complexity that in some cases, for instance the fishing day limitation to reduce fishing mortality in the recovery plan for cod, has contributed to the failure of policy.

Setting regulations to this level of detail at the highest governmental levels is inefficient. It has allowed the development of a culture of short-term focus that has encouraged TACs to be set higher than long-term sustainability objectives would demand. And it has disassociated the decision-making process from the stakeholders it affects and the Member State organisations which have to enforce it.

A range of alternative governance models could be envisaged, with different levels of autonomy afforded to regional/local decision making bodies. One end of the spectrum might be geographical regions that act effectively as current Member States do, with a single set of de-nationalised fleets and a single management and control authority. This is not within the vision of the current EU treaties which preserve Member State EEZs under UNCLOS. So the decision-making bodies at regional level will probably still have to be made up of Member States acting together to organise management at local level. At another end of the spectrum one might see regional implementing committees, with relatively limited additional powers of coordination of action and recommendation to the Commission and Council on implementing measures, much along the lines of organising committees of Joint Deployment Plans implemented by the Community Fisheries Control Agency. This is somewhere along the lines suggested by the Commission in giving RACs more control on setting technical measures against the Commission providing overall objectives – the issue of results-based management.

The most effective arrangement will, in our view, be one where Member States concerned with regional issues deal with them in a semi-autonomous way, implementing local measures on issues such as closed seasons, mesh size regulations, discard limits, etc, to meet central EU strategic requirements. These regional bodies will have to fit into the EU system, and for reasons of consistency and coordination will have to be part of a centrally-managed CFP. Strategic goals would be set in Brussels, by the current decision making entities (the Commission, Council and Parliament), and tactical, day-to-day management would be undertaken at a regional level by a regional management body made up of a subset of Member States.

The performance of each management body would be judged against strategic outcomes – such as requiring that EU agreed limit and target reference points are

met for all stocks, that EU agreed targets on bycatch and discards are met, that the data collection regulation is complied with. Individual Member States would continue to take action on implementation and control, but with more incentive to engage in cooperative activities within their region. Sanctions would be levied by the Commission on all Member States within a region if the region itself failed to meet its targets.

The construction of regional organisations may be problematic. Some regions are easy to define biogeographically – the North Sea, Baltic, Mediterranean, Atlantic, Biscay to Southern Ireland, Irish and Celtic Seas, West of Scotland. Some species are migratory or straddling, however, and it is not easy to see how they would fit into regions of geographical extent. An alternative would be to divide regions by fleet – the demersal fleet, the Nephrops fleet, the pelagic fleet. This would not be generally as appropriate as biogeographical regions, because it would not be easy to consider multispecies interactions and ecosystem approaches within such management groupings.

The actions that a regional body might be able to take for management, in order of increasing complexity, could be:

- Agreeing technical regulations such as mesh sizes for different fleets which would assist in meeting the strategic targets.
- Agreeing and amending long-term management plans and decision rules for all species.
- Agreeing appropriate implementations of ecosystem based fisheries management, in particular locally appropriate networks of MPAs that make sense to fishermen and conservationists.
- Note that it would remain important that any ability to depart from scientifically determined management limits on an annual basis must not be re-introduced at regional level; quotas should still be determined by the Commission in accordance with scientific advice and pre-agreed decision rules.
- Agreeing target reference points based on regional conditions and socio-economic objectives, always assuming they are within biological safe limits. This would take the previous discussion of multiple methods of evaluating target reference points into account.
- Deciding to move to different types of management, such as effort (input) rather than catch (output) control; this would imply some departure from the current system of relative stability in catches, because effort based systems by their nature do not allow prediction of precise outputs.
- Deciding on transfers between Member States within a region, and even potentially on the introduction of region-wide ITQ systems. The latter would imply a relaxation of relative stability, although relative stability ratios would presumably be used in an initial allocation of a regional ITQ.

In terms of control, regional bodies would develop the systems already being implemented by the Community Fisheries Control Agency (CFCA), but these could potentially go further, to:

- regional information sharing in real-time – information such as VMS/VDS, logbook, landings information could be held centrally for a region;
- multi-lateral agreements on patrolling and inspection throughout a region;
- regional observer and inspector training and deployment programmes.

A number of legal issues would have to be investigated for this to happen:

- Depending on the level of autonomy anticipated for regional management, it would have to be clear how technical regulations implemented at regional level would become binding on all regional partners, and potentially on third parties fishing in their waters.
- Although it might be technically possible for a regional management body to negotiate with third parties (such as Norway) without the services of the Commission, it is probably most sensible to keep this function as a Commission competency.

The advisory structure to regional management bodies requires investigation. The creation of the RACs were a step in this direction and several communications[93] have demonstrated the will from the European Commission to improve the decision making process and governance system which currently exists. Communication between the scientific community, the fishing industry and policy and decision makers is vital to this process. The recent reviews of the RACs have demonstrated their positive contributions in the following areas:

- Providing a forum for the exchange of views, and understanding of different points of view, between stakeholders.
- Building confidence in science, through collaborative projects started at the RACs between industry and science. It is noteworthy, for instance, that the work on new management plans and discard reduction, initiated from within the RACs, has so far been more effective in generating change in industry practices than individual external policy studies such as the Commission's initiative on a discard ban or WWF's recommendations on MPAs.

The RACs therefore should have a significant advisory function to any regional management body.

Any move to regional bodies needs to consider these questions:

- The definition of region – and our preference is to do this in ecologically meaningful ways;
- The actions that should be devolved to regional management;
- The powers that regional management organisations would have, and how these would relate to central EU control;

[93] Communication from the Commission to the Council and the European Parliament. Improving consultation on Community fisheries management. COM(2006) 246 final.

- The advisory structures that would advise the regional organisations;
- The legal basis for such organisations;
- The control and audit of activities.

5 A vision for European fisheries into the future

5.1 What would a future European fisheries landscape look like?

The vision for European fisheries should closely follow the principles of sustainable development. The definition of sustainable development as used by the Brundtland Commission" (1983) meets the needs of the present without compromising the ability of future generations to meet their own needs." Management systems should reflect and integrate multiple objectives. The result should be stable and diverse ecosystems able to support a successful and profitable fishing industry which provides social and economic benefits to the European economy and its citizens, to the fisheries sector and all related sectors. The aim of the EU Lisbon Strategy is to create "the most dynamic and competitive knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion, and respect for the environment by 2010".

This can only be achieved in the long term if fisheries stocks and the ecosystems they exist in and depend on can be restored and maintained. Full application of Ecosystem Based Management is defined as the need to 'plan, develop and manage fisheries in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from a full range of goods and services provided by marine ecosystems'[94].

The level to which fisheries stocks and marine ecosystems should be restored to needs to be defined. Restoring 'natural ecosystem function' is often stated as the goal for conservation activities. However, the marine environment has long been altered by human activities such as fishing. The Marine Strategy Framework Directive (MSFD), which entered into force in July 2008, sets out the management measures, monitoring and assessment programmes to be adopted by all Member States within a fixed timeframe. The objective of the MSFD is to achieve 'good ecological status' by 2020, the definition of which is left to be defined by each Member State. The question of what is 'good ecological status' is an important one and must be kept under review, since the expectation of what a healthy ecosystem baseline looks like may shift over time[95].

The MSFD will form the environmental pillar of the European Maritime Policy. This Policy will seek to provide integration of different sectoral policies in the maritime area. It provides an important new framework to guarantee greater consistency between the

[94] FAO, 'The ecosystem approach to fisheries', *FAO Technical Guidelines for Responsible Fisheries*, (Rome: FAO, 2003), No. 4, Suppl. 2.

[95] Pauly, Daniel (1995) Anecdotes and the shifting baseline syndrome of fisheries. Trends in Ecology and Evolution 10(10):430.

CFP and other Community policies having an impact on the sustainable development of oceans and seas.

In order to work, the rules of the CFP must be fairly implemented and perceived to be so by its key stakeholders. Consequently, compliance and trust must be fostered. This may require significant cultural changes to take place in order to trigger modifications in behaviour as well as an effective enforcement system. The current governance system is perceived to be 'top-down' and should aim to be more participatory if it is to engender support and better compliance, and to devolve more responsibility for technical decisions to regional or local level.

Fisheries need to be economically viable, profitable and within capacity bounds set by fishing opportunities. It may be necessary to use public money for further decommissioning to reduce capacity, but an alternative is industry-led adjustments to capacity in response to economic incentives and in return for long-term fishing rights. Transferrable rights have been used in other jurisdictions successfully to increase profitability and reduce capacity, although government funds may be required to start such systems off and special consideration needs to be given to coastal community needs and small scale fishers.

Ultimately, the 'vision' for fisheries management in the European Union should be to provide a leading positive example as it does in other areas such as environmental policy. In the past six months, past year the European Commission has implemented an increasing number of initiatives aimed at improving the state of the marine environment for a long lasting and growing economy. The reformed CFP 2012 should reflect the policy objectives of these recent EU initiatives.

To summarise, the vision for European fisheries of the future is healthy fish stocks, managed at high stock levels by responsive decision rules and without unnecessary political intervention, and a smaller industry, operating at peak efficiency and profitability.

5.2 What can we expect with a revitalised fishery?

The ultimate aim of a recovery of key stocks would be a return to the relative abundance, profitability and positive trade balance in fish that existed in the 1970s. While our pelagic stocks have generally been maintained demersal stocks have declined over the last 30 years. Over the whole of the Atlantic fishing areas in EU waters, 40% of the demersal fish catch in the early 1970s has been lost; and in the North Sea this percentage rises to 57%. The reason for basing these calculations on the early 1970s is that this was before the major increases in demersal catches, particularly gadoid species, that occurred mostly from the mid 1970s to the late 1980s (Figure 6).

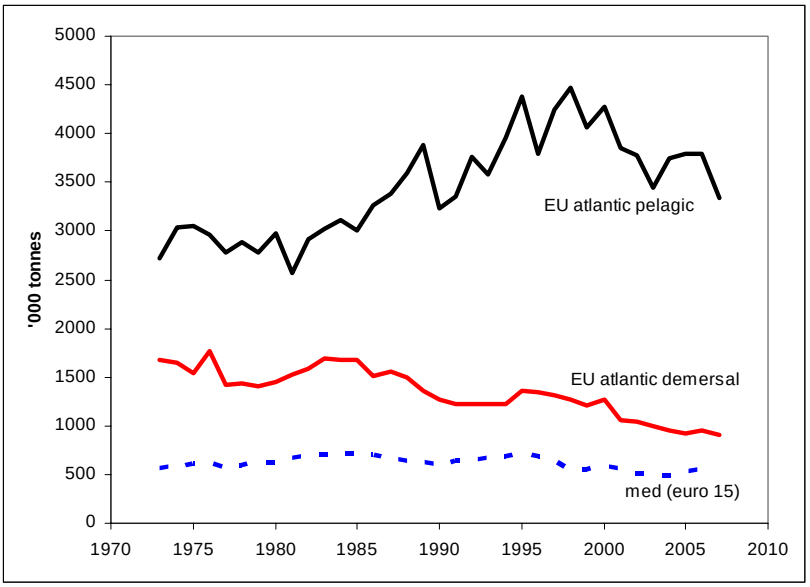

Figure 6 Catches in the EU area of the NE Atlantic (Baltic + ICES areas IV-IX) by all countries, split by pelagic and demersal (the latter including cephalopods, but not including inshore crustaceans and molluscs such as lobsters, crabs, oysters, mussels) and catches in the Mediterranean by Euro-15 countries. Source: Eurostat.

These major declines in demersal catches have shown up also in EU fish trade imbalances (Figure 7). The EU now imports some 60% of its fish, and this situation has considerably worsened in the last 20 years. A recovery of domestic stocks would significantly contribute to redressing this trade imbalance, although the overall balance will continue to be negative.

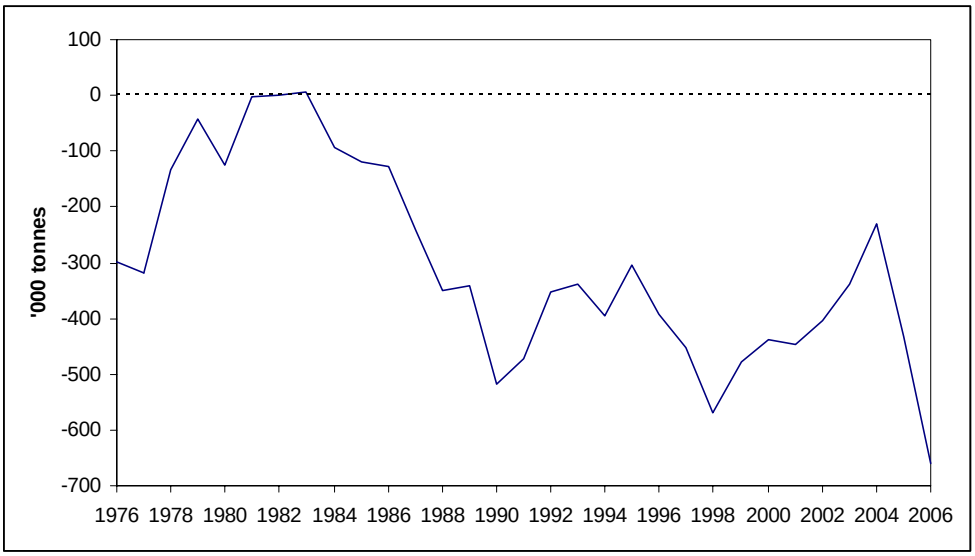

Figure 7 Trade imbalance in fresh, chilled or frozen product between the EU (selected as Denmark, Germany, Ireland, France, Italy the Netherlands and UK to allow comparisons back to 1976) and extra-EU countries (tonnes). Source: Eurostat.

The benefits that could flow from better compliance are significant. The preparatory study for the impact assessment undertaken by MRAG in 2008 to explore the effect of the Commission's proposals for improvements to the community control regulation (presented as COM(2008) 721 final of 14.11.2008) included a detailed economic benefit model for EU fleets[96,97]. Nine stocks in seven fisheries were modelled: North Sea cod, Baltic cod (east), North Sea plaice and sole, Northern hake, Southern hake, Western mackerel, and GSM-06 and -09 Mediterranean hake.

The model assumed that a short-term increase in inspection effort and the introduction of other measures such as greater use of electronic monitoring and an increase in the proportion of land-based inspections proposed by the Commission would lead to a reduction in unreported/illegal fishing and stimulate a recovery of the stock. Fishing fleets would initially experience a loss of income as the benefits that they are currently accruing from unreported landings was removed, but would benefit in the long term from higher catches as stocks recovered. The basis for the assumed effectiveness of increased land-based inspections was the experience of the Scottish Fisheries Protection Agency, which has achieved a spectacular reduction in unreported landings, from over 60% in 2003 to near zero in 2007, through raising its inspection rate from 20% to 40% of landings and through an industry led buyers and sellers registration scheme aimed at eliminating 'black fish' (unreported landings) from the supply chain[98]. Profitability and compliance are linked: improved compliance leads to increased profitability and higher incomes; lower profitability and low incomes increase the benefits of non-compliance.

The model showed large benefits for some stocks and small or negative ones for others. Overall, for those stocks that are in need of recovery the control measures were shown to create that recovery normally within a 4-5 year period through better control of catches. By contrast, the status quo (i.e. no enhanced control activity) scenarios did not have this success. Overall, the regulatory instrument produced a 51% increase in the biomass, a 44% increase in gross turnover (landed value of fish) and a 59% increase in added value of the nine modelled stocks. If it was extended to all the stocks in the EU, the effect of this regulation would be to restore all EU stocks within 15 years, which would be a significant environmental gain.

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[96] MRAG Ltd., Oceanic Développement, Poseidon Aquatic Resource Management Ltd, Lamans s.a., Institute of European studies and IFM, Impact Assessment of a Proposal to Reform and Modernise the Control System applicable to the Common Fisheries Policy (London: MRAG, 2008; Available from http://ec.europa.eu/fisheries/publications/studies/control_impact_assessment_report_en.pdf).

[97] European Commission, Commission Staff Working Document accompanying the Proposal for a Council Regulation establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy: Impact assessment. SEC(2008) 2760, (Brussels, 14.11.2008).

[98] Scottish Fisheries Protection Agency, Annual Report and Accounts 2006-2007 (Edinburgh: The Stationery Office, 2007).

Total net profits (total benefit from catches, including added value, minus costs of catching and inspection for the situation where control is improved, compared to the total benefit from catches accounting for costs in the current situation) of €8.9 billion would be generated across all the stocks for the time span 2010 – 2019. Naturally the effects would be greatest for stocks that are currently most depleted. For North Sea cod a net benefit of a comprehensive new control regime for the period from 2010 – 2019 would be more than € 2.8 billion, even though initial losses (to the illegal sector of the industry) would be €257 million in 2010 and €104,000 in 2011. Applying the rationale of the case studies to all other stocks in the ICES regions in Community waters indicated that if high levels of compliance were to be achieved by implementing the raft of proposed elements through a new, binding regulation – the Net Benefit to the Community over the first ten years would be about €10 billion.

Although initially increased inspections and other means of control would increase costs in the short term, in the long term the cost of control activities would drop from 17% of turnover to 3% of turnover as compliance and the state of the stocks improved over the next 10 years, which compares favourably with the current level of 9% of turnover. The short- and long-term control costs for all Member States are reproduced from the MRAG study (

Table 14). These benefits were also shown to have a strong carry through to increased employment, particularly in the processing and ancillary sub-sectors. Employment in the total fisheries sector of the EU-15 decreased from 404,000 persons in 1997 to 313,000 persons in 2005 (including by 23%, in the catching sector from about 240,000 in 1997 to 167,000 in 2005), but could be expected to make back much of this loss as stocks recover.

Table 14: Results of the MRAG (2008) study. Current national enforcement budgets, against projected Control strategy actions for case study fisheries (€ million). Source: MRAG, 2008[99].

	Current expenditure	Year 1, % current expenditure	Year 10 (% of current expenditure)
Belgium	1.28	43%	-55%
Denmark	25.75	166%	-19%
Germany	27.67	105%	-25%
Netherlands	15.38	-47%	-80%
UK	34.41	-76%	-92%
France	27.60	-19%	-58%
Spain	27.77	-53%	-93%
Portugal	22.13	-79%	-98%
Ireland	52.03	-90%	-98%
Poland	1.18	207%	2%
Sweden	15.77	34%	-41%
Latvia	1.04	-18%	-69%
Lithuania	0.24	-34%	-71%
Estonia	1.88	-70%	-90%
Finland	1.30	220%	15%

Other studies have also found significant benefits from recovered fish stocks, including a 31% increase in rents from the recovery of the west channel sole stock[100] and, for most fleets fishing in the North Sea, a move from a loss to profit (not counting added value benefits) is indicated as cod recover[101]. The results of the latter study are consistent with those obtained in the MRAG study: the gross value added benefits of allowing North Sea

[99] MRAG Ltd., Oceanic Développement, Poseidon Aquatic Resource Management Ltd, Lamans s.a., Institute of European studies and IFM, Impact Assessment of a Proposal to Reform and Modernise the Control System applicable to the Common Fisheries Policy (London: MRAG, 2008; Available from http://ec.europa.eu/fisheries/publications/studies/control_impact_assessment_report_en.pdf).

[100] T. Bjorndal and M. Bezabih, The Economic Benefits of Fisheries Management: Assessing Potential Economic Rents in Sea Fisheries - The Case of Western Channel Sole (London: Defra, 2008) (Available at http://www.defra.gov.uk/marine/pdf/fisheries/200805econ-fishman-case.pdf, accessed December 2008).

[101] European Commission, Impact Assessment regarding the Commission's proposal establishing revised measures for the recovery of cod stocks. Commission Staff Working Document, SEC(2008) 386 (Brussels, 2.4.2008).

cod to recover are €300-400 million[102], generating an increase of some 3 times the current gross value added; and profitability in the cod fleet would improve from an overall loss of 1% of landed value to a profit of 21% of landed value.

In the present paper, we repeated the model calculations assuming the following ideal responses: no discarding, and adoption of F_{MSY} as a target reference point. F_{MAX} (ICES) was used as a proxy for F_{MSY}. The results are similar to those obtained by MRAG (2008), but the magnitude of the changes is larger (Table 15, Table 16).The fleet value added, which includes crew share and profit (which is mostly negative in the early series, as shown by the Commission's study of North Sea cod[103]) improves by 129% over a 10 year period. Moreover, all stocks, even the heavily depleted Southern hake, recover to biomasses greater than the precautionary level (Bpa) by 2013 under Fmsy scenarios. Fleet profitability also improves as stocks improve (Table 17).
We have earlier advocated the use of $F_{0.1}$ as providing added precaution in the situation where F_{MSY} is not well defined. For the some stocks in our single species model using $F_{0.1}$ rather than F_{MAX} would not significantly affect catches – for north sea cod catches would rise by 156% rather than 180% (Table 15) under F_{MAX}, for Baltic cod catches would rise by 217 rather than 214% and for northern hake catches would rise by 64% rather than 58% (i.e. catches would be higher under $F_{0.1}$) - whereas rises in biomass would be much more significant under the $F_{0.1}$ scenario – 2196%, 439% and 177% respectively compared with 1604%, 296% and 82%. For sole and plaice, however, although stock sizes would rise similarly under gains in catch would be lower under $F_{0.1}$ than F_{MAX}.

Another important point to note is that simply for these stocks alone the move to more profitable fisheries with higher stocks is able to generate 400,000 tonnes of additional catch. This is almost the level of the trade imbalance. MRAG found that their grand total net benefit against the situation that might pertain in the absence of taking any action to reduce IUU fishing and discarding was €8.4 billion (i.e. total gross value added minus the additional costs of control to create the change, minus the gross value added that would have been generated in the absence of additional control measures). Our revised calculation using MSY as a target is €8.9 bn. MRAG further estimated that another €1.1 billion would be contributed by other stocks. If we apply this pro rata to Table 16 we arrive at a total possible net benefit compared to doing nothing of €10.1 billion Europe-wide, including the Mediterranean over the 10 years modelled.

[102] See MRAG et al., Impact Assessment, Table 33; and European Commission, Impact Assessment regarding the Commission's proposal establishing revised measures for the recovery of cod stocks, Annex 1.
[103] European Commission, Impact Assessment on recovery of cod stocks, Opp. Cit

The benefits will not only be seen in total catch, profit and value added. Table 15 shows that the trophic level of most species will also increase[104]. However, there may be unintended ecosystem impacts that accompany a major recovery of a stock such as cod, for instance a reduction in nephrops stock size and catches. The down side, of course, is that in the early stages of recovery, and particularly when adopting low fishing mortality targets such as Fmsy, catches may initially decrease. This is shown in the model as occasional negative gross fleet value added. Furthermore, the MRAG scenario assumes that control effort will have to increase in the early years, although it may later decline again. The costs of this additional control effort are, however, taken into account in the calculations of net benefit.

There is no reason that European stocks should not recover, so long as the stock or the environment is not so damaged that recruitment dynamics of the stock are changed or the overall carrying capacity of the environment is changed. Experience in the past has shown, however, that rapid action is required to stop stocks getting into too perilous a state. Some stocks that are showing signs now of a slow recovery could easily be halted by departure from the recovery planned low fishing mortality (e.g. North Sea cod, Southern Hake, Baltic cod). It is also evident that pelagic and crustacean stocks are more likely to recover rapidly than demersal stocks, and that recovery is often dependent upon the fortuitous arrival of one or a few good recruitment years[105]. The recent recoveries of North sea herring in the late 1970s and early 1990s, of Norwegian spring spawning herring in the 1990s[106], and of northern hake attest to this, and also to the possibility of generating recovery in European stocks. However, stock recovery is not an easy or smooth process. Although a number of US stocks have been successfully recovered since 2000[107], and there has been a significant improvement in US fish stock status, this improvement has been gradual – a reduction in the number of overfished stocks (biomass lower than reference points) from 36% to 27% of assessed stocks from 2002 – 2008, and a reduction in the number of stocks subject to overfishing (fishing mortality higher than reference points) from 24% to 21% over the same time period[108]

[104] Calculated as a weighted average of trophic level in the catch of each species, where trophic level changes with age and size; see MRAG (2008) for details.

[105] Caddy, and Agnew, 'overview of recent global experience with recovery plans'.

[106] O. Dragesund, A. Johannessen and Ø. Ulltang, 'Variation in migration and abundance of Norwegian spring spawning herring (Clupea harengus L.)', Sarsia, Vol. 82, 1997, pp. 97-105.

[107] A.A.Rosenberg, J.H. Swasey and M. Bowman, 'Rebuilding US fisheries: progress and problems', Front. Ecol. Environ., Vol. 4, 2006, pp. 303-308.

[108] NMFS, Annual Report to Congress on the Status of U.S. Fisheries – 2002, (Silver Spring, MD: U.S. Dept. Commerce, NOAA, Natl. Mar. Fish. Serv., 2003, available at http://www.nmfs.noaa.gov/sfa/statusofstocks.pdf. Accessed December 2008). Data for the third quarter 2008 were used to assess current status (accessed December 2008).

Table 15 Simulation results (Stock and Catch trajectories, tonnes and Trophic level, arbitrary scale) for moving to F_{MSY}, eliminating IUU fishing and, with the exception of plaice, eliminating discarding, all starting 2010. Original model source, MRAG (2008).

	SSB			Catch			Trophic level of the catch			Recruitment projection assumptions
	2007	2019	% increase	2007	2019	% increase	2010	Scenario 3	Scenario 3	
North Sea cod	39,000	664,700	1604%	62,000	173,747	180%	5.32	5.42	1.9%	geometric mean 1997-2006 for 2008, then hockey stick to geometric mean of recruitment 1989-2000
Baltic cod	118,000	467,500	296%	55,000	172,742	214%	5.34	5.38	0.7%	hockey stick to geometric mean of recruitment 1989-2000
North Sea plaice	215,000	591,500	175%	49,000	94,931	94%	4.68	4.62	-1.3%	geometric mean 1997-2006
North Sea sole	19,000	52,000	174%	14,500	14,498	0%	4.94	4.96	0.3%	geometric mean 1997-2006
Northern hake	129,000	235,300	82%	44,000	69,584	58%	4.27	4.29	0.4%	hockey stick going to geometric mean 1978-2003
Southern hake	16,000	48,600	204%	14,500	16,019	10%	4.20	4.22	0.5%	geometric mean 1997-2006 for 2008, then hockey stick to geometric mean recruitment 1982-1988
Western mackerel	2,532,000	2,757,400	9%	579,000	557,128	-4%	4.14	4.15	0.2%	geometric mean 1997-2006
Mediterranean hake	3,000	13,000	333%	4,000	6,088	52%				production model

Table 16 Simulation results (Economic trajectories, values in Euros) for moving to Fmsy, eliminating IUU fishing and, with the exception of plaice, eliminating discarding, all starting 2010. Original model source, MRAG (2008). The "do nothing" scenario is the status quo – management to just above Bpa, with continued current levels of IUU fishing and discarding.

	Annual catch	Gross Turnover	Gross Fleet value added (crew share and profit)	Gross processing value added	Total gross V.A.	Gross Inspection cost	Net benefit over do-nothing scenario
NORTH SEA COD							
2010	30,313	109,332,763	-10,449,968	-9,311,430	-21,995,195	28,013,177	-433,986,616
2011	48,586	200,698,635	47,546,539	32,839,899	91,741,614	26,720,851	-304,116,983
2012	69,646	291,285,238	93,945,949	63,423,491	179,970,997	26,328,519	-183,381,572
2013	92,085	387,773,197	144,120,436	96,474,951	275,360,638	12,712,863	262,647,775
2014	115,343	467,869,423	144,120,436	96,474,951	275,360,638	12,320,531	360,222,824
2015	130,087	531,400,545	195,357,715	129,970,119	372,543,355	11,928,198	437,699,025
2016	148,428	610,575,035	235,998,353	156,537,983	449,627,223	11,261,233	534,430,342
2017	161,399	668,557,411	323,737,126	213,895,147	616,043,015	10,633,502	605,409,514
2018	172,932	721,284,992	357,466,777	235,945,115	680,018,683	9,267,160	670,751,522
2019	173,747	729,661,836	362,825,415	239,448,199	690,182,513	8,642,840	681,539,673
TOTAL		4,718,439,075	1,894,668,780	1,255,698,425	3,608,853,481	157,828,875	2,631,215,504
Net additions in 10 years	143,434	620,329,073	373,275,383	248,759,629	712,177,708	-19,370,338	1,115,526,289
BALTIC COD							
2010	60,875	136,964,779	44,872,220	36,273,615	117,419,450	131,389,794	-292,399,017
2011	81,882	174,774,342	66,249,090	54,094,405	174,437,899	126,810,799	-56,360,051
2012	98,961	213,864,810	88,456,472	72,611,252	233,678,976	125,482,334	-17,457,546
2013	123,378	268,460,281	120,716,976	99,553,678	319,824,331	116,337,075	56,697,146
2014	132,337	277,375,632	123,359,440	101,673,053	326,705,547	115,005,219	57,672,816
2015	146,744	309,744,644	144,346,834	119,262,710	382,872,253	52,649,673	217,308,637
2016	146,744	339,476,771	163,624,527	135,419,456	434,463,439	51,322,401	256,371,629
2017	164,532	352,161,625	171,849,122	142,312,537	456,474,197	49,999,469	274,017,226
2018	172,742	372,293,039	184,901,912	153,252,157	491,406,226	48,681,298	299,722,603
2019	172,742	374,849,997	186,559,791	154,641,634	495,843,059	47,367,677	305,605,121
TOTAL		2,819,965,920	1,294,936,383	1,069,094,497	3,433,125,376	865,045,740	1,101,178,564

	Annual catch	Gross Turnover	Gross Fleet value added (crew share and profit)	Gross processing value added	Total gross V.A.	Gross Inspection cost	Net benefit over do-nothing scenario
Net additions in 10 years	111,867	237,885,218	141,687,571	118,368,019	378,423,608	-84,022,117	598,004,138
NORTH SEA PLAICE & SOLE							
2010	66,741	222,775,690	66,757,370	51,470,812	138,583,897	12,690,751	-43,238,250
2011	88,309	347,001,992	160,773,067	132,553,296	344,412,136	12,076,312	161,434,841
2012	91,501	314,737,911	133,240,232	108,731,109	283,513,479	7,853,167	104,222,725
2013	99,232	344,618,396	146,224,442	119,354,650	311,188,289	6,876,554	128,558,846
2014	103,321	345,308,144	146,666,382	119,707,391	312,111,232	6,425,797	129,294,569
2015	105,975	353,511,793	151,952,149	123,947,916	323,190,319	6,021,980	142,608,862
2016	108,154	363,347,587	158,431,418	129,249,446	336,964,325	5,674,214	156,493,306
2017	108,980	367,369,832	161,030,635	131,340,228	342,422,710	5,371,566	162,297,101
2018	156,797	476,002,125	230,406,151	186,545,849	486,992,871	5,095,450	307,169,520
2019	156,895	478,976,595	232,325,801	188,088,188	491,020,783	4,830,891	311,478,169
TOTAL		3,613,650,064	1,587,807,647	1,290,988,886	3,370,400,041	72,916,684	1,560,319,689
Net additions in 10 years	90,154	256,200,905	165,568,431	136,617,376	352,436,886	-7,859,860	354,716,419
NORTHERN HAKE							
2010	49,156	304,515,899	162,425,342	67,148,068	261,635,889	27,564,767	-2,831,799
2011	54,278	318,990,584	172,113,387	71,075,102	277,176,419	18,855,502	18,960,040
2012	58,031	345,305,574	188,273,778	77,663,342	303,130,959	17,431,508	41,156,383
2013	61,054	365,781,630	200,580,428	82,705,603	322,916,303	14,678,643	65,330,712
2014	63,701	367,618,576	200,262,003	82,585,842	322,415,214	12,992,153	56,078,435
2015	65,777	382,279,787	208,611,365	86,004,615	335,837,583	11,494,195	67,389,388
2016	68,624	395,490,179	215,986,545	89,027,572	347,696,546	10,275,203	76,987,880
2017	67,576	404,424,036	220,509,197	90,897,172	354,982,055	9,325,547	83,431,936
2018	69,232	410,826,576	223,342,419	92,083,391	359,558,673	8,582,895	87,829,205
2019	69,584	415,751,898	226,641,245	93,421,236	364,850,820	7,980,380	93,249,253
TOTAL		3,710,984,740	2,018,745,709	832,611,943	3,250,200,463	139,180,792	587,581,432

	Annual catch	Gross Turnover	Gross Fleet value added (crew share and profit)	Gross processing value added	Total gross V.A.	Gross Inspection cost	Net benefit over do-nothing scenario
Net additions in 10 years	20,428	111,235,999	64,215,904	26,273,168	103,214,932	-19,584,386	96,081,052
SOUTHERN HAKE							
2010	8,526	48,393,129	28,533,574	8,190,195	42,120,656	14,405,559	-1,643,692
2011	9,462	64,538,438	39,881,782	11,397,020	58,850,498	13,431,839	17,173,534
2012	10,562	72,937,642	45,674,662	13,036,722	67,391,931	11,964,988	27,241,742
2013	11,607	80,703,009	51,016,282	14,548,956	75,268,016	9,928,587	37,363,355
2014	13,424	89,911,787	57,404,942	16,355,951	84,686,687	8,197,504	49,680,025
2015	14,163	95,529,914	61,214,364	17,435,568	90,303,882	6,784,481	57,125,294
2016	14,060	95,500,231	60,985,914	17,375,484	89,968,587	3,429,738	60,705,341
2017	14,789	101,149,776	64,822,011	18,462,415	95,624,846	2,804,520	67,609,047
2018	15,548	107,076,359	68,856,493	19,605,324	101,573,538	2,427,658	74,533,455
2019	16,019	111,077,640	71,513,138	20,359,404	105,491,154	2,190,463	79,229,120
TOTAL		866,817,924	549,903,161	156,767,039	811,279,795	75,565,338	469,017,220
Net additions in 10 years	7,493	62,684,511	42,979,564	12,169,208	63,370,498	-12,215,096	80,872,812
MACKEREL							
2010	533,197	538,839,338	316,648,970	247,620,977	633,468,146	3,764,660	282,416,720
2011	552,768	529,951,876	310,144,829	242,499,300	620,366,422	2,124,896	262,338,276
2012	560,794	544,357,618	320,687,430	250,801,057	641,603,087	2,041,458	270,049,389
2013	561,713	548,983,982	324,073,157	253,467,143	648,423,182	1,760,579	271,033,196
2014	561,920	529,012,181	309,457,129	241,957,772	618,981,141	1,681,099	238,455,349
2015	561,450	532,302,656	311,865,208	243,854,011	623,831,897	1,608,382	240,932,682
2016	560,071	534,719,508	313,633,941	245,246,796	627,394,772	1,543,126	242,560,735
2017	558,609	537,037,653	315,330,436	246,582,700	630,812,137	1,484,233	245,722,370
2018	557,725	539,895,426	317,421,850	248,229,580	635,025,010	1,331,203	250,280,575
2019	557,128	543,021,371	319,709,520	250,031,003	639,633,217	1,230,665	255,111,786
TOTAL		5,378,121,609	3,158,972,470	2,470,290,339	6,319,539,013	18,570,300	2,558,901,080
Net additions in 10 years	23,931	4,182,032	3,060,550	2,410,026	6,165,071	-2,533,995	-27,304,934

	Annual catch	Gross Turnover	Gross Fleet value added (crew share and profit)	Gross processing value added	Total gross V.A.	Gross Inspection cost	Net benefit over do-nothing scenario
Mediterranean hake							
2010	3,690	23,551,025	12,763,437	4,042,375	18,501,236	35,497,280	-20,947,310
2011	4,039	24,455,636	13,332,653	4,222,782	19,326,472	33,769,563	-18,592,867
2012	4,389	26,906,567	14,803,983	4,689,006	21,459,471	32,188,188	-15,088,190
2013	5,265	32,496,517	18,250,504	5,781,244	26,456,054	28,413,336	-6,529,992
2014	5,653	33,611,231	18,881,036	5,980,986	27,370,084	12,283,309	10,304,642
2015	5,740	34,369,346	19,287,182	6,109,611	27,958,806	10,929,922	12,045,573
2016	5,827	35,134,765	19,697,925	6,239,693	28,554,191	10,046,358	13,332,284
2017	5,914	35,907,487	20,113,262	6,371,231	29,156,238	9,538,526	14,256,950
2018	6,001	36,687,513	20,533,196	6,504,226	29,764,948	9,247,123	14,976,272
2019	6,088	37,474,843	21,028,614	6,661,244	30,483,193	9,043,886	15,719,404
TOTAL		320,594,932	178,691,791	56,602,399	259,030,693	190,957,491	19,476,764
Net additions in 10 years	2,398	13,923,818	8,265,177	2,618,868	11,981,956	-26,453,395	36,666,715
GRAND TOTAL		**21,428,574,265**	**10,683,725,941**	**7,132,053,528**	**21,052,428,862**	**1,520,065,220**	**8,927,690,253**
Total value 2010	752,498	1,384,372,623	621,550,944	405,434,613	1,189,734,080	253,325,989	-512,629,965
Total value 2019	1,152,203	2,690,814,180	1,420,603,524	952,650,908	2,817,504,738	81,286,803	1,741,932,527
% change	53%	94%	129%	135%	137%	-68%	

Table 17 Adjustment of the Commission's calculations[109] on profitability of the North Sea fleet following recovery of cod to the estimated catches at MSY.

fleet	Denmark DTS 12-24	Denmark PG 00-12	Denmark PG 12-24	UK DTS 12-24	UK DTS 24-40	Germany DTS 24-40	Belgium TBB 24-40	Netherlands TBB 40+
current situation								
gross revenues	56	23	26	142	105	33	67	126
crew share	31	16	14	42	25	7	25	30
net profit	-10	-8	-3	-13	5	22	6	-20
gross value added	31	13	17	47	46	30	36	32
net profit/gross revenues	-17%	-33%	-12%	-9%	5%	66%	9%	-16%
TAC 175000 t								
gross revenues	103	37	70	251	275	142	99	186
crew share	56	25	38	61	76	31	35	45
net profit	7	-4	16	85	74	108	18	22
gross value added	72	26	59	159	166	139	58	86
net profit/gross revenues	7%	-10%	22%	34%	27%	76%	19%	12%

[109] European Commission, *Impact Assessment on recovery of cod stocks, Opp. Cit*

5.3 Conclusion and Recommendations

European fisheries management has suffered for a long time from an imbalance or conflict between a number of different factors: capacity and fishing opportunities; incentives for illegal fishing and effectiveness of control means; and political, social and environmental interests in TAC setting. Although the reform in 2002 went some way to addressing these issues, it is not yet fully implemented or effective. Even when it is implemented, some key faults still remain, notably the potential for political intervention and the overcapacity and uneconomic operation of the fleet.

Further reform is necessary, and we have shown what this might deliver – significant benefits in terms of profitability of the fleet, increased fish stocks and catch, healthier more resilient marine ecosystems, and the ability to redress in some part the EU's growing trade imbalance in fish.

In our view the changes that would be likely to benefit the efficient development of the CFP are as follows:

Structural

- Targeted decommissioning may be efficient in the short term, but is unlikely to be efficient in the long-term. On the other hand, the cost of reducing the entire EU fleet to match fishing opportunities through withdrawal may not be prohibitive when compared with the total subsidy to the sector.
- The increasing use of rights-based systems should encourage rationalisation of the fleet as well as improved economic performance.
- Rights-based systems should probably be implemented by Member States individually. Because fishing communities are in close contact with each other, efficiency/profit gains in one fleet sector would likely cause other fleet sectors to wish for similar benefits in their sectors. Thus natural commercial competition may well drive many adjacent fleets to demand some element of rationalisation and rights.
- Rights-based systems need to be fully controlled and monitored, and coastal / small-scale fishers may require additional protection or exclusion from the rights based system.

Control

- The control reforms of the Commission have received significant attention, but should in any case be supported.
- The development of rights should also imply responsibilities.

Conservation

- There is a pressing need to include all EU stocks in long term management plans.

- For the many stocks for which assessments are not currently possible, there are now tools available for risk-based assessment and pragmatic, precautionary harvest control rules that are not based on analytical assessment and/or use fishery-independent data.
- Adopting yield-per-recruit $F_{0.1}$ targets rather than F_{MAX} would have significant conservation goals where F_{MSY} cannot be analytically determined. Target reference points set lower than F_{MSY} (eg F_{MEY} = approximately 0.9x F_{MSY}) will deliver higher economic efficiency and more precautionary management even though in some cases total catches would be lower than under F_{MAX}.
- Multispecies effects should be taken into account when setting goals for management plans, along with socio-economic considerations, to arrive at pragmatic target reference points that are precautionary but may not be optimal for all species. Multispecies MSY will not usually equal the sum of single species MSY.
- For low trophic level species the demands of predators should be taken into account in setting target reference points, and this will normally lead to reference points that are more precautionary than indicated by single-species considerations.
- To manage fisheries during anticipated climate change, selection of low fishing mortality will reduce stress on fish populations and render them more resilient to change. Reducing impacts on bycatch and habitats will also increase biodiversity and reslience.
- Other aspects of ecosystem based fisheries management, such as the development of area management, mitigation measures, and reduction of discarding, should be developed in close consultation with the fishing industry to ensure that they are accepted and implementable.
- Stakeholders need to be further involved in the acquisition of scientific data and the development of harvest control rules and technical measures. The ICES benchmark workshops and STECF stakeholder briefing sessions are key developments that should be fostered.

Governance

- At a minimum the recovery/long-term management plans should be modified to provide for administrative (Commission Decision) application of harvest control rules agreed at Council level.
- The role of RACs needs to be strengthened, and they need to be allowed to engage more formally with third parties.
- Models of regional governance should be explored. We have developed a number of alternatives here, but clearly this is a very large area with multiple interests. What appears to be a minimum in terms of delivering less complexity and more applicable technical rules is to devolve the development of those rules to a regional body. A natural extension of this is to make regional organisations — possibly RACs, but including other potential multilateral government organisations — responsible for implementation of all

aspects of fishery management, and being held accountable at EU level for higher level deliverables such as overall ecosystem health.

6 ANNEX 1

Table 18 Summary of Stakeholder views of the Common Fisheries Policy and its upcoming reform

Stakeholder	CFP Topic	Position
North Sea Regional Advisory Council	Strengthen fisheries science	• Stakeholders should have more direct role in formulating requests for scientific advice • More industry science partnerships must be established to provide additional sources of data • Concerned about ICES decision to remain independent. • May be scope for STECF to take more central role in providing scientific advice • Each RAC should provide a forum between scientists and stakeholders to reduce uncertainties and discuss how outstanding issues can be resolved • ICES and RACs should play a role in preparing management plans and options, not ICES alone.
	Long term management plans	• Agree with moving towards long term management plans for principal fisheries, but must be well founded in biological and economic terms, be transparent, take into account impacts on wider ecosystem and species interactions, and should be prepared for each fishery rather than single stocks.
	Rights based management	• Do not want EC introducing another top-down intervention that jeopardizes relative stability, which has already shown itself to be a flexible instrument through swaps and transfer arrangements between MS. This could possibly be further developed under revised CFP.
	Results based management	• One possibility is removing EC, Ministers and Parliament entirely from micro-management of fisheries; with fishing organizations taking direct responsibility through specifically tailored management plans.
	Regional advisory councils	• Suggest a small research and policy support unit be funded to improve interaction with scientists.
	Regional decisions	• Where policy decisions affect a particular region, decision-making authority should be devolved to a sub-committee of relevant regional ministers that would agree on approach for formal ratification at Council. • Is critical that CFP takes into account social/institutional factors into account. Will incentivise fishing industry to take responsibility for its own activities.
	Comitology	• Want further delegation of decision making authority to groups of MS officials.
	6 and 12 mile limits	• Want the present limits retained.
	Fishing capacity	• In favour of publically funded, voluntary decommissioning schemes where there is a need for them.
	General	• Regulatory Impact Statements further developed and strengthened • Control and enforcement be improved • Improved management of Special Areas of Conservation (SACs), including coherent designation of areas across MS and improved stakeholder consultation. • Concerned about integration of environmental and fisheries interests in CFP.
Coalition for Fair Fisheries Arrangements	General	• CFFA position is to support such broad based review, given the continuous failure of the CFP
	Social and economic factors	• Demand that all proposals should be accompanied by a social and economic impact assessment, looking in particular at impacts on the small scale fishing sector. We also demand that, based on these impact assessment, accompanying measures are proposed to mitigate any negative impact such measures may have on small scale fishing communities.

Denmark Ministry of Food, Agriculture and Fisheries	Catch limits	• fishery should be exercised within clear impact limits. First and foremost in the form of the total outtake of stocks: The individual fisherman should be accountable for his total catches, not just his landings at port after having discarded less valuable fish.
	Improved monitoring and incentives	• It has to be the responsibility of the fisherman to document his use of the resource and should take that responsibility by own choice. • Fishermen able to fish in a selective way will have a clear interest in such a regime: They should get the benefit of increased vessel quotas to reflect that all catches are counted against the quota. Control could be simplified and reduced, and days at sea restrictions would be irrelevant. • Politically the new regime could be implemented gradually in a "second management track", without compromising the possibility of fishers to continue fishing under the present regime.
German Ministry of Food, Agriculture and Consumer Protection	Ecologically sound and sustainable concept in resource management	• Fixing of annual catch levels by the Fisheries Council exclusively on the basis of scientific recommendations according to the precautionary principle. For reasons of political expediency, the Fisheries Council frequently deviated from the scientific recommendations in the past. This must no longer happen in the future. • developing multiannual eco-system-oriented management strategies encompassing several fish species. Fisheries are frequently polyvalent, i.e. several species are being fished at the same time. This must be taken into consideration when fixing catch levels. The additional biological and ecological data required for this must be permanently collected by fisheries research as a priority task. • Need to improve technical measures for stock conservation such as gear selectivity, catch monitoring, reduce discards and at least a reduction of industrial fisheries in the short term
	Reduction of overcapacity	• A balance between fleet capacities and available resources on the basis of the precautionary principle • Immediate scrapping of vessels • Determining a limited number of days at sea or days of fishing to reduce the fishing pressure on particularly threatened stocks in the short term • By law the fishermen are only allowed to fish during specific fishing periods • Improvement and intensification of inspection • Rejects supporting the fleets with public funds until a balance between the fishing opportunities and the fishing capacities is re-established.
Ireland Department of Agriculture and Food	Protection of small scale fisheries	• will not support a policy which promotes the concentration of activity and benefits in the hands of a small number of large companies • aim is for a policy which maximises the development of all our coastal communities and for this reason it is vital that quotas and their management are retained under national competence and not moved to a market based mechanism • would involve the introduction of a strict days at sea limitations for fishing vessels operating off the South and West coast
United Kingdom Government - DEFRA	General	• Over centralization and a top-down management approach have served to alienate stakeholders and undermined the CFP. • Aim for more stable regulations and effective longer-term management planning – meaning fewer detailed changes each year; more regional management; and more involvement in management. by fishermen and other stakeholders.
	Decommissioning schemes	• Urge MS to resist calls for subsidies to offset fishing vessels' rising operation costs. Public aid should instead be channeled into attractive decommissioning schemes and into the economic diversification of fisheries-dependent coastal communities.
	Regional management	• Decentralised management, whereby strategic objectives are set centrally and are delivered through methods devised at a regional level. • Creation of RACs is a positive step in this direction. • Agenda driving reform should be the Council and Commission working closely with regional management bodies, who should take the lead in devising strategies for delivering the desired outcomes.
	Effort reduction	• A toolkit of measures is necessary to bring fishing capacity and fishing opportunities into balance, including TACs, quotas, effort controls, and technical measures such as closures.
UK National	Decentralising	• that the CFP cannot be successfully managed on a command and control basis because of its scale and the variety and complexity of the fisheries under it.

Federation of Fishermen Organisations (NFFO)	management	• The alternative is to find ways of delegating management responsibility to the fishing industry, subject to an overall framework and adequate audit arrangements.
Ifremer – French Marine Science Institute		• Stronger dialogue between scientists and fishermen to make the most of real-time observations of fishermen. • efficient stakeholder participation in the improvement of the assessment-advisory process and in the implementation of the ecosystem approach
Spanish Ministry of Environment and Marine Affairs.		• CFP should continue as an integrated policy – progress since last 2002 reform – need to assess weakness and strengths of the current system for future reform. • Successful additions from last reform: long tem management plans, adoption of MSY, improvements in governance, improvements in scientific information, proposal discard policy • The guiding principle for the reform should be to be objective, easy to understand and apply in the fisheries sector and easy to implement and contol by the administrations. • However need for reform on the following issues…
	MSY	• Establish fMSY value to apply in multispecies fisheries. Discussions need to take place on how to set this and what to consider in its establishment: profitability, catch, effect on resource?
	Long term management plans	• • lacking a biological approach to multiannual plans • guidelines would be needed management in the longer term, with a mid-term reviews.
	discards	•
		• The discard problem is mostly blamed on the absence of selectivity in various fisheries, but they also are caused by a lack of fishing quotas
	Ecosystem approach	• Need to extend policy to cover all marine activities that have an impact on the marine environment and also to go beyond the 'european community' approach to a more international view. • The fisheries sector should not be the only one faced with the implications linked to the application of the ecosystem approach.
	Governance	• RACs should be developed to become true consultation bodies • Increase representation of the sector in government bodies • Recognize importance of both written and spoken languages • Need for more flexible governance structures that consider the characteristics of the industry and the various Member States. • Establish a proper mechanism for the development of regulations/rules with appropriate deadlines
	Scientific advice/information	• Bring scientific community and fishing community closer together • Increase awareness and sense of consciousness in the fisheries sector • Develop a new normative framework
	TACs/quotas	• Currently system is too rigid • Based on a principle which differs from the current reality of that state of the fishing industry and fisheries-dependent populations of Member States. • Not approved of by the fisheries sector, by government administrations or by scientists. • There is a lack of quotas • Fishermen are worried because their fishing opportunities are being reduced

		• Quota swaps between member states do not resolve the lack of quota problem • There are fishery closures for species caught in other multispecies fisheries • The lack of quotas leads to high grading • Sometimes fishermen cannot fish because the quotas have already been exceeded and the fishery is closed.
	Other	• Improve scientific coordination in RFMOs • Push for equitable governance criteria for the members of RFMOs. • Reinforce RFMOs, their role and their presence in the European community. • Continue fight against IUU fishing • Maintain fisheries agreements and establish new ones to facilitate access of the fleet community to new fishing grounds
Long distance fleet RAC		• The new CFP should continue to promote access EU ships to the waters of Third Countries • Community action in the RFMOs is essential in the fight against IUU fishing • The EU is a major world destinations of fishery products, need to adapt its policy on the common organization of the markets to be a policy of responsible and sustainable fisheries. Need to reward compliant activities and penalize illegal activities.
Italian Ministry for Agricultural policy, forests and food.	General	• Not even been a mid term review – a reform of the CFP is welcomed. Considers that there are significant shortcomings to be addressed. • The only point actually included for obligatory reform, review is article 17, point 2 which deals with the access rights in territorial 12nm zone • Disagree with the conclusions in the working group report of the Commission in September 2008 which put the blame of the CFP failures on the quota system and the Council decision making process. The issues and system in relation to setting quotas are not the same throughout Europe. In the Mediterranean and Black Sea, quotas are set by the GFCM and tuna quotas for Europe are set by ICCAT. • Also disagree with the Commission and the indication in the working document of the 17th September that ecological sustainability should prevail over that of social and economic
	Decentralization of decision-making	• Need to implement a more flexible system for the conservation of resources which is responsive to the different local situations –the multi-annual planning framework and the establishment of the RACs are already a step in this direction. • Propose also that this approach is extended to national management plans following the 2006 Mediterranean regulation and renewed technical measures.
	Capacity reduction	• scrapping of vessels to reduce fishing capacity reduction, there should continue to be the key objective in future CFP • Over the last 15 years, capacity has been reduced about 5% in terms of tonnage and 2% in engine power. The costs in terms of social and economic policy should be subject to thorough evaluation. •
	Common organization of the markets	• The current role of producer organizations is generally limited, particularly for management and, consequently, in the process of price formation. • Although a reform of the COM policy is planned in any case, the purpose of better marketing and promotion of products should also be included in the debate on the new CFP • A more satisfactory and stable profitability may induce fishermen to limit fishing effort and the number of days spent at sea. •
	simplification	• Need to simplify the regional regulation, which has become too complex for national authorities and operators. • Some progress has been made – for instance in the preparation for the annual decision-making meeting on setting quotas. Much remains to be done. • An example of regulatory complexity is the regulatory framework on recovery of stocks, which include recovery plans long-term management plans both at the EU and national level. Although these plans are formally different, their objective is similar: the preservation and protection of stocks over the long term, the adjustment of fishing effort in accordance with the state of resources.

	Other	• The next Common Fisheries Policy must be ambitious, but must be supported by an adequate amount of resources financial planning in the period after 2013. • The process of reform of the CFP coincide substantially with that for revision of the common budget. The hope is that, in the end, the funds available are consistent with the objectives set.
Portuguese Ministry for agriculture, rural development and fisheries.	Access to territorial waters	• essential to avoid an excessive increase in fishing effort to ensure the sustainability of species whose stocks are in poor conditions or are simply highly sensitive. • Also important to ensure the sustainability of traditional small-scale fishing activities from which many small fishing communities still depend on. • Current system of reserving fishing rights in the 12nm (territorial waters) for artisanal fishermen and fishery dependent coastal communities should be maintained and perhaps even extended to cover the outermost regions in the Azores and Madeira. • The option of establishing fishing agreements between neighbouring Member States is seen as a positive development, providing the needed flexibility to ensure good management of between neighbouring countries.
	Fleet management	• Necessary to continue the adjustment of capacity of certain segments of the fleet specialized in certain species. • Portugal has made substantial fleet reductions and will continue to do so. Since 2004, no funding has been given for new vessel construction. • Believe it is possible to reduce fleet capacity and, simultaneously, renewing and modernizing it. Many old vessels still need to be modernized to improve on-board fish conservation, health and safety conditions and improve fuel economy. • Currently the industry per se does not have funding capacity to implement these renovations. • Need to define more suitable parameters for assessing capacity rather than just tonnage and Kw power.
	Resource management	• TACs are not appropriate for multi-species fisheries management. When the quota of one species is reached, it is not feasible to stop the fleet. The continuation of the activity has the effect increasing discards • Management of fishing effort should be combined with a set of appropriate technical measures including the quantity and technical characteristics of fishing gear as well as the implementation of exclusion boxes or closed areas in pre-defined locations in order to preserve sensitive species. • Robust stock assessment procedures are essential for fisheries management and should be strengthened. • Management should be guided by an ecosystem and precautionary approach
	Relative Stability	• The principle of fisheries stability should be maintained. It gives the guarantee to Member States of having a share of the fishing opportunity. However, it may be necessary to identify the distortions in the system and correct them. • The rules to be adopted under the reform must take into account the need to ensure equitable access to resources, independent of economic power, and which does not discriminate against small vessels, particularly those dependent on multispecies fisheries. • Have reservations towards the adoption of rights based management system. Believe that the current quota allocation system should continue as this considers the differences between the Member States and respects the principle of subsidiarity. • Advocate that the key decisions, for instance the establishment of principles and decisions important for implementation activities should continue to be taken by the Council maintaining the current balance in the distribution of powers. • Believe that the management of fishery resources is not a purely technical matter. Therefore, we believe that the principle of subsidiarity should be the guideline of the governance system.
	Control	• Importance of the proposal for reform already put forward stresses the following concerns from Portugal: the feasibility and fairness of the measures to be adopted, and the respect of powers and obligations of Member States in this regard.
	Other	• Importance of considering economic social and environmental aspects equally. Equality, sharing of resources and improving efficiency in certain aspects of the CFP were also mentioned. • Positive developments since last reform include the formation of the RACs and multi annual management plans. • Yet, overcapacity and the poor state of fishery resources persists.
Greek stakeholders		• The individualization of the quotas is a practice which will lead to further oppression of the small scale fisheries sector. The CFP must take into consideration the importance of this sector for Greece (from a socioeconomic point of view) as it occupies 44% of the Greek

including Minsitry of Environment and fishing associations		fishery workforce and constitutes 96% of the Greek fishing fleet.
	Support artisanal small scale fisheries	• The CFP must support the small scale fisheries as it represents a major economic activity in some of the most disadvantaged and isolated regions of the EU, support the women's participation, and provide incentives for the entry of new fishermen to the profession, as well as support organizations of artisanal fishermen and improve the infrastructure of the distribution chain and certain fishing methods.
	Participatory governance	• Active representation of all the fishermen's associations in decision-making bodies and in public hearings where the context, priorities and timetable for completion in local, regional and European level will be organized will be very welcome from the sector.
	Regional considerations	• Concerning the management of resources, the CFP must take into consideration the fact that the Mediterranean has many special features as it mainly consists of international waters, there are non-EU fishing fleets not operating under the CFP directives.
	Definition of fishing capacity – adapted to small scale fisheries	• The determination of the fishing capacity must be subjected not only to the gross tonnage (GT) and the engine power (KW) of the vessel, but also to the vessel's characteristics, gears and technology used. The engine power of the small scale fisheries' vessels should not be subjected under consideration for the estimation of the fishing capacity, as these vessels use static gears and their engines power is not affecting their actual fishing capacity.

Source: Compiled by MRAG from interviews, consultations with stakeholders and published material from these groups.

Table 19 Recent history of decision making in stocks without recovery/multiannual plans.

The table shows the difference between the final Council decision on the TAC and the Commission proposal.

Other species

Species (Common Name)	*Species (Latin Name)*	ICES Fishing Zone	Diff as % of actual (2009)	Diff as % of actual (2008)
Greater silver smelt	*Argentina silus*	I, II (EU and International waters)	0	0
Greater silver smelt	*Argentina silus*	III, IV (EU and International waters)	0	0
Greater silver smelt	*Argentina silus*	V, VI, VII (EU and International waters)	0	0
Tusk	*Brosme brosme*	EU and international waters of I, II and XIV	16.66667	56.52174
Tusk	*Brosme brosme*	EU and international waters of III	14.28571	0
Tusk	*Brosme brosme*	EU and international waters of IV	15.15152	3.896104
Herring	*Clupea harengus*	VIaS, VIIbc	6.248658	10.71122
Herring	*Clupea harengus*	VIa Clyde	15	15
Herring	*Clupea harengus*	VIIa	8.333333	8.333333
Herring	*Clupea harengus*	VIIe, f	0	0
Herring	*Clupea harengus*	VIIg, h, j, k	0	10.70976
Anchovy	*Engraulis encrasicolus*	VIII	0	0
Anchovy	*Engraulis encrasicolus*	IX, X, CECAF 34.1.1 (EU waters)	15	15
Cod	*Gadus morhua*	VIIa	0	8.507089
Cod	*Gadus morhua*	NAFO 2J3KL	0	0
Cod	*Gadus morhua*	NAFO 3NO	0	0
Cod	*Gadus morhua*	NAFO 3M	0	0
Witch flounder	*Glyptocephalus cynoglossus*	NAFO 2J3KL	0	0
Witch flounder	*Glyptocephalus cynoglossus*	NAFO 3NO	0	0
American Plaice	*Hippoglossoides platessoides*	NAFO 3M	0	0
American Plaice	*Hippoglossoides platessoides*	NAFO 3LNO	0	0
Short fin squid	*Illex illecebrosus*	NAFO sub-zones 3 and 4	0	0
Megrims	*Lepidorhombus spp.*	IIa (EU waters), IV (EU waters)	15.02818	7.388854
Megrims	*Lepidorhombus spp.*	Vb (EU waters), VI, XII, XIV	21.29332	5.555556
Megrims	*Lepidorhombus spp.*	VII	15	15
Megrims	*Lepidorhombus spp.*	VIII a,b,d,e	15.01176	15.01176
Megrims	*Lepidorhombus spp.*	VIIIc, IX, X, CECAF 34.1.1 (EU waters)	0	0

Yellowtail flounder	*Limanda ferruginea*	NAFO 3LNO	90	0
Common dab and Flounder	*Limanda limanda and Platichthys flesus*	IIa (EU waters), IV (EU waters)	10	18.18182
Anglerfish	*Lophiidae*	IIa (EU waters), IV (EU waters)	0	0
Anglerfish	*Lophiidae*	Vb (EU waters), VI, XII, XIV	7.400754	0
Anglerfish	*Lophiidae*	VII	8.333333	8.333333
Anglerfish	*Lophiidae*	VIIIa,b,d,e	8.333333	8.333333
Anglerfish	*Lophiidae*	VIIIc, IX, X, CECAF 31.1.1 (EU waters)	16.70455	25.01279
Capelin	*Mallotus villosus*	IIb	0	0
Capelin	*Mallotus villosus*	NAFO 3NO	0	0
Haddock	*Melanogrammus aeglefinus*	VIb, XII, XIV	0	23.26489
Haddock	*Melanogrammus aeglefinus*	Vb, VIa (EU waters)	-30.5461	25.65359
Haddock	*Melanogrammus aeglefinus*	VII, VIII, IX, X, CECAF 34.1.1 (EU waters)	24.08671	15.43311
Haddock	*Melanogrammus aeglefinus*	VIIa	0	19.063
Whiting	*Merlangius merlangus*	Vb (EU waters), VI, XII, XIV	0	0
Whiting	*Merlangius merlangus*	VIIa	0	0
Whiting	*Merlangius merlangus*	VIIb, c, d, e, f, g, h, k	0	15
Whiting	*Merlangius merlangus*	VIII	15	15
Whiting	*Merlangius merlangus*	IX, X, CECAF 31.1.1 (EU waters)	15.00766	15.00766
Hake	*Merluccius merluccius*	VIII a, b, d, e	0	0
Lemon sole and Witch	*Microstomus kitt & Glyptocephalus cynoglossus*	IIa (EU waters), IV (EU waters)	9.995584	18.18048
Ling	*Molva molva*	I, II (EU and International waters)	15.55556	0
Ling	*Molva molva*	IIIa, EU waters of IIIb,c,d	15	5
Ling	*Molva molva*	IV (EU waters)	14.98599	2.80112
Ling	*Molva molva*	V (EU and International waters)	0	0
Norway lobster	*Nephrops norvegicus*	IIIa (EU waters), IIIbcd (EU waters)	0	0
Norway lobster	*Nephrops norvegicus*	IIa (EU waters), IV (EU waters)	4.944236	0
Norway lobster	*Nephrops norvegicus*	Vb(EU waters), VI	10.52882	0
Norway lobster	*Nephrops norvegicus*	VII	13.26572	0
Norway lobster	*Nephrops norvegicus*	VIII a,b,d,e	10.52632	0
'Penaeus' shrimps	*Penaeus spp.*	French Guyana	0	0
Plaice	*Pleuronectes platessa*	Vb (EU waters), VI, XII, XIV	0	15.01272
Plaice	*Pleuronectes platessa*	VIIa	0	5.895078
Plaice	*Pleuronectes platessa*	VII b, c	0	5.454545
Plaice	*Pleuronectes platessa*	VII d, e	4.842876	9.366337
Plaice	*Pleuronectes platessa*	VII f, g	0	0
Plaice	*Pleuronectes platessa*	VII h, j, k	0	5.610561
Plaice	*Pleuronectes platessa*	VIII, IX, X, CECAF 34.1.1 (EU	14.95536	14.95536

		waters)		
Pollack	*Pollachius pollachius*	Vb (EU waters), VI, XII, XIV	97.06873	14.88889
Pollack	*Pollachius pollachius*	VII	15	0
Pollack	*Pollachius pollachius*	VIII a, b, d, e	0	0
Pollack	*Pollachius pollachius*	VIIIc	14.8855	14.8855
Pollack	*Pollachius pollachius*	IX, X, CECAF 34.1.1 (EU waters)	14.93056	14.93056
Saithe	*Pollachius virens*	VII, VIII, IX, X, CECAF 34.1.1 (EU waters)	14.98681	0
Turbot and brill	*Psetta maxima & Scophthalmus rhombus*	IIa (EU waters), IV (EU waters)	9.9943	26.06878
Skates and rays	*Rajidae*	IIa (EU waters), IV (EU waters)	0	0
Skates	*Rajidae*	NAFO 3LNO	-58.8235	0
Greenland halibut	*Reinhardtius hippoglossoides*	NAFO 3LMNO	0	0
Redfish	*Sebastes spp.*	NAFO 3M	-8.79304	0
Redfish	*Sebastes spp.*	NAFO 3LN	0	0
Redfish	*Sebastes spp.*	NAFO 3O	-185.714	0
Redfish	*Sebastes spp.*	NAFO subarea 2, Divisions IF and 3K	0	-35.1578
Common sole	*Solea solea*	IIIa, IIIb,c,d (EU waters)	11.875	18.61702
Common sole	*Solea solea*	Vb (EU waters), VI, XII, XIV	14.70588	14.70588
Common sole	*Solea solea*	VIIa	0	8.520179
Common sole	*Solea solea*	VIIb, c	0	6.779661
Common sole	*Solea solea*	VIId	0	7.932656
Common sole	*Solea solea*	VIIf, g	5.337362	4.564315
Common sole	*Solea solea*	VIIh, j, k	0	14.92308
Sole	*Solea spp.*	VIIIc, d, e, IX, X, CECAF 34.1.1 (EU waters)	14.96711	14.96711
Sprat	*Sprattus sprattus*	IIa (EU waters), IV (EU waters)	-12.7493	0
Sprat	*Sprattus sprattus*	VIId, e	0	15.00651
Horse mackerel	*Trachurus spp.*	X, CECAF Azores	15	15
Horse mackerel	*Trachurus spp.*	CECAF Waters-Madeira	15	15
Horse mackerel	*Trachurus spp.*	CECAF Waters-Canary Islands	15	15
White hake	*Urophycis tenuis*	NAFO 3NO	-70	0

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