

Marine Policy

January 2015, Volume 51 Pages 375-384

<http://dx.doi.org/10.1016/j.marpol.2014.09.022><http://archimer.ifremer.fr/doc/00248/35912/>

© 2014 Elsevier Ltd. All rights reserved.

Archimer
<http://archimer.ifremer.fr>

The regional management of fisheries in European Western Waters

Le Floch Pascal^{1,2,*}, Murillas Arantza¹, Aranda Martin¹, Daures Fabienne^{1,2}, Fitzpatrick Mike¹,
Guyader Olivier^{1,2}, Hatcher Aaron¹, Macher Claire^{1,2}, Marchal Paul^{1,2}

¹ Université de Brest, UMR Amure, Quimper, France

² Ifremer, France

* Corresponding author : Pascal Le Floch', email address : plefloch@univ-brest.fr ; amurillas@azti.es ; maranda@azti.es ; fabienne.daures@ifremer.fr ; mike.fitzpatrick@nuigalway.ie ; olivier.guyader@ifremer.fr ; aaron.hatcher@port.ac.uk ; claire.macher@ifremer.fr ; paul.marchal@ifremer.fr

Abstract :

A survey of past and existing management measures applied to different fisheries in European Western Waters is analyzed as a typology of co-management between governments and stakeholders. Faced with increasing constraints on accessing fish stocks, management measures have evolved toward fishing rights individualization, limited access and various other specific measures. Restrictions on access have changed fishermen's behaviour in several significant ways. A comparative analysis, based on qualitative data collected through interviews and focus groups, is developed for fisheries from the following European countries: France, Ireland, Spain and the United Kingdom. Past and existing individual harvesting rights in the four countries are reviewed and compared.

Keywords : Management, Fishery governance, Common Fishery Policy (CFP)

1. Introduction

Managed under the CFP, the European Western Waters fisheries are commercially exploited by fishing fleets from different European countries, including France, Ireland, Spain and the United Kingdom. Various management measures have been put in place, both at national and regional level. At the national level, vessel decommissioning schemes were among the main

39 measures developed in the framework of the first CFP reform (1993-2002). The second
40 reform (2003-2012) was characterised by regional policies such as recovery and management
41 plans.

42

43 A new CFP has been agreed by Council and Parliament to be effective from 1 January 2014
44 (Regulation (EU) No 1380/2013 of the European Parliament and of the Council) after a long
45 public debate launched by the European Commission since 2011. The Green paper on reform
46 of the CFP and the followed citizen's consultation reports outlined different proposals. These
47 included five main policies: the implementation of discard bans, the objective of Maximum
48 Sustainable Yield by 2015, the regionalisation of management measures, an emphasis on the
49 social dimension and the promotion of Transferable Fisheries Concessions (TFCs). Rights-
50 based management has been presented by the EC as a more efficient management approach to
51 reduce overcapacity and give more responsibility to the industry. TFCs have been promoted at
52 the European level, acknowledging that safeguard clauses could be necessary to avoid
53 concentration of property rights (CEC, 2009, p8). Moreover, relative stability should be
54 progressively replaced by a more flexible tool, "such as allocating fishing rights" (CEC, 2009,
55 p16).

56

57 The French State has gradually transferred authority for TAC and quota species management
58 to the Producer's Organisations – PO – (Larabi *et al.*, 2013). Under the management of sub-
59 quotas by POs, new tools, such as landings limits per vessel have been developed (e.g., for
60 hake, anchovy, sole, mackerel). Ireland has promoted the Celtic Sea Herring Management
61 Advisory Committee, in addition to the North Western Regional Advisory Council, created in
62 2004 for strengthening dialogue between stakeholders (Fitzpatrick, 2014b). In Spain, a system
63 of individual quotas for mackerel and horse mackerel has been introduced for purse seiners
64 since 2013. These individual quotas are not tradable. With respect to the Basque offshore
65 fleets, rights are allocated to individual vessels. POs can pool the individual rights of their
66 members and manage them collectively. Quota transferability is possible within and across
67 POs (Aranda *et al.* 2012). In the UK, the quota management system is similarly largely
68 devolved to the POs, except in the case of inshore vessels (under 10m in length) which are
69 still managed centrally (by the Marine Management Organisation (MMO) in England and
70 Wales). Quota trading is possible within and between POs (Hatcher, 1997; Appleby, 2013).

71 The main objective of this paper is to show how management measures have evolved toward
72 fishing rights individualization and limited access among other measures within a general

73 context of restrictions on fish stock access to the resources. Face to new regimes of fisheries
74 management, governance structures at regional and national levels have been adapted.

75 In particular, the increasing role of the fishermen's organisations (e.g. Producer Organizations
76 – POs) in quota management will be analysed together with different forms of co-
77 management regimes. With this aim, a comparative methodology is developed for a case
78 study concentrated on fisheries performed in the European Westerns Waters.

79
80 In particular, this paper looks at the experiences from (i) the French fishing fleets exploiting
81 the Bay of Biscay sole, (ii) the Irish fleets targeting the Celtic Sea herring fishery, (iii) the
82 Spanish Basque purse-seiners exploiting mackerel, anchovy and tuna and the off-shore
83 trawlers targeting hake, megrim and anglerfish, (iv) the Southwest English demersal fishery.
84 Faced with increasing constraints on accessing fish stocks, management measures have
85 evolved for each local case study towards fishing rights individualisation, limited access and
86 other specific management measures.

87
88 The paper is structured as follows: Section 2 lays out a conceptual approach to governance in
89 fisheries management, highlighting the main themes involved at a regional level (governance
90 issue, management measures). Section 3 describes the case studies by country across the
91 Western Waters (in terms of species, gears and fleets). Section 4 explains the management
92 governance at an EU and national levels, and inter-relationships between both levels. Past and
93 existing management measures are presented in Section 5 based on stakeholder's experiences
94 for all four countries. Finally, Section 6 presents a discussion of the main results showing
95 progress realized during the second CFP reform (2003-2012).

96 97 2. A conceptual approach of governance in fisheries management

98
99 In the literature devoted to governance issues in fisheries (Schlager and Ostrom, 1992),
100 fishermen organization , rights-based management, leadership, social capital and
101 regionalization are the main concepts used to highlight the main academic themes for
102 benchmarking in fisheries (Grafton et al., 2007).

103
104 One of the major recent trends in the fishing sector has been the increasing role of fishermen's
105 organisations in quota management (Holland et al., 2013). In France and in the UK, the
106 central administration has gradually transferred the allocation procedures for quotas to POs. In

107 view of quota over-consumption situations, POs have had to introduce new rules within their
 108 organizations to impose limitations on individual consumption by species. The
 109 implementation of individual fishing rights (France, Spain, UK) or access restrictions (Celtic
 110 Sea herring in Ireland) reflects the European debate on transferable fishing concessions (TFC)
 111 within the third reform of the CFP (Symes, 2009).

112
 113 Several kinds of rights-based management systems exist and quotas can be allocated to the
 114 owner, the vessel, but also to a collective i.e. a community or fishermen organisation
 115 (Costello et al., 2008). Quota can be spatial and concern one or several species. Their
 116 transferability is not necessarily without limits. Overall, a rights-based management system
 117 could be adapted to different fisheries. The success of rights-based management, specifically
 118 transferable fishing concessions in the new CFP reform (EC, 2013), depends on the
 119 governance arrangements which could be a top-down/bottom-up procedure or a regionalized
 120 approach (Hegland *et al.*, 2012; Gezelius *et al.*, 2010). Other assets required for better
 121 fisheries management such as leadership amongst direct users of fisheries (Gutierrez et al.,
 122 2011). All attributes related to co-management (fishermen's organisation, social capital,
 123 leadership, regionalisation, right-based management) are key-elements of the institutional
 124 arrangements (Hilborn et al., 2005). Table 1 offers a synthesis of an analytical framework for
 125 fisheries co-management describing five broad types. This paper will highlight the progress of
 126 the different management measures in Western Waters by adopting different co-management
 127 systems according to the typology presented in Table 1.

128
 129 Table 1. Typology of co-management

130

Type of co-management		Relationships	Nature of management
Top-down management by the state	hierarchical	Minimal exchange of information between government and users	Centralized
Co-management consultation	by	Extensive and formal mechanisms for consultation	Centralized
Co-management by partnership		Government and users as decision- making partners	Co-managed
Co-management by delegation		Users as decision-makers, but endorsed by Government	Decentralized
Industry self-management with		Users as decision-makers,	Decentralized

131 Source: adapted from Raakjaer, 2009 and Hegland *et al.*, 2012

132

133 This typology is rooted in the classification proposed by Sen and Nielsen (1996), which
134 considered five institutional arrangements between Government and local stakeholders. Only
135 one type of fisheries management process can be defined as a pure co-management scheme
136 (co-management by partnership), where Government and users of the marine resource
137 (fishermen, processors, non-governmental organizations) act as decision-making partners
138 (Jentoft, 1989). The four other alternatives adopt either a centralized or decentralized
139 procedure. Detailed information on the different case studies follows.

140

141 3. Methodology

142

143 The European research project SOCIOEC is an interdisciplinary, European wide project
144 bringing together scientists from several fisheries sciences with industry partners and other
145 key stakeholders. The case studies investigated under the SOCIOEC research project are the
146 Western Waters fisheries, the Baltic Sea, the Mediterranean Sea and the Black Sea, the North
147 Sea, and the Pelagic fisheries. Non-EU fisheries are included for comparative assessment
148 (Iceland, Australia, New-Zealand). In the case of the Western Waters, four countries (France,
149 Ireland, Spain and UK), are compared for a better understanding of socio-economic effects of
150 the main management principles under the CFP (SOCIOEC, 2013).

151

152 A comparative methodology, based on qualitative data collected through interviews and focus
153 groups, is developed for each case study. Lists of past and existing management measures
154 applied in Western Waters are analyzed against a typology of co-management between
155 government and stakeholders. Restrictions on fish stocks access have changed fishermen's
156 behaviour in several significant ways. This paper compares the experiences and outcomes of
157 the four different Western Waters nations management approaches in the context of the
158 current CFP reforms.

159

160 Spatial distribution of all segments indicates heterogeneous experiences in Western Waters
161 (Figure 1). Spatial dynamics reveal highly different vessel movements at sea. Spanish fleets
162 located in areas VI and VII are subjected to the largest distances. The Herring fishery
163 exploited by the Irish fleets was concentrated on inshore spawning aggregations but fishing

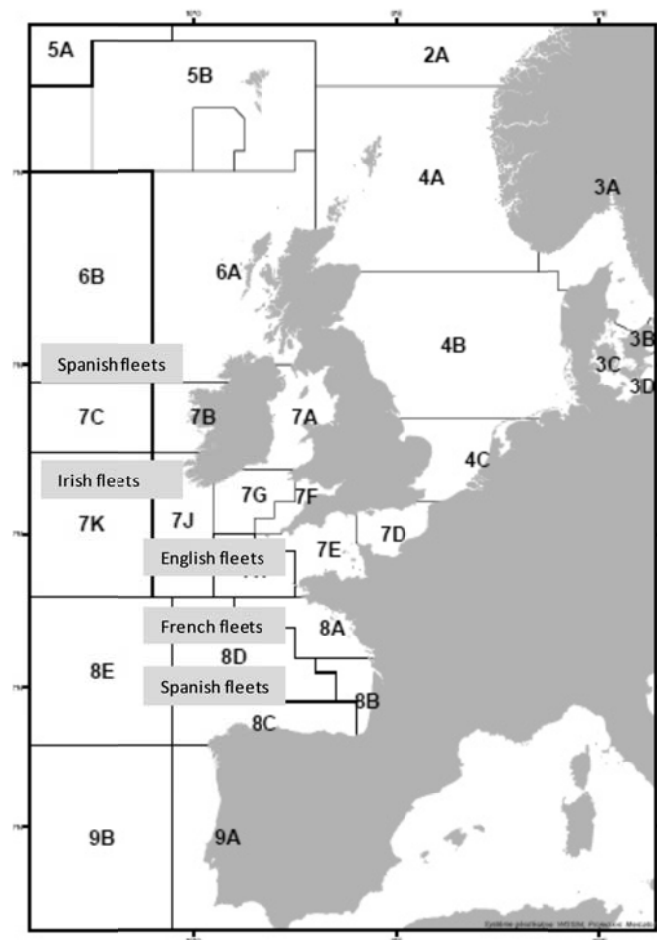
164 activity in the main fishery has moved further offshore in the past few years in order to avoid
165 impacts on spawning fish. The various spatial locations raise specific organizational
166 arrangements. The French and English vessels are concentrated near their own national
167 coastlines.

168

169 Figure 1. Spatial distribution of fishing effort for the French, the Irish, the Spanish Basque and the
170 English demersal fleets

171

172



173

174

175

176

Source: Anonymous, 2013

177 The main characteristics explored through interviews and focus groups are internal factors of
178 regional and local fisheries. These internal factors can be rights and rules adopted by
179 fishermen, their legitimacy and their enforcement compliance, power structures inside
180 institutional and organizational arrangements, and leadership (Gutierrez *et al.*, 2011). These
181 characteristics define decision-making arrangements. Semi-structured interviews and focus

182 groups were conducted at different scales for each sub-case study in France, Ireland, Spain
 183 and the UK, with the aim of achieving several objectives: to begin with, qualitative
 184 information was collected on fishermen's incentives to change or adapt fishing behaviour in
 185 view of tighter constraints for access regulation of stocks. A second issue relates to managers'
 186 capabilities. The professional skills and qualifications of local and regional managers are key
 187 elements in evaluating their ability to deal with external shocks. Another issue deserving
 188 attention in the process of interviews and focus groups is the managers' use of financial
 189 resources. New fisheries management measures require new methods of collecting and
 190 spending appropriated budgets. Finally, the success and failure of previous and existing
 191 management measures are also closely dependent on communication methods between
 192 managers and fishermen.

193
 194

195 4. The fisheries, with particular reference to species, gears and fleets

196

197 Each country is characterized by multi-fleet and multi-species fishing, located in main areas
 198 of the European Western Waters. Detailed information about fishing areas, fleet
 199 characteristics and target species are shown in Table 2.

200

201 Table 2. Characteristics of the case studies
 202

Sub-case	ICES areas	Fleet	Length range (meters)	Target Species
The French fleets	VIII Bay of Biscay	Bottom trawlers	12-16 m.	Nephrops, Sole, Hake
			16-20 m.	
			20-24 m.	
		Gill-netters	<12 m.	Sole, Hake
			12-16 m.	
The Spanish fleets	VIII Bay of Biscay	Purse-seiners	20-38 m.	Anchovy, Tuna, Mackerel
		Mixed trawlers	30-43 m.	Hake, Megrim, Anglerfish
	VI/VII	Mixed Trawlers	30-43 m.	
The Irish fleets	VII Celtic Sea	Polyvalent trawlers	15-20 m.	Herring, pelagic and demersal
			20-24 m.	
			>24 m.	
		The sentinel fishery	<15 m.	Herring and shellfish
The English fleets	VII/VIII	Trawlers, netters	10-24 m.	Mixed demersal
			24-40 m.	
		Beam trawlers, dredgers	21 m.	Sole, Plaice, Scallops
			28 m.	

203

204

205 *French demersal fleets operating in the Bay of Biscay (BoB)*

206 The demersal fishery in the Bay of Biscay is mainly exploited by French fishing fleets with
207 Spanish and Belgian fleets also catching hake and sole in this area. This fishery is of great
208 interest to scientists and professionals (fishermen and other stakeholders). Targeted species
209 include nephrops, sole and hake which are among the 10 most important commercial species
210 (in value) for the French fishing fleets. 700 French vessels of different sizes (less than 10
211 meters to more than 20 meters) with 2000 fishermen are involved in the Bay of Biscay
212 demersal fishery. These vessels are mostly trawlers and gillnetters. Their total landings
213 amount to 50,000 tons with a value of €270 m yearly, representing more than 30% of the
214 French total landings value. With annual landings between 5,500 to 7,500 tons (€65 to €85
215 millions), sole is one of the three main commercial species at the national level. The BoB
216 landings for sole, mostly for the fresh market, contribute 60% of the sole national landings
217 with a value of €5 m The French fleet accounts for around 90% of the total landings in the
218 Bay of Biscay sole fishery. French gillnetters are the major contributors to the sole catches,
219 followed by French trawlers (targeting sole, cuttlefish, squid, hake or whiting) and Belgian
220 beam trawlers (exploiting sole in the Bay of Biscay in summertime).

221

222 *Irish fleets targeting Celtic Sea Herring*

223 There are two distinct Irish fleets targeting Celtic Sea herring. The main fishery, which is
224 allocated 89% of the Irish quota, comprises vessels mainly over 15 meters in length and has a
225 mix of multipurpose vessels which switch between pelagic and demersal species throughout
226 the year and solely pelagic vessels which use refrigerated sea water tanks to store their catch.
227 There is also a small-scale fleet, known as the sentinel fishery, which is allocated 11% of the
228 quota and which can fish inside a specific area closed to fishing by larger vessels in order to
229 protect spawning herring. The numbers of vessels in this fleet have increased from 4 in 2009
230 to 16 in 2012. The majority of these vessels are approximately 10 meters in length. The main
231 fishery occurs between September and November while the sentinel fishery occurs between
232 November and February. Both fleets (main and sentinel) are multispecies fleets. Many of the
233 smaller sentinel fishery vessels target shellfish with pot fisheries outside of the herring season.
234 The multipurpose vessels in the main fishery usually focus on trawling for mixed demersal
235 species in the Celtic Sea when not fishing for herring while the pelagic vessels also target
236 mackerel, other herring stocks, blue whiting, horse mackerel, sprat, albacore tuna and boarfish

237 when not targeting Celtic Sea herring. All of these vessels fish use the method of pair pelagic
238 trawling.

239

240 *Basque purse-seiner and trawler fleets (BoB and ICES areas VI and VII)*

241 The “Baka” trawlers of Spain and particularly the Basque country fleet (north-east of Spain)
242 operate in ICES Sub-areas VI, VII and VIII a, b, d. “Baka” trawlers can be defined as a single
243 vessel which trawls a “bottom net” operating in contact with the seabed. These vessels exploit
244 multi-species fisheries targeting mainly, hake, anglerfish and megrim; the average storage
245 capacity is 50 tons. Bottom pair trawlers comprise two vessels trawling a single very high
246 vertical opening net. The main target species is hake. The Basque fleet currently includes 11
247 otter trawler fishing vessels, with an average length of 38 meters and an average power of 461
248 kW. A single otter trawler crew is made up of 13 fishermen, with a fleet employing around
249 143 people. The most important social impact over the last decade is due to the decrease in
250 vessel number. The size of the Basque trawler fleet fell by 60% between 1992 and 2010.
251 Their total landings account for 140,000 tons with a total annual revenue of €290 m. The
252 Basque fleet includes 42 purse-seiners of an average length of 32 meters and an average
253 power of 467 kW. A single purse seiner operates with 12 fishermen, with the fleet employing
254 around 500 people. The fleet is multispecies, distributing its activity across the mackerel,
255 anchovy and tuna seasons. The purse seiners can shift fishing gear to pole and line (using live
256 bait), hand lines and trolling, depending on the species and fishing season. Their total landings
257 amount to 19,000 tons with a total annual revenue of €32m.

258

259 *SW English demersal fleets*

260 Most of the UK-registered vessels fishing in Western Waters (ICES sub-areas VII and VIII)
261 belong to two POs: the *South Western Fish Producers’ Organisation* (SWFPO) and the
262 *Cornish Fish Producers’ Organisation* (CFPO). Between them, these POs represent the
263 majority of fishing vessels based in South West England (principally the counties of Devon
264 and Cornwall), although they both also have member vessels from other parts of the UK. The
265 UK Western Waters offshore demersal fleet includes beam trawlers, demersal trawlers, liners
266 and netters. Main target stocks include sole, plaice, hake, megrim and monkfish. The principal
267 landing ports for SW English vessels are Brixham in Devon (particularly for the SWFPO
268 vessels) and Newlyn in Cornwall (for CFPO vessels). Other important landing ports include
269 Plymouth in Devon and Looe in Cornwall, although landings are also made into French and
270 Belgian ports. Brixham is a major port for beam trawlers landing sole and plaice as well as

271 scallops. There is an important seasonal fishery for cuttlefish. Newlyn also receives
 272 significant landings from liners, netters and demersal trawlers catching hake and megrim.
 273 These high-value fisheries predominantly supply European export markets such as France and
 274 Spain. There are just under 200 vessels in the CFPO, of which around 80 are inshore vessels
 275 (10 meters or under in overall length). The SWFPO has about 70 over 10 meters vessels and
 276 only 8 inshore vessels. Approximately half the offshore vessels in the SWFPO are beam
 277 trawlers and/or scallop dredgers.

278

279 5. Management governance: national and EU and inter-relationships

280

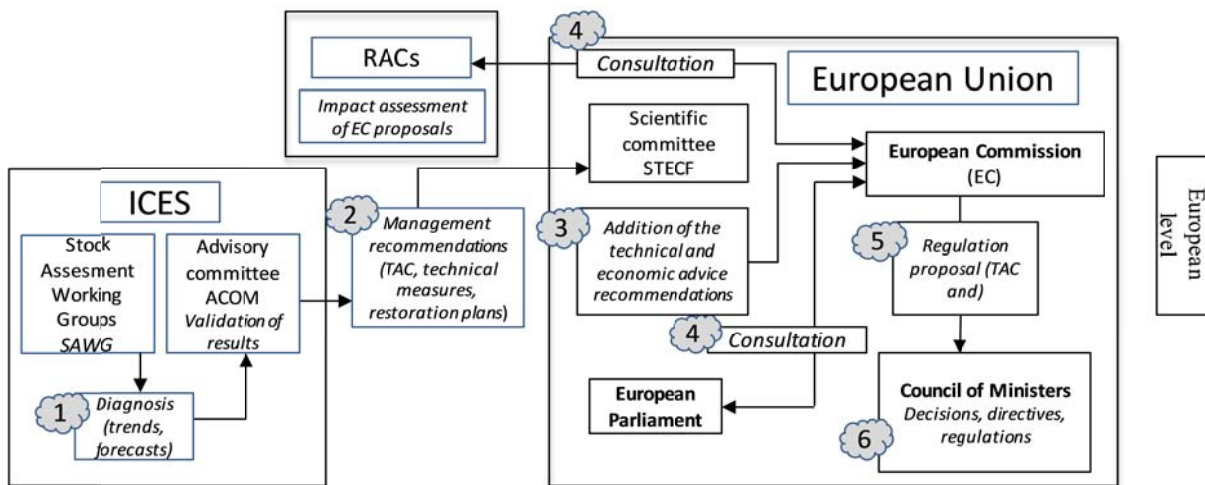
281 The CFP, implemented in 1983, has been reformed three times, in 1992, 2002 and 2013
 282 (Figure 2). In each instance, reforms aimed to preserve declining fish stocks. The late 1980s
 283 saw the fishing industry become a victim of its own success: high prices for fish landings led
 284 the industry to over-invest, which led to overfishing. Some claimed this was exacerbated by
 285 EU fishing industry grants, which were seen as a good way to promote regional development.
 286 The 2002 review withdrew the grants allocated to build new boats and provided incentives for
 287 decommissioning existing vessels. Recovery plans were also adopted in relation to specific
 288 threatened species, while management plans were implemented for some other stocks. In
 289 addition, a Compliance Scoreboard was published for member states and a code of conduct
 290 for responsible fishing was developed.

291

292

Figure 2. Fisheries management's institutional organisation

293



294

295

296

Source: Lagièrre et al., 2013.

297

298 The third CFP came into force on January 1 2003, with the creation of the Regional Advisory
299 Councils (RACs). The RACs include stakeholders split into working groups. Focus group
300 methodology is well known in the fisheries fields, serving as advisory boards and stock and
301 impact assessments of European Commission proposals.

302

303 On 13 July 2011, the European Commission presented its proposals for the third reform of the
304 EU Common Fisheries Policy (Commission of the European Communities, 2009). These
305 included the implementation of discard bans, explicit reference to Maximum Sustainable
306 Yield as a management objective, more incentives given to strengthen the regionalisation of
307 management, an increased focus on social sustainability, and the promotion of Transferable
308 Fisheries Concessions (TFC). The fourth Common Fisheries Policy is being implemented
309 during the course of 2014 (European Commission, 2013).

310

311 *France*

312 Management responsibility for French quota involves three main players: The Department for
313 Marine Fisheries and Aquaculture is responsible for allocating and controlling national quotas
314 on behalf of the Ministry of Agriculture and Fisheries. Producer Organisations (POs) are
315 authorized by the Central State (Ministry of Agriculture and Fisheries) to manage sub-quotas.
316 20 French POs were recognised by the EU in 2010 (14 located on the Atlantic coast). Vessel
317 owners form the third player in this structure, as members or non-members of one of the POs.
318 The adoption of TFC is officially non-applicable in France under the Fisheries Act adopted in
319 1997. The law prevents the transferability of fishing rights, stating that marine resource are
320 common wealth. Moreover, fishing rights allocated by the central authority (the French
321 Ministry of fisheries) to POs or vessels, as sub-quotas per species, are not transferable. In
322 2006, the legal framework has evolved to give more responsibility to POs (JORF, 2006).
323 Track records per vessel were computed, based on the total landings registered in the years
324 2001, 2002 and 2003 (Larabi et al., 2013). Pioneer POs have experimented with new fisheries
325 management using individual quotas (IQs), without transferability. One of the first fisheries
326 using IQs has been the sole fishery in the Bay of Biscay, with a history of quota over-
327 consumption.

328

329 *Ireland*

330 86% of the Celtic Sea Herring TAC is allocated to Ireland and the fishery has in recent years
331 been mainly exploited by Ireland. The only other significant players involved in the fishery
332 are Dutch and Dutch owned vessels from France and Germany (Marine Institute, 2012).
333 Management responsibility for the Irish quota rests with the Irish fisheries minister and the
334 relevant staff from the Department of Agriculture, Food and the Marine. However in 2005 a
335 management advisory committee which had been operating on an ad hoc basis since 2001 was
336 officially recognized by the Fisheries Minister. This committee, the Celtic Sea Herring
337 Management Advisory Committee (CSHMAC), although officially only advisory in status,
338 following ministerial recognition, found that most of its advice has been accepted. Therefore
339 the management of the fishery could be considered as an informal version of co-management.
340 The committee consists of representatives of four POs, fishermen, processors, scientists, a
341 marine mammal NGO and control authorities. The CSHMAC makes operational level
342 decisions such as the length of the season and the size of weekly allocations within that period
343 while the Minister retains control of who has access rights and in certain cases when the
344 fishery will finish. In 2012 the Fisheries Minister introduced a new ruling which restricted
345 access to the fishery for larger vessels based on a track record of landing a defined quantity of
346 fish within a reference period.

347

348 *Spain*

349 In the case of the Basque country, fisheries institutions play a key role in the day-to-day
350 fishing activity. The pelagic fleet is organised under the umbrella of the “*cofradías*”, which
351 are ancient institutions representing fishermen’s (boat owners’ and crew members’) interests,
352 and centralize trading of the fish caught by their members. In turn, POs regroup the industrial
353 trawler owners. Their initial role was fish trading, but has evolved to include fishing activity
354 management and the administration of all members’ fishing rights and can even extend to
355 proposing conservation and management measures (e.g. limiting landing quantities of small
356 legally marketable fish to improve prices and sustain the stocks). “*Cofradías*” are now
357 assembled under the umbrella of the PO model in order to access the powers that the EU’s
358 legal framework provides for POs, such as proposing market measures that are extended to
359 other producers. Offshore POs are usually associated with both the South Western Waters
360 RAC, and the North Western Waters RAC. Inshore POs take part in the South Western
361 Waters RAC and the Pelagic RAC.

362

363 *UK*

364 In the UK quota management has been substantially devolved to the POs since the 1980s
365 (Hatcher, 1997). Each year the UK national quotas are allocated to the POs who then have
366 responsibility for allocating quota to the individual vessels they represent and managing quota
367 uptake throughout the year. Until 1999 PO quota allocations were based upon average
368 landings of member vessels over the previous three years, but from 1999 these historical
369 rights were “frozen” as Fixed Quota Allocations (FQAs). The FQA holdings of individual
370 vessels now determine the percentages of the UK quotas which the POs receive each year.
371 Each PO can determine how it chooses to allocate quota amongst its membership, for example
372 using individual quotas (IQs) or monthly landings limits from a common quota pool. For the
373 most part, quota uptake by the inshore (10m overall length and under) fleet as well as those
374 few offshore vessels which do not belong to a PO is managed directly by the national fisheries
375 administrations or their appointed agencies (the *Marine Management Organisation* - MMO -
376 in the case of England and Wales). Most UK POs, including those described in this article, are
377 legally constituted as “mutual” societies (fishermen’s organisation but a few are established as
378 private companies. Although quota is not explicitly tradeable in the UK, FQA entitlements
379 can be transferred between licences and there is an active in-year lease market for quota
380 which takes advantage of relaxed rules permitting quota exchanges between POs.

381

382 6. Management measures

383

384 In the late 2000s, individual authorisations were expanded in response to quota
385 overconsumption. These fisheries management measures take various forms such as
386 individual quota for the sole fishery (France), limited access for the Celtic Sea Herring fishery
387 (Ireland), individual daily catch limits for mackerel and anchovy (purse seiners, Spain),
388 individual quota for bluefin tuna (purse seiners, Spain), individual transferable quota for the
389 Spanish trawlers, and “fixed quota allocations” for the UK. These management measures have
390 sometimes called for new partnerships between Government and stakeholders (requiring new
391 forms of incentives, capabilities, financial resources, and communication). This section
392 presents various stakeholders’ experiences from past and existing incentives, management
393 measures and their contribution to the sustainability of the fisheries, representing one of the
394 goals within the new Common Fishery Policy.

395

396 *France: Individual quota on sole Fishery*

397 The Bay of Biscay sole fishery has been under a management plan since 2002. Following a
398 first recovery plan, a multiannual management plan was implemented in 2006 (EC N°
399 388/2006). The first step of the multiannual management plan in 2008 was the restoration of
400 the stock at a level of precautionary spawning biomass. Following the new framework of the
401 CFP Reform, the Bay of Biscay sole management plan implemented in 2006 will become a
402 Bay of Biscay multi-specific management plan. Quota management by POs mainly relies on a
403 quota pooling system with redistribution among members. POs manage sub-quotas allocated
404 by the member state that correspond to their members' rights based on the 2001-2003 track
405 records. Following quota constraints, POs have introduced systems of individual landings
406 limits by vessel. This measure was first used by two POs in 2006 in order to avoid penalties
407 for regular over-consumption of their allocated sole sub-quotas (Larabi *et al.*, 2013). In 2011,
408 with the increasing sub-quota constraints, many POs generalised a limitation system on
409 individual landings for at least the main sole producers, the sole gillnetters. The sole fishery in
410 the Bay of Biscay is commercially exploited by trawlers and gill-netter fleets belonging to one
411 of the nine POs located on the French Atlantic Coast. The 9 POs located on the Atlantic Coast
412 manage 60% of the domestic sole landings. The other major contribution for this species
413 comes from the Eastern Channel fisheries. The interviews highlighted a generalization of the
414 sole sub-quotas' individual management. This situation results from a stronger or tighter
415 constraint due to the lack of resource availability. Six of the nine POs involved in the sole
416 fishery management implemented landings limits per vessel in 2012. However, an individual
417 management system is seldom generalised for all vessels within a PO, but rather is established
418 according to fishing activities or “metiers” (fish-gear associated to target species and fishing
419 grounds) and/or vessel lengths. POs primarily apply individual limits to the larger sole
420 producers, usually the largest sole gillnetters. This system is very limited for some POs owing
421 to the absence of a global monitoring system. For example, the smallest producers for which
422 sole is a by-catch are not concerned with individual limits but receive a global allocation. The
423 criteria adopted for sole sub-quota management vary between POs. A few of them determine
424 limits in proportion to the reference track records (2001-03 production average); some POs
425 allocate quotas according to more recent track record keys, and other POs use maximal
426 production over the last 10 years or a fixed package.

427

428 *Ireland: Restriction of access*

429 The area of rights based management represents one of the major problems facing the Irish
430 Celtic Sea Herring fishery (Fitzpatrick, 2014a). Prior to 2012 there was an open access

431 situation in the fishery for vessels under 25 meters in length which had an automatic
432 entitlement to fish for herring. The recent success in rebuilding the stock has resulted in a
433 classic free rider issue with increased numbers of larger vessels booking in to the fishery.
434 Many of these larger vessels had not participated in the fishery for much of the previous
435 decade despite holding valid Celtic Sea Herring licenses. Attempts by the CSHMAC to
436 address this issue in 2010 by specifying a preclusion on whitefish and shellfish fishing for the
437 period of the herring fishery for any vessel booking in did not have the desired effect partly
438 due to difficulties in obtaining timely information from the relevant Department officials. In
439 2012 a new access policy was published by the fisheries minister, (Dept. Agriculture, Food
440 and Fisheries, 2012), which sought to limit access to vessels which landed Herring between
441 2006 and 2010. This has resulted in approximately 38 vessels qualifying for access to the
442 fishery from 2012. Incidentally this is higher than the average participation over the previous
443 4 years.

444

445 *Spain: Various forms of individualization*

446 In the case of pelagic species, various forms of individualization of catch limits and fishing
447 rights have been introduced over the last five years. The first step to the introduction of
448 individual limits and rights was the allocation of proportions of the pelagic quotas to fishing
449 techniques. In the case of the mackerel fishery, the national regulation was implemented in
450 2010 (Orden ARM/271/2010¹) with the aim of distributing the Spanish catch quota by gear,
451 with 30% of the quota allocated for trawlers, 28% for purse seiners and 35% for artisanal
452 fisheries. For all of them, 7% of the catch should be kept for the second half of the year.
453 Landing limits have been considered for the mackerel fishery in recent years. In 2009 daily
454 limits² within top-down hierarchical management by the Spanish administration were
455 introduced. However, these limits were initially proposed by the PO concerned (i.e. OP
456 Cantabrico), as extension of rules for all POs involved in the fishery³. The limits impose a
457 constraint on catches and are not allocated on the basis of catch records. They are not
458 transferable amongst vessels. Landings limits on anchovy are adopted within the *cofradías*
459 and are usually respected by fishermen. It seems that these moral/social incentives are widely
460 accepted because of the perceived legitimacy of the group's decisions. The rationale for the

¹ Orden ARM/271/2010, de 10 de febrero, por la que se establecen los criterios para el reparto y la gestión de la cuota de caballa, y se regula su captura y desembarque.

² Orden ARM/2091/2008. In 2011, the Spanish administration introduced new daily limits by vessels.

³ In accordance with Commission Regulation 696/2008 of 23 July 2008 laying down detailed rules for the application of Council Regulation (EC) No 104/2000 as regards the extension to non-members of certain rules adopted by producers' organisations in the fisheries sector.

461 landings cap is both an improvement of the anchovy price, and a protection of the resource.
462 The collapse and closure of the anchovy fishery that occurred in 2004 seems to have triggered
463 conservation measures and respect of group decisions. According to fishermen, the strategy to
464 limit landings results in better prices (although not as good as initially expected). There are
465 other factors that contribute to this. In 2008, a system of individual quotas for blue-fin tuna
466 was introduced. The national quota was divided among diverse fishing techniques, including
467 purse seining. Within each technology vessels receive individual quotas. According to the
468 regulation in force (ARM/1753/2011⁴) these can be pooled within a given fishermen's
469 organization, being also tradable amongst the diverse Spanish fishing technologies e.g. from
470 purse seiners to tuna farms. In this case self-management is adopted under the PO umbrella.
471 For instance, in 2012, 70% of the rights allocated to purse seiners fishing with live bait in the
472 Bay of Biscay were transferred to a Spanish company in the Mediterranean, which carries out
473 tuna farming (Anon. 2012). In 2013, the total fishing quota was temporarily transferred (just
474 for that year) to a Spanish tuna farmer in the Mediterranean (Anon., 2012). In relation to the
475 offshore fleet, in July 1997, the ministry passed Law 23/1997⁵ that allows free trade of rights
476 among companies owning vessels in the same list, without transferring the ownership of the
477 vessel. In December 2006, the Order APA 3773/2006⁶ established a system of ITQs for
478 vessels over 100 GRT operating in ICES areas Vb, V, VII and VIIIa,b,d,e. This system was
479 made permanent through the Order ARM/3812/2008⁷.

480

481 *UK: Mixed views on quota trading*

482 In the UK there are mixed views on quota trading and this is to some extent reflected in the
483 differences between POs in the way in which quota is allocated internally. In Scotland, for
484 example, many of the PO administrations continue to take a strong position against quota
485 trading and operate quota pools for all stocks. In England and Wales, more POs operate IQ
486 systems for at least some stocks and some vessels. In the South West, the CFPO has adopted
487 what is commonly known as a "pool-plus" system, whereby quota is pooled but individual

⁴ Orden ARM/3315/2010, de 21 de diciembre, por la que se modifica la Orden ARM/271/2010, de 10 de febrero, por la que se establecen los criterios para el reparto y la gestión de la cuota de caballa, y se regula su captura y desembarque

⁵ Ley 23-1997 reguladora de la pesca de altura en el Atlántico Nordeste.

⁶ ORDEN APA/3773/2006, de 7 de diciembre, por la que se establecen para el año 2007, las condiciones de distribución y gestión de las cuotas asignadas a España de especies demersales, en aguas comunitarias no españolas, de las subzonas V b, VI, VII y VIII a, b, d, e del Consejo Internacional para la Exploración del Mar.

⁷ ORDEN ARM/3812/2008, de 23 de diciembre, por la que se establecen las condiciones de distribución y gestión de las cuotas asignadas a España de especies demersales, en aguas comunitarias no españolas, de las subzonas Vb, VI, VII y VIIIa,b,d,e del Consejo Internacional para la Exploración del Mar.

488 vessels are able to supplement their monthly landings limits from the pool with quota leased
489 privately from other vessels. Where vessels have acquired additional FQA units, these
490 effectively give rise to IQs. The SWFPO operates IQs for most of its membership, although a
491 group of smaller inshore vessels do work within a quota pool. Many UK POs operating quota
492 pools hold some FQAs centrally (on so-called “dummy” licences) which are used for the
493 benefit of the membership as a whole. Both the CFPO and, to a lesser extent, the SWFPO,
494 have invested in FQAs in order to secure additional quota for the membership as a whole. The
495 CFPO also holds FQAs acquired by the *Dutchy Fish Quota Company* which aims to secure
496 quota for the benefit of fishermen in Cornwall. Both POs assist their members with quota
497 trading where required, for example by arranging exchanges (“swaps”) with other UK POs
498 via the Marine Management Organisation (MMO), but are not otherwise actively involved in
499 quota trading: there are a number of private companies which act as brokers in this market.
500 Although day-to-day management decisions are taken by the PO offices, decisions on quota
501 management approaches are taken by elected representative boards or at general meetings.

502

503 7. Management progress

504

505 Collecting information on fisheries management measures requires the implementation of
506 both qualitative (Silverman, 2010) and quantitative techniques. This paper, however, relates
507 only to the former. Firstly, semi-structured face-to-face interviews with fishermen’s
508 representatives were used to analyse fisheries governance issues, such as centralized or
509 decentralized processes, relationships between local, national and European Government with
510 stakeholders, the role of the Regional Advisory Councils (RACs), among others. Secondly,
511 focus groups with fishermen were used to examine issues related to fisheries management
512 measures and more importantly, issues related to fishermen’s behaviour, in particular
513 compliance behaviour. The main reason for the interview/focus group structure is the fact that
514 fishermen usually take part in the decision process via their representative’s participation in
515 RACs and/or other fora, which makes it more difficult or easier for the
516 fishermen/representatives to speak freely about governance issues (De Vos and Van
517 Tatenhove, 2011).

518

519 The economics of proximities (Torre and Rallet, 2005) is relevant in inter-organizational
520 collaboration between stakeholders. Geographical and organizational proximities are the more
521 frequent dimensions used in the literature (Knoben and Oerlemans, 2006). Face-to-face

522 interactions (questionnaires, focus groups, informal discussions) are facilitated with low
523 geographical distances and/or high organisational proximity (Torre and Gilly, 2000).

524

525 Each Western Waters case study selected the most appropriate technique (semi-structured
526 interviews or focus groups, or both) for collecting qualitative information on stakeholders'
527 (mainly fishermen's representatives or fishermen) perceptions of past and existing fisheries
528 management measures.

529 Semi-structured face-to-face interviews were organized to examine the French Producers
530 organizations managing the sole fishery in the Bay of Biscay. For the Irish fleets targeting the
531 Celtic Sea Herring fishery, face-to-face semi-structured interviews were conducted
532 simultaneously with choice experiment surveys. Additionally meetings of the management
533 advisory committee were attended as a research observer. In the Basque case study,
534 interviews were organized with local fishermen representatives, while focus groups were
535 organized with both local fishermen and local scientists. Information on devolved quota
536 management in South West England was obtained through semi-structured interviews with
537 representatives of the two Producers' Organisations (POs) which are responsible for the
538 majority of fishing vessels in the region.

539

540 *France*

541 Semi-structured, face-to-face interviews were carried out with official representatives of all 9
542 French POs concerned with the sole fishery in the Bay of Biscay in June and July 2012
543 (Lagière et al. 2013). Limitations to fisheries access have changed fishing behaviour in
544 several main ways. Most fishermen acknowledged strong impacts of the progressive
545 implementation of individual quotas on fishing behavior. As a consequence, fishermen had to
546 adapt their fishing strategy either by increasing their fishing effort on sole fishery, or
547 diversifying their activity. In any ways, reallocating the production on others species was
548 necessary. Other changes relate to a reduced number of days at sea for the most specialised
549 gillnetters. Some exits from the industry or from sole fishery have been registered. Another
550 crucial issue addresses fishermen. Crew members are more attracted to vessels owning the
551 largest share of sole sub-quotas. Hence some POs are confronted with a deck-hand turnover
552 between members. These interviews showed that compliance with sub-quotas and national
553 quota is possible by strengthening the monitoring and management system of the fishery and
554 by more individualised production management within POs.

555

556 *Ireland*

557 How fishermen will respond to this access change and whether it will result in rationalization
558 or consolidation of fishing rights is still uncertain, as the new policy has only been
559 implemented since 2012. Information from PO representatives indicates that there is a
560 growing appetite for tradeable licences within the fishery. A choice experiment survey
561 conducted in this fishery in 2013 (Fitzpatrick *et al*, 2014b) indicates however that the majority
562 of fishermen involved in the fishery are opposed to such tradeability. The access restriction
563 itself created some conflict between fishermen as some felt that they were unfairly excluded
564 from a fishery due to not participating when stocks were low. Another area where there has
565 been an attempt to strengthen rights based management has been in the establishment of the
566 sentinel fishery which has a twofold aim. Firstly to safeguard the interests of small scale
567 fishing vessels by setting aside a fixed allocation of the quota and secondly to enhance the
568 scientific knowledge base by allowing smaller vessels to fish inside an otherwise closed area
569 and ensuring that scientists receive samples of catch from that area. The sentinel fishery is
570 still an open access fishery for vessels under 10 meters and there are fears that the 2012 access
571 restriction will produce an increase in participation in the sentinel fishery despite the limited
572 quota available.

573

574 *Spain*

575 In the case of individual daily limits for mackerel stock, several elements have promoted non-
576 compliant behavior from some vessel segments, following information derived from focus
577 groups: (i) fishermen's expert knowledge on good mackerel stock status, (ii) the high level
578 competition between purse-seiners, trawlers, and even the artisanal fleet for the mackerel
579 stock, (iii) the seasonal character of the fishery and, (iv) the low level first-sale prices. With
580 the aim of achieving good results in terms of the sustainability of this fishery, a new
581 complementary and coercive top-down management by the Spanish administration was
582 introduced, namely, a reinforced control system at ports. Thus, compliance and sustainability
583 are possible only under coercive management. For the anchovy stock, managed by individual
584 daily limits, the purse seine fleet is the only one that targets anchovy, hence the lack of
585 incentive to compete for the resource. In relation to the market, the Bay of Biscay anchovy
586 enjoys a well established reputation among consumers; this seems to protect the price from
587 competition from anchovy imports. Finally, this measure provides correct incentives and
588 contributes to the fishery's sustainability. In the case of IQs for blue-fin tuna, the role of the
589 PO is perceived by the sector as very positive, having contributed to the success of this

590 management system. In spite of this, fishermen do not think this experience could be applied
591 to other fisheries in the Basque Country. The fourth experience concerns ITQs for hake,
592 megrim and anglerfish. The offshore sector agrees with the ITQ system but claims that the
593 roots of the sector's problem can be found in the initial allocation of the national share by the
594 European Commission. The failures of the *relative stability* principle are argued as one of the
595 main reasons for fishermen's behavior. Issues related to ITQ transfers among PO associates,
596 among other issues, are organized through the PO concerned.

597 *UK*

598 UK fishermen can join any PO in any part of the country, however, so that although most POs
599 do have a strong regional identity, members are often attracted by the quota management
600 systems or specialisations offered by the PO. Thus, for example, the SWFPO membership
601 includes beam trawlers and scallop dredgers from outside the Southwest, even Scotland.
602 Although there is an active FQA/quota market in the UK, and fishing firms routinely use the
603 money value of FQAs as security for bank loans, the legal position is that FQAs are not
604 private property in law. This was tested recently in a UK High Court judgement which found
605 that Government had the right to allocate FQAs as it saw fit, without financial compensation,
606 and that fishing firms had no "legitimate expectation" that the rights conferred by FQAs
607 amounted to possession. This is despite the fact that FQAs had been adjusted to reflect private
608 quota trades three times (in 2001, 2005 and 2011).⁸

609

610 8. Discussion

611

612 Table 3 compares various co-management processes based on Sen and Nielsen's typology,
613 offering a comparative approach of the regional management of fisheries between the
614 northern (Ireland and UK) and the southern countries (France and Spain) in the Western
615 Waters (Hadjimichael et al., 2013).

616

617 The sole fishery exploited by the French fleets (trawlers and netters) has been managed under
618 individual quotas since 2006, with authority devolved from the State to POs. It is a
619 decentralized procedure by delegation (co-management by delegation) from the French State
620 with different regimes applied by POs depending on the local profiles of fishermen (specific
621 rules for sharing the sole quota). Where fishermen have accepted this new regime for solving
622 seasonal over-consumption of collective quota for sole, other controversial situations have

⁸ "High Court Spells Out Quota Rights", *Fishing News*, 26 July 2013, p.2.

623 occurred. Reallocating the fishing effort on other stocks is very limited. Securing
624 attractiveness of the sole fishery is a crucial issue for fishermen and their representatives via
625 POs and scientists.

626

627 The Irish Celtic Sea Herring fishery is currently managed as a partnership between an
628 officially recognised, industry-led advisory committee, the Celtic Sea Herring Management
629 Advisory Committee (CSHMAC) and the government. The CSHMAC makes operational
630 level decisions such as the length of the season, the size of weekly allocations within that
631 period and makes recommendations on issues such as how the quota should be allocated
632 between fleet sectors and the definition of areas where fleet sectors may operate. The minister
633 has the final say on these issues and critically retains decision making power over the issue of
634 who has access rights.

635

636 Basque purse seiner fisheries are managed under a centralized regime via the Spanish State.
637 This centralized regime is combined with self-management for quota pooling in the particular
638 case of the bluefin tuna, and therefore the system can be best characterized as co-management
639 by partnership. A specific scheme is applied for the anchovy fishery, where daily limits are
640 adopted and managed within the “*cofradía*” as self-management. Traditional top-down
641 hierarchical management by the state is applied to the mackerel fishery. In this last case,
642 fishermen’s behavior is subjected to strong control. For other fisheries regulations compliance
643 contributes to the success of the management measures. Regarding Basque trawlers, the ITQ
644 system comes from a centralized regime except for some issues. Pooling ITQs are organized
645 within the corresponding PO under a self-management regime which contributes to the
646 success of this fishery, with high regulatory compliance by fishermen. Again, this system can
647 be considered to be “co-management by partnership”.

648

649 The English FQA/PO system can be best characterised as “co-management by partnership”
650 since, given the quota allocation system decided at central government level the POs have a
651 considerable degree of flexibility to manage quota at the local/sectoral level. It is important to
652 appreciate that enforcement remains the task of Government while the ability to trade quota is
653 restricted in the sense that permanent changes in quota “ownership” are still a relatively minor
654 part of the overall trading activity.

655

656

Table 3. A comparative approach of co-management in the Western Waters case studies

Sub-case	Fleet	List of management measures	Who are the local/regional managers?	Type of co-management
The French fleets	Bottom trawlers	IQs on sole since 2006	Government has delegated to POs the introduction of individual quotas as a new tool for fisheries management	Co-management by delegation
	Gill-netters			
The Spanish fleets	Purse-seiners	Individual daily limits by vessel for mackerel stock.	Initially proposed by the PO concerned (i.e. OP Cantabrico) Management by the state (Spanish Government)	Top-down hierarchical management
		Individual daily limits on anchovy landings.	Adopted within the "cofradías"	Self-management
	Trawlers	ITQs for blue-fin tuna	ITQs have been used in the hake, megrim and anglerfish fisheries and scrapping subsidy	Management by the state (Spanish Government) and pooling quotas organized within the POs (transferability)
The Irish fleets	Polyvalent trawlers	Limited access, weekly quotas, spatial fishing rights based on vessel size.	Partnership between CSHMAC (PO's, fishermen, processors, NGO, fisheries control officer, scientist) and government.	
	The sentinel fishery	Weekly quotas, fishing in area, spatial fishing rights based on vessel size.		
The English fleets	Trawlers/netters	FQAs as a basis for PO allocations: IQs or monthly allowances (or both) within individual POs	POs manage allocations from central Government	
	Beam trawlers/dredgers	FQAs as a basis for PO allocations: IQs or monthly allowances (or both) within individual POs		

659 One of the major recent trends in the European fishing sector has been the increasing role of
660 the fishermen's cooperatives (e.g. Producer Organizations – POs) in quota management.
661 Various forms of co-management have been used, by delegation, by partnership, through self-
662 management procedure or top-down hierarchical management.

663

664 In France, the Central Administration has gradually transferred the allocation quota
665 procedures between fishermen to local level. In view of quota over-consumption situations,
666 POs have had to introduce new rules within their organisations to impose limitations on
667 individual consumption by species. In Spain this trend has been noted in the context of purse-
668 seiners where “*cofradías*” are able to manage anchovy on the basis of daily limits. In turn,
669 blue-fin tuna are managed at the PO level on the basis of individual quota pooling. In the case
670 of trawling, POs also manage the transferability of the ITQs. The Celtic Sea Herring fishery
671 represents a fairly unique situation in Ireland as the local management committee has a strong
672 input to quota management decisions while in other Irish fisheries quota management has not
673 been devolved to the PO's. The introduction of a more defined restricted access regime in the
674 main fishery has resulted in the issue of nationally-tradable quotas being discussed more
675 frequently. In the UK, devolved management of quotas has a long history and the system of
676 PO quota management is now well established. While differences remain between POs in the
677 extent to which the market is permitted to play a role in their internal quota allocation, all POs
678 now find they must allow some quota trading by their members. Whether the UK will follow
679 the Netherlands and Denmark in moving any closer to an ITQ system proper (with continued
680 PO responsibility) is unclear.

681

682 9. Conclusion

683

684 Several changes in the governance of quotas and the economic context have marked this
685 recent period. Faced with increasing restrictions on accessing fish stocks, various new
686 management measures have been introduced, including individualizing fishing rights, access
687 limits and other specific measures. The main issues arising for the Western Waters from the
688 latest CFP reform concern the implementation of landings obligations (discard bans). It
689 remains to be seen how these will be introduced into the Western Waters fisheries but the
690 devolved flexibility of quota allocation within the POs is likely to play an important role in
691 matching catch and quota holdings. The implementation of these individual fishing rights
692 schemes and other limited access regimes reflect the European debate on transferable fishing

693 concessions within the CFP third reform. It would be a legitimate question to ask whether
694 public leasing among fishermen’s organisation would be a sustainable system for the Western
695 Waters fisheries or whether the recently implemented system is on a “slippery slope” towards
696 market privatization (Lam and Pauly, 2010). It is too early to predict how attitudes and
697 perceptions with regard to quota trading and compliance may change as the discard bans start
698 to be put in place. We should perhaps highlight the fact that solving the discard problem may
699 require a more flexible approach such as quota swaps between POs of different member
700 states.

701
702
703

704 References
705

- 706 Anon., 2012. *Finaliza la mejor campaña de bonito en los últimos 5 años*, Europa Azul,
707 No.132 Nov-Dic.
- 708 Appleby T., 2013. Privatising fishing rights: The way to a fisheries wonderland?, *Public Law*,
709 pp. 481-497. ISSN 0033-3565
710
- 711 Aranda, M., Iriondo, A., Curtin, R. 2012. La flota vasca de altura al fresco: Análisis de su
712 gestión y capacidad de pesca. Servicio de Publicaciones del Gobierno Vasco. In spanish.
- 713 Commission of the European Communities, 2009. *Green Paper – Reform of the Common*
714 *Fisheries policy*, Brussels, 28p
- 715 Costello C., Gaines S.D., Lynham J., 2008. Can catch shares prevent fisheries collapse ?
716 *Science*, 321, 1678-1681.
- 717 De Vos B.I., Van Tatenhove J.P.M., 2011. Trust relationships between fishers and
718 government: New challenges for the co-management arrangements in the Dutch flatfish
719 industry, *Marine Policy*, 35:218-225.
- 720 Department of Agriculture, Food and Fisheries, 2012. *Management Arrangements and Fleet*
721 *Policy Statement for Irish Herring fisheries*, June 2012, Dublin, Ireland
- 722 EC (2013) Regulation (EU) No 1380/2013 of the European Parliament and of the Council of
723 11 975 December 2013 on the Common Fisheries Policy, amending Council Regulations
724 (EC) No 976 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC
725
- 726 Fitzpatrick M, Eigaard O., Maravelias C., Hynes S., Reid D., 2014a. In preparation. *A Choice*
727 *Experiment of Fishermen’s Preferences for Future Management Options within the Common*
728 *Fisheries Policy*. In Press
- 729 Fitzpatrick M., 2014b. *From boom and bust to local stewardship: a governance benchmark*
730 *for Celtic Sea fisheries management*. Chapter 3 in “Social issues in sustainable marine
731 fisheries management”, edited by Urquhart, J. MARE Publication Series, Springer
- 732 Gezelius S.S., Raakjaer J., Hegland T.J., 2010. Reform drivers and reform obstacles in natural
733 resource management: The Northeast Atlantic Fisheries from 1945 to the present, *Human*
734 *Ecology*, 38:471-483.
- 735 Grafton R.Q., Kompas T., McLoughlin R., Rayns N., 2007. Benchmarking for fisheries
736 governance, *Marine Policy*, 31, pp470-479
- 737 Gutierrez N.L., Hilborn R., Defeo O., 2011. Leadership, social capital and incentives promote
738 successful fisheries, *Nature*, 470:386-389.
- 739 Hadjimichael M., Delaney A., Kaiser M.J., Edwards-Jones G., 2013. How Resilient Are
740 Europe’s Inshore Fishing Communities to Change? Differences Between the North and the
741 South, *Ambio*, 42:1037-1046.
- 742 Hatcher A., 1997. Producers’ Organisations and devolved fisheries management in the United
743 Kingdom: collective and individual quota systems. *Marine Policy* 21(6): 519-534
- 744 Hegland T.J., Ounanian K., Raakjaer J., 2012. Why and how to regionalize the Common
745 Fisheries Policy, *Maritime Studies*, 11:7.
- 746 Hilborn R., Orensanz J.L., Parma A.M., 2005. Institutions, incentives and the future of
747 fisheries, *Philosophical Transactions of the Royal Society B Biological Sciences*, 360:47-57.

- 748 Holland D.S., Kitts A.W., Pinto Da Silva P., Wiersma J., 2013. Social Capital and the Success
749 of Harvest Cooperatives in the New England Groundfish Fishery, *Marine Resource*
750 *Economics*, 28, pp133-153
- 751 Jentoft S., 1989. Fisheries co-management: Delegating government responsibility to
752 fishermen's organizations, *Marine Policy*, 13:137-154
- 753 Journal Officiel de la République Française (JORF) n_301 du 29 décembre 2006 page 19953
754 texte n°104: Arrêté du 26 décembre 2006 établissant les modalités de répartition et de gestion
755 collective des possibilités de pêche (quotas de captures et quotas d'effort de pêche) des
756 navires français immatriculés dans la Communauté européenne. NOR: AGRM0602585A.
- 757 Knoblen J., Oerlemans L.A.G., 2006. Proximity and inter-organizational collaboration: A
758 literature review, *International Journal of Management Reviews*, 8(2):71-89.
- 759 Lagièrre R., Macher C., Guyader O., 2013. *Description des systèmes de gestion mis en place*
760 *par les OP dans le cas de la pêche de sole du golfe de Gascogne*, Technical report, Ifremer,
761 33p
- 762 Lam M.E., Pauly D., 2010. Who is right to fish? Evolving a social contract for ethical
763 fisheries, *Ecology and Society*, 15(3):16
- 764 Larabi L., Guyader O., Macher C., Daurès F., 2013. Quota management in a context of non-
765 transferability of fishing rights: The French case study, *Ocean & Coastal Management*,
766 84:13-22
- 767 Marine Institute, 2012. *The Stock Book, Report to the Minister for Agriculture, Food and the*
768 *Marine, Annual review of fish stocks in 2012 with management advice for 2013*, Galway,
769 606p
- 770 Raakjær J., 2009. *A Fisheries Management System in Crisis - the EU Common Fisheries*
771 *Policy*. Aalborg University Press, Aalborg
- 772 Schlager E., Ostrom E., 1992. Property-rights regimes and natural resources: a conceptual
773 analysis, *Land Economics*, 68(3):249-262
- 774 Sen S., Nielsen J.R., 1996. Fisheries co-management: a comparative analysis. *Marine Policy*,
775 20 (5): 405–418
- 776 Silverman, D., 2010. *Doing Qualitative Research*, London, Sage
- 777 Socioec, 2013. *Critical report of current fisheries management measures implemented in EU*
778 *Western Waters, Socioec Research programme, Deliverable 69, Brussels, 62p*
779 (<http://www.socioec.eu/media-centre-4/socioec-deliverables>)
- 780 Symes D., 2009. Reform of the European Union's Common Fisheries Policy: Making
781 fisheries Management Work, *Fisheries Research*, 100 :99-102.
- 782 Torre A., Gilly J.P., 2000. On the analytical dimension of proximity dynamics. *Regional*
783 *Studies*,34(2), 169 –180.
- 784 Torre A., Rallet A., 2005. Proximity and localization, *Regional Studies* 39: 1: 47-59.