



Intertek Fisheries Certification (IFC)

10A Victory Park  
Victory Road  
Derby  
DE24 8ZF  
UK

[www.intertek.com/food/msc-certification](http://www.intertek.com/food/msc-certification)

## **INTERTEK FISHERIES CERTIFICATION**

**Ref: 82080/v5**

**Assessors: J. Andrews, M. Pawson**

**MSC Assessment Report for**

**Cornish Hake Gill Net Fishery**

**Client: Cornish Fish Producers Organisation Ltd**

**Version 5: Public Certification Report**

**Client Contact:**

Paul Trebilcock  
Cornish Fish Producers Organisation Ltd  
46 Fore St  
Newlyn  
Cornwall  
TR18 5JR

Tel + 44 01736 351050  
Fax +44 01736 350632  
[www.cfpo.org.uk](http://www.cfpo.org.uk)

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## 1 SUMMARY

1. This report sets out the results of the assessment of the Cornish Hake Gill Net Fishery against the Marine Stewardship Council (MSC) Principles and Criteria for Sustainable Fishing. The assessment was carried out over the period April 2010 to March 2014.
2. The assessment was carried out by a team of two assessors: Jim Andrews and Mike Pawson. The assessment of Principle 1 was led by Mike Pawson; Principles 2 and 3 were led by Jim Andrews. A full account of the assessment team members' relevant experience is set out in section 10.1 of this report.
3. The evaluation process for this assessment involved gathering information relevant to the fishery during a site visit in Cornwall; discussions with experts and stakeholders; and reviewing relevant literature. The assessment team then compiled a draft report, and met to 'score' the performance of the fishery. The draft report that was produced by the team has been considered by the client, subject to peer review, and then published for stakeholder comment (in February 2015) before being published as a Final Report on the MSC website.
4. The main strengths of this fishery are that the gear and fishing practices used selects only larger hake and other retained species. The hake stock itself has recovered from a poor status in the late 1990s, and the objectives of the recovery plan for Northern hake have now been met. A new management plan is currently being developed for the fishery by the EC.
5. The assessment team had some concerns about whether the current reference points for the fishery are appropriate, and noted that ICES are working to develop new reference points that are consistent with the MSY approach.
6. The main weaknesses of the fishery lie in its potential effect on the marine environment. The main issues of concern are the incidental capture of cetaceans in hake nets, the discarding of spurdog and porbeagle shark, and also the current level of understanding of the Celtic Sea ecosystem.
7. Cetacean bycatch in this fishery has been considered carefully. During the 1990s, it was estimated that as much as 6% of the Celtic Sea harbour porpoise population were caught in hake nets each year. However, current observer data suggest that this has fallen, and may now be in a range of between 0.03% and 0.11% (though it should be noted that observations in recent years have been limited in their extent). While this level of bycatch lies well within international standards, a condition has been raised to encourage further reductions in cetacean bycatch. The client fleet has already participated in trials of management measures that may achieve these reductions.
8. Intertek Fisheries Certification has determined that this fishery should be certified according to the Marine Stewardship Council Principles and Criteria. Some conditions were identified for the fishery. These are:-
  - **Harvest Control Rules** – in light of a ICES review of the stock assessment model for Northern hake in 2013, and the adoption of the MSY approach, new harvest control rules are being developed for the fishery but have not yet been formally defined. Action is required to ensure that appropriate harvest control rules are agreed and implemented.
  - **Discarded species** - recent changes to TACs have resulted in spurdog being discarded from this fishery. There is some uncertainty about the current scale of spurdog discarding from the fishery, and thus uncertainty about the potential effect of the fishery on the status of this

species. The uncertainties about discarding also compromise understanding of the overall ecosystem effect of the fishery. Action is required to establish monitoring arrangements for discards from the fishery.

- **Management of ETP species bycatch** - management measures (acoustic pingers) that would substantially reduce the bycatch of harbour porpoise have only recently been fully implemented in the UK and evidence is required to demonstrate that implementation has been successful.

## 2 INTRODUCTION

This report sets out the results of the assessment of the Cornish Hake Gill Net Fishery against the Marine Stewardship Council (MSC) Principles and Criteria for Sustainable Fishing.

### 2.1 The fishery proposed for certification

The client for this assessment is the Cornish Fish Producers Organisation (CFPO), which is a body charged with the administration of fish quotas and promotion of the fishing industry in Cornwall, UK.

The MSC Guidelines to Certifiers specify that the Unit of Certification (UoC) is "*The fishery or fish stock (=biologically distinct unit) combined with the fishing method/gear and practice (=vessel(s) pursuing the fish of that stock)*" The fishery proposed for certification is therefore defined as:

Species:	European Hake; Hake ( <i>Merluccius merluccius</i> )
Geographical Area:	Western English Channel, Bristol Channel, Celtic Sea and Western Approaches ICES Divisions: VIIe, VIIf, VIIg, VIIh, VIIj, VIIk. FAO Statistical Area 27 (North East Atlantic)
Method of Capture:	Bottom-set gill nets 120mm mesh size
Stock	Northern Hake Stock (in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d)
Management:	Combination of EU regulations and national UK legislation.
Client Group:	Cornish Fish Producers Organisation

In the course of the certification it is possible that further companies/vessels may join the client group. This would be in accordance with the MSC's stated desire to allow fair and equitable access to the certification. Any permanent or temporary changes to the membership of the client group will be reported by the client and reviewed at annual surveillance audits.

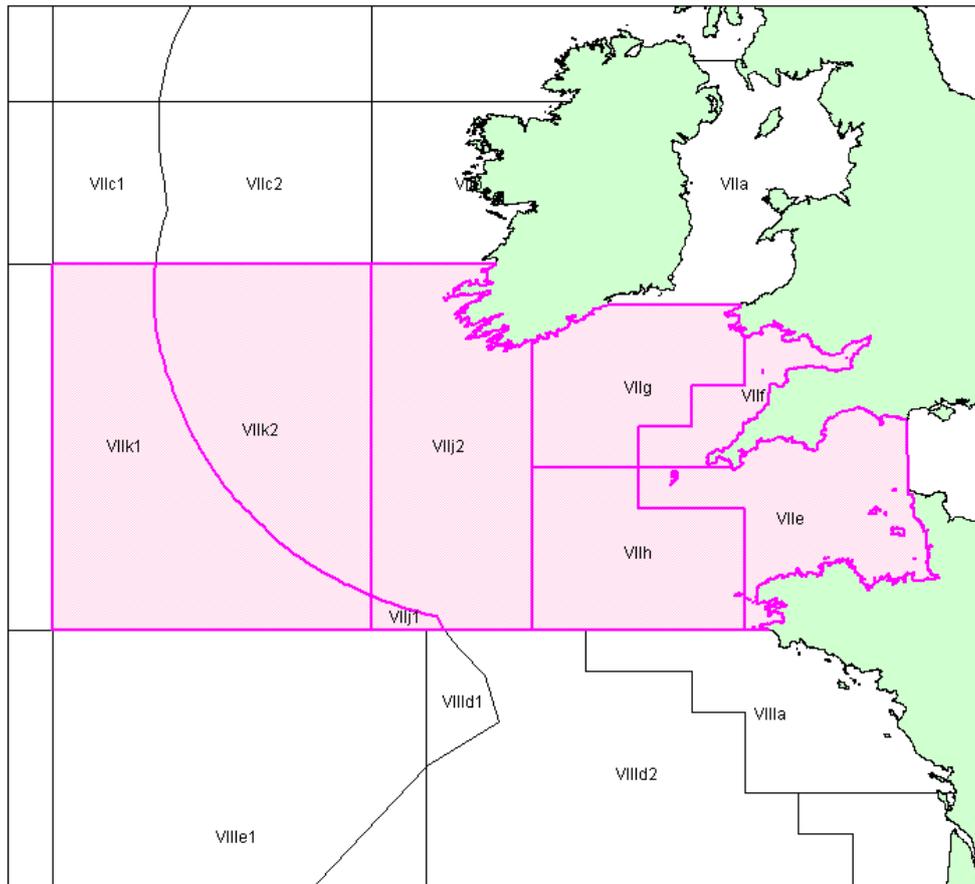


Figure 1: Map of the Unit of Certification area for the Cornish Hake Gill Net Fishery, showing the relevant ICES divisions.

Table 1: List of vessels in the UoC for the Cornish Hake Gill Net fishery.

<b>Boat Name</b>	<b>PLN</b>	<b>LOA</b>
Serene Dawn	PW156	11.86*
Gary M	PZ643	11.87*
Ajax	PZ36	18.28
Britannia V	FH121	15.15
Harvest Reaper	PW177	17
Stelissa	PZ498	20.6
Silver Dawn	PZ1196	17.93
Govenek of Ladram	PZ51	22.65
Joy of Ladram	E22	20.4
Ocean Pride	FH24	18.75
Charisma	PW45	16.6
Berlewen	PW1	14.97
Karen of Ladram	PW3	20.84
Ygraine	SS284	11.95*
Trevoise	PW64	12.44

\* These vessels are smaller than 12m, the size at which the use of “pingers” is mandatory, but these vessels use pingers on their nets.

## 2.2 Report Structure and Assessment Process

The aim of the assessment is to determine the degree of compliance of the fishery with the MSC Principles and Criteria for Sustainable Fishing, as set out in Section 9 of this report.

This report sets out:

- the background to the fishery under assessment and the context within which it operates in relation to the other areas where the target species (European hake, Northern stock) is fished
- the qualifications and experience of the team undertaking the assessment
- the standard used (MSC Principles and Criteria)
- stakeholder consultation carried out. Stakeholders include all those parties with an interest in the management of the fishery and its impacts, and include fishers, management bodies, scientists and environmental Non-Governmental Organisations (ENGO's)
- the methodology used to assess ('score') the fishery against the MSC Standard.
- a scoring table with the Scoring Indicators adopted by the assessment team and Scoring Guidelines which aid the assessment team in allocating scores to the fishery. The commentary in this table then sets out the position of the fishery in relation to these Scoring Indicators.

The intention of the early sections of the report is to provide the reader with background information to interpret the scoring table commentary.

Finally, as a result of the scoring, the Certification Recommendation of the assessment team is presented, together with any conditions attached to certification.

In draft form, this report has been subject to critical review by appropriate, independent, scientists ('peer review'). The comments of these scientists are appended to this report. Responses to these comments are given in the peer review texts and, where amendments are made to the report on the basis of peer review comments, these are also noted in the peer review text. Following peer review, the report was then released for public scrutiny on the MSC website. A "Final Report" was released for a further period of public scrutiny. This Public Certification Report is now published after all public consultation has been completed.

The report, containing the recommendation of the assessment team, any further stakeholder comments and the peer review comments, has been considered by the IFC (Intertek Fisheries Certification) Governing Board (a body independent of the assessment team). The Governing Board has then made the final certification determination on behalf of IFC Ltd.

The complete report, containing the IFC Ltd Determination and all amendments, is now released for publication as the Public Certification Report.

## 2.3 Stakeholder meetings attended

Information used in the main assessment has been obtained from interviews and correspondence with stakeholders in this fishery, notably:

- I1. Nathan Rozarieux, Seafood Cornwall, 13<sup>th</sup> July 2010, Newlyn, Cornwall.
- I2. Paul Trebilcock, Cornwall Fish Producers Organisation, 13<sup>th</sup> July 2010, Newlyn, Cornwall.
- I3. Alan Dwan, Skipper FV Ajax, 13<sup>th</sup> July 2010, Newlyn, Cornwall
- I4. Nick Tregenza, Chelonia Ltd, 14<sup>th</sup> July 2010, Long Rock, Cornwall
- I5. Tom Hardy, Cornwall Wildlife Trust, 14<sup>th</sup> July 2010, Long Rock, Cornwall
- I6. Sue Sayer, Cornwall Seal Group, 27<sup>th</sup> September 2010, Telephone Interview
- I7. Simon Northridge, Sea Mammal Research Unit, 12<sup>th</sup> October 2010, Telephone Interview
- I8. Colm Lordan, Marine Institute, 12<sup>th</sup> October 2010, Telephone Interview
- I9. Al Kingston, SMRU, 18<sup>th</sup> February 2014, Telephone interview.
- I10. Formal feedback on compliance from the MMO, 10<sup>th</sup> September 2014
- I11. Andy Wheeler, CFPO, telephone and email February 2014
- I12. Al Kingston, SMRU, telephone and e-mail correspondence, February 2014
- I13. Gemma Frazer, MMO. E-mail correspondence confirming compliance record of UoC, September 2014

## 2.4 Other information sources

Published information and unpublished reports used during the assessment are listed below:

### 2.4.1 Publications

Anon (2010). Joint data collection between the fishing sector and the scientific community in Western Waters. Final report to the European Commission Directorate-General for the Fisheries and Maritime Affairs. Contract SI2.491885, Ref. FISH/2007/03; 267p. Available from: [http://ec.europa.eu/fisheries/documentation/studies/joint\\_data\\_collection\\_western\\_waters\\_en.pdf](http://ec.europa.eu/fisheries/documentation/studies/joint_data_collection_western_waters_en.pdf)

Arbault, S. and Lacroix-Boutin, N. (1968). Ichtyoplankton. Oeufs et larves de poissons téléostéens dans le golfe de Gascogne en 1964. Rev. Trav. Inst. Pêch. marit. 32(4): 413-476.

ASCOBANS, 2009. Report of ASCOBANS / HELCOM Small Cetacean Population Structure Workshop. Eds. Evan, P.G.H. & Teilmann, J. ASCOBANS, Bonn, German. 143pp. Available from: [http://www.serviceboard.de/ascobans\\_neu/files/Report\\_PopulationStructureWorkshops2007small.pdf](http://www.serviceboard.de/ascobans_neu/files/Report_PopulationStructureWorkshops2007small.pdf)

Babcock, B. A., and Cortes, E. 2009. Bayesian surplus production model applied to porbeagle catch, cpue and effort data. ICCAT, Collective Volume of Scientific Papers, SCRS/2009/068, 7pp.

Bendall, V. A., Hetherington, S. J., Ellis, J. R., Smith, S. F., Ives, M. J., Gregson, J. and Riley, A. A. 2012. Spurdog, porbeagle and common skate bycatch and discard reduction. Fisheries Science Partnership 2011–2012, Final Report. 88 pp. [http://www.cefas.defra.gov.uk/media/577769/mf047\\_fsp\\_report\\_2012\\_final\\_vb.pdf](http://www.cefas.defra.gov.uk/media/577769/mf047_fsp_report_2012_final_vb.pdf)

Bertignac, M., and de Pontual, H. (2007). Consequences of bias in age estimation on assessment of the northern stock of European hake (*Merluccius merluccius*) and on management advice – ICES Journal of Marine Science, 64, 8p.

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### 2.4.2.2 EC Legislation

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### 3 GLOSSARY OF ACRONYMS USED IN THE REPORT

ACFA	Advisory Committee on Fisheries and Aquaculture (EC Committee)
ACOM	Advisory Committee of ICES.
ALK	Age-Length Key
$B_{loss}$	Lowest observed spawning stock biomass
Cefas	Centre for environment fisheries and aquaculture science
CFP	Common Fisheries Policy
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CODA	Cetacean Offshore Distribution and Abundance in European waters
CPUE	Catch Per Unit (of fishing) Effort
Defra	Department for the environment, food and rural affairs
EU	European Union
$F_{max}$	Fishing mortality at maximum yield
FU	Fishery Unit
ICES	International Council for the Exploration of the Sea
IFC	Intertek Fisheries Certification
IUCN	International Union for the Conservation of Nature
IUU	Illegal, Unlicensed, Unregulated fishing
lim	Limit reference point ( $B_{lim}$ , $F_{lim}$ ), beyond which there is a risk of recruitment failure
LPUE	Landings Per Unit Effort
M	Natural mortality
Métier	A fishery unit employing a specific gear in a particular fishing area (and season), within which the species composition in the catch is relatively consistent (in this case, gill netting and trawling for hake are two métiers).
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
pa	Precautionary reference point ( $B_{pa}$ , $F_{pa}$ ), giving a high probability of avoiding recruitment failure
RAC	Regional Advisory Council
SCANS	Small Cetacean Abundance in the North Sea and adjacent waters
SMRU	Sea Mammal Research Unit
SPR	Spawners Per Recruit
TAC	Total Allowable Catch
UoC	Unit of Certification
VHVO	Very High Vertical Opening – a type of trawl used to catch hake.
VPA	Virtual Population Analysis
WGMMM	ICES Working Group on Hake, Megrims and Monkfish.
XSA	Extended Survivors Analysis

## 4 BACKGROUND TO THE FISHERY

### 4.1 Introduction

The fishery under assessment is a gill net fishery for the European Hake, *Merluccius merluccius*, in the Celtic Sea to the west of the UK mainland and south of Ireland. This section of the report describes the fishery under assessment, before subsequent sections consider the fish stock, environmental effects of the fishery, and its management in more detail.

The Cornish hake gill-net fishery has been assessed at the same time as two other fisheries prosecuting the same stock (the Grupo Regal hake longline fishery and the DFPO North Sea trawl hake fishery). Dialogue to assist harmonisation was held between the respective assessment teams during the course of this assessment.

### 4.2 Biology of the Target Species

#### *General distribution*

European hake are widely distributed along the Continental shelf and the shelf slope in the north-eastern Atlantic from northern Norway and Iceland south to Mauritania, and are most abundant at depths of 100-300 m from Ireland south to Gibraltar and in the Mediterranean Sea (Casey and Pereiro, 1995).

#### *Stock definition*

Although genetic studies provide no evidence of population structuring in the northeast Atlantic (Plá and Roldán, 1994; Roldán et al., 1998), ICES assumes two different stock units for assessment and management purposes: the Northern stock, in Division IIIa, Subareas IV, VI and VII and Divisions VIIIa,b,d (essentially, north of 44° 30' N); and the Southern stock in Divisions VIIIc and IXa along the Spanish and Portuguese coasts (ICES, 2009). This assessment concerns the Northern hake stock.

#### *Spawning areas*

Hake spawn from February through to July along the shelf edge, the main areas used by the Northern stock extending from the northern Bay of Biscay to the south and west of Ireland (Arbault and Lacroix-Boutin, 1968; Coombs and Mitchell, 1982) (Figure 1). French ichthyoplankton surveys in 1978 indicated that the main spawning period was in March, in depths of 120-160 m and associated with water temperatures of 11-12°C (Pawson, 1995).

#### *Larvae and juveniles*

Hake larvae appear to be most abundant during March to June offshore along the shelf edge from southern Ireland to the southern Bay of Biscay (Casey and Pereiro, 1995). Young hake descend to the seabed from May onwards and begin a demersal existence at a length of approximately 4 cm. They concentrate initially at depths in excess of 200 m, but move to shallower water (75-120 m) by September when the modal length is around 11 cm. Two major nurseries are recognised in the Northern stock area: one in the Bay of Biscay and one off southern Ireland (Figure 1). As 0- and 1-group fish, hake appear to favour habitats with muddy substrates.

When three years old, hake begin to move into shallower regions of the Celtic Sea and the Bay of Biscay, but as they approach maturity they disperse to offshore regions.

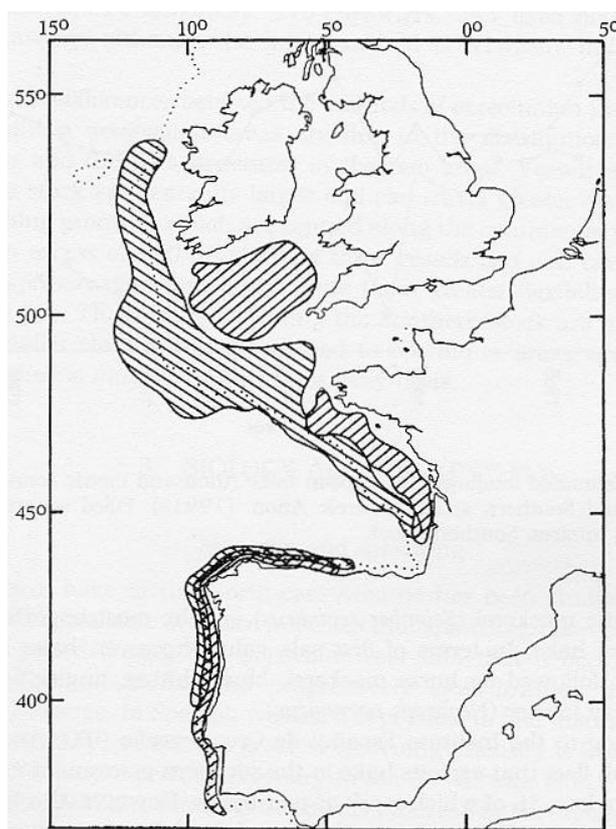


Figure 2: Main spawning and nursery areas of European hake. Spawning areas along the continental shelf edge (sloping downwards from left to right); nursery areas on the shelf (sloping downwards from right to left) (from Casey and Pereiro 1995).

#### *Adult migrations*

Hake have been tagged (de Pontual et al., 2006), but the population's movements are most clearly indicated by the seasonal distributions of catches in the fishery. From December to March, the hake fishery commences in the southern Bay of Biscay and moves north, reaching the northern Bay of Biscay in March and April. Subsequently, hake appear on the Celtic Sea shelf-edge in June and July. Between August and December the hake fishery is centred to the west and southwest of Ireland, and catch rates decline in shallower waters. A small proportion of the hake involved in these migrations will enter the deeper regions of the western English Channel.

#### *Biological parameters and population structure*

Male hake mature at 20-27 cm and female hake at 57-70 cm. In northern Bay of Biscay and the Celtic Sea, the sex ratio is approximately 1:1 for hake less than 30-40 cm. Males are more abundant than females until the fish attain 50-55 cm, and then females become more abundant. Males greater than 60 cm are rare. Differences in the growth of the sexes may explain these changes in sex ratio. The combined effects of a lower growth rate in males and similar mortality rate at length would lead to a greater proportion of males at intermediate lengths and a greater proportion of females at higher lengths. Hake in northern regions (Bay of Biscay, Celtic Sea) appear to grow to a greater maximum total length (~ 140 cm) than those around the Iberian Peninsula (~ 100 cm).

The ageing of hake has proved to be very difficult because there is no firm criterion for distinguishing 'true' and 'false' annual rings on the otoliths, and a lack of validation. Data from a tagging study conducted in 2002 in the Bay of Biscay were used by de Pontual et al. (2006) to reveal under-

estimation of growth and inaccuracy in the current ageing criteria used by hake otolith readers, and Bertignac and de Pontual (2007) discuss the consequences this has for stock assessment. As a result, ICES changed the assessment model to a length-based approach in 2010 (see section 5.5.2).

#### 4.3 History of the Fishery

Historically, hake have been caught in a number of métiers operating in ICES Sub-areas VI, VII and VIII, mainly operating out of Spain, France, the UK and Ireland, either as a target species (lines and set nets) or an important by catch (trawls). The different Fishery Units described in section 4.4 below have remained relatively unchanged over the last thirty years, though the respective levels of effort have fluctuated. For example, in the case of four Spanish components of trawling in medium to deep waters, the bou-trawl was very important in the 1980s and 1990s, but disappeared in 2000, whilst new bottom pair-trawls (operating with “Naberan” Very High Vertical Opening (VHVO) nets since 1993) are now the main Spanish gear used to target hake in the Bay of Biscay. During the same period, French trawlers have progressively adopted twin-trawl nets.

Reports from the client fleet (I2, I3), and from Ireland (I8) as well as published information (Tregenza et al, 1997a; SMRU, 2009), indicate that the number of vessels gill netting for hake has fallen considerably since the peak of the fishery in the early-mid 1990s. The UK netting fleet currently comprises 19 over 12m vessels operating from the southwest, 3 of which used ring nets to catch pelagic fish (SMRU, 2014), compared to a fleet of 40 hake netting vessels that operated from Newlyn in the 1990s (I2, I3). There are, however, signs of a resurgence of gill netting in the Irish hake fishing fleet: gill netting accounted for 42% of landings in 2009, compared to just 13% in 2001 (I8, section 18.1.6).

#### 4.4 Fleet and Gear Description

Today, hake is caught in mixed trawl fisheries together with megrim *Lepidorhombus* spp, monkfish *Lophius* spp and *Nephrops norvegicus* and in directed gill-net fisheries. An important increase in landings has occurred in the northern part of the distribution area (Division IIIa, and Subareas IV and VI) in recent years. Since the introduction of the VHVO trawl in the mid-1990s, no significant changes in fishing technology have been introduced.

Currently, the main fishery for Northern hake is conducted in 12 Fishery Units (FU, defined by the ICES Working Group on Fisheries Units in Sub-areas VII and VIII in 1985, ICES, 1991). These Fishery Units are summarised in Table 2.

Three hake Fishery Units are found in ICES Sub-area VII:

- FU 1 long-line in medium to deep water;
- FU 3 Gill nets (which includes the Cornish gill net fishery, the UoC); and
- FU 4 non-*Nephrops* trawling in medium to deep water,

The client fleet for this fishery operate from Newlyn in Cornwall, and land hake to Newlyn and Padstow, where landing are recorded and inspected by Marine Management Organisation (MMO) officers.

Most of the vessels are over 15m in length; only 2 are shorter than 15m (both of these vessel are under 12m). All of the vessels longer than 12m are legally required to use acoustic “pingers” to mitigate cetacean interactions (see section 6.4.3.6 of this report). The two vessels smaller than 12m use these pingers at all times as well.

All of the vessels in the UoC use hake nets with a 120mm mesh, which is larger than the 100mm legal requirement. All of the vessels work in waters shallower than 180m.

**Table 2:** Main Fishery Units for the Northern hake stock [Source: ICES, 2010a].

<b>Fishery Unit</b>	<b>Description</b>	<b>Sub-Area</b>
FU1	Long-line in medium to deep water	VII
FU2	Long-line in shallow water	VII
FU3	Gillnets	VII
FU4	Non- <i>Nephrops</i> trawling in medium to deep water	VII
FU5	Non- <i>Nephrops</i> trawling in shallow water	VII
FU6	Beam trawling in shallow water	VII
FU8	<i>Nephrops</i> trawling in medium to deep water	VII
FU9	<i>Nephrops</i> trawling in shallow to medium water	VIII
FU10	Trawling in shallow to medium water	VIII
FU12	Long-line in medium to deep water	VIII
FU13	Gillnets in shallow to medium water	VIII
FU14	Trawling in medium to deep water	VIII

**Table 3** Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d) (Northern stock). TAC, and landings and discards estimated by ICES (thousand t), 1987 – 2012 (source ICES, 2013a).

Year	Agreed TAC	ICES landings	Discards
1987	63.5	63.4	2.0
1988	66.2	64.8	2.0
1989	59.7	66.5	2.3
1990	65.1	59.9	1.5
1991	67.0	57.6	1.7
1992	69.0	56.6	1.7
1993	71.5	52.1	1.5
1994	60.0	51.3	1.9
1995	55.1	57.6	1.2
1996	51.1	47.2	1.5
1997	60.1	42.6	1.8
1998	59.1	35.0	0.8
1999	55.1	39.8	0.8
2000	42.1	42.0	0.6
2001	22.6	36.7	0.5
2002	27.0	40.0	0.3
2003	30.0	43.1	+
2004	39.1	46.4	+
2005	42.6	46.6	4.0
2006	43.9	41.5	+
2007	52.7	44.4	2.1
2008	54	47.8	3.5
2009	51.5	59.0	7.1
2010	55.1	73.1	6.5
2011	55.1	79.6	8.0
2012	55.1	75.2	14.6

In recent years, Spain accounted for the major part of the international hake landings reported to ICES (around 60%), followed by France (around 25%), with the UK, Denmark, Ireland, Norway, Belgium, Netherlands, Germany, and Sweden contributing the remainder.

It is noted that landings have exceeded the TAC for the fishery since 2009. Information from the client fleet demonstrates that they have remained within their quota allocation (see Table 4).

Table 4: Hake quota allocation and actual landings for the CFPO, 2010-2014. [Source: CFPO].

Year	Final Quota Allocation to CFPO (t)	Landings by CFPO vessels (t)
2010	319.3	231.8
2011	312.3	312.2
2012	534.6	534.5
2013	794.7	759.4
2014	921.9	915.6

## 5 STOCK ASSESSMENT

### 5.1 Commercial catch

#### 5.1.1 Landings:

Historic estimates of Northern hake landings, by fleets of all nationalities and all ICES divisions, are presented in Table 3. Landings increased from 50,000 t in the late 1970s to 66,500 t in the late 1980s. A steep decrease in landings was experienced through the 1990s, when the lowest level was recorded in 1998. Landings in the next decade remained constant at between 40 and 50 thousand t, increasing from 2008 to a peak of almost 80,000 t in 2011 and 75,200 t for 2012.

Official landings in most years since 2001 have been higher than the agreed TAC (Table 3) and the TAC has been set higher than scientific advice. This pattern contributed significantly to the unsustainable exploitation of the stock until the introduction of the recovery plan in 2004, when the discrepancy between ICES advice, agreed TAC and landings began to decrease, but then increased again as the rapidly recovering stock overtook the constraints of the recovery plan.

Though landing weight data are available by year, gear type and ICES division since 1978, the current assessment approach requires landings data on a quarterly basis, which have only been available since 1990. Thus, only two decades of landings data are available for model input, which precludes reliable estimates of SSB and fishing mortality rates (due to the lack of contrast in the data).

From 1990, length frequency distributions have been collected in a quarterly basis and in a finer geographic resolution (by FU), though only landings by the main FUs and countries are sampled for length compositions. These are then substituted for landings by those FUs that are not sampled.

Conversion from length to age was previously carried out with an age-length key (ALK) based on otolith readings since 1992. Because of inconsistencies in the data for age 0 hake in recent years, and a low confidence in the estimate of numbers of this age group in the landings, age 0 has been removed from the commercial catch-at-age matrix used in the ICES assessment and from the commercial fleet tuning indices since 2003. However, indices for age 0 are available from surveys and are included for calibration in the assessment.

#### 5.1.2 Discards:

EU member states are now required under the EU Data Collection Regulation to collect data on discards, and there have been some recent improvement in the availability of discard data for hake (number of fleets sampled and area coverage). However, sampling does not cover all fleets contributing to hake catches, discard rates of several fleets are not known and, when data are available, it has been difficult to incorporate them in a consistent way.

For example, estimates of discards for the French artisanal and coastal trawl fisheries in the Bay of Biscay, based on the length compositions obtained during French surveys, were significantly different (by up to 10x) from estimates obtained by a sampling programme of discards in the French *Nephrops* trawl fishery in 2002. Similarly, estimates of discards for the Spanish trawl fleets operating in the ICES Sub-area VII between 1988 and 2008 varied from very small amounts to more than 1000t in 2003-2005 and over 2000 t in 2008. Fixed gears were also sampled, but no significant discards were observed (Pérez et al., 1996).

In light of these uncertainties, and due to difficulties in reconstructing an historical series, ICES did not include discard estimates in the time series of Northern hake catch data in stock assessment conducted between 2003 and 2008, and used landings only, plus survey catch-per-unit-effort (CPUE)

series. Since 2008, discards estimates from several fleets have been used in the length-based assessment.

### 5.2 Biological parameters

Mean weights-at-age are estimated from a fixed length-weight relationship (ICES, 1993), and the mean weights-at-age in the total catch are assumed to represent the mean weights in the stock (there are no fishery-independent estimates). A constant value of 0.2 for natural mortality (M) has been assumed for all age classes and years up until the 2010 assessment, when an M value of 0.4 was found to fit the (new) model then adopted (growth rate was previously underestimated). The same maturity ogive is used for each year, with 20% mature at age 3 (both sexes combined) and 100% at age 6 (ICES, 1993).

### 5.3 Surveys

Groundfish surveys are carried out throughout the range of the Northern hake stock (Figure 3).

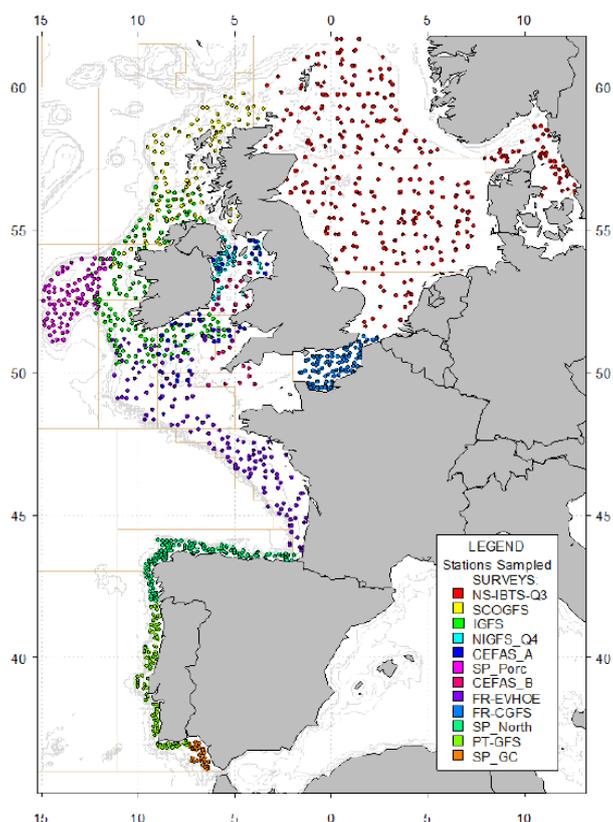


Figure 3: Map of East Atlantic groundfish surveys [Source: ICES, 2010a]

Abundance indices (essentially CPUE) for Northern hake are available from a number of research-vessel surveys, including:

- The French Evhoe groundfish survey (FR-EVHOE) that has taken place in autumn since 1997 and uses a GOV trawl with a 20 mm cod-end liner on the continental shelf in both the Bay of Biscay and Celtic Sea.
- The French Ressgasc groundfish survey (FR-RESSGASC) which covered the shelf in the Bay of Biscay from 1978 to 2002, using a 25 m “Vendéen type” bottom trawl. It was carried out each

quarter until 1997, and afterwards only twice a year (spring and autumn). Surveys data prior 1987 are not used in the assessment due to a change in the research vessel used.

- The Spanish Porcupine groundfish survey (SP-PGFS) has been carried out every year in September since 2001, and covers depths between 180 and 800 m on the Porcupine Bank between longitude 12° W and 15° W and from latitude 51° N to 54° N.
- Irish Ground Surveys (IGFS) are conducted annually in the autumn to the west of Ireland and in the Celtic Sea.

There are large uncertainties associated with estimating the most recent recruitment in the assessment, which is based on a single survey, and geometric mean recruitment over the available time series has been used in the absence of reliable recruitment estimates (usually the last two years in the assessment).

#### **5.4 Commercial LPUE**

Landings-per-unit-effort (LPUE) time series from three fleets have been used in recent assessments to tune the XSA model. These are:

- the A Coruña trawl fleet, which targets mainly hake and operates in deeper water close to the shelf slope in Divs VIIb-c, j-k;
- the trawl fleet from Vigo, which targets megrim in shallower waters in Divs VIIj-h and takes hake as by-catch;
- pair-trawl fleets from Ondarroa and Pasajes, which target hake in the Bay of Biscay.

Effort and LPUE data for other commercial fleets have been provided to ICES, but have not been used in recent assessments to tune the XSA model. These do not include data for the Cornish gill netters. ICES notes that only a small number of vessels are involved in the gillnet fishery, which makes LPUEs very sensitive to small changes in the number of trips, and also that LPUEs expressed in kg/day may not be the most appropriate index of abundance.

#### **5.5 Status of the Stock & Reference Points**

The MSC assessment methodology requires that stock status to be assessed in relation to the reference points used for managing the fishery (FAM v2). A sustainable stock status is defined as a stock reaching a biomass level that maintains high productivity and has low probability of recruitment overfishing.

The Northern hake fishery would have comfortably met the MSC requirements prior to the production of the ICES advice for the management of the stock in 2011 (ICES 2010 advice). Before this time, stock biomass and fishing mortality rates were estimated and stock status was evaluated in relation to the reference points used by management that were defined by the ICES working group following the precautionary approach (ICES advice 2009).

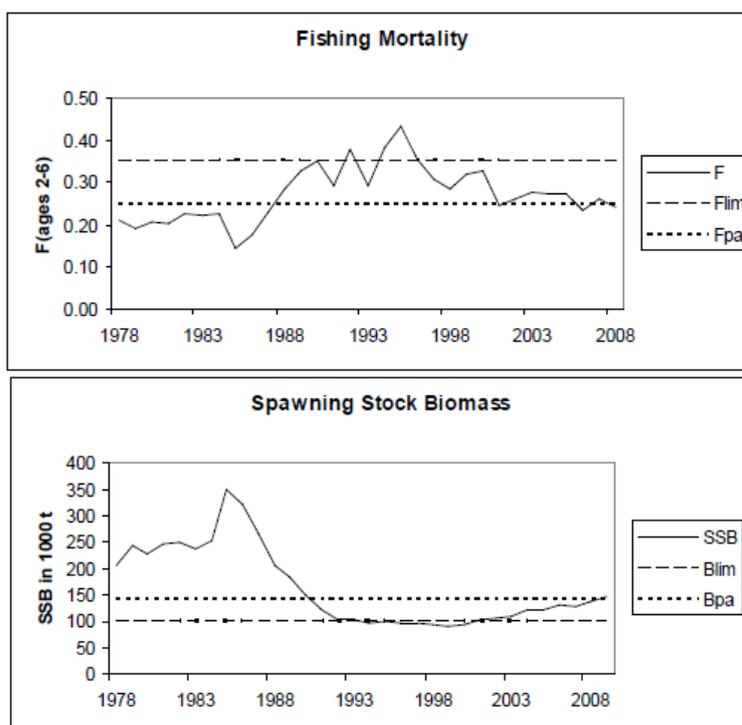
In 2010, however, as a result of a review carried out by ICES on the stock assessment methodology for Northern hake, the assessment shifted from an age-based approach to a length-based model, which had significant consequences in terms of defining stock status, *viz.*:

- The shift in stock assessment methodology changed the perception of historic stock trends, with the absolute levels of spawning stock biomass (SSB), fishing mortality (F) and recruitment having shifted to different levels.
- As a result of the above, the reference points contained within the hake recovery plan were no longer appropriate and need to be re-calculated
- Under the length-based assessment, current population parameters (i.e. biomass, mortality rates and recruitment rates) could not be provided due to: (1) the modelled time period, 1990-2009, does not exhibit strong contrast in the available data and (2) little information is available on large fish from the trawl fishery (larger than 60 cm). Therefore, ICES considered that the assessment of the stock status was indicative of trends only.

Following harmonisation in 2010 with the parallel MSC assessment of the Spanish long-line hake fishery, it was decided that Principle 1 could not be evaluated by taking into account only the stock assessment and fishery management practices applied since the introduction of the hake recovery plan and prior to 2010 (EC Reg. No 811/2004). Whilst ICES’ advice on management of the stock takes into account the position of the stock in relation to the reference points set by the management plan currently in place, the shift in assessment methodology in 2010 and its consequences for stock status and management had to be reflected in the scoring of the fishery and condition of certification. It was agreed that the MSC assessment process for both fisheries would be held in abeyance until such a time as ICES was able to offer more certain advice on Northern hake stock status and management.

**5.5.1 Stock status & reference points using an age-based assessment (as of 2009)**

ICES advice in 2009 was that Northern hake had full reproductive capacity ( $SSB_{2009} > B_{pa}$ ), had been harvested sustainably in relation to precautionary limits since 2001 ( $F_{2001-2008} \sim F_{pa}$ ), and that there was a low risk of stock depletion, though it was overfished in relation to high long-term yields. Recruitment had been stable over the last decade.



Source: ICES 2009

Figure 4: Summary of stock assessment of hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d

The reference points adopted in the Northern hake recovery plan (Table 4) were defined following the precautionary approach to fisheries management (ICES, 1998). The limit biomass reference point ( $B_{lim}$ ) is defined as the lowest SSB observed below which recruitment became impaired or the dynamic of the stock is unknown, whilst the limit fishing mortality-based reference points ( $F_{lim}$ ) is defined as the fishing mortality that drives the stock to  $B_{lim}$ . The precautionary biomass reference point ( $B_{pa}$ ) is defined as the SSB level at which there should be a high probability that the stock will be above  $B_{lim}$ . Similarly,  $F_{pa}$  is estimated as the fishing mortality that will ensure a high probability of  $F$  being below  $F_{lim}$ .

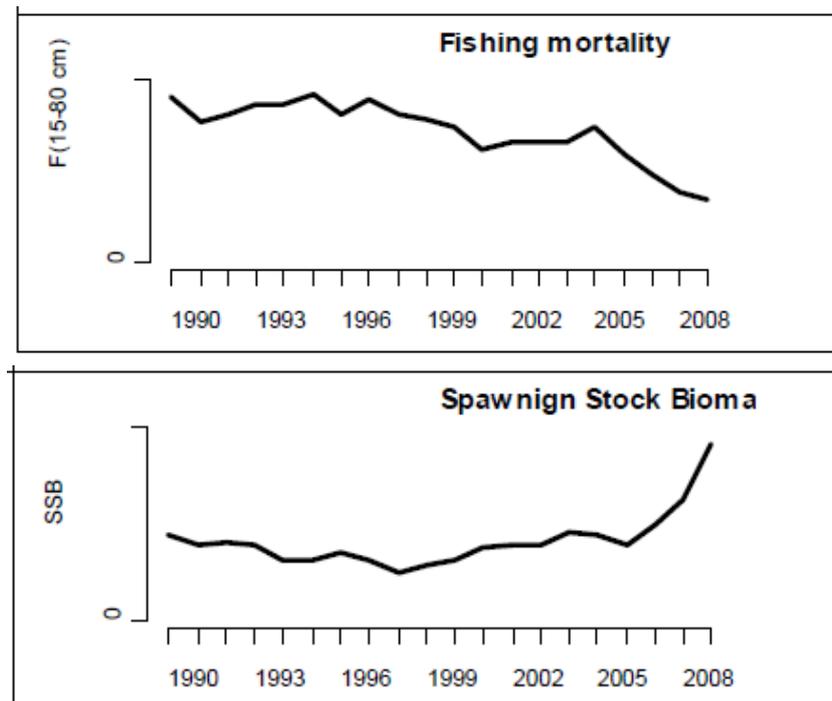
Table 5: Reference points used under the 2004 Northern hake recovery plan

Type	Value	Technical Basis
Blim	100,000 t	Blim = Bloss (Biomass 1994)
Bpa	140,000 t	$B_{pa} \sim B_{lim} * \exp(1.645 * 0.2)$
Flim	0.35	Flim = Floss
Fpa	0.25	$F_{pa} \sim F_{lim} * \exp(-1.645 * 0.2)$
Ftarget	0.25	Recovery Plan
FMSY	0.10-0.18	$F_{0.1} - F_{max}$

Source: ICES Advice 2009

### 5.5.2 Stock status & reference points using a length-based assessment (2010)

The benchmarked assessment in 2010 led ICES to consider that no reliable assessment could be presented for Northern hake (due chiefly to concerns over ageing). As a result, the assessment model used by ICES shifted from an age-based approach to a length-based model in 2010. In the 2010 assessment, recruitment estimates appeared to be without substantial trends over the whole series, though some recent increase in recruitment was observed, with recruitment in 2008 estimated to be among the highest of the series. The level of SSB increased from 2006 to 2008 in line with the good incoming recruitments. Annual fishing mortality, calculated for sizes 15-80 cm, declining sharply in 2005-2008. However, as stated above, the length-based assessment could not provide good estimates of current stock abundance and mortality, and ICES considered that the assessment of the stock status in 2010 (Fig. 5) was indicative of trends only.



Source: ICES 2010

Figure 5: Summary of stock assessment of hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d.

Following a special request by the European Commission for advice regarding the definition of reference points consistent with MSY for its introduction in the development of the long-term management plan, ICES recommended  $F_{SSB35\%}$  ( $F = 0.29$ ) as  $F_{MSY}$  proxy. A stock-recruitment relationship cannot be used for the estimation of reference points due to the small variability in SSB during 1990-2008 and the subsequent lack of a relationship.

### 5.5.3 Stock status & reference points using a length-based approach (2011)

For the 2011 assessment, ICES extended the modelled time period back to 1978, providing a clearer perspective of the historical development of the stock and improving the quality of the assessment. The uncertainty of SSB and F estimates was lower, though there was still a shortage of tuning data, particularly in relation to earlier years for areas outside VII and VIII and for the larger individuals in the population.

Figure 6 shows that SSB had been increasing since 1998 and was estimated to be at a record high in 2011. Fishing mortality had been decreasing in recent years, but was still above  $F_{MSY}$ . Recruitment appeared to fluctuate without substantial trend over the whole series. After high recruitment in 2006 to 2008, the last two recruitments were estimated to be low.

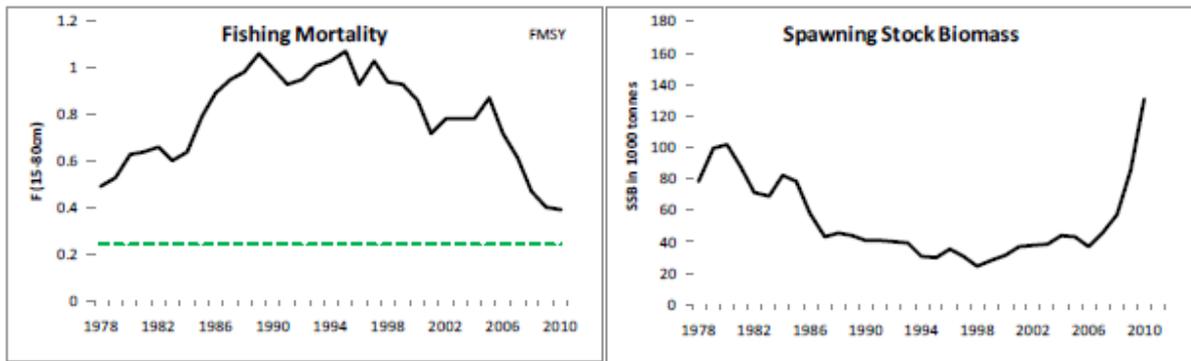


Figure 6: Summary of assessment results for hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIA, b, d carried out in 2011. F is based on lengths 15–80 cm, corresponding to approximately 1–5 years old; in previous assessment years the F age range was 2–6 years old. Source: ICES 2011

**5.5.4 Stock status & reference points using the most recent length-based assessment (2013)**

As indicated above, ICES has recently experienced some uncertainty in the assessment of the Northern hake stock, and there was no assessment in 2012. In 2013, a length-based model (SS3) was used by ICES WGHMM which incorporates commercial landings, abundance indices from four survey (EVHOE-Q4, PGFS-Q4, IGFS-Q4, and RESSGASC), and uses constant values for the maturity ogive and natural mortality (0.4) (ICES, 2013b). The latest scientific advice on stock status, given in June 2013, is that SSB has been increasing since 1998 and is estimated to be record high in 2013, whilst fishing mortality has decreased sharply in recent years and was equal to the  $F_{MSY}$  proxy in 2011 and 2012 (Figure 7). Recruitment has fluctuated without substantial trend over the whole series. After relatively low recruitments in 2009, 2010, and 2011, recruitment in 2012 is estimated to be the highest in the time-series.

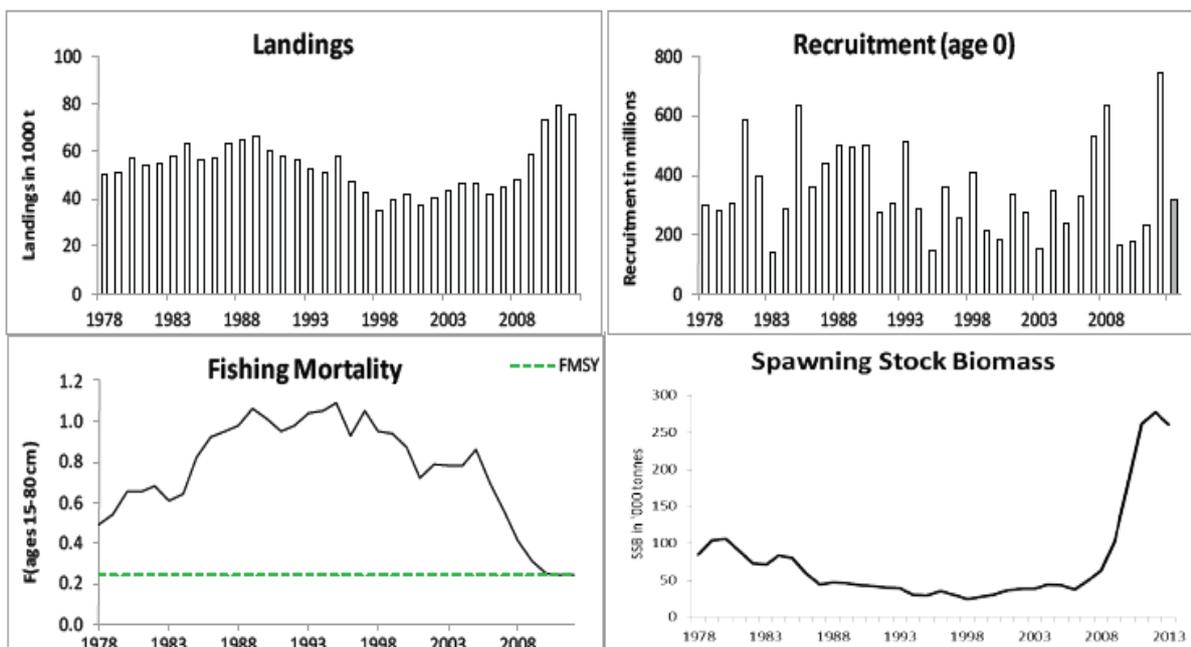


Figure 7: Summary of stock assessment results for hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIA, b, d (weights in thousand t). Assumed value for recruitment in 2013 is shaded

The estimates of SSB in 2011 were revised upwards by 70% and the F in 2010 revised downwards by 36% compared to the 2011 assessment because of upward revisions of incoming recruits. Nevertheless, all signals coming from the surveys and the fishery are consistent in showing a considerable increase in stock biomass. The impact of the strong 2008 year class can be seen clearly in the landings, and the high recruitment estimated in 2012 is based on consistent observations from two surveys.

This stock was benchmarked by ICES in 2014 (midway through the MSC assessment process), when ICES' assessment again showed that the SSB has been very high in recent years and F has decreased significantly over the last decade, though it remains above FMSY (see below). Recruitment in 2012 is estimated to be the highest in the time-series (ICES 2014a). Compared to the assessment conducted in 2013, current assessment estimates of SSB in 2013 have been revised downwards by 36% and the F in 2012 revised upwards by 75%. This reversal in quantifying SSB and F levels is a frequent result of reconfiguring assessment models which does, not, however, change the perception of stock trends nor of relative stock status. It is clear that trajectories for SSB and fishing mortality, and indices of year class strength, have been consistent through the assessments carried out since 2009, which suggests that the signals arising from landings and survey information represent a true reflection of the stock's dynamics.

Using the benchmarked assessment, ICES adopted new reference points for this stock, redefining FMSY at 0.27 and estimating MSYBtrigger at 46,200 t (=Bpa) and Blim = 33,000 t (ICES, 2014b, 2014c) (Table 5).

Table 6: Reference points for hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIa,b,d (Northern stock) (ICES, 2014b, 2014c).

<i>Type</i>		<i>Value</i>	<i>Technical basis</i>
MSY approach	MSY Btrigger	46 200	Bpa,
	FMSY	0.27	Stochastic simulations on a combined stock–recruitment relationship
Precautionary approach	Blim	33 000	A low biomass which was followed by a quick recovery
	Bpa	46 200	1.4 × Blim

SSB in 2014 (at 161,707 t) is clearly at an historically high level, well above both limit Biomass and MSYBtrigger, and fishing mortality has fallen to an historic low (around 0.4), but remains above FMSY.

The assessment still suffers from a shortage of tuning data, particularly in relation to earlier years, for areas outside Subareas VII and VIII and for the larger individuals in the population. Some discards from Subareas VII and VIII have been included in the assessment since 2003, but there is considerable uncertainty associated with estimation of discards and discards in northern areas (Subareas IV and VI) which appear to have increased in recent years but are not included in the assessment. In 2009 -12 observed discards averaged 11.20% by weight of the total catch and this level of discards is used in the assessment (ICES Advice 2013, Book 9).

In order to reduce uncertainty in discards estimates, an increased sampling level for on-board observer programmes is needed for some FUs (non-*Nephrops* trawlers, gillnetters, and longliners). Hake

otoliths are currently collected, but they are not used in the assessment due to lack of a validated ageing method. It is, therefore, important that research on hake ageing from otoliths is continued to further investigate the assumed fast growth rate and the high natural mortality that generate a rapid turn-over of the hake stock dynamics.

## **5.6 Harvest Strategy**

### **5.6.1 Hake Recovery Plan**

A recovery plan for the Northern hake stock was implemented in 2004 (EC Reg. No. 811/2004, Annex 9.4.10). The aim of the plan was to increase SSB to above 140,000 t, to be achieved by limiting fishing mortality to 0.25 and by allowing a maximum change in TAC between years of 15% when the SSB was above 100,000 t. This plan used target values based on precautionary reference points (see Table 4) that are no longer appropriate, and has apparently not been evaluated by ICES.

In addition to the 2004 recovery plan, a number of regulations and measures are used in the management of the Northern hake stock. These include:

1. Minimum landing size set at 27cm for fish caught in Subareas IV, VI, VII and VIII and 30cm for fish caught in IIIa.
2. Minimum mesh size of 100mm for otter trawlers when hake comprises more than 20% of the total weight of marine organisms retained on board. This measure does not apply to vessels less than 12 m in length and which return to port within 24 hours of their most recent departure (EC Reg. 1162/2001).
3. Minimum mesh size of 100 mm for all otter trawlers fishing in two specific (nursery) areas, regardless of the amount of hake caught (EC Reg. 494/2002), one in Subarea VII (SW of Ireland) and the other in Subarea VIII (Bay of Biscay).
4. Fishing effort limitations measures (EC Reg. 1954/2003) in a biologically sensitive area in Divisions VIIb, VIIj, VIIg and VIIh.

### **5.6.2 Long-term management plan**

Article 3 of the hake recovery plan prescribes that a management plan should be implemented when the target biomass (i.e. 140,000 t) of the Northern hake stock has been reached in the past two years. In 2009, a proposal for a Council Regulation to establish a long-term plan for the Northern hake stock and the fisheries exploiting that stock was presented by the European Commission (COM/2009/0039). The proposed plan aims for the sustainable exploitation of the resource in accordance with MSY, on the basis of scientific advice. The proposed long-term management plan also includes the need for a revision of the fishing mortality reference points, harvest control rules and technical conservation measures.

As a result of the shift in 2010 by ICES from an age-based approach to a length-based stock assessment model, the outcome was considered indicative of trends only in SSB, fishing mortality and recruitment, which had consequences for the finalisation of the proposed long-term management plan since existing target and limit biomass reference points were no longer appropriate.

In a special request for advice in June 2010, the Commission asked ICES to advise on whether a target fishing mortality rate of 0.17 (averaged across ages 2 to 6) remains appropriate for exploiting the stock consistent with MSY (as included in 2009 ICES advice). ICES was also invited to comment on any new implications that have arisen concerning the Commission's proposal for a Council Regulation establishing a long-term management plan for the Northern hake stock (COM/2009/039).

ICES responded to the Commission's request and in 2013 and recommended  $F_{30\%SPR}$  (i.e.  $F = 0.24$ ) as a potential proxy for  $F_{MSY}$ , as  $F_{MSY}$  could not be estimated directly. In June 2014, however, ICES used the benchmarked assessment to set new reference points for this stock, redefining  $F_{MSY}$  at 0.27 and estimating  $MSY_{Btrigger}$  at 46,200 t (=Bpa) and  $Blim = 33,000$  t (ICES, 2014b, 2014c).

Now that  $MSY_{Btrigger}$  and  $F_{MSY}$  have been identified for this stock, ICES follows the  $MSY$  approach to give advice implying fishing mortality at  $F_{MSY} = 0.27$ , resulting in landings of no more than 78 457 t in 2015. This is expected to lead to an  $SSB$  of 277 kt in 2016.

Note that, in lieu of any agreement on a long-term management plan for Northern hake, the recovery plan (EC Reg. No. 811/2004), which uses target values based on precautionary reference points that are no longer appropriate, was still being used as a basis for management of the hake fishery in 2014.

## 5.7 Harvest Control Rule & Tools

The long-term management plan is still under development, and the harvest control rules used for the setting of TACs have been as described in the Recovery Plan (Articles 5 & 6).

1. Each year, the Council shall decide by qualified majority on a proposal from the Commission on a TAC for the following year for the Northern hake stock concerned.
2. The TAC shall not exceed a level of catches corresponding to a fishing mortality rate of 0.25, based on scientific evaluations carried out by the STECF and the most recent ICES reports
3. The Council shall not adopt a TAC which would lead to a decrease in spawning stock biomass in its year of application, based on STECF and the most recent ICES Advice.
4. Where it is expected that the setting of the TAC for a given year in accordance with paragraph 2 will result in a quantity of mature fish at the end of that year in excess of the target level indicated in Article 2 (i.e. 140,000 t), the Commission will carry out a review of the recovery plan and propose any adjustments necessary on the basis of the latest scientific evaluations. Such a review shall in any event be carried out not later than three years following the adoption of this Regulation with the aim of ensuring that the objectives of the recovery plan are achieved.
5. The following rules shall apply:
  - a. where the rules provided for in paragraph 2 or 4 would lead to a TAC for a given year which exceeds the TAC of the preceding year by more than 15 %, the Council shall adopt a TAC which shall not be more than 15 % greater than the TAC of that year or;
  - b. where the rule provided for in paragraph 2 or 4 would lead to a TAC for a given year which is more than 15 % less than the TAC of the preceding year, the Council shall adopt a TAC which is not more than 15 % less than the TAC of that year.

### *Setting of TACs in exceptional circumstances.*

Where the quantities of mature fish of the Northern hake stock concerned have been estimated by the STECF, in the light of the most recent ICES report, to be less than 100,000 t, the following rules shall apply:

- a. Article 5 shall apply where its application is expected to result in an increase in the quantities of mature fish of the Northern hake stock concerned, at the end of the year of application of the TAC to a quantity equal to or greater than 100,000 t;
- b. where the application of Article 5 is not expected to result in an increase in the quantities of mature fish of the Northern hake stock concerned, at the end of the year of application of the TAC, to a quantity equal to or greater than 100,000 t, the Council shall decide by a qualified

majority, on a proposal from the Commission, on a TAC for the following year that is lower than the TAC resulting from the application of the method described in Article 5.”

ICES advice in 2010, 2011 and 2012 was indicative of trends only and the position of the stock in relation to reference points could not be estimated. Therefore the harvest control rules set under the recovery plan could not be applied to set the TAC for 2011. Instead, an EU policy paper on fisheries management that classified the Northern hake stock under category 8 was used: “*Stock status is unknown but trends based assessment indicates an increase in SSB. The resulting TAC increase should not exceed 15%*”. The TACs for 2011, 2012 and 2013 were set at the 2010 level; 55,100 t.

However, TACs have been ineffective in regulating the fishery in recent years as landings have greatly exceeded the TACs since 2009 (due, possibly to the disconnect between the recovery plan measures and the unexpected large increase in biomass since 2008). This is reflected in the ICES advice for 2013 which, on the basis of the MSY approach that implies fishing mortality at  $F_{MSY} = 0.24$ , is that landings in 2014 should be no more than 81,846 t (total catches of no more than 84,111 t if discard rates do not change), which is expected to lead to an SSB of 333,000 t in 2015 (an historic high). The TAC set for 2014 is consistent with this advice.

Because discards of juvenile hake can be substantial in some areas and fleets, both ICES and the Commission have noted for many years that the SSB and the long-term yield could be substantially improved by reducing mortality of small fish, using measures that shift the selection pattern towards larger fish (Smith, pers. comm. - CEFAS work for the EC in 1999). This applies particularly to trawl fisheries, whereas the Cornish gillnet fishery (for example) has a consistently good selection pattern (see Reville et al, 2006).

## 6 ECOSYSTEM CHARACTERISTICS

### 6.1 Introduction

The Cornish hake gill-net fishery takes place in the Celtic Sea, to the south and west of the United Kingdom and Ireland (Figure 1). The fishery takes place on the continental shelf, in waters around 100m deep, where the mixing of oceanic and coastal waters fuels a highly productive ecosystem.

The key features of the Celtic Sea environment, and the interactions between the fishery and aspects of the ecosystem, are considered in this chapter.

### 6.2 Ecosystem overview

An overview of the ecosystem characteristics, based on a comprehensive literature review, is set out in ICES (2008 (pages 1-12)). The key points noted in this review are:-

- The productivity of the ecosystem depends on the presence of oceanic fronts; principally the Irish Shelf Front, the Ushant Front at the mouth of the English Channel and the Celtic Sea Front at the entrance to the Irish Sea. The mixing of water bodies at these fronts encourages phytoplankton growth, which provides food for zooplankton that are in turn fed upon by fish.
- The bloom of phytoplankton on the shelf starts around April and collapses in October. In recent years, the bloom has occasionally persisted until December, and there has been a steady increase in the intensity of the bloom over the past 20 years.
- The overall abundance of zooplankton in the Celtic Sea has dropped in recent years, and the composition of the zooplankton community has also changed. Calanoid copepod abundance has declined in recent years.
- The temperature and salinity of the upper ocean (0-800m) waters in this area have gradually increased over the period 1975-2006. In 2005, water temperature was 0.8°C above the long-term mean and salinity was 0.04‰ above the long-term mean (1975-2005).
- The Celtic Sea groundfish community consists of over 100 species, and the most abundant 25 comprise 99% of the estimated biomass and 93% of the estimated numbers.
- Analysis of stomach content of the main predator species in the Celtic Sea (hake, megrim, monkfish, whiting *Melanogaster merlangus*, cod *Gadus morhua* and saithe *Pollachius virens*) suggests that they are all generalist feeders. Overall, higher densities of particular prey species in the environment correspond with higher occurrences in predators' stomachs. This means that conventional modelling of the ecosystem using models (such as a Multi Species Virtual Population Analysis, MSVPA) is unlikely to yield useful insights.
- Planktivorous fish such as herring or sprat appear to be a less important component of the Celtic Sea ecosystem than in other northeast Atlantic areas. The ecosystem appears to depend on benthic productivity as a driver for fisheries production.
- The recent warming of the northeast Atlantic waters has coincided with a general northward movement of the distribution of certain fish species, and sightings of southern species such as triggerfish, *Balistes* spp, have increased in the area.

ICES (2008) noted that the Celtic Sea ecoregion has attracted less research interest than other areas such as the North Sea, and recommended a more integrated approach to data analysis and modelling of predator-prey relations and inter-dependencies among commercial species in this area. Since the ICES review was published, the EC has commissioned joint data collection work involving the fishing industry and scientists in the area (Anon, 2010). Other work to improve understanding, knowledge and management of ecosystems in the area has been carried out by the recently established "Balanced Seas" project (see section 6.5).

### 6.2.1 Effect of the fishery on ecosystems

Hake is caught in a variety of mixed-species fisheries that use a range of gears. The impact of these fisheries on the ecosystem has not been assessed.

Adult hake feed on fish (mainly blue whiting *Micromesistius poutassou* and other gadoids, sardine *Sardina pilchardus*, anchovy *Engraulis encrasicolus*, and other small pelagic fish), whilst juvenile hake prey mainly upon planktonic crustaceans such as euphausiids, copepods, and amphipods. Hake is preyed upon by sharks and other fishes, and juveniles are eaten by adult hake (ICES, 2008).

ICES (2008) reports that there is evidence that the size structure of commercial fish populations in the Celtic Sea has changed over time, with larger individuals becoming relatively less abundant than smaller fish. There has also been a concomitant reduction in the mean trophic level of the fish community, resulting from a reduction in the abundance of large piscivorous fish like cod and hake, and an increase in smaller pelagic species. The upsurge in the hake stock may have reversed this trend.

### 6.2.2 Effect of ecosystems on the fishery

The major trends in the ecosystem are a gradual warming of surface waters, an increase in phytoplankton abundance, and a change in zooplankton composition (with a reduction in calanoid copepod abundance). Analysis of the trophic web in the Celtic Sea suggests that it is driven by benthic production, which seems to be independent of changes in plankton production. The impacts on hake population dynamics of these ecological factors or environmental conditions are not taken into account at present in the hake stock assessment or in management of its fishery.

### 6.2.3 Managing ecosystem effects

Article 6 of the EC Treaty sets out the basis for implementing an ecosystem approach to fisheries management through the Common Fisheries Policy (CFP). In implementing this strategy, the EC has taken a range of actions relevant to the fishery under assessment. These include the hake stock recovery plan that has restored the status of the stock; EC Regulation 812/2004 which addresses cetacean bycatch; and technical measures and annual TAC regulations that apply to non-target species in the fishery.

The Commission is presently working to develop an Integrated Maritime Policy that will link the management of fisheries under the CFP with the management of other human activities under the Marine Strategy Framework Directive and the conservation of wildlife under the Habitats Directive (EC, 2008). One goal of this work is to deliver an improved ecosystem-based approach to fisheries management.

In the UK EEZ, the Marine & Coastal Access Act promises a new approach to ecosystem management, through regulation of human activities and improved protection of wildlife. Though this Act was made in 2009, progress with its implementation has been limited to date, so its practical benefits cannot be evaluated.

## 6.3 Non-target species

Revill et al (2006) report 10 species of fish were caught in hake net trials in the UoC area, using meshes of 80, 100, 120 and 140mm. These included cod, haddock *Melanogrammus aeglefinus*, monkfish *Lophius piscatorius*, whiting, pollack *Pollachius pollachius*, megrim *Lepidorhombus whiffiagonis*, bib *Trisopterus luscus*, red mullet *Mullus surmuletus*, ling *Molva molva* and saithe.

This study demonstrated that the 120 mm mesh used by the fleet in the UoC catches very few non-target species compared to the smaller mesh sizes on trial. The 120 mm mesh size also retains only

larger fish; no undersized cod, haddock, ling or pollack were retained by these nets.

### 6.3.1 Retained non-target species

Two sources of information about retained non-target species have been used in this assessment. The first is landings data provided by the client; and the second is an independent study of gill net fishing in part of the UoC carried out under the UKs “Fisheries-Science Partnership” programme. Each is considered below.

#### 6.3.1.1 Client landings data

The client provided landings data for 6 vessels that at some point in 2013 were targeting hake using 120mm gill nets. It should be noted that these landings data include catches made by netting gears other than hake gill nets. At times, all vessels moved away from targeting hake to targeting other species, and may have used wreck nets, tangle nets and 'hake nets' in the same trip.

Annual landings for the three vessels that reported the majority of hake landed (and are, therefore, most likely to be using hake gill nets) are shown in Table 5, along with the percentage of the total landings that each retained species represents, both for these three main hake fishing vessels and for all six vessels combined. All vessels show a similar catch composition during periods of the year when they are targeting hake.

Table 7: Annual landings (t) of retained species by the three main hake netters that operated in the UoC, and for all 6 vessels that at some point were targeting hake using 120mm gill nets combined, 2010 – 2013. The target species is highlighted, and all elements making up more than 5% of retained or discarded species are shown in red [Source CFPO].

Species	2010	2011	2012	2013	4-year mean (t)	% of total landings (3 main hake netting vessels)*	% total landings for all 6 CFPO netters*
Monkfish	75.0	109.1	145.0	78.3	101.8	13.9	13.3
Cod	0.2	22.4	57.2	66.6	36.6	5.0	5.0
Haddock	21.4	28.7	31.5	54.8	34.1	4.7	4.7
Hake	167.7	201.9	499.0	497.8	341.6	46.6	46.4
Megrim	17.0	1.3	1.7	2.3	5.6	0.8	0.7
Plaice	1.8	0.3	+	0.4	0.6	+	+
Pollack	212.8	208.5	199.1	107.6	182.0	24.8	25.6
Saithe	18.9	10.7	29.2	45.7	26.1	3.6	3.7
Sole	0.2	0.2	0.1	+	0.1	+	+
Whiting	3.4	3.7	7.2	5.2	4.9	0.7	0.1
Horse mackerel	0.1	+	0.4	0.1	0.2	+	+
Mackerel	+	0.1	0.1	0.3	0.1	+	+
Total landings	518.6	586.9	970.7	859.3	733.1		

\* Note that these landings result from fishing with hake nets and also with other gear over the course of each year.

### 6.3.1.2 Fisheries-Science Partnership Catch Study

Catches of target and non-target species in the set net fisheries in the UoC area have recently been studied in detail under the UK “Fisheries-Science Partnership” programme (Bendall et al, 2012). Two commercial netters (FV “Charisma” and FV “Govenek of Ladram”, both members of the UoC) were chartered by Cefas between August 2011 and March 2012. Data were collected on the numbers of retained and by catch (discarded) species taken in offshore net (gill, trammel and tangle) fisheries in ICES Divisions VIIe-h. Particular emphasis was placed on collecting data on current catch levels of elasmobranchs of conservation interest (porbeagle *Lamna nasus*, common skate *Dipturus batis* ‘complex’ and spurdog *Squalus acanthias*) and their survivability following discarding; the study also provided an indication of catch composition in part of the area fished by gill net vessels.

The field study occupied 20 fishing days split between three commercial fishing trips to coincide with the seasonal abundance of common skate, porbeagle and spurdog in the bycatch. The most useful information for the present assessment came from FV “Charisma” (a 16.6 m gillnetter operating out of Newlyn and Padstow, Cornwall), which used 150 gillnets of 120 mm mesh size and 3600–4800 m length during September 2011 (Table 6). Although FV “Govenek of Ladram” (a 22.7 m long gillnetter operating out of Newlyn) also used gillnets of 120 mm mesh size, her catches were recorded across a mixture of gears, including 12 wreck nets and 18 trammel nets, and it is not possible to distinguish catches taken by 120mm gillnets alone.

The areas fished in the FSP study were based on local knowledge and the experience of the skippers in relation to seasonal occurrence of the three elasmobranch species in commercial fisheries within the Celtic Sea. They did not necessarily coincide with the areas usually fished when targeting hake; this information should therefore be regarded as an illustration of catch composition in part of the area fished for part of the year, rather than a definitive description of the catch of the fleet.

On the basis of the landings data for the 6 vessels that at some point were targeting hake using 120mm gill nets in 2013 (Table 5), the main retained species (more than 5% of catch) are hake, pollack, monkfish and cod, whilst haddock, saithe, megrim and whiting are minor retained species. However, the client notes that the monkfish landings are almost entirely attributable to tangle nets, whereas landings of cod, saithe, pollack, whiting and haddock are mainly attributable to wreck netting.

According to the FSP data (Table 6), the main retained species of a hake gillnetter (albeit working in a limited area for only one month in 2011) are hake, haddock and cod, whilst ling, pollack, saithe, whiting and megrim are minor retained species.

Table 8: Species composition (numbers and %) in retained and discarded parts of the catch of FV “Charisma”, observed for 21 sites fished with hake gill nets in September 2011. The target species is highlighted, and all elements making up more than 5% of retained or discarded species are shown in red. Species contributing less than 0.1% of the total catch are not shown [Source: Bendall *et al*, 2012]

Species	Catch		Retained		Discarded	
	No.	%	No.	%	No.	%
Allis shad	2	+	0		2	+
Monkfish	6	+	3	+	3	+
Bib	4	+			4	+
Black mouth dogfish	2	+			2	+
Blue shark	6	+			6	+
Blue whiting	5	+			5	+
Cod	516	27%	506	27%	10	1%
Common skate	5	+		0%	5	+
Edible crab	15	1%		0%	15	1%
Grey gurnard	8	+	8	+		
Haddock	126	7%	99	5%	27	1%
<b>Hake</b>	<b>650</b>	<b>34%</b>	<b>622</b>	<b>33%</b>	<b>28</b>	<b>1%</b>
Lesser-spotted dogfish	139	7%			139	7%
Ling	56	3%	54	3%	2	+
Mackerel	15	1%			15	1%
Megrim	16	1%	14	1%	2	+
Pollack	29	2%	29	2%		
Porbeagle	19	1%			19	1%
Red gurnard	2	+			2	+
Saithe	18	1%	16	1%	2	+
Spurdog	187	10%			187	10%
Whiting	46	2%	30	2%	16	1%
Witch	3	+			3	+
<b>TOTAL</b>	<b>1885</b>		<b>1384</b>		<b>501</b>	

From these two sources of information we judge that the main retained species (more than 5% of catch) of Cornish vessels when targeting hake using 120mm gill nets are likely to be pollack, haddock and cod, whilst monkfish, saithe, megrim, ling and whiting are minor retained species.

ICES have provided advice on the stock status of most of the above species in the UoC area in 2013 (ICES, 2013c). This advice is summarised below.

### 6.3.1.3 Main retained species

#### 6.3.1.3.1 Pollack

Commercial landings data and groundfish surveys suggest that the highest densities of pollack are found in the English Channel and Western Approaches, where they appear to be widely dispersed during summer and autumn and congregate around wrecks and reefs where they are targeted by set nets. In November or December the adults migrate to offshore spawning areas where they form dense aggregations.

There is insufficient information available to determine whether pollack in the western Channel and Western Approaches may be treated as a single stock. ICES considers that the available information is insufficient to evaluate the exploitation and stock trends of pollack in the Celtic Sea ecoregion, and the status of exploited stock is not known. There are no surveys that provide abundance indices.

A TAC is set for pollack in ICES subareas VI and VII (see Figure 1 for ICES areas). In 2012 it was estimated that the sustainable catch for subarea VI would be around 160 t and for subarea VII a catch of around 4,000 t would be sustainable. This estimate was based upon a Depleted-Corrected Adjusted Catch (DCAC) method. Catches from subarea VII have increased from around 3,900 t in 2008 to 4,800 t in 2013 (ICES WGCSE, 2014). ICES advice is that a precautionary TAC is set for subarea VII, which has been 13,495 t since 2011, and landings have increased from 3,900 t to 4,800 t between 2008 and 2013, of which approximately 4% is taken by the UoC.

#### 6.3.1.3.2 Haddock

Landings data indicate that haddock may make up just under 5% of the UoC catch; observer data suggest a slightly higher level of just over 5%. It is therefore appropriate to consider this a “main” retained species.

Haddock occurs in the Celtic Sea only when very large year classes “overspill” from the main spawning and nursery areas west of Scotland. This stock was benchmarked in 2012. ICES (2013) assessment of haddock in Divisions VIIb–k used an ASAP (Age-Structured Assessment Programme; NOAA toolbox) with international landings, age composition of landings and discards; and two survey (Irish and French) and one commercial fishery (Irish otter trawl) abundance indices, plus discard estimates. On the basis of this assessment, SSB shows a slowly increasing trend over the time-series and a sharp increase in 2011 with the maturing of the strong 2009 cohort, though SSB is now declining as this cohort is reduced. Fishing mortality remains above the  $F_{MSY}$  proxy and appears to have increased in 2012. Recruitment in 2009 was exceptionally good, but has been below average since then.

ICES have recommended a status quo TAC for haddock in Divisions VIIb-k. Though the SSB is thought to be increasing, it seems likely that this stock is overfished. Discarding of small haddock is felt to be a major problem in this fishery (official landings were just 2,600 t in 2009, whilst discards were thought to be over 7,000 t), but this is unlikely to be an issue for the haddock caught in the hake gill-net fishery, which are all large.

#### 6.3.1.3.3 Cod

The cod stock in the western Channel, Bristol Channel and Celtic Sea (ICES Divs VIIe-k) is highly dependent on incoming recruitment, and ICES’ 2013 assessment estimated the 2009 year class to be the strongest since 2000. The SSB is assessed to have increased from below Blim to well above MSY Btrigger since 2010. Recruitment has been highly variable over time, with occasional very high recruitment (e.g. 1987 and 2010). Fishing mortality shows a declining trend since 2005 and is now around the  $F_{MSY}$  proxy.

Research on the processes which influence recruitment in cod has focussed on the North Sea and Norwegian waters, where climate warming appears to have resulted in a northwards shift in the production of cod, but this effect has not been observed in the Celtic Sea. This may be reflected in the absence of a specific management plan for this cod stock (plans are in place for the North Sea and Skagerrak, Kattegat, Eastern Channel, West of Scotland and Irish Sea cod stocks). Since 2005, an area off north Cornwall (the Trevoise Box) has been closed to fishing in March to protect spawning cod.

For cod, ICES recommend a reduction of the TAC in ICES Divisions VIIe-k of 15%. Landings in 2009 were 3,200 t. ICES' advice was for a TAC of <2,600 t and a TAC of 4,023 t was agreed. There are no management objectives for this stock or a management plan, but a plan is under development. Biological limits for this cod stock have not been defined.

### 6.3.1.4 Minor retained species

#### 6.3.1.4.1 Monkfish (anglerfish)

The white anglerfish, *Lophius piscatorius*, is usually caught at depths of 20-150 m, although they have been recorded down to 550 m. The closely related black anglerfish, *Lophius budegassa*, has a more southerly distribution, and tends to occur at depths from 100 m down to 800 m. *L. piscatorius* is most abundant in the deeper water of the western English Channel and Celtic Sea throughout the year, and this species is dealt with here.

For assessment and management purposes, ICES uses three different stock areas for anglerfish, of which that covering Divisions VIIb-k and VIIa,b,d applies here. There has been no accepted assessment for *L. piscatorius* since 2007, and neither the state of the stock (SSB) nor F in relation to precautionary limits, high long-term yield or an agreed target is known. However, on the basis of LPUE trends and survey data, ICES suggested that the biomass of *L. piscatorius* has been increasing as a consequence of good recruitment since 2001, an interpretation supported by the industry's observations. Co-incidentally, an increasing proportion of small anglerfish are being caught and discarded, which has resulted in uncertainties in recent levels of catch.

In 2013, ICES advised that the long-term trend in biomass of *L. piscatorius* is increasing, and the average stock biomass indicator in the last two years (2011–2012) is 55% higher than the average of the three previous years (2008–2010).

There are separate TACs for Subarea VII and Divisions VIIa,b,d,e, which apply to both *L. piscatorius* and *L. budegassa* combined, since they are caught on the same grounds and by the same fleets and usually are not separated in the landings. Since 1<sup>st</sup> February 2006, there has been a ban on gillnets set at depth greater than 200m along the shelf edge in Divisions VIa,b and VIIb,c,j,k.

There is no minimum landing size for anglerfish, but an EU Council Regulation (No. 2406/96) laying down common marketing standards for certain fishery products fixes a minimum weight of 500 g for anglerfish. Council Regulation (EC) No. 1954/2003 established measures for the management of fishing effort in a 'biologically sensitive area' in Divisions VIIb, VIIj, VIIg, and VIIh where effort exerted by the vessels of each EU Member State may not exceed their average annual effort calculated over the period 1998–2002.

#### 6.3.1.4.2 Saithe

There is no assessment of saithe in the UoC area (where the species is not commercially important) and there are no surveys that provide abundance indices. However, the 2013 ICES assessment of saithe in Subareas IV and VI, and Division IIIa provides an indication of stock status of saithe in the UoC area. Recruitment has been below average since 2006 and shows a declining trend in recent year, and the latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around  $F_{MSY}$  since

1997.

#### 6.3.1.4.3 Megrin

There are two megrim species in the fishery area: megrim (*Lepidorhombus whiffiagonis*) and four-spot megrim (*L. boscii*). Megrim is most abundant between 100 and 300 m, whilst four spot megrim is found mostly between 200 and 600 m. ICES stock area in Divisions VIIb,c,e-k and VIIIA,b,d applies here. This stock was benchmarked in 2012, using a statistical catch-at-age model, with commercial catches (international landings, ages and length frequencies); four survey indices and three commercial indices (Spain and Ireland) and discard estimates. Though the model results have an adequate fit to the data, they can only be interpreted as trends. ICES advice for 2014 is that new data (landings, discards and surveys) available for this stock do not change the perception of the stock in 2012 (ICES, 2013c), which indicate an SSB increase of 25% in the last two years (2009–2010) relative to the three previous years (2006–2008). However, the stock is below the long term average, and fishing mortality in the last decade has been stable but above long-term average

ICES considers that the harvest control rules are expected to stabilize stock size, but they may not be suitable if the stock size is low and/or overfished. The TAC has been consistently around 20kt (of which 5% is *L. boscii*) since 1999.

#### 6.3.1.4.4 Whiting

Whiting, *Merlangius merlangus*, are abundant in the North Sea, the Irish Sea and the English Channel and are taken mainly in mixed species (cod, whiting, hake, *Nephrops*) fisheries using otter-trawls and beam-trawls targeting. In western waters (Sub-area VII), demersal trawlers may use mesh sizes that retain a high proportion of small whiting and discard rates are high so TACs based on landings do not control overall catches in many areas.

The ICES assessment of the whiting stock in ICES Div VIIe-k (Western English Channel, Bristol Channel and Celtic Sea) is based on an age-based analytical assessment (XSA) using commercial catches (international landings and ages from catch sampling); three survey indices and two French commercial indices. This stock is scheduled to be benchmarked in 2014. The assessment shows that SSB has been increasing since 2008 and is well above MSY Btrigger, whilst fishing mortality has shown a declining trend since 2007 and has been below the  $F_{MSY}$  proxy since 2011. Two recruitments, 2008 and 2009, have been above average and have now entered the fishery and are contributing to the spawning stock. ICES advises that technical measures should be introduced to reduce discard rates, though this does not apply to the UoC, where the 120 mm mesh size is selective for large whiting.

#### 6.3.1.4.5 Ling (*Molva molva*)

ICES provided quantitative advice for ling in Divisions IIIa and IVa, and Subareas VI, VII, VIII, IX, XII, and XIV for the first time in 2012 (ICES, 2012b). There is no analytical assessment of the stock status in this area. Reference points have not been proposed, however adult abundance (as measured by commercial indices) is above the average of the time-series (2000 – 2011). Abundance is considered to be stable at the current volume of catch.

Since 2003 an annual unilateral TAC has been applied by the EC for ling. ICES advised in 2012 that the TAC should be 10,800t in 2013 for Divisions IIIa and IVa, and Subareas VI, VII, VIII, IX, XII, and XIV (a precautionary 20% reduction of long term average catches). This advice has been carried forward in subsequent years (ICES, 2013f).

### 6.3.2 Discarded non-target species

Independent information about discarding of non-target species from the fishery is available from the Fisheries-Science Partnership study described in section 6.3.1.2 above. The results of this study are summarised in Table 8, which shows the number of fish and proportion (by number) of the catch made up by each species.

The selectivity of the UoC's hake fishing gear (see Fig. 17) minimises discarding, provided that quota regulations permit the fish caught at sea to be landed. The CFPO work closely with the fleet to minimise discarding as a result of quota restrictions, but the limited UK cod quota currently makes some cod discarding unavoidable (Interviews I2, I3).

Although the catch composition shown in Table 6 are expressed in numbers rather than weight, it is apparent only lesser-spotted dogfish and spurdog would be considered "main" by catch species (i.e. making up 5% or more of the catch), whilst edible crab (*Cancer pagrus*), mackerel, whiting and porbeagle shark are considered minor by catch species that are caught in more than insignificant quantities.

There is some concern about the status of porbeagle sharks, so the assessment team has taken this species into consideration here even though the incidence of capture was just 1% for the FV Charisma. The team has noted the occasional capture of common skate by vessels using hake nets. The species caught is understood to be the blue skate (*Dipturus cf. flossada*) which is considered to be much more abundant in the Celtic Sea than the flapper skate (*Dipturus cf. intermedia*) (Griffiths et al, 2010). Common skate have not, therefore, been considered further in this assessment.

Fishers off SW England have had historically important target and non-target fisheries for various elasmobranchs, including spurdog, porbeagle and common skate. The spatial distribution of the catches of these species recorded by observers during the FSP observer trips is shown in Figure 8.

In the FSP (Bendall et al, 2012) study, lesser-spotted dogfish and spurdog were the main elasmobranch bycatch in gillnets, and common skate the main bycatch in trammel nets. Overall, the elasmobranch bycatch appeared to be distributed widely throughout the area, and most of the fish were returned to sea alive. This FSP study also placed 621 identification tags and 70 electronic tags on spurdog, porbeagle and common skate that were released alive.

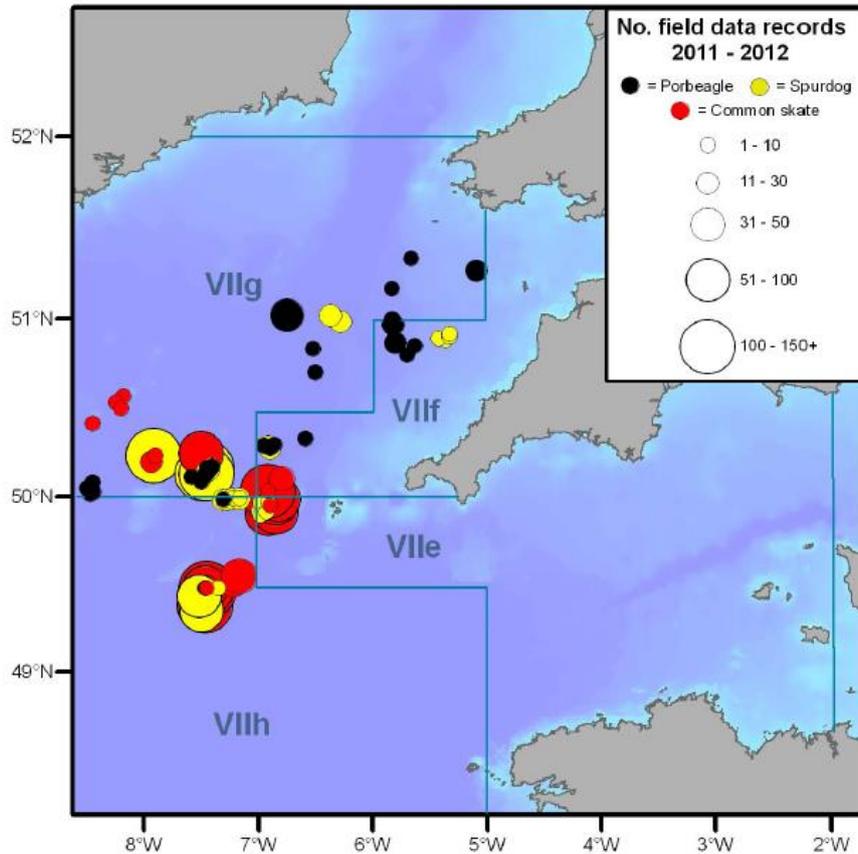


Figure 8: Spatial distribution and quantity of spurdog, porbeagle and common skate bycatch recorded in FSP trips (May 2011 to March 2012) [Source: Bendall et al, 2012].

A self-sampling scheme for shark bycatch produced a total of 23 bycatch logbook cards returned in October and November 2011 from three fishing vessels (FV “Charisma”, FV “Berlewen” and FV “Govenek of Ladram”). The distribution of recorded bycatch illustrated in Figure 99 shows that porbeagle catches were widely distributed throughout ICES Divisions VIIf-g during October and November 2011, and that large quantities (up to 50 individuals) were recorded during October 2011. Large catches were also recorded for common skate (up to 40 individuals) in October and for spurdog (150–200 individuals) in November 2011.

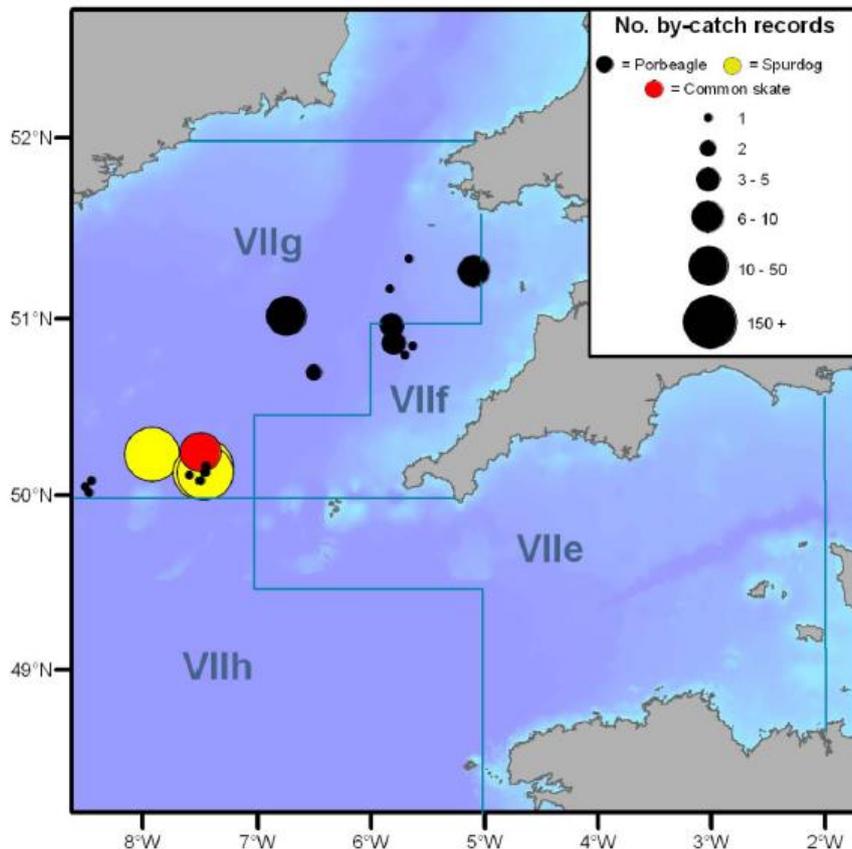


Figure 9: Spatial distribution of voluntary recorded bycatch of “shark species of interest” by FVs “Charisma”, “Berlewen” and “Govenek of Ladram” during October/November 2011. [Source: Bendall et al, 2012].

EC regulations have recently been put in place to close targeted fisheries for these species and also to prevent the landing of bycatch. The total allowable catches (TACs) of porbeagle and spurdog are currently set to zero, and common skate is now listed along with some other elasmobranchs on the TAC and quota regulations as ‘Prohibited species’: this has resulted in these species being discarded in commercial fisheries.

However, these species can be sufficiently locally and/or seasonally common in the Celtic Sea that bycatch can be significant and which, under a zero TAC, has to be discarded (dead or alive). Survival rates in the 2011 FSP study were reported to be consistently high for common skate (92%) and spurdog (73%) prior to discarding. Survival rates of porbeagle were lower, with only four (20%) recorded as being alive prior to discarding.

*A note on the conservation status of spurdog, porbeagle and common skate.*

Because of their vulnerability to fishing and slow recovery from population depletion, spurdog, porbeagle and common skate are now all listed as Critically Endangered in the Northeast Atlantic by the International Union for Conservation of Nature (IUCN). These species are also listed in the UK Biodiversity Action Plan list of priority species, which requires that statutory bodies should “have regard” to their conservation. However, these species do not meet the MSC Criteria for Endangered, Threatened or Protected (ETP) species and are thus most appropriately considered as bycatch rather than ETP species. The consequences of discarding of these bycatch species are considered species-by-species below.

### **6.3.2.1 Spurdog**

Historically, there has been a catch of spurdogs retained by this fishery. There has been a ban on landing spurdog since 2010. Landings data from 2009 (the last full year when landings of spurdogs were permitted, with only a maximum landing size of 100 cm in effect) indicate that the CFPO netting fleet landed a total of 50.8 t of spurdog. Since fishing practices and gear have not changed since 2009, the assumption that a similar quantity of spurdog is now discarded from the fishery was borne out by the FSP charter on FV “Charisma” in September 2011, when 187 spurdog were recorded caught and discarded. Variation in length of soak time did not appear to have an impact upon the numbers of spurdog caught nor on survival rates (to discarding), which were consistently high, with 283 (73%) returned to the sea alive.

It is reported that spurdog is often found on the same grounds as hake, which limits the potential for mitigation. The fleet report that spurdog capture is sporadic, and that moving nets to avoid the spurdog is ineffective: by the time that the nets are hauled and the problem has been identified, the spurdog have moved to another area.

The spurdog stock unit extends across the NE Atlantic. The most recent assessments undertaken by ICES was a benchmark carried out in 2011 using a delta-lognormal GLM-standardized index of abundance and a population dynamic model, which uses landings data, a statistical analyses of survey length distribution data (spurdog are difficult to age accurately), and estimates of fecundity.

Model estimates indicate a strong decline in spurdog total biomass to around 15% of pre-exploitation levels, which appears to have been driven by relatively high exploitation levels. This level of decline would justify an IUCN listing of ‘Endangered’, but would not support a listing of ‘Critically Endangered’. Though fishing mortality appears to have declined in recent years, biomass has declined to record low level in recent years and ICES advice is that, to allow the stock to rebuild, catches should be reduced to the lowest possible level in 2013 and 2014.

In 2012, ICES advised on the basis of the precautionary approach that there should be no targeted fishery, that catches in mixed fisheries be reduced to the lowest possible level, and that a rebuilding plan should be developed for this stock. The prohibition of landing catches of spurdog by EU vessels has resulted in landings across all ICES subareas declining in recent years, and those from the Celtic Sea ecoregion (Subareas VI and VII) have declined at a greater rate than those from Subareas II–IV. In 2012, the latter areas accounted for 70% of the total landings of spurdog due to less restriction on the (Norwegian) fishery.

### **6.3.2.2 Lesser spotted dogfish**

There is no assessment available for lesser spotted dogfish: this is not a commercially important species and appears from surveys to be abundant. Discards are known to survive well (Rodríguez-Cabello et al., 2005; Revill et al., 2005), which accounts for the species’ high abundance in fished areas.

### **6.3.2.3 Porbeagle shark**

Porbeagles are known to be susceptible to overfishing and, following the crash in the Norwegian fishery, the IUCN listed Northeast Atlantic porbeagle as ‘Critically Endangered’ (Stevens et al., 2006). Though a proposal to list porbeagle shark on Appendix II of CITES was accepted at the Conference of Parties in 2013, the implementation of this listing has been delayed by 18 months (14 September 2014) to enable Range States and importing States to address potential implementation issues.

The first assessment of the NE Atlantic porbeagle stock was carried out in 2009 by the joint ICCAT/ICES meeting using a Bayesian Surplus Production (BSP) model (Babcock and Cortes, 2009) and an age-structured production (ASP) model (Porch *et al.*, 2006). The 2009 assessments have not

been updated.

The BSP model uses catch and standardized cpue data and all trials demonstrated that the population continued to decline slightly after 1961. The model runs used the most biologically plausible assumptions about unfished biomass or biomass in 1961. The relative 2008 biomass (B2008/BMSY) is estimated at between 0.54 and 0.78 and the relative 2008 fishing mortality rates (F2008/FMSY) between 0.72 and 1.15.

The ASP model used the same input data as in the BSP model, but incorporated age-specific parameters for survival, fecundity, maturity, growth, and selectivity. Depending on the assumed F in the historic period (the model estimated value was considered to be unrealistic), the 2008 relative spawning–stock fecundity (SSF2008/SSFMSY) was estimated between 0.21 and 0.43 and the 2008 relative fishing mortality rate (F2008 /FMSY) between 2.54 and 3.32. It was concluded that these exploratory assessments indicate that current biomass is below BMSY and that recent fishing mortality is near or possibly above FMSY. It appears that sustained reductions in fishing mortality would be required if there is to be any stock recovery, and that recovery of this stock to BMSY under zero fishing mortality would take 15 to 34 years.

The ICES continues to advise on the basis of the precautionary approach that no fishing for porbeagle should be permitted, landings of porbeagle should not be allowed, and a rebuilding plan should be developed for this stock. No reference points have been proposed for this stock. Since 2012, EC Regulations 23/2010, 57/2011 and 44/2012 have prohibited fishing for porbeagle in EU waters and, for EU vessels, to fish for, to retain on board, to tranship and to land porbeagle in international waters. The Norwegian and Faroese fisheries have ceased and have not resumed.

In the FSP study, porbeagle survival rates (to release) were consistently low, just 4 (20%) were recorded as alive on hauling. Variation in the duration of soak time did not appear to have an impact upon the numbers of porbeagle captured nor the chances of survivability. There did not appear to be a discrete habitat or localized abundance of porbeagle, and the bycatch often consisted of a few individuals spread widely across ICES Divisions VII-f-g. SW fishers observe that it has become very hard to avoid porbeagle bycatch.

#### **6.3.2.4 Mackerel**

The stock unit for mackerel is the NE Atlantic, for which an analytical model is used with catch numbers-at-age data from the fishery and fishery-independent abundance indices from egg surveys that have been carried out every three years since 1977. In September 2012, ICES advised that fishing mortality (F) on mackerel had declined since the high levels in early 2000s and has been relatively stable since 2006, though F in 2011 was above both MSY and precautionary levels. The 2005 and 2006 year classes are the highest on record, boosting SSB to its highest level in the last 30 years, and ICES estimated that SSB in 2012 was at 2.67 million t, well above BMSY<sub>trigger</sub> and Bpa. No update assessment was available for 2013, but ICES (2013d) reported that catches of mackerel have been increasing since 2005 and have been around 900 kt since 2010, and that the mackerel egg survey index show a doubling of the SSB since 2004, and a 30% increase from 2010 to 2013.

#### **6.3.2.5 Edible crab**

ICES does not conduct assessments on or provide advice on edible crab stock status, but Cefas produces an annual report describing the status of stocks six crab assessment areas in English and Welsh waters. The information presented consists of catch and effort data from the fishery and the size structure of crabs in the landings, which is used to estimate exploitation levels and abundance indices in each assessment area, and an analytical perspective on stock status including reference points derived from aggregated length distribution data. The status of the stock of edible crab around SW England is good, with spawning stock and exploitation around the levels required to produce MSY. The status of the stock has not changed since the last assessment in 2010. Landings have been

relatively stable in recent years.

## 6.4 Endangered, Threatened & Protected (ETP) species

ETP species are defined by the MSC as those that are recognised by national legislation and/or Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, CITES. Information on UK ETP species has been obtained from the JNCC website (JNCC, 2014). The species that meet these criteria include various species of elasmobranch, marine mammals and birds, which are considered in turn below.

### 6.4.1 Bony fish

Two Allis shad (*Alosa alosa*) were observed in the catch of the FV *Charisma* (see Table 8). This species is listed in Schedule 5 of the Wildlife and Countryside Act (which makes it an offence to intentionally kill this species); and also under Schedule 4 of the Habitats Regulations (which prohibits their killing with poisons or explosives). There is no evidence that the UoC are in breach of these protection measures.

### 6.4.2 Elasmobranchs

The only ETP elasmobranch species found in the UoC area are the basking shark (*Cetorhinus maximus*) and the angel shark (*Squatina squatina*). Neither of these species was reported taken in the hake gillnet fishery.

### 6.4.3 Marine mammals

Six species of cetaceans are regularly observed in this area (Reid *et al.*, 2003). Minke whale *Balaenoptera acutorostrata* is found throughout the region, particularly off western Scotland and Ireland. SCAN surveys and observer programmes on ships of opportunity have recorded bottlenosed dolphin *Tursiops truncatus* in large numbers off western and southwestern Ireland and in smaller numbers throughout the region. There is thought to be a distinct inshore population of bottlenose dolphins in the south of England. Common dolphin *Delphinus delphis* are widely distributed in shelf waters, but especially in the Celtic Sea and adjacent areas. White-beaked dolphin and white-sided dolphin (*Lagenorhynchus albirostris* and *L. acutus*) occur over much of the shelf, but are less common in the southwest. Harbour porpoise *Phocoena phocoena* is by far the most numerous of the cetaceans found in the Celtic Sea ecoregion, particularly southwest of Ireland and west of Scotland (Hammond *et al.*, 2002; Wall *et al.*, 2004). Santos *et al.* (2004) suggested that whiting and sandeel (*Ammodytes* spp) are the most important prey for porpoises around the coasts of Scotland, comprising around 80% of the diet.

Grey seals (*Halichoerus grypus*) are common in many parts of the Celtic ecoregion, with population estimates ranging from approximately 50 000 to 110 000 animals (SCOS, 2005). The majority of individuals are found around the Hebrides and Orkney Isles, although some 5000–7000 are thought to exist in the Irish Sea and Celtic Sea (Kiely *et al.*, 2000). Studies of grey seal diet in the western Irish Sea reveal that the predominant prey species (Norway pout, bib, poor cod *Trisopterus minutus*) are not the principle target species for commercial fisheries in this region (Kiely *et al.*, 2000). However, a study by Hammond and Harris (2006) off western Scotland revealed that grey seals may be an important predator for cod, herring *Clupea harengus*, and sandeels in this area. Common seals (*Phoca vitulina*) are also widespread in the northern part of the ecoregion with an estimated 15 000 animals (SCOS, 2005). Smaller numbers (ca. 4000) are seen around Ireland, but very few further to the south.

#### 6.4.3.1 Marine mammal interactions with the fishery

Concerns have been raised during this assessment about interactions of this fishery with both cetaceans and pinnipeds.

##### Pinnipeds

Pinnipeds (seals) may be adversely affected by gill net fisheries through entanglement. If a seal becomes entangled in a net and is unable to break free it is likely to die. Seals that break free or that become entangled in loose fragments of net may survive the encounter but may subsequently experience injuries that can be fatal in the long term.

In discussions with the Cornwall Seal Group, it was reported that approximately 4-5% of seals around the Cornish coast may show signs of entanglement. Gill nets are the most common type of net in which seals become entangled. Vessels in the client fleet report negligible levels of gear loss, whether entire lengths of net, or panels from within a length of net, since the gear is constantly tended and is rarely lost.

The Sea Mammal Research Unit (SMRU) monitor and report interactions between fisheries and marine mammals to ensure that the UK complies with the requirements of EC Regulation 812/2004. The most recent SMRU report (Northridge et al, 2014) estimates that 469 grey seals are caught in drift and set nets around the UK, of which 395 were caught in ICES divisions VIIa-j. About 388 seals are thought to be caught annually in tangle and trammel nets. No seals were reported to be caught in hake gill nets by SMRU (Northridge et al, 2014).

##### Cetaceans

Incidental by catch in fisheries has been acknowledged to be a threat to the conservation of cetaceans in this ecoregion (CEC, 2002; Ross and Isaac, 2004; Parsons et al, 2008). As in other areas, this mainly affects small cetaceans, i.e. dolphins, porpoises and the smaller toothed whales. Species caught in the region are primarily the harbour porpoise, common dolphin, Atlantic white-sided dolphin, white-beaked dolphin, bottlenose dolphin, striped dolphin *Stenella coeruleoalba* and long-finned pilot whale *Globicephala melas* (ICES, 2010d).

An extensive review of published and anecdotal information on the by catch of cetaceans in pelagic trawls and other fisheries in the Celtic Sea was carried out for Greenpeace in 2004 (Ross and Isaac, 2004). It identified a small number of fisheries where cetacean bycatch could be documented. These were: bass pair-trawl fishing in the western Channel; mackerel and horse mackerel trawling SW of Ireland; and gillnetting for hake in the Celtic Sea. In the last two cases, the number of animals caught was low, whilst bycatches in the bass pair-trawl fishery have attracted considerable public attention. The report identified that many countries had initiated cetacean bycatch monitoring programmes, and had generally found little or no evidence that bycatch had occurred.

Detailed investigations of the interactions between the hake gill net fishery and both harbour porpoises (Tregenza et al, 1997a) and common dolphins (Tregenza et al, 1997b) in the Celtic Sea were carried out at the height of the fishery in the 1990s. These authors concluded that gillnets in the Celtic Sea were at that time catching around 2,200 harbour porpoise and 230 common dolphins per year. Particular concern was noted that the bycatch of harbour porpoise equated to 6.2% of the harbour porpoise population in the Celtic Sea (estimated at that time to be just over 36,000 animals). The introduction of an EC Regulation (Regulation 812/2004) to address bycatch of cetaceans in fisheries has, among other things, improved understanding of the extent of the interaction between this fishery and marine mammals. EU Member States are now required to monitor cetacean bycatch and report to the Commission.

In the UK, the monitoring of cetacean bycatch in fishing fleets is carried out by SMRU on behalf of

the Government. The most recent SMRU report (Northridge et al, 2014) includes estimates of the total bycatch cetaceans in UK drift net and set net fisheries. It is estimated that around 40 common dolphins are caught in hake nets each year out of a UK total of 322 animals (see Table 9).

The 2014 SMRU report examined the potential effect of net fisheries on harbour porpoise in greater detail than previous reports. Two issues were examined: the first was the apparent increase in the harbour porpoise catch rate in net fisheries in recent years; and the second was the possible effect that the use of pingers by the over-12m vessels in the UK may have had on harbour porpoise catch rates.

The data describing changes in harbour porpoise catch rates over time are summarised in Table 10. There is evidence that the overall catch rate for all netting métiers has increased in the last 4 years (2010-13) relative to the 2005-13 dataset. There have not, however, been any observations of harbour porpoise bycatch in the hake net fishery in the 2010-13 period (though only 4 hauls have been observed, compared to 13 porpoises in 267 hauls in the entire dataset).

Assessing the effect of pingers on the bycatch of harbour porpoises has been complicated by the process of implementing the statutory use of pingers in the UK (there was a derogation in place which meant that the use of pingers was not mandatory until July 2013); and also because the EU logbooks outside the North Sea do not allow for net fleet lengths to be recorded. SMRU have therefore made two estimates of mortality: one assumes that no fishing vessels have been using pingers, and that historic bycatch rate data should apply to the activities of the fishery (a worst case scenario); and another estimate based on the “best case scenario” where all vessels fully comply with the requirements to use pingers (i.e. all over 12m vessels use pingers, and that these are deployed correctly throughout all fleets of gear). The results of this comparison are shown in Table 11. The “best case scenario” is anticipated to reduce harbour porpoise bycatch in the hake gill net fishery from 88 animals per year to around 22 per year. The overall UK catch of harbour porpoise is expected to fall from 1917 to 1652 animals per year (note that this is from the North Sea, Irish Sea and Celtic Sea combined, and not just the UoC area).

The SMRU (Northridge et al, 2014) data are for UK vessels only, and do not provide an estimate of the total catch of cetaceans in the UoC area. ICES (2010d) collated the information submitted by Member States under Regulation 812/2004 and conclude that all fishing activity in the Celtic Sea, English Channel and Bay of Biscay caused a bycatch of 1,348 harbour porpoise and 1,137 common dolphins in 2008. ICES has not published any more recent estimates of total bycatch.

Table 9: Common dolphin and seal bycatch estimates for the UK fishing fleet, stratified by fishery, in 2013. Hake gill nets are highlighted and the estimated numbers of animals killed by the whole UK fleet are shown in bold. [Source: Northridge et al, 2014]

Metier	Estimated total bycatch	LCL (2-Sided)	UCL (2-Sided)	UCL (1-Sided)
<b>Common Dolphin</b>				
Drift demersal	0	0	62.24	50.64
Drift pelagic	0	0	47.82	38.9
Gill	58.57	12.09	170.8	151.11
<b>Gill hake</b>	<b>40.5</b>	<b>14.94</b>	<b>87</b>	<b>79.07</b>
Gill light	0	0	267.6	217.44
Gill flatfish	0	0	223.15	181.29
Tangle Trammel	223.41	144.73	329.93	312.14
<b>Totals</b>	<b>322 (CV=0.095)</b>	<b>172</b>	<b>1189</b>	<b>1031</b>
<b>Seals</b>				
Drift demersal	0	0	62.24	50.64
Drift pelagic	0	0	47.82	38.9
Gill	19.52	0.4943	108.59	92.49
<b>Gill hake</b>	<b>0</b>	<b>0</b>	<b>24.73</b>	<b>20.11</b>
Gill light	0	0	267.6	217.44
Gill flatfish	60.61	1.5345	336.88	286.96
Tangle Trammel	388.82	283.3756	521.45	499.5
<b>Totals</b>	<b>468.95</b>	<b>285.4044</b>	<b>1369.31</b>	<b>1206.04</b>

Table 10: Comparison of bycatch of harbour porpoise by UK vessels in all metiers over two periods of time: 2005-13 and 2010-13. (Note that all predictions of porpoise mortality in the hake fishery use the higher 2005-13 value). [Source: Northridge et al, 2014].

Metier	Observed Hauls	Porpoises	Porpoises / 100 Hauls	Bycatch Rate	Standard error	95% LCL (2-Sided)	95% UCL (2-Sided)	95% UCL (1-Sided)
<b>2010-2013 Series</b>								
Drift net	126	2	1.587	0.0159	0.0112	0.0019	0.0562	0.0491
Gill	475	5	1.053	0.0105	0.0047	0.0034	0.0244	0.022
Gill hake	4	0	<i>0.000a</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0.6024</i>	<i>0.5271</i>
Gill light	250	3	1.2	0.012	0.0089	0.0025	0.0347	0.0307
Gill flatfish	442	1	0.226	0.0023	0.0023	0.0001	0.0125	0.0107
Tangle / Trammel	1855	45	2.426	0.0243	0.0042	0.0178	0.0323	0.031
<b>Totals</b>	<b>3152</b>	<b>56</b>						
<b>2005-2013 Series</b>								
Drift net	192	2	1.042	0.0104	0.0073	0.0013	0.0371	0.03243
Gill	1296	14	1.08	0.0108	0.0031	0.0059	0.0181	0.01684
Gill hake	267	13	<i>4.869 a</i>	<i>0.0487</i>	<i>0.0142</i>	<i>0.0026</i>	<i>0.0818</i>	<i>0.0763</i>
Gill light	604	3	0.497	0.005	0.0037	0.001	0.0144	0.01279
Gill flatfish	939	1	0.106	0.0011	0.0011	0	0.0059	0.00504
Tangle / Trammel	3593	64	1.781	0.0178	0.0025	0.0137	0.0227	0.02189
<b>Totals</b>	<b>6891</b>	<b>97</b>						

Table 11: Estimates of bycatch of harbour porpoise (*Phocoena phocoena*) for the UK fishing fleet, stratified by fishery, in 2013. Two estimates are presented – one assumes that none of the fleet are using “pingers”; the other assumes that all vessels are using “pingers” perfectly. Hake gill nets are highlighted and the estimated numbers of animals killed by the whole UK fleet are shown in bold. [Source: Northridge et al, 2014]

Metier	Estimated total 2013	LCL (2-Sided)	UCL (2-Sided)	UCL (1-Sided)	Porpoises "saved"
<b>No pingers</b>					
Drift demersal	52	6.4	183.7	160.7	
Drift pelagic	40	4.8	141.1	123.4	
Gill	266	86.7	617.2	556.8	
<b>Gill hake</b>	<b>88</b>	<b>47.2</b>	<b>147.5</b>	<b>137.5</b>	
Gill light	529	111.1	1525.6	1352.2	
Gill flatfish	130	4.3	714.7	609.3	
TangTram	812	598	1076.8	1033.1	
<b>TOTALS</b>	<b>1917 (CV=0.126)</b>	<b>858.3</b>	<b>4407</b>	<b>3973</b>	
<b>Pingers for all over 12m vessels</b>					
Drift demersal	51.92	6.3	183.7	160.7	0
Drift pelagic	39.89	4.85	141.1	123.4	0
Gill	227.98	71.93	579.4	518.2	38
<b>Gill hake</b>	<b>21.49</b>	<b>5.04</b>	<b>208.5</b>	<b>175.6</b>	<b>66</b>
Gill light	519.62	108.7673	1997.1	1759.1	10
Gill flatfish	129.71	4.26	729.2	621.7	0
TangleTrammel	661.08	467.82	1019.9	958.3	151
<b>TOTALS</b>	<b>1652 (CV=0.147)</b>	<b>669</b>	<b>4859</b>	<b>4317</b>	<b>265</b>

The UoC fleet under assessment forms part of the hake gill net fishery listed in Table 9 - Table 11. SMRU consider that there were 19 vessels over 12 m in length operating in the UoC area in 2013 (Northridge et al, 2014), and the UoC fleet currently comprises of 11 vessels of this size (see Table 1).

**6.4.3.2 Population status**

ICES have published advice on the status of cetacean species in the area (ICES, 2010d; ICES 2010e). This advice has considered the survey data from the SCANS (Small Cetacean Abundance in the North Sea and adjacent waters) surveys that were carried out in 1994 and 2005 for the continental shelf waters between southern Norway and the Straits of Gibraltar. These remain the most recent surveys of the cetaceans in the area. The ICES advice focused on the status of harbour porpoise and common dolphins.

*Harbour porpoise*

In 1994, the SCANS survey estimated a population of harbour porpoise in the continental shelf waters of 341,366 individuals (95% CI: [260,000 449,000]), including c.250,000 in the North Sea, 33,000 in the Baltic Sea, and 36,000 in the Celtic Sea (Hammond et al., 2002). In July 2005, SCANS-II covered a wider geographical area and produced an estimate of 386,000 individuals (95% CI: [261,300;- 569,200]) for the European continental shelf (SCANS-II 2008), and an estimate of 335,000 individuals for the region surveyed in 1994.

Although the overall abundance estimates were similar, an increase in the abundance of harbour porpoises was noted in the Celtic Sea and adjacent shelf waters between July 1994 and July 2005 from 36,280 (CV = 0.57) to 80,600 (CV = 0.50) individuals, respectively. Highest densities in 2005 were reported off southern Ireland and along the south-west coast of the UK (see Figure 10, where some 80,600 individuals were estimated, compared to 36,000 in 1994.

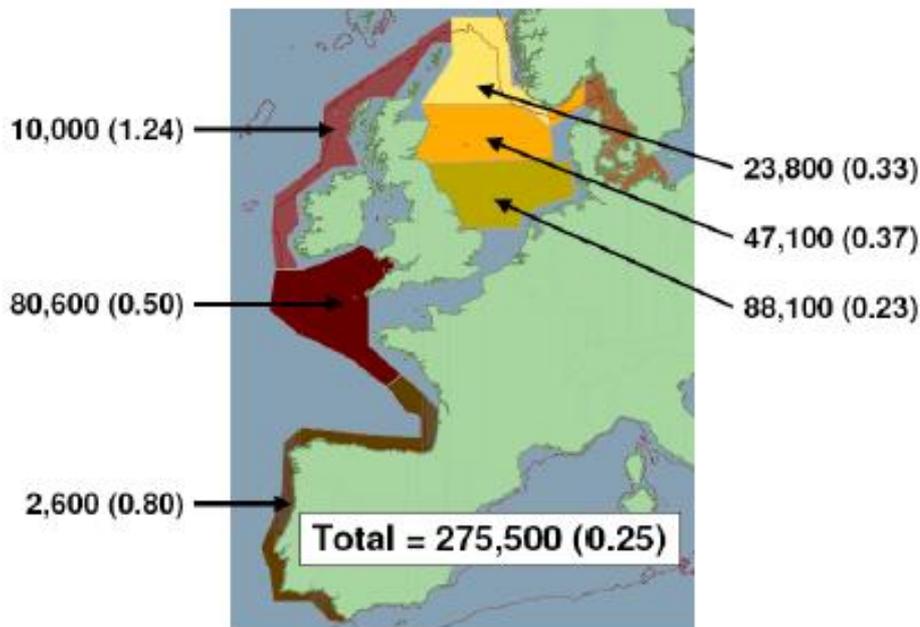


Figure 10 Abundance estimates (and coefficients of variation, CV) from the shipboard SCANS II survey in 2005 for harbour porpoise. [Source: ASCOBANS, 2009].

No significant change in abundance was detected in the North Sea harbour porpoise population between the 1994 and 2005 SCANS surveys. However, a southwards shift in distribution occurred: densities in the southern part of the North Sea increased in 2005; while densities in more northern regions, such as off Shetland, Orkney and eastern Scotland, declined (see Figure 10). This finding was supported by co-incident increases in sightings and strandings in the southern North Sea. Figure 10 also indicates that harbour porpoise densities in the Celtic Sea and western English Channel increased between 1994 and 2005. The cause for this increase is not known but, as in the southern North Sea, a plausible explanation is the movement of animals into these waters (ICES, 2010e).

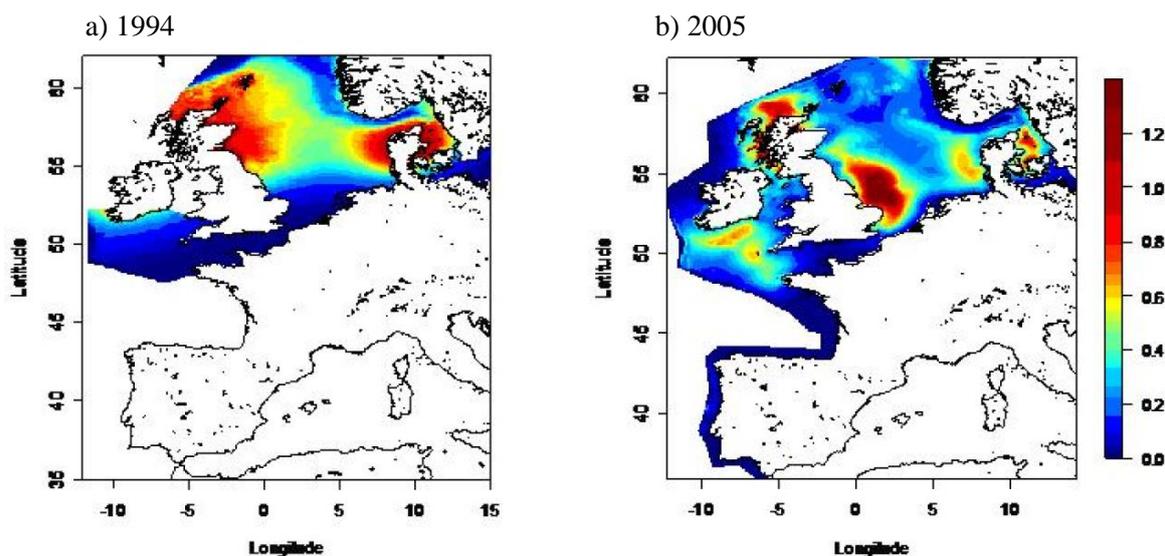


Figure 10: Harbour porpoise estimated density (number per km<sup>2</sup> in the SCAN (1994) and SCAN-II (2005) surveys. [Source: SCANS-II, 2008].

### Common dolphin

The spatial distribution of common dolphins is shown in Figure 11. Strong seasonal movements have been reported within this region, with dolphins being more widely dispersed in deeper offshore waters during summer (May - October) compared to the winter period (November - April), when pronounced aggregations occur in the shelf waters in the western English Channel and further offshore in parts of the Celtic Sea (ICES, 2005)

An estimated 50,507 common dolphins (95% CI: [28,742 – 88,751]) were present in continental shelf and slope waters in July 2005 (SCANS-II, 2008). Of this total, 11,141 individuals were estimated to be in the Celtic Sea and contiguous shelf waters; 4,919 in the English Channel; 825 in the Irish Sea; and 2,199 in the nearshore waters of the Scottish west coast, 11,661 in waters off the west coast of Ireland, 392 in the inner Bay of Biscay, and 17,916 in waters off the Atlantic coasts of France and Iberia. Highest densities occurred in the Celtic Sea, extending into St George’s Channel and the southern Irish Sea, in the western English Channel, and along the continental shelf off southwest Ireland and to the west of Ireland and Scotland (south of the Outer Hebrides) (ICES, 2010e)

The regional variability of common dolphin abundance is illustrated by the CODA (Cetacean Offshore Distribution and Abundance in European waters) survey in 2007, which estimated that 116,709 common dolphins (95% CI: [56,915 – 246,740]) were present in European offshore waters, beyond the continental shelf edge (CODA, 2009).

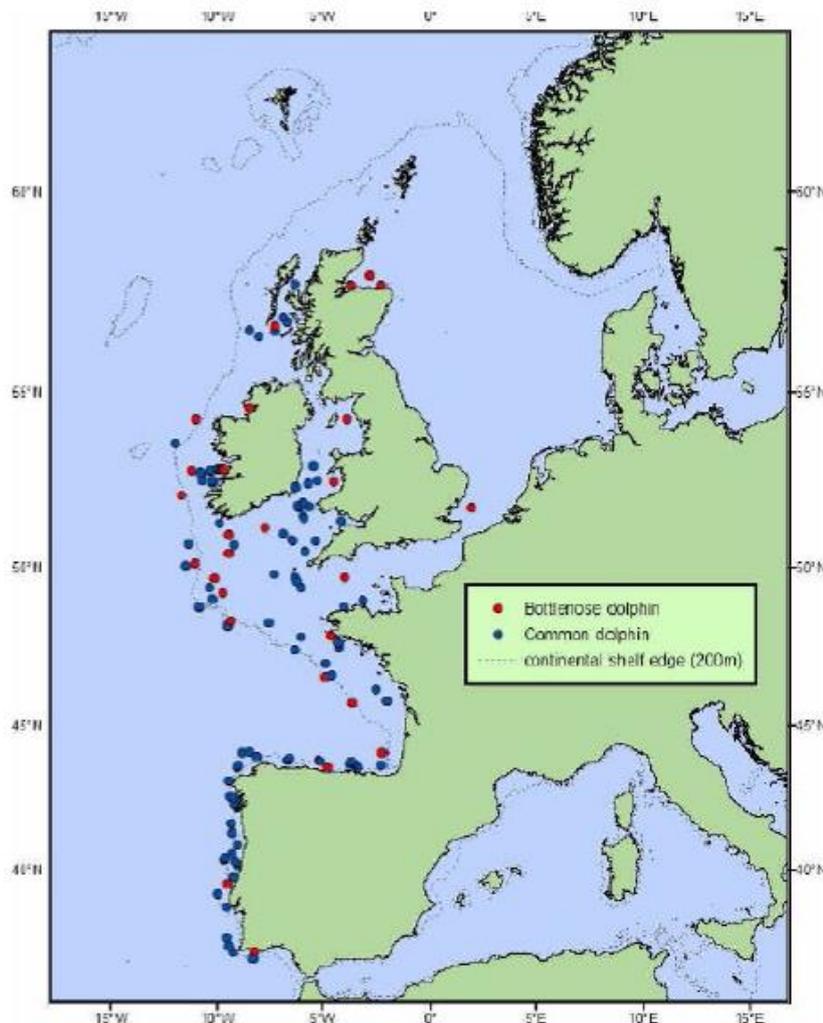


Figure 11: Sightings of bottlenose and common dolphins during the 2005 SCAN-II survey [Source: ICES, 2010c]

**6.4.3.3 Potential effect of fishing on cetacean populations**

The work carried out by Tregenza et al. (1997a, b) set out to establish the relationship between cetacean bycatch rates in the bottom-set gill net fisheries (not only hake gill nets) in the Celtic Sea and the population of harbour porpoise in the area. By combining the estimated bycatch rate in the gill-net fleet (2,200 harbour porpoise per year) with the 1994 SCAN population estimate of 36,280 animals in the Celtic Sea, the annual mortality rate due to bycatch was estimated at over 6% of the population. This level considerably exceeded the 1% “threshold for concern” identified by the International Whaling Commission (Tregenza et al, 1997a). Common dolphin mortality rates due to fisheries bycatch were estimated at the same time to be around 0.3% per annum (Tregenza et al, 1997b)

It is possible to repeat these calculations using the more recent data on bycatch gathered by SMRU and collated by ICES, and using the 2005 SCAN-II data. The results are displayed in Table 12.

In 1993, the estimated bycatch of harbour porpoise in Irish and UK bottom-set gill nets in the Celtic Sea alone was 2,200 animals (Tregenza et al, 1997a); in 2008 the bycatch over a wider area was estimated at 1,348 animals (ICES, 2010e). The bycatch by UK and Irish vessels alone in 2008 was estimated to be 998 harbour porpoise, less than half of the 1993 figure. SMRU estimate that the UK

hake-netting fleet accounted for a bycatch of between 22 and 88 harbour porpoise in 2013 (the figures representing the best and worst case scenarios that could be achieved with or without the use of pingers respectively) (Northridge et al, 2014). This apparent decline in bycatch is consistent with observations of bycatch falling when fishing effort reduced in the North Sea (Vinther & Larson, 2004)

By contrast, the overall common dolphin bycatch estimate was higher in 2008 than in 1993 (1,137 and 230 individuals respectively) (ICES 2010d; Tregenza et al, 1997b). Again, the 2008 figures include a wider geographic range, and also include fishing methods such as pair trawling that were not included in the 1993 estimate. SMRU estimated that the UK hake netting fleet accounted for a bycatch of 40 common dolphins in 2013 (Northridge et al, 2014).

ICES (2010c) note that, over the period 1994-2005, the total harbour porpoise population in the NE Atlantic, based on the SCAN and SCAN-II data, had hardly changed (see section 6.4.3.2). However, the estimated size of the population in the Celtic Sea was 36,280 in 1994 and 80,700 in 2005.

For common dolphins, the 1994 population estimate for the NE Atlantic was 75,500 individuals (Tregenza et al, 1997b); in 2005 the population was estimated in the SCANS-II area at 50,507 (SCANS-II, 2008), and in the CODA area further offshore it was estimated at 116,709 (CODA, 2009). ICES (2010c) note that there is just one North East Atlantic common dolphin population.

On the basis of this examination of published information, the entire UK hake-netting fleet was estimated to take a bycatch of 70 harbour porpoise and 30 common dolphins in 2012; for 2013 the figures were 22-88 harbour porpoise (the range depending on the effectiveness of pinger implementation) and 40 common dolphin (Northridge et al 2012, 2014). This bycatch equated to 0.09% of the Celtic Sea harbour porpoise population in 2012, and between 0.03 and 0.11% in 2013. The common dolphin mortality in this fishery equated to and 0.06% of the NE Atlantic common dolphin population in 2012 and 0.08% in 2013.

The UoC hake netting fleet is a subset of the UK netting fleet. There are 19 UK registered over 12m vessels working with nets (gill, tangle and trammel nets) in subarea VII. The UoC fleet comprises 11 over 12m in length vessels. The bycatch of cetaceans by the UoC fleet will be correspondingly lower than the figures presented in Table 12.

ICES has recently summarised the procedures used to determine reference points for marine mammal bycatch in advice to the EC. These reference points included those established by the International Whaling Commission, the USA (under the Marine Mammal Protection Act) and also by ASCOBANS (for harbour porpoises in non-depleted areas). Of these, the ASCOBANS algorithm, which is to use a reference point of 1.7% of the best available population estimate, is the one that is most precautionary, as it should achieve a conservation objective of 80% of carrying capacity, 95% of the time (see ICES, 2013d)

Table 12: Population size, estimated bycatch, and calculated mortality of harbour porpoises and common dolphins in the UoC area (data relating to the activities of the hake fleet are highlighted). [Data from ICES, 2010d, 2010e; Tregenza et al, 1997a,b; SCANS-II, 2008; CODA, 2009; Northridge et al, 2012; Northridge et al, 2014].

Item		Harbour porpoise	Common dolphin
<b>Population size</b>			
	1994	Celtic Sea	36,280
		SCANS Area	341,366
			75,500
	2005	Celtic Sea	80,600
		SCANS-II Area	385,617
		CODA Area	116,709
<b>Estimated bycatch</b>			
	1993 - UK & Irish set nets	Celtic Sea	2,200
			230
	2008 - All fishing	Celtic Sea, Bay of Biscay, English Channel	1,348
			1,137
	2012 - UK Hake Fleet	Celtic Sea	70
			30
	2012 - All UK set nets	Celtic Sea & Channel	821
			254
	2013 - UK Hake Fleet	Celtic Sea (best case)†	22
			na
	2013 - UK Hake Fleet	Celtic Sea (worst case)†	88
			40
<b>Population mortality due to bycatch</b>			
<i>1994 SCANS Data</i>			
	1993 - UK & Irish set nets	Celtic Sea	6.06%
	1993 - UK & Irish set nets	SCANS Area	0.3%
<i>2005 SCANS-II Data</i>			
	2008 - All fishing	Celtic Sea	1.67%
	2012 - UK Hake Fleet	Celtic Sea	0.09%
	2012 - All UK set nets	Celtic Sea & Channel	1.02%
	2013 - UK Hake Fleet	Celtic Sea (best case)†	0.03%
	2013 - UK Hake Fleet	Celtic Sea (worst case)†	0.11%
	2008 - All fishing	SCANS-II estimate	n/a
	2012 - UK Hake fleet	SCANS-II estimate	n/a
	2013 - UK Hake Fleet	Celtic Sea	n/a
			2.25%
			0.06%
			0.08%
<i>2007 CODA Data</i>			
	2008 - All fishing	CODA Area	n/a
	2012 - UK Hake fleet	CODA Area	n/a
			0.97%
			0.03%

† Range of mortality estimates based on best case and worst case scenarios for use of pingers (see section 6.4.3.1 of this report and Northridge et al, 2014)

#### 6.4.3.4 Seabirds

Wild birds, including seabirds, are protected in the UoC area by the EC “Birds Directive” (described in section 6.4.3.5 below). The key findings of a report on the impact of fisheries on seabirds published by ICES (ICES, 2010c) are summarised here.

Although there is no overall requirement to report seabird-fishery interactions, a review of 30 studies reporting bird bycatch in coastal gillnet fisheries in the Baltic Sea and the North Sea region found that between 100,000 and 200,000 seabirds are killed per year. Another study during 2006-2009 estimated that the seabird bycatch in the gillnet and longline fisheries of Mecklenburg-Vorpommern (including catches in the adjacent German EEZ) ranged between 15,880 and 18,165 birds per winter season (November - May). Seabird bycatch in the spring herring fishery in Greifswald lagoon (February - May) ranged between 904 and 2034 birds. All of these estimates lack data on total fishing effort and highlight the need for further development of assessment tools and methodologies.

Many seabird populations in several parts of European seas are declining. In waters west of the UK (OSPAR Region III), population levels below 75% of their long-term averages were observed in all but one year between 1988 and 1992 and in all years since 2002. In 2008 and 2009, the following species were below 75% of their long-term mean abundance: roseate tern, European shag, herring gull, Arctic skua, black-legged kittiwake, northern fulmar, great black-backed gull, razorbill, and common guillemot, of which five species showed substantial declines. Several of the nine species have been affected by fisheries, either directly (e.g. bycatch of fulmars on long-lines) or indirectly (e.g. depletion of black-legged kittiwake prey by fisheries).

The causes of seabird declines require further investigation, including evaluating changes in the availability of prey species. For example, low abundance of sandeels off the east coast of Britain may be responsible for poor breeding of black-legged kittiwake colonies in this region, but would not explain similar poor performances at colonies in western Britain where black-legged kittiwakes tend to feed on other species of fish.

Climate change is likely to impact significantly on seabird populations. The breeding success of some seabird populations in the Celtic Sea has already been linked to climatic fluctuations in the North Atlantic. Projected consequences of global warming, such as sea level rise, increased storminess and rises in sea/air temperatures are also likely to have a direct impact on seabird populations.

No interactions between the fishery under assessment and seabirds have been identified in the recent ICES review or reported in the bycatch observer studies that have been carried out in this fishery since the early 1990s.

#### 6.4.3.5 Protection of ETP species

A range of international, regional and national legislation provides protection for the ETP species in the UoC area. This is briefly outlined here.

At the international level, the United Nations Convention on the Law of the Sea (UNCLOS) sets the foundation for the sustainable management of “marine living resources”, which includes ETP species as well as fish stocks. UNCLOS calls for its signatories to “*co-operate with a view to the conservation of marine mammals and in the case of cetaceans shall in particular work through the appropriate international organisations for their conservation, management and study*”<sup>1</sup> The EU, UK and Ireland are UNCLOS signatories.

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<sup>1</sup> UNCLOS Articles 65 & 120

The United Nations Convention on Biological Diversity (CBD) was agreed in 1992, and calls for parties to aid the recovery of threatened species through the development and implementation of plans or management strategies. In the UK, the CBD is being implemented through the production and implementation of Biodiversity Action Plans (BAPs) for threatened species and habitats.

The Bonn Convention on the Conservation of Migratory Species of Wild Animals (CMS) is highly relevant for marine species. Most of the cetaceans found in the UK are listed in Appendix II of this convention, identifying them as “*migratory species that would significantly benefit from international cooperation*”.

Further international protection is provided by CITES. All species of cetaceans in UK waters are listed in the CITES appendices, which restricts international trade in these species. At a more practical level, trade in any cetaceans in Europe is prohibited by the EC Regulation of Trade in Endangered Species.

At a regional and domestic level, protection of ETP species is provided by the EC “Birds Directive” and “Habitats Directive” with their transposing domestic legislation. The Birds Directive protects all species of wild birds, as appropriate, and their habitats in designated areas known as “Special Protection Areas” (SPA). The Habitats Directive protects certain species in all places at all times, including all species of cetaceans, and it also enables areas of the sea to be protected as “Special Areas of Conservation” (SAC).

#### 6.4.3.5.1 Protection of cetaceans

Cetaceans (whales and dolphins) are protected by a range of specific international, regional and domestic legislation in addition to the measures described above.

At the international level, the International Convention for the Regulation of Whaling was signed in 1946, and aims to “*provide for the proper conservation of whale stocks and thus make possible the orderly development of the whaling industry*”. The International Whaling Commission (IWC) established under this convention works to encourage research, and to implement measures to protect and manage whaling activity around the world. In 1996, the IWC identified that a bycatch of 1% (of an area’s population) should be a threshold of concern for harbour porpoise populations (IWC, 1996).

The Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS) was signed in 1992, and came into force in 1994. ASCOBANS currently has ten parties, including the UK. It calls for parties to:-

*“undertake to cooperate closely in order to achieve and maintain a favourable conservation status for small cetaceans.”*

The Agreement also requires Parties to apply certain “*conservation, research and management measures*”. These measures include working towards:

- “(a) the prevention of the release of substances which are a potential threat to the health of the animals,*
- (b) the development, in the light of available data indicating unacceptable interaction, of modifications of fishing gear and fishing practices in order to reduce by-catches and to prevent fishing gear from getting adrift or being discarded at sea,*
- (c) the effective regulation... of activities which seriously affect their food resources,”*<sup>2</sup>

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<sup>2</sup> ASCOBANS Annex 1, Article 1.

Fisheries bycatch has been identified by ASCOBANS as the highest priority for small cetaceans in the Agreement area. The second ASCOBANS Meeting of Parties (MoP) defined the “*unacceptable interaction*” mentioned in Annex 1 Article 1(b) as being the total anthropogenic removal above 2% of a population and, in response to an IWC-ASCOBANS Working Group on harbour porpoises in 1999, the MoP in 2000 resolved that this level should be set at 1.7%, and that a lower level should be set for depleted cetacean populations.

In 2004, the EC introduced Regulation 812/2004 “*laying down measures concerning incidental catches of cetaceans in fisheries and amending Regulation (EC) No 88/98*”. This Regulation requires, *inter alia*, the use of Acoustic Deterrent Devices (ADDs, more often known as “pingers”) on specified types of gill net, tangle net and drift net deployed from vessels of 12 m or longer; onboard observer programmes for bycatch monitoring on fishing vessels of 15 m or more; and pilot projects to monitor the impact and effectiveness of pingers, and also the levels of bycatch in smaller (<12 m) vessels. The requirements for the use of pingers are illustrated in Figure 12.

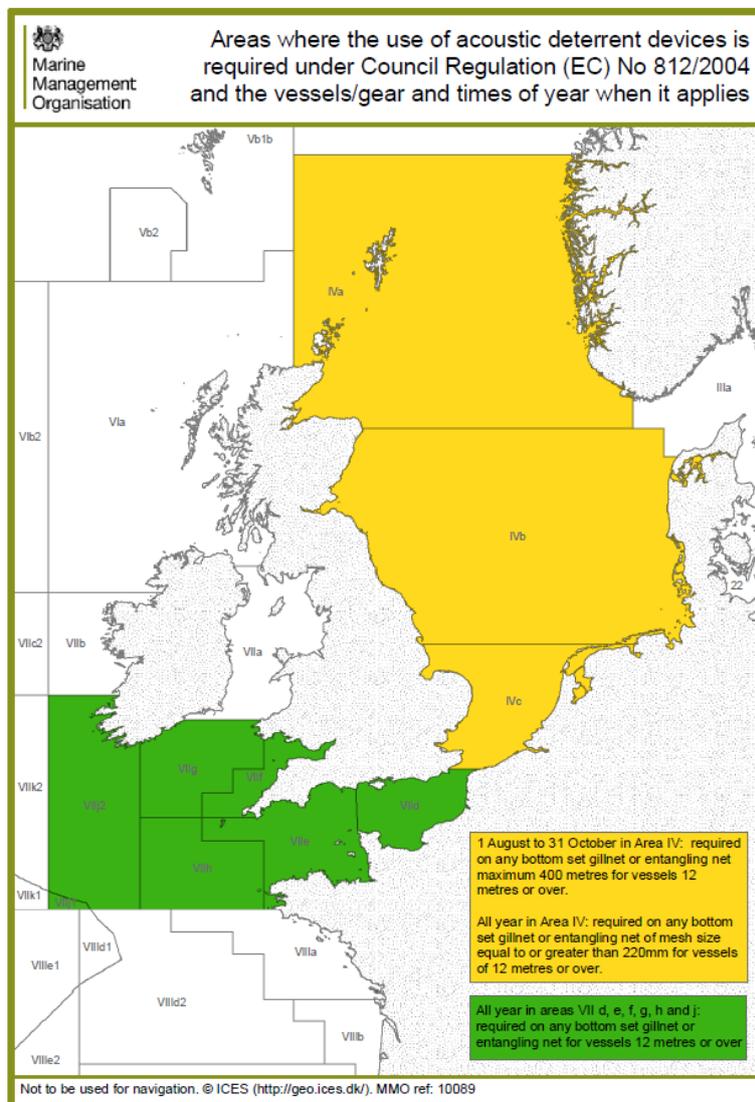


Figure 12: Map of areas around the UK where the use of acoustic pingers is required as a cetacean bycatch mitigation measure. [Source: MMO, 2014b]

In the UK, regulations are in force to protect cetaceans from harm, including from “reckless disturbance”. The laws protecting cetaceans are complex, but in summary they create three levels of gradually increasing protection:

- Intentional harm (such as disturbing, killing or injuring) to some species is an offence within territorial waters (up to 12nm offshore) under the Wildlife and Countryside Act.
- Deliberate harm (such as disturbing, killing or injuring) to some species is an offence created by the Habitats Regulations (within 12 nm) and the Offshore Habitats Regulations (out to 200 nm).
- Reckless disturbance is an offence introduced by the Countryside and Rights of Way Act (“CROW Act”) that has been applied specifically to whales, dolphins and basking sharks, up to 12 nm offshore.

The penalty for breaking any of these laws can be a fine of up to £5,000 and in some circumstances a term of up to six months in prison.

#### **6.4.3.6 Mitigating impacts on cetaceans: Acoustic Deterrent Devices**

An EC Regulation was introduced in 2004 to require the use of pingers on fishing nets in order to reduce the bycatch of cetaceans (EC Regulation 812/2004). Because of concerns about the safety and practicality of the pinger designs available to the industry, the UK was granted a derogation to allow the implementation of this Regulation to be delayed whilst trials of different pinger designs were carried out.

Trials of different pingers have now been carried out by the hake fleet in collaboration with the SMRU to identify a protocol for their deployment and operation that provides effective deterrence whilst remaining safe and practical (Kingston & Northridge, 2011; Northridge et al, 2011). An effective protocol has been identified, whereby a small number of loud pingers (the “DDD-03L” pinger) are deployed at 4km intervals along a fleet of nets, with each pinger having an effective deterrence range of 2km. Tests of these pingers aboard CFPO hake vessels show a 95% reduction in porpoise bycatch in fleets of nets less than 4km long and 66% in longer fleets.

The EC has issued a derogation to the UK to allow the DDD-03L pinger to be used in the over 12m fleet, in accordance with a specified operational protocol (MMO, 2014a,c). This derogation is required because the DDD-03L pinger does not exactly match the pinger specification set out in Regulation 812/2004.

The UK Government implemented a “soft start” to the introduction of this protocol. The new pinger protocol was introduced in September 2013, and all vessels have been expected to comply with the requirements by July 2014.

The data describing cetacean interactions in Table 9 & Table 12 during 2012 were thought to describe the level of bycatch when around 18% of UK gill net vessels were using pingers (Northridge et al., 2012). The estimates for cetacean mortality in 2013 considered both the best case scenario (all vessels using pingers) and the worst case scenario (no vessels using pingers) to demonstrate the potential effect that they may have on bycatch mitigation (Northridge et al, 2014). In future years as the full implementation of the Regulations takes effect it should be possible to quantify the effect that pingers have had on cetacean bycatch.

#### **6.4.3.7 Animal welfare**

There are significant concerns about the animal welfare implications of cetacean bycatch, and also the associated with entanglement of marine mammals with lost or discarded fishing nets (Interviews I4, I5, I6 and I7).

The animal welfare issues associated with cetacean bycatch, and the current lack of a regulatory response to them, have been considered in detail by the Whale & Dolphin Conservation Society (Soulsbury et al., 2008).

Animal welfare issues are not addressed in the MSC Principles and Criteria<sup>3</sup>, and lie outside the scope of this assessment.

### **6.5 Habitats**

Fishing using static gear such as bottom-set gill nets has very little impact on seabed habitats compared to mobile gear (Jennings & Kaiser, 1998). The habitats reported to be typical of the continental shelf area are therefore unlikely to be significantly affected by this fishery.

Ellis et al (2002) report that over 340 species of invertebrate and fish were captured in a survey of the epibenthos of ICES Divisions VII-f-h. The most ubiquitous species were the hermit crab (*Pagurus prideaux*) and the dragonet (*Callionymus maculates*), both of which are prey for commercial fish species. Two epibenthic communities predominate in the area. On the shelf slope, this is dominated by a sea anemone; and on the continental shelf the epibenthos is dominated by the hermit crab and other mobile invertebrates (shrimps and echinoderms). There is evidence from studies of larval abundance in plankton that long-term benthic production is increasing in the area (Heath, 2005).

No biogenic reefs or other sensitive marine habitats that could be damaged by set nets or the anchors used are reported to occur on the seabed in the UoC area.

The European “Natura 2000” strategy for conserving marine and terrestrial wildlife is delivered through two EC Directives: the “Birds Directive” (made in 1979 and recently codified in 2009 (Directive 147/2009/EC)), and the “Habitats Directive” (Directive 92/43/EC). These two Directives provide objective criteria for designating a Europe-wide network of protected sites, collectively termed “Natura 2000”, which are a core part of the EC’s commitment to delivering the objectives of the 1979 Berne Convention and the 1992 United Nations Convention on Biological Diversity. The Natura 2000 network comprises two types of protected sites: Special Protection Areas (SPAs), which aim to protect birds and the habitats that support them; and Special Area of Conservation (SACs), which protect terrestrial and marine habitats and species.

The EC Habitats Directive was transposed into UK legislation by the 1994 “Habitats Regulations” and extended to apply up to 200 nm offshore in 2007 by the “Offshore Habitats Regulations”. This legislation enables areas of seabed habitat to be protected, and the current extent of the SACs that have been established under this legislation are shown in Figure 13.

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<sup>3</sup> These are listed in section 9 of this report.

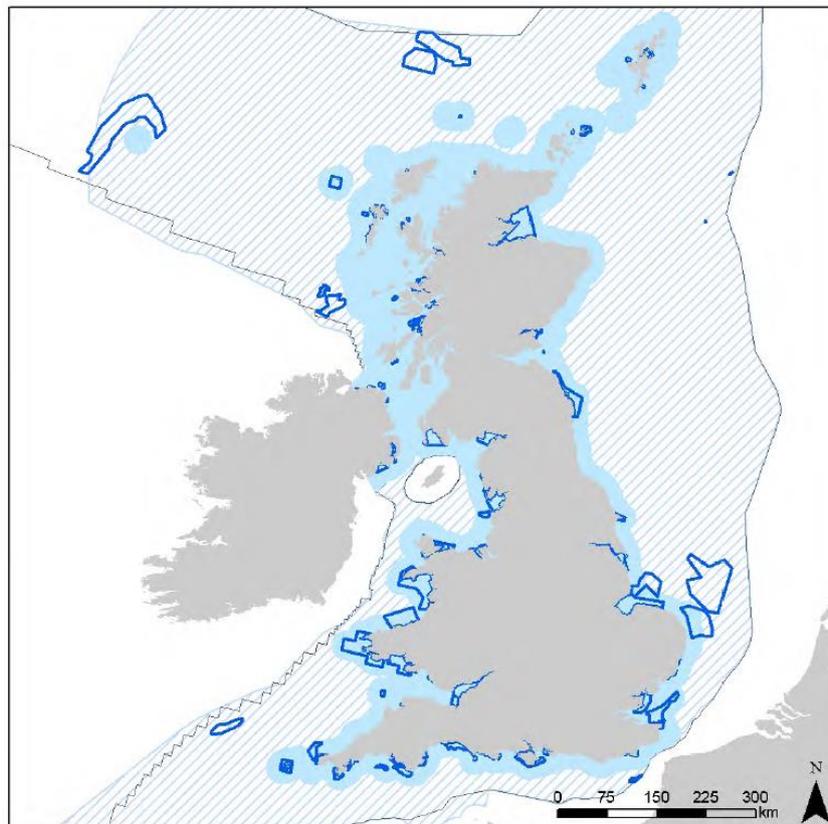


Figure 13: The location of Special Areas of Conservation (SACs) with marine components around the UK [Source: JNCC, 2010a]

There are several SACs in the inshore waters of the UoC area, and an offshore SAC has been proposed at Haig Fras, a 45 km long granite outcrop on the continental shelf. The potential impact of fishing on this site has been discussed at an Anglo-French workshop (JNCC, 2011). This workshop concluded that the low level of static gear activity (set nets and pots) did not require management intervention, but that some management measures might be required to address the impacts of trawling on the site.

In England and Wales, the Marine and Coastal Access Act 2009 has led to new Government strategies for marine wildlife conservation. The purpose of these strategies is to deliver a UK network of ecologically coherent and well-managed marine protected areas, with the aim that the UK meets its commitments to the Convention on Biological Diversity and contributes to achieving Good Environmental Status across Europe’s seas by 2020 under the EC Marine Strategy Framework Directive (JNCC, 2010b).

Twenty-seven Marine Conservation Zones (MCZs) were designated in English and Welsh waters in November 2013, three of which are located offshore and within the UoC area (Figure 14). These are:-

- East of Haig Fras – an area between 80-100 m deep which has rocky and soft (coarse sediment, sand and mud) habitats. This MCZ covers an area of 400 km<sup>2</sup>.
- South-West Deeps – covering an area of 1824 km<sup>2</sup> of seabed between 100-149 m composed mainly of coarse sediment, sand and mixed sediments.
- The Canyons – an area covering 661km<sup>2</sup> which contains cold water coral reefs in waters between 100 m and 2,000 m deep.

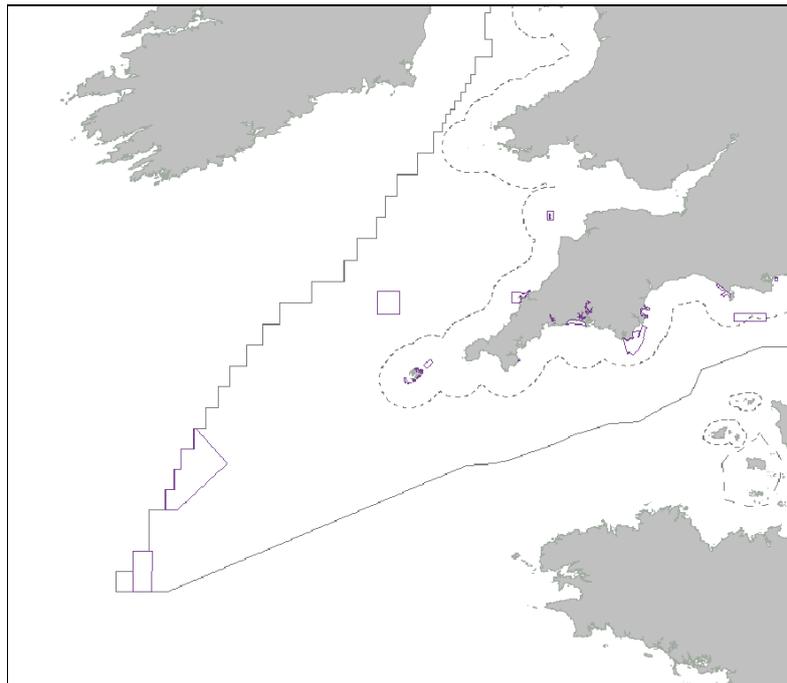


Figure 14: Location of Marine Conservation Zones (outlined in purple) in the UoC area. [Source: JNCC, 2014]

The process of identifying possible MCZs has been lengthy and has involved a wide range of stakeholders. In England, this strategy was progressed through the Marine Conservation Zone (MCZ) Project, within which “Finding Sanctuary” set out the framework for marine wildlife conservation within UK waters in the south west. The Welsh Assembly Government launched its own strategy for establishing MCZs in Welsh waters (Welsh Assembly Government, 2009).

The team notes that activity to conserve marine habitats in the UoC area demonstrates that information describing seabed habitats is available in sufficient detail to enable areas requiring protection to be identified, that there is legislation in force that can provide this protection, and that this has been successfully implemented.

Statutory nature conservation agencies have indicated that the habitats in all of these MCZs are vulnerable to bottom trawling. The Canyons MCZ is also considered to be sensitive to static gear (JNCC & Natural England, 2012). Information about the activity of the UK hake gill net fleet indicates that they do not fish as far south as the Canyons MCZ area (see Figure 15).

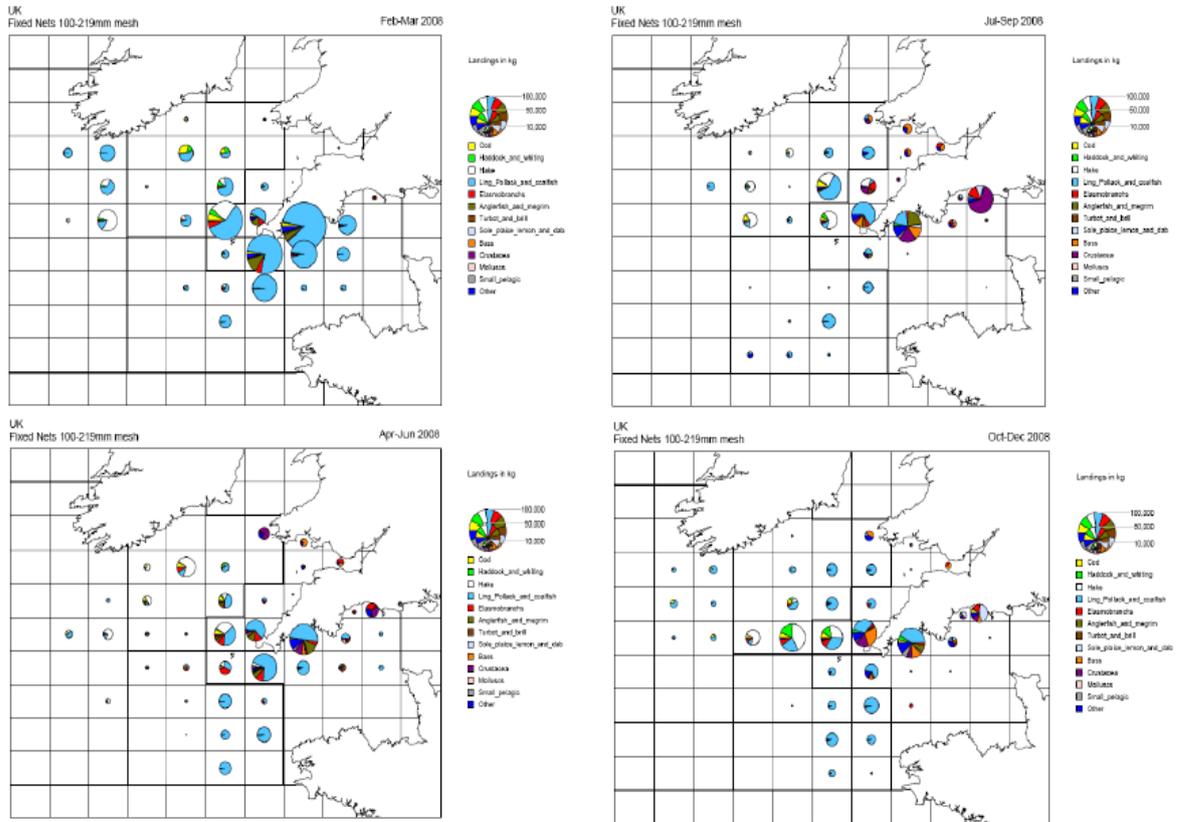


Figure 15: Landings of fish by UK set netters using mesh sizes of 100-219 mm mesh during each quarter of 2008. Pie charts show relative weight of landings and proportion of each species (hake are shown by white segments) in each statistical rectangle [Source: Anon, 2010].

## 7 FISHERY MANAGEMENT FRAMEWORK

### 7.1 Overview

The Cornish Hake fishery under assessment takes place largely outside UK territorial waters and within EC waters. The fishery is managed through the EC Common Fisheries Policy (CFP), which is an international agreement implemented by the EC and its Member States.

The EC CFP sets out long-term management objectives for the hake stock based upon current scientific advice. This determines the overall Total Allowable Catch (TAC) for the stock, which is then allocated according to pre-determined rules to the fleets of EC Member States. The annual review of scientific advice and stock management engages a wide range of stakeholders through a variety of means. This management regime is implemented through EC and Member State legislation. The key details of this management framework are set out in this section of the assessment.

### 7.2 Governance & policy

The broad context of the fishery management system for the UoC is considered here in respect of the legal framework for fisheries management; consultation roles and responsibilities; the roles of different management organisations; long-term objectives for the fishery; and the incentives that the management system creates for sustainable fishing.

#### 7.2.1 Legal / customary framework

The management framework for this fishery is provided by international agreements and delivered through enforceable legislation made by the EC.

##### 7.2.1.1 International agreements

The framework for managing the shared fishery resources in the North-East Atlantic is set out in the *Convention on the Future Multilateral Cooperation in North-East Atlantic Fisheries* (NEAFC, 2007a). This “new” convention replaced the original 1982 convention and incorporates revisions to give effect to other international agreements including the UN Convention on the Law of the Sea (United Nations, 1982), the UN “Straddling Stocks” agreement (United Nations, 1995), the FAO “*Compliance Agreement*” (FAO, 1993), and the FAO *Code of Conduct for Responsible Fisheries* (FAO, 1995). NEAFC has also reached agreements with ICES and with the OSPAR Commission to ensure that its activities are informed by, and compatible with, current fisheries advice and initiatives to conserve the marine environment (NEAFC, 2007b; NEAFC, 2008a).

##### 7.2.1.2 Legislation and Regulation

The CFP, the primary fisheries legislation within the EC, came into being in 1983. It has been reviewed thoroughly and the current basic fisheries regulation (No.1830/2013) was adopted by the Council of Ministers in December 2013.

This Regulation sets out the strategic aims of the CFP and enables the Council of Ministers, or in certain cases the Commission, to make more detailed Regulations. The principal Regulations relevant to the hake fishery are those that set the TAC and quotas for fishing fleets; specify technical restrictions for fishing activity (such as limits on trawl and gill-net mesh sizes); and restrict fishing in the North Sea to encourage the recovery of cod stocks. Outside the CFP framework, other EC legislation dealing with habitats and species protection is also relevant to fisheries management and to fishermen.

EC Regulations are directly applicable in each Member State and throughout EC waters, meaning that all vessels are legally required to abide by their provisions. Implementation of the CFP at a national level is carried out by Member States' fishery enforcement agencies who co-operate in policing the fishery (e.g. satellite monitoring, landing recording etc). National Governments may also make their own domestic legislation to support the enforcement of EC Regulations.

The EC's fisheries inspectorate monitors the national enforcement process and its results. The Commission can also request fishery-related data from member states.

## **7.2.2 Management systems and processes**

The fishery is managed by a range of organisations, at international, national and local level, which provide opportunities for participation from a wide range of organisations. The key features of the management systems and processes relating to this fishery are summarised below.

### **7.2.2.1 Management regime**

The management of the hake fishery is based upon a system of regular stock assessments and management review, summarised in Figure 16 and explained below.

Scientific advice lies at the core of the management regime. This advice is provided by the ICES Advisory Committee (ACOM) which draws on the on-going work of international scientists from relevant research laboratories and institutions on stock biology and marine science. The main working group now responsible for providing the scientific basis for advice on Northern hake is the Working Group on the Assessment of Southern Shelf Stocks of Hake, Monk and Megrin (WGHMM). The assessment working group may draw on the work of other ICES working groups, study groups and workshops on for example surveys, reference points, recruitment processes and N.E. Atlantic ecology.

Stock assessment and data collection methodologies are regularly reviewed - at ICES level and at the level of the contributing laboratories and research institutions. Within ICES, a methods working group review methods for fish stock assessment as necessary, and there are specific working groups dealing with various issues relevant to the fishery.

The assessments carried out by ICES Working Groups are reviewed and evaluated by the ICES Advisory Committee (ACOM), which then provides advice on the status of target and non-target stocks to the EC. Where relevant, the advice is considered at a joint meeting between officials of the EU and other coastal states. ICES advice, translated into Commission proposals, informs the deliberations of the EC Fisheries Council which, at its annual meeting in December each year will determine the TAC for Northern hake for the following year, based on this advice.

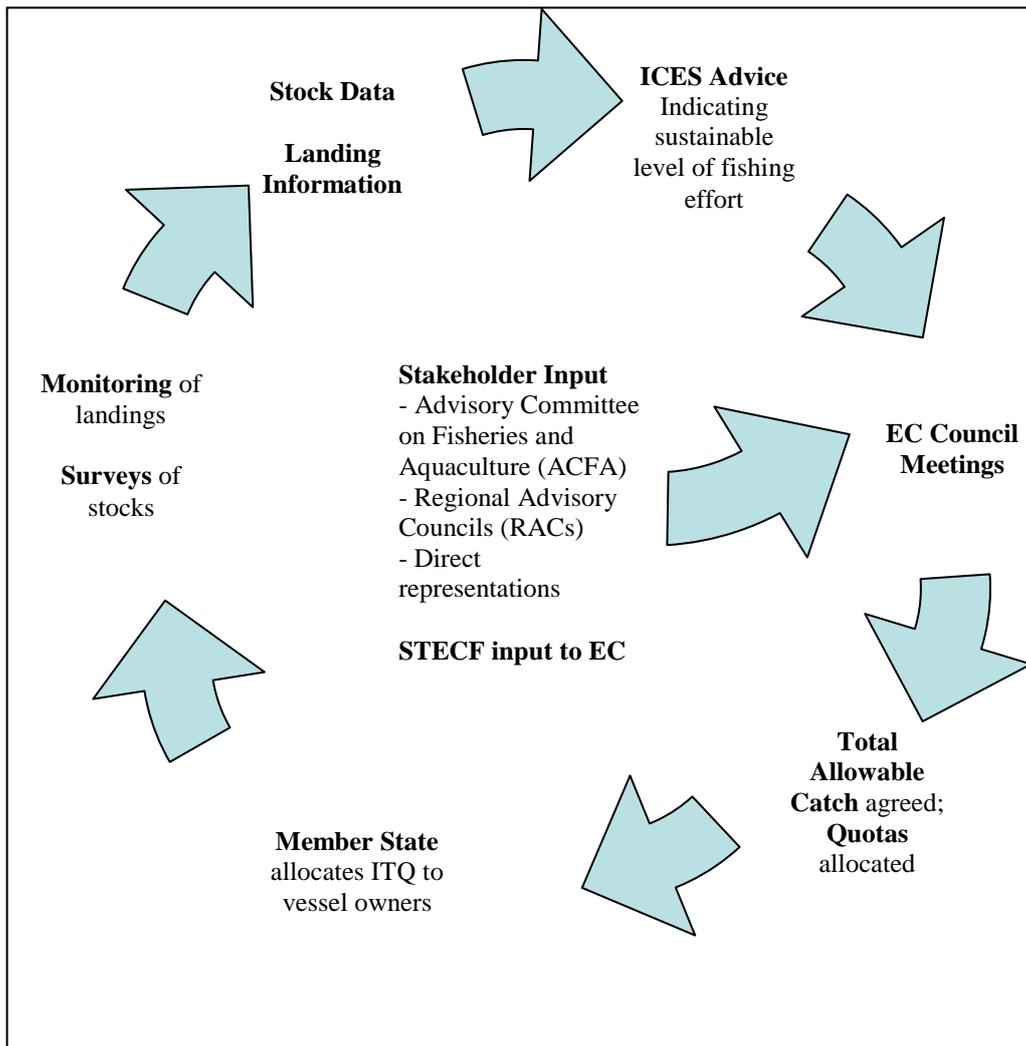


Figure 16: Diagram of the procedure for administering the management of the **Northern Hake Stock at the EC level.**

The TAC for each stock is shared out in quotas which limit the amount of fish that can be landed by Member States. Quotas are shared out according to the principle of ‘relative stability’. This principle guarantees Member States a fixed percentage of a species’ TAC (its national quota) in a certain area from one year to the next, based on historic fishing activity. Member States do not receive quotas for those areas in which they have not historically fished.

Following the allocation of the quotas to member states, the principle of subsidiarity operates. Each member state can administer its quota according to its own preferences, provided the catch limits are adhered to and that all member state fishermen are treated equally. In the UK, the trend has been for Government to hand the management of quotas to the producer organisations (POs). These organisations, run by fishermen or their representatives, decide how to manage the quotas during the course of the year and usually try to ensure that the fishery remains open for the whole year.

Compliance with the quota system is monitored carefully. Vessels have to report landings to the National Authorities who in turn report aggregate national information to the EC. If the stage is

reached when the national quota for a particular species is near to being taken, the member state authority will make a decision to close the fishery taking that species, working with the industry to achieve this.

The management regime for the fishery allows for regular and ongoing review of its performance. This occurs at every level of the system, with policy documents formulated at an EC level as a result of initiatives at national, sub-national and European levels. These policies and resulting operational plans and practices are then subject to wide consultation before ratification, and prescribed monitoring and evaluation processes after ratification. These systems also include formal consultation and review processes involving all EC Member States' fisheries administrations, and committees such as ACOM, STECF (the committee by which the EC seeks expert opinion on fisheries), the Advisory Committee on Fisheries and Aquaculture (ACFA) dealing with all stakeholder concerns at a European / "horizontal" level), and the Regional Advisory Councils (RACs) dealing with regionally specific technical issues.

Data gathered by management institutions also inform the management regime, and the work of the management organisations in every Member State is itself subject to review. The data that are used to inform the management regime include the register of vessels, fleet activity (days at sea & vessel monitoring system –VMS - data), inspection and monitoring of landings, and some catch monitoring.

#### **7.2.2.2 Consultation**

Extensive consultative processes are in place at national and European levels to debate policy, plans and management, and recent years have seen the introduction of more formal procedures to incorporate a wider stakeholder community within such consultations.

At a European level, key institutions are the ACFA - which comprises a contact group at the European level for all stakeholders at national and regional levels – and the RACs – which comprise a contact group dealing with particular fisheries at the regional level. The North Western Waters RAC covers the area within which the Cornish Hake Gill Net fishery operates (see Figure 17).

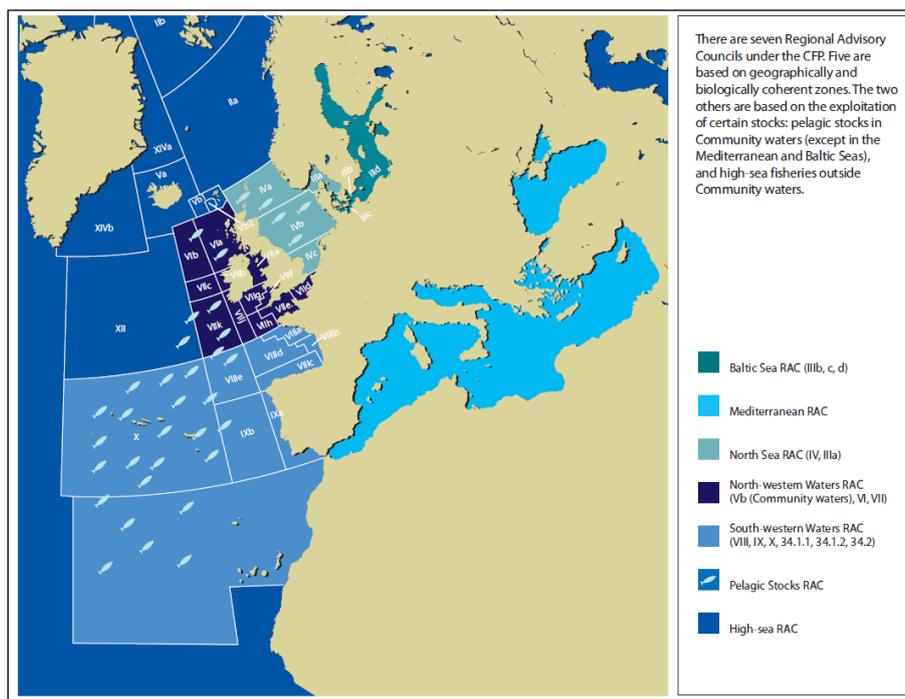


Figure 17 Map showing the extent of the Regional Advisory Councils (RACs) established under the EC Common Fisheries Policy in 2002 (from EC, 2009)

At a national level, administrations operate formal consultation procedures combining mailings on current issues and proposed changes to management systems and regular scheduled face-to-face meetings with key stakeholders. The UK Marine Management Organisation (MMO) has arranged meetings with the industry to explain and assist the introduction of the EC regulations relating to Illegal, Unlicensed and Unregulated (IUU) fishing (Regulation 1005/2008), and also worked with the client fleet to assist the introduction of electronic logbooks, which all of the UoC fleet (vessels over 15m) were required to be using by 1<sup>st</sup> December 2012.

**7.2.3 Long term objectives**

There are explicit long-term management objectives under the EC Regulation No 811/2004, implementing measures for the recovery of the Northern hake stock. This was aimed at increasing the SSB to values equal to or greater than 140 000 t, which has been met. The management objectives are likely to be modified in the near future based on the new assessment approach adopted by ICES and redefinition of target fishing mortality and associated biomass levels. The main articles of the Northern hake recovery plan are summarised in 5.6 above.

The recovery plan regulation also incorporates measures to assist enforcement of the TAC restrictions for hake, notably requirements to record the time spent in the areas covered by the plan (Article 7); to notify the authorities of any landings of more than 50 kg of hake (Article 8); and, when more than 2 t of hake are aboard a vessel, only to land the fish at a designated fishing port, in this case, Newlyn in Cornwall (Article 9).

The management regime also includes measures that are relevant to MSC Principle 2. These can be seen at the international level and in EC legislation. The EC CFP regulation presently in force (Regulation 1380/2013) contains provisions to implement the ecosystem-based approach to fisheries management (Article 2(3)); gradually eliminate discarding (Article 2(5)(a)); and contributed to the

attainment of “Good Environmental Status” by 2020 (in line with the objectives of the Marine Strategy Framework Directive (2008/56/EC)).

#### **7.2.4 Incentives for sustainable fishing**

Economic and social incentives are provided by the management regime through the allocation of catch quotas at a level compatible with sustainable fishery management. A supporting legal regime provides an additional incentive to comply with management measures, through the penalties that can be imposed for non-compliance with the CFP. Administrative, technical and quota-related offences can all result in legal action, prosecution and fines. These measures all contribute to sustainable fishing and ecosystem management, and are regularly reviewed as part of the ongoing process of fisheries management established by the CFP.

The EC and Member States provide funding to the fishing industry. Previously, this was provided via the Financial Instrument for Fisheries Guidance (FIFG), which was superseded by the European Fisheries Fund (EFF) in 2007. Concerns have been raised by some NGOs that FIFG represented a subsidy to the industry. However, the actual aims of FIFG were to “*achieve a balance between fisheries resources and their exploitation*”. The purpose of the EFF is to both support the industry as it adapts its fleets to make them more competitive and also to promote measures to protect and enhance the environment. One of the main objectives of the EFF is to “*promoting environmentally-friendly fishing and production methods*”. It is therefore clear that the objectives of both FIFG and EFF are consistent with MSC Principles, and that there are no subsidies that would encourage unsustainable fishing.

### **7.3 Fishery specific management system**

This section focuses on the aspects of the management system that apply directly to the UoC.

#### **7.3.1 Fishery – specific objectives**

A number of technical regulations have been introduced in recent years to promote the recovery of the Northern hake stock. The most important of these are aimed at improving the selectivity pattern (size of fish caught) in trawl fisheries catching hake. None is directly applicable to the Cornish gill net fishery.

Clear objectives are set out in the recovery plan for this stock (summarised in section 7.2.3). The plan’s objectives embrace a precautionary approach, and determine management policy for the fishery.

A mesh size of at least 100 mm has to be used throughout EC waters when fishing for hake (Regulation 850/98) and, within the Irish “hake box” established in 2002 (under EC Regulation 494/2002), a mesh size of at least 120 mm has to be used, as part of the hake recovery plan. The 120 mm mesh size restriction applies to the UoC area, and the fleet under assessment all use net mesh sizes of 120 mm or larger (Interviews I2, I3). This mesh size minimises capture of hake smaller than 60 cm (see Figure 18).

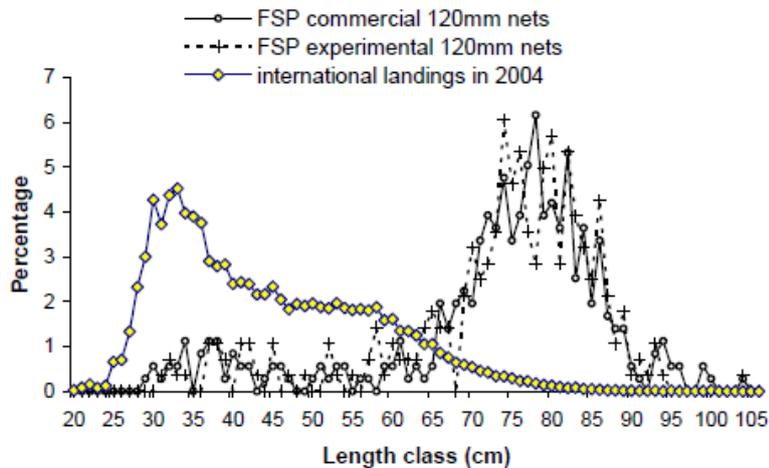


Figure 18 Hake selectivity – percentage length frequency of hake caught by 120 mm mesh gill nets compared to the length distribution in international landings of Northern hake in 2004 (from Revill et al, 2006)

Short-term management objectives are determined for the fishery annually at the meeting of the EC Council of Ministers where fishing opportunities (TACs) for the coming year are set in the light of the long-term objectives for the fishery. The overall TAC for the stock is then shared as national quotas, which are fixed proportions of the TAC for this stock. Quota allocations can be “swapped” within and between Member States.

At the national level, the quota is shared between vessels on the basis of historic rights and other quota entitlements through national allocations. These allocations determine the fishing opportunities for each vessel prosecuting the Northern hake stock. Again, opportunities arise for “swapping” quota between vessels, subject to certain rules. The CFPO plays a central role in ensuring sufficient quota is available for its member vessels to operate, by swapping or purchasing additional quota as necessary

A large sea area has been designated as a “biologically sensitive area”, principally to protect the hake nursery area to the south and west of Ireland (Figure 19). Within this area, restrictions on fishing effort have been established by the EC (Regulation 1954/2003 and 1415/2004), in addition to the technical measures establishing the Irish Hake Box in 2002 (under Regulation 494/2002). A review of this area by ICES (ICES, 2010f) identifies the potential benefits of this area for hake stocks and for some other fish species.



monitoring results. These measures can be quickly implemented. This was demonstrated for hake during the late 1990s, when the TAC was reduced from 60,000 t in 1997 to 22,600 t in 2001 under the hake emergency plan.

At the EC level, the division of quotas between Member States is determined according to the principle of relative stability, which means that proportional allocations of TAC to Member States are consistent from year to year. The outcome of meetings of the Council of Ministers clearly demonstrates that all of this information is taken into account, and explains the basis for management actions. This information is formally reported.

### **7.3.3 Compliance & enforcement**

Within the European Union, it is the responsibility of each Member States to make sure that the rules agreed under the CFP are enforced. The system for enforcing regulations and monitoring compliance with them within the UoC is summarised here.

#### **7.3.3.1 Monitoring, control & surveillance**

Fishing vessels working outside their national fisheries jurisdiction (beyond the 12 nm limit, but within the 200 nm zone or to median lines with adjacent states) are liable to inspection at sea or otherwise by the fisheries inspectorates of the country in whose waters they are working. In those circumstances, any alleged infringements of EC rules would be prosecuted in the courts of the jurisdiction in which the alleged offence was detected.

All EU vessels over 15 m are subject to EC satellite monitoring (VMS) if fishing in EU waters – as defined within the CFP. VMS data provide a report of the activity of a fishing vessel every two hours, including its location, heading and speed, and thus an independent record of where it has been fishing.

National authorities are also responsible for aggregating national fleet landings to a national total and policing other EC control requirements applicable on landing and as the fish moves through the distribution chain. This information is gathered from log books that vessels must complete while fishing, and by monitoring the fish landed on their return to port. The client fleet must land to “designated ports” where landings can be inspected by fishery officers of the UK MMO.

In April 2005, the EC Council of Ministers agreed to set up the Community Fisheries Control Agency to help Member States fulfil their control and inspection obligations (CFCA: Council Regulation (EC) No 768/2005). It strengthened the uniformity and effectiveness of enforcement by pooling EU and national means of fisheries control and monitoring resources and co-ordinating enforcement activities. This operational co-ordination has helped to tackle the shortcomings in enforcement resulting from the disparities in the resources and priorities of the control systems in the Member States. The Agency has not changed the obligations of the Member States to enforce CFP measures, nor those of the EC to ensure that Member States fulfil these obligations.

#### **7.3.3.2 Registration of Buyers and sellers of fish**

The Registration of Buyers and Sellers (RBS) and Designation of Fish Auction Sites scheme has been fully operational in England since 2005. These Regulations require that all buyers and sellers of fish at first sale are registered and that all auction sites of first-sale fish are designated. Once registered, buyers and sellers are able to buy and sell fish directly from vessels’ landings and must submit either a buyer’s or seller’s sales note to the local fisheries office within 48 hours of the sale taking place. In addition, buyers and sellers are also required to keep records of each purchase and sale. These records shall be made available for inspection at all reasonable times

Since the introduction of the scheme, representatives of the industry have acknowledged the positive impact it has had on compliance by providing greater transparency, improved cross checking of fish

landings data, and contributed to reduced levels of undeclared landings (MMO, 2010).

### **7.3.3.3 IUU Fishing**

There have been no concerns raised about Illegal, Unregulated and Unreported (IUU) fishing for hake in the UoC area or by the fleet under assessment. Nevertheless, the bodies responsible for managing European fisheries have recently taken steps to reduce the incidence of IUU fishing.

Until recently, the responsibility for addressing IUU fishing lay with the “flag state” of each fishing vessel. This approach required the flag state to take action if one of its registered vessels was found to be carrying out IUU fishing. There have been growing concerns about the effectiveness of this approach. New measures now apply in the UoC area, which enable concerted international action against IUU fishing through the application of “port state measures” (PSMs).

The EC has made a Regulation under the CFP to address IUU fishing specifically (Council Regulation 1005/2008). This came into force on 1<sup>st</sup> January 2010, and sets out a legally enforceable framework based upon a catch certification scheme that will distinguish legally caught fish from IUU fish. These requirements mean that all fish have to be accompanied by paperwork that unambiguously identifies its provenance.

This suite of measures means that any vessels that are engaged in IUU fishing can be readily identified, prevented from landing fish in the UoC area, for example, and prosecuted for breaching Port State Measures (PSM). PSMs are now enforced by the relevant authorities throughout the UoC area.

The EU publishes a list of the vessels known to have been engaged in IUU fishing (the latest list is set out in EC Regulation 672/2013). None of the vessels in the UoC are in this list.

### **7.3.3.4 Compliance**

Compliance with regulations is monitored by national enforcement bodies. The feedback obtained by the assessment team from enforcement bodies is that the client fleet complies with all relevant rules and regulations in force (I8, I13).

At a wider level, ICES have expressed concern about hake landings data from France, which are considered to be unreliable and may compromise the quality of the stock assessment (ICES, 2010b).

### **7.3.4 Research Plan**

The emergency plan in response to the perilous state of the Northern hake stock in the late 1990s, and the ensuing recovery plan, stimulated a considerable upsurge in research on hake, for example in relation to technical measures to protect juveniles and assessment methodology and associated biological parameters (such as growth and stock identity). The results of this research is largely reported through ICES, which brings together the work of national fisheries scientists within an international organisation that facilitates cooperation, collaboration and consistency in fisheries research and advice. ICES working groups routinely gather and analyse information on stock status, develop and review assessment methodologies used in the fishery and also investigate specific stock issues and identify priorities for future research. Other issues such as climate change, associated changes to plankton, and ecosystem effects of fisheries are also investigated by ICES study groups and workshops.

The results of ICES research are condensed into management advice by ACOM (and STECF during the stock recovery phase). This advice is submitted to the EC to guide future management of the stock in advance of annual negotiations of TACs and fishing opportunities. The results of ICES

research are disseminated to interested parties in a timely fashion through reports and publications, all of which are readily available from the ICES website.

### 7.3.5 Monitoring and evaluation

The management regime for the hake fishery incorporates measures that allow for review of the management plan for the stock, and the EC CFP.

The recovery plan for the Northern Hake Stock (EC Reg No 811/2004) was agreed in 2004, with the aim of increasing the SSB to above 140,000t. Apparently, ICES did not evaluate this plan.

In early 2010, ICES held a benchmarking workshop to evaluate the status of the Northern hake stock. The EC asked for ICES to respond to its proposals on the management of the stock at this workshop. The response from ICES was that previously defined precautionary reference points, based upon an age based stock model were inappropriate. Instead, new reference points should be applied to the fishery, derived from a length-based model.

ICES advised that the most recent EC proposal for a long-term hake management plan (COM(2009) 122 FINAL) to attain MSY should be revised to take account of this new assessment approach, the latest information, and to deliver the MSY approach for the fishery. This approach has formed the basis of ICES advice for setting the TAC in subsequent years.

Within the CFP, regular internal review of the management system occurs at every level. At the EC level, policy documents are reviewed internally and by Member States. The resulting policies, operational plans and practices are then subject to wide consultation before implementation, and regular evaluation. These systems also include formal consultation and review processes involving all EC Member State fisheries administrations, and committees such as ACOM, STECF, ACFA dealing with industry concerns at a European level, and the RACs dealing with specific technical and management issues.

There is also on-going and extensive review of stock assessment and data gathering methodologies by ICES and at the level of the contributing laboratories and research institutions. Within ICES, a methods working group keeps methods for fish stock assessment under regular review. In addition, other study and working groups exist to review the precautionary approach, discards, biological sampling, reference points, and recruitment variability.

ICES can, and does, involve external scientists in extensive review of its methodologies as and when considered necessary and working group stock assessments are routinely subject to external review. The North Western Waters RAC also provides opportunities for stakeholder involvement in the review of management advice and decisions for the hake fishery.

The overall management framework for all EC fisheries is subject to decadal review. The most recent CFP review process has recently finished, after several years of consultation and discussion among a wide range of stakeholders throughout Europe. The EC Member States reached agreement in December 2013 to a reformed CFP, replacing the previous (2002) CFP Regulation. The new CFP Regulation (EC Regulation 1380/2013) came into force on 1<sup>st</sup> January 2014. The main goals of the new CFP are to stop overfishing, reduce discarding, reform the management process, and to establish sustainable standards with respect to international fishing activity and trade in fish.

In summary, the management system is subject to internal review at all levels, while key parts of the management system are subject to rather less frequent external review.

## 8 OTHER FISHERIES AFFECTING TARGET STOCK

### 8.1 Other hake fisheries

The Cornish gill net fishery accounts for a very small proportion of the landings of Northern hake, which is exploited chiefly by Spanish (~ 60%) and French (~ 25%) fleets. Most hake are caught in mixed-species trawl fisheries (targeting megrim, monkfish and/or *Nephrops*, along with hake) and in hake-directed gill-net and long-line fisheries in ICES Sub-areas VII and VIII, though an important increase in landings has occurred in the northern part of the distribution area, from a combination of trawl, seine, long-line and gill-net fisheries in Division IIIa and Subareas IV and VI in recent years.

### 8.2 Other MSC-Certified Hake Fisheries - Harmonisation

There are two MSC-certified fisheries prosecuting the Northern European hake stock, the Grupo Regal Spain Hake Longline Fishery (completed assessment in February 2014), [http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/grupo-regal-spain-hake-longline/assessment-downloads-1/20140401\\_PCR\\_HAK208.pdf](http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/grupo-regal-spain-hake-longline/assessment-downloads-1/20140401_PCR_HAK208.pdf); and the Danish North Sea hake fishery (completed assessment in October 2014) [http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/dfpo-denmark-north-sea-skagerrak-and-kattegat-hake/assessment-downloads-1/20141030\\_PCR\\_HAK243.pdf](http://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/north-east-atlantic/dfpo-denmark-north-sea-skagerrak-and-kattegat-hake/assessment-downloads-1/20141030_PCR_HAK243.pdf).

The MSC recognise the need for harmonisation when several fisheries prosecuting the same stock using the same fishing method area all assessed. The procedure for this is set out in the MSC Technical Advisory Board (TAB) Directive D-015(v2) of July 2008. The intent of this procedure is that Certification Bodies “*assessing fisheries that have areas of overlap are required to ensure consistency of outcomes so as not to undermine the integrity of MSC fishery assessments.*” This procedure was subsequently incorporated in Annex CI of the MSC Certification Requirements that were issued during the course of this assessment.

The assessment teams for this Cornish hake gill-net fishery and the Spanish hake long-line fishery held harmonisation discussions in September 2010, and again in January 2014 (with the assessment team for Danish North Sea hake), which focused on harmonisation of the assessments with respect to Principle 1. The outcome was a common view on the current status of the hake stock and no differences in scoring P1 or those elements of P3 (management) that are common to the three fisheries, based on ICES’ 2013 update on the Northern hake stock assessment and subsequent advice. The later completion of the Cornish gill net hake fishery assessment, however, allowed ICES’ advice and stock assessment published in July 2014 to be taken into account, which has led to some differences in scoring. Most elements of P2 (ecosystem effects) are sufficiently different between the three UoCs (different gear, or fishing area) that harmonisation is not required for this Principle.

The following table provides a comparison of individual scores between the client fishery and the other relevant UoCs, namely DFPO North Sea and Skagerrak set net hake, and Grupo Regal longline hake. The main task is to identify those PIs where the current fishery scored outside the main range of these UoCs and where there is a material difference to the outcome between fisheries. This is particularly important where other fisheries have scored below 80 and a condition has been set.

Table 13 Summary of the relevant P1,2 and P3 scores for Cornish gill net hake, , and Grupo Regal Spain longline hake assessments

PI No.	Performance Indicator (PI)	Cornish gill net	DFPO North Sea hake set nets	Grupo Regal Spain longline
1.1.1	Stock status	100	90	90
1.1.2	Reference points	90	75	75
1.1.3	Stock rebuilding			
1.2.1	Harvest strategy	90	90	90
1.2.2	Harvest control rules & tools	75	75	75
1.2.3	Information & monitoring	80	80	80
1.2.4	Assessment of stock status	90	90	90
2.5.1	Ecosystem outcome	80	90	100
2.5.2	Ecosystem	90	90	80
2.5.3	Ecosystem	75	90	85
3.1.1	Legal & customary framework	100	85	95
3.1.2	Consultation, roles & responsibilities	100	80	85
3.1.3	Long term objectives	100	100	100
3.1.4	Incentives for sustainable fishing	80	90	80
3.2.1	Fishery specific objectives	80	80	70
3.2.2	Decision making processes	90	80	80
3.2.3	Compliance & enforcement	90	95	85
3.2.4	Research plan	80	80	80
3.2.5	Management performance evaluation	80	90	80

With respect to Principle 1, the stock assessment in 2014 has allowed ICES to set biomass reference points (only an estimate of FMSY was available in 2013), and this also provides more certainty on stock status. Hence the higher scores for PI 1.1.1 and PI 1.1.2. There has been no progress with implementing a long-term management plan, and the scores for the remainder of P1 remain the same for all three UoCs.

Because the respective fisheries are all exploiting the same stock, Northern hake, it would be expected that the score for ecosystem impacts would be similar, though Cornish gill nets score lower (and have a condition) because the assessment team for this fishery found that relatively less is known about impacts on the Celtic Sea ecosystem than by the other two fisheries.

The generally higher Principle 3 scores for the Cornish gill net fishery reflect the well established management, compliance and surveillance arrangements in place in the UK.

## 9 STANDARD USED

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock exists, and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations. The Principles and their supporting Criteria are presented below.

### 9.1 Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.<sup>4</sup>:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

### 9.2 Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.

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<sup>4</sup> The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations

3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

### 9.3 Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

#### A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

1. Demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process.
2. Be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings.
3. Observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability.
4. Incorporates an appropriate mechanism for the resolution of disputes arising within the system<sup>5</sup>.
5. Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.
6. Act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty.
7. Incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion.
8. Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.

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<sup>5</sup> Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.

9. Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
  - a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
  - b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
  - c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
  - d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
  - e) establishing no-take zones where appropriate.
10. Contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

## B. Operational Criteria

Fishing operation shall:

1. Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.
2. Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.
3. Not use destructive fishing practices such as fishing with poisons or explosives;
4. Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch etc.
5. Be conducted in compliance with the fishery management system and all legal and administrative requirements.
6. Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

## 10 BACKGROUND TO THE EVALUATION

### 10.1 Evaluation Team

This assessment has been prepared by a team of two experts.

#### **Dr Jim Andrews.**

Jim has 22 years' experience working in marine fisheries and environmental management. His previous experience includes running the North Western and North Wales Sea Fisheries Committee as its Chief Executive from 2001 to 2005, and previously working as the SFC's Marine Environment Liaison Officer. He has an extensive practical knowledge of both fisheries and environmental management and enforcement under UK and EC legislation. Jim has formal legal training, with a special interest in the policy, governance and management of fisheries impacts on marine ecosystems. He worked with the UK Government and Government Agencies to implement the EC Habitats Directive at the local and national level; and also chaired Government working groups preparing new marine nature conservation legislation. Before working in fisheries management Jim developed integrated coastal zone management plans in protected wildlife sites for English Nature, one of the UK's statutory nature conservation agencies. Today, he is Director of AWJ Ltd, a company that provides legal, policy and management advice to fishery regulators and environmental managers; as well as working with the fishing industry and regulators to develop sustainable fisheries that are compatible with the ecosystems of protected wildlife sites. Jim has been involved in the review of several MSC certification assessments including the South-West Mackerel Handline Fishery, Loch Torridon Nephrops, Burry Inlet Cockles, North Sea Herring and South Georgia Patagonian Toothfish. He has worked as an assessor and lead assessor on MSC certifications within the UK and Europe and in India. In 2008 he worked with the MSC and WWF on one of the pilot assessments using the new MSC Risk Based Assessment Framework. Jim has carried out numerous MSC Chain of Custody assessments within the UK.

#### **Dr Mike Pawson.**

Mike Pawson retired as senior fisheries advisor at Cefas, Lowestoft, in 2007 after 38 years carrying out biological research and providing scientific advice to Defra, the EC and other national and international organisations on fish stock abundance (marine teleosts, elasmobranchs, salmonids and eels), technical conservation measures and fisheries management regulations, and on related monitoring, sampling, survey and research programmes. Between 1974 and 1980, he initiated and led acoustic surveys for blue whiting and mackerel, and trawl surveys in the North Sea (1975-1979), and then spent 1 year working as an UNESCO Expert in Ichthyology in Tripoli, Libya. From 1980 to 1990, Mike designed and managed MAFF's coastal fisheries programme, implementing biological sampling, trawl surveys, a fishermen's logbook scheme and socio-economic evaluation in relation to sea bass fisheries. Between 1990 and 2000 he led the Cefas Western demersal team, providing analytical assessments and management advice for 12 finfish stocks (including Northern hake). During this time he was co-ordinator of the Anglo-French English Channel Fisheries Study Group (1989-1997) and chairman of the ICES Southern Shelf Demersal Stock Assessment Working Group (1996-98), and subsequently chaired the ICES Seabass Study Group (2000-04) and Elasmobranch Study Group (2001-02). He has initiated and managed EU-funded multi-national projects on methods for egg-production stock biomass estimation, bio-geographical identity of English Channel fish stocks, bio-economic modelling of Channel fisheries, development of assessment methods for elasmobranchs, marine recreational fishing in Europe etc.

Mike has provided scientific evaluation, quality assurance and advice to several national and EC-funded projects on fisheries biology, monitoring and assessment, and was an expert advisor to the EC

at the inception of the Hake Recovery Plan. Since 2002, Mike directed and managed the assessment of salmon and eel stocks in England and Wales and provided scientific advice on their conservation. One of his major roles over the last 20 years has been peer-reviewing papers, reports and manuscripts in preparation. Mike has acted as peer reviewer for over 40 MSC certification assessments, and has worked as an assessor on 12 MSC certifications.

## 10.2 Previous certification evaluations

The fishery has not been previously assessed against the MSC standard.

## 10.3 Inspections of the Fishery

Inspection of the fishery focused on the practicalities of fishing operations, the mechanisms and effectiveness of management agencies, and the scientific assessment of the fisheries.

Meetings were held as follows. Some of the key issues discussed have been identified for each meeting.

Name	Affiliation	Date	Key Issues
Nathan de Rozarieux	Seafood Cornwall	13 <sup>th</sup> July 2010	<ul style="list-style-type: none"> <li>• Composition of the Unit of Certification fleet</li> </ul>
Paul Trebilcock	Cornish Fish Producers Organisation	13 <sup>th</sup> July 2010	<ul style="list-style-type: none"> <li>• Patterns of fishing activity</li> <li>• Catch composition and stock status.</li> <li>• Capture of non-target species.</li> <li>• Collaboration in fisheries monitoring activity.</li> <li>• Compliance with regulations and enforcement.</li> </ul>
Alan Dwan	Skipper, FV Ajaz	13 <sup>th</sup> July 2010	<ul style="list-style-type: none"> <li>• Patterns of fishing activity</li> <li>• Catch composition &amp; discarding.</li> <li>• Capture rates of ETP species.</li> <li>• Relationship with enforcement bodies.</li> </ul>
Nick Tregenza	Chelonia Ltd	14 <sup>th</sup> July 2010	<ul style="list-style-type: none"> <li>• Cetacean by catch observations in the hake netting fishery.</li> <li>• Status of ETP species in the UoC area.</li> </ul>
Tom Hardy	Cornwall Wildlife Trust	14 <sup>th</sup> July 2010	
Sue Sayer	Cornwall Seal Group	27 <sup>th</sup> September 2010	<ul style="list-style-type: none"> <li>• Entanglement of seals in discarded fishing nets around Cornwall.</li> </ul>
Simon Northridge	Sea Mammal Research Unit	12 <sup>th</sup> October 2010	<ul style="list-style-type: none"> <li>• Bycatch rates of cetaceans in set nets.</li> <li>• Effectiveness of pingers and participation of CFPO vessels in trials.</li> </ul>
Colm Lordan	Marine Institute	12 <sup>th</sup> October 2010	<ul style="list-style-type: none"> <li>• Fishing activity of the Irish fleet within the UoC.</li> <li>• Irish perception of stock status.</li> </ul>

Name	Affiliation	Date	Key Issues
Andy Wheeler Paul Trebilcock	CFPO	February 2014	<ul style="list-style-type: none"><li>• Discuss landings data</li></ul>
Stuart Hetherington	Cefas	February 2014	<ul style="list-style-type: none"><li>• Discard / observer FSP study</li></ul>
Al Kingston	SMRU	February 2014	<ul style="list-style-type: none"><li>• Bycatch of cetaceans in hake nets.</li></ul>

Notes of each meeting are enclosed in Appendix D (section 18) of this report.

## 11 STAKEHOLDER CONSULTATION

### 11.1 Stakeholder Consultation

Over 40 relevant stakeholders were identified and consulted specifically by IFC as part of this assessment. Information was also made publicly available at the following stages of the assessment:

Date	Purpose	Media
23 <sup>rd</sup> April 2010	Announcement of assessment	Direct E-mail/letter Notification on MSC website Advertisement in press
23 <sup>rd</sup> April 2010	Notification of Assessment Team nominees	Direct E-mail Notification on MSC website
21 <sup>st</sup> May 2010	Notification of intent to use MSC FAM Standard Assessment Tree	Direct E-mail Notification on MSC website
21 <sup>st</sup> May 2010	Notification of assessment visit and call for meeting requests	Direct E-mail Notification on MSC website
13 <sup>th</sup> -14 <sup>th</sup> July 2010	Assessment visit	Meetings
9 <sup>th</sup> June 2011	Notification of Proposed Peer Reviewers	Direct E-mail Notification on MSC website
	Notification of Public Draft Report	Direct E-mail Notification on MSC website
	Notification of Final Report	Direct E-mail Notification on MSC website

### 11.2 Stakeholder Issues

The issues raised by stakeholders are listed in Appendix D (Section 18) of this report. The key issues are briefly summarised below:-

- By catch of cetaceans in the fishery – this was an issue of raised by NGOs and other stakeholders. Evidence of historically high levels of cetacean by catch that exceeded internationally accepted standards was presented to the assessment team in the form of published research papers during the site visit.
- Discarding of non-target species, notably spurdog and cod, was mentioned by the client group.
- The status of the hake management plan was called into question by some stakeholders who were concerned that its constraints might be ignored by the EC once target biomass levels had been achieved.

## 12 OBSERVATIONS AND SCORING

### 12.1 Introduction to scoring methodology

The MSC Principles and Criteria set out the requirements of certified fishery. These Principles and Criteria have been developed into a standard (Fishery Assessment Methodology) assessment tree - Performance Indicators and Scoring Guideposts - by the MSC, which is used in this assessment.

The Performance Indicators (PIs) have been released on the MSC website. In order to make the assessment process as clear and transparent as possible, each PI has three associated Scoring Guideposts (SGs) which identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Performance Indicator; 100 represents a theoretically ideal level of performance and 60 a measurable shortfall.

For each Performance Indicators, the performance of the fishery is assessed as a 'score'. In order for the fishery to achieve certification, an overall weighted average score of 80 is necessary for each of the three Principles and no Indicator should score less than 60. As it is not considered possible to allocate precise scores, a scoring interval of five is used in evaluations. As this represents a relatively crude level of scoring, average scores for each Principle are rounded to the nearest whole number.

Weights and scores for the Fishery are presented in the scoring table (Appendix A).

## **13 LIMIT OF IDENTIFICATION OF LANDINGS FROM THE FISHERY**

Traceability of product from the sea to the consumer is vital to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated: Traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody. These requirements are assessed here.

### **13.1 Traceability within the fishery**

Traceability of broad-scale fishing activity within this fishery is provided by the statutory requirements to record all fishing in logbooks and through monitoring of vessel activity by fisheries enforcement bodies and VMS.

The client (CFPO) has a statutory role in managing the fish landings from vessels in the UoC. All fishing activity and landings are carefully monitored by the client to ensure compliance with EC CFP quota requirements.

The new EC measures that have been implemented to address problems with landing of IUU fishing provide an additional safeguard against mixing of fish from different sources (see section 7.3.3.3). All landings of fish must be accompanied by certificates stating the origin of the fish. These new Port State Measures and the accompanying penalties for non-compliance, mean that the risk of IUU fish being landed by Cornish PO vessels is negligible.

The vessels included in this UoC are listed in Appendix D of this report. In the course of the certification, it is possible that further companies/vessels may join the client group. This would be in accordance with the MSC's stated desire to allow fair and equitable access to the certification. Any changes to the membership of the client group on a permanent or temporary basis will be reported by the client and reviewed at annual surveillance audits.

#### **13.1.1 Carriage and use of different fishing gears**

It is noted from the FSP research work into this fishery (Bendall et al, 2012) that netting vessels may carry and use several types of net during a single trip.

Information provided by the client and in the FSP research indicates that the catch of hake in wreck and trammel nets is negligible. The risk of non-MSC certified fish (caught in fishing gear that is outside the scope of the UoC) is also considered to be negligible. Vessels operating in the fishery have been directed by the client to segregate any hake that should be caught in wreck or trammel nets from those caught in gill nets to ensure that there is no mixing of MSC and non-MSC product.

#### **13.1.2 Risk of fishing outside the UoC**

The geographic extent of the UoC has been selected to cover the area prosecuted by the UoC fleet. All of the hake fishing activities of these vessels take place in the UoC area. There is negligible risk of the fleet fishing outside the UoC.

### **13.2 At-sea processing**

There is no at-sea processing of the fish. Only gutted whole fish are landed.

### **13.3 Points of landing**

The UoC fleet all operate from Newlyn in Cornwall, and all landings are made to Newlyn and Padstow in Cornwall. Catches are inspected at the point of landing by MMO enforcement officers based in Newlyn. No other ports are within the scope of this assessment.

### **13.4 Eligibility to enter chains of custody**

The scope of this certification ends at the points of landing which are listed above. Downstream certification of the product would require appropriate certification of storage and handling facilities at these locations.

### **13.5 Actual Eligibility date**

The actual eligibility date is 12<sup>th</sup> August 2014 (this date being 6 months prior to the likely publication date for the public comment draft report). Any hake caught by the UoC fleet after this date and held in MSC Chain of Custody certified facilities will be eligible for sale under the MSC ecolabel.

## 14 ASSESSMENT RESULTS

The Performance of the Fishery in relation to MSC Principles 1, 2 and 3 is summarised below:

Overall weighted Principle-level scores		Hake <i>M. merluccius</i>
Principle 1 - Target species	PI 1.1.3 Not scored	89.4
	PI 1.1.3 Scored	NA
Principle 2 - Ecosystem		82.3
Principle 3 - Management		89.5

**The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any Indicators.**

**Intertek Fisheries Certification has therefore determined that the Cornish Hake Gill-Net Fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.**

### 14.1 Conditions

As a standard requirement of the MSC certification methodology, the fishery shall be subject to (as a minimum) annual surveillance audits. These audits shall be publicised and reports made publicly available.

The fishery attained a score of below 80 against 5 Performance Indicators. The assessment team has therefore set conditions for continuing certification that the client is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body, but no longer than the term of the certification.

As a standard condition of certification, the client shall develop an 'Action Plan' for Meeting the Conditions for Continued Certification', to be approved by IFC.

The Conditions, associated timescales and relevant Scoring Indicator are set out below.

Condition 1	Harvest Control Rules and Tools
1.2.2	Harvest Control Rules and Tools
	There are well defined and effective harvest control rules in place
SG80 guidepost(s) not met:	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
Score:	75
Rationale	In 2004, a recovery plan for the Northern hake stock was implemented which included well defined harvest control rules, but these are now effectively obsolete, due to the changing perception of the stock (biomass at an historic high, but uncertainty in the absolute value). A long-term management plan has not yet been implemented. Though advice is given by ICES according to its MSY approach (i.e. exploit at $F_{MSY}$ ), it is not apparent how the exploitation rate will be reduced if limit reference points (which are

Condition 1	Harvest Control Rules and Tools
	presently not defined) are approached.
Condition	Support work to develop and adopt well-defined harvest control rules that are consistent with the harvest strategy and ensure that exploitation rates is reduced as limit reference points are approached. The HCR should be contained within a long-term management plan.
Annual Milestones	<p>Years 1-2: Support the adoption of well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rates is reduced as limit reference points are approached. Resulting score: 75</p> <p>Year 3: A new long-term management plan shall be implemented which contains well defined harvest control rules that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Resulting score: 80</p> <p>Years 4-5: No further action required Resulting score: 80</p>
Suggested Action	<p>1st and 2nd Year of certification: Work with relevant stakeholders to support the adoption of well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The limitations of the new assessment method to estimate SSB and F should not prevent well-defined control rules to be implemented for the management of this fishery.</p> <p>3rd year of certification: A long-term management plan should be implemented which contains well defined harvest control rules that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p>

Condition 2	Discarded species
	Outcome
2.2.1	The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.
SG80 guidepost(s) not met:	Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.
Score:	70
Rationale	Although it is likely that both spurdog and porbeagle sharks are outside $B_{lim}$ , there has been a management response (setting of a zero TAC, ban on landings etc) to this. Thus, some main bycatch species are likely to be outside biologically based limits, but there is a partial strategy of mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of these very widely dispersed stocks (cover whole of NE Atlantic). However, given the continuing by catch (and associated mortality) of both species in the hake gill net fishery, and the considerable time it will take to show that recovery is occurring, it cannot at the moment be said that

Condition 2	Discarded species
	<p>they are demonstrably effective. These elements would score 60.</p> <p>It is highly likely that lesser spotted dogfish are within biologically safe limits, and mackerel and edible crab are all highly likely to be within biologically safe limits (BMSY<sub>trigger</sub>), with a high degree of certainty for mackerel (these elements would return scores of 80, 100 and 100 respectively).</p> <p>Since all elements meet SG 60, and some achieve higher performance at or above SG80, but some do not meet SG 80 and require intervention to make sure they get there, a score of 70 is indicated (CR v1.3, Table C2).</p>
Condition	Evidence is required to show that that the partial strategy in place for managing the impact of the fishery on spurdog ensures that the fishery does not hinder the recovery or rebuilding of spurdog stocks. If the current strategy is not effective, then new management measures should be identified and adopted with a view to establishing a more effective regime.
Annual Milestones	<p>Years 1-2: Design and implement a programme of monitoring work that will determine the contribution of this fishery to overall mortality of spurdog. Resulting score: 70</p> <p>Years 2-3: Ongoing implementation of monitoring programme. Resulting score: 70</p> <p>Years 4-5: Report results of monitoring programme; implement any new management measures (if necessary) that are likely to improve effectiveness of management strategy. Resulting score: 80</p>
Suggested Action	<p>1st and 2nd year of certification: Work with relevant stakeholders (e.g. Cefas) to design an appropriate discard monitoring programme for the fishery.</p> <p>4<sup>th</sup> and 5<sup>th</sup> year of Certification: work with vessels in the UoC fleet, Cefas and the MMO to design and trial management measures that could reduce spurdog mortality in the fishery.</p>

Condition 3	Discarded species
2.2.3	<p>Information</p> <p>Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.</p>
SG80 guidepost(s) not met:	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
Score:	70
Rationale	<p>There is good information about historic landings and on catch composition for this fishery from fishery-independent sources that provides accurate, verifiable and quantitative information about by catch. This enables spurdog to be identified as a main bycatch species and porbeagle as a minor but vulnerable species.</p> <p>This information has contributed to current understanding of the status of the respective populations, based on which ICES have recommended the strategy of prohibiting spurdog and porbeagle landings as a means of restoring the population, and the EC has implemented these proposals.</p> <p>Now that spurdog and porbeagle are no longer a retained species, the quantity of information recorded by the client fleet will reduce, since this focuses on retained species. It is, therefore possible, that insufficient data will in future be gathered to detect a change in risk to both species, especially since their capture tends to be</p>

Condition 3	Discarded species
	sporadic. The fishery meets all of the SG60 requirements and the first 3 of the SG80 requirements. A condition has been generated to address the need for recording information about discarding from the fishery.
Condition	Action should be taken to establish a discard monitoring programme for the fishery that is capable of detecting any increase in risk to the main bycatch species.
Annual Milestones	Years 1-2: Design and implement a discard monitoring programme for this fishery that will record both the quantity and composition of discards. Resulting score: 70  Years 2-3: Ongoing implementation of monitoring programme; start of annual reporting. Resulting score: 80  Years 4-5: Ongoing monitoring and reporting of discarding from the fishery. Resulting score: 80
Suggested Action	1st and 2nd year of certification: Work with relevant stakeholders (e.g. Cefas) and the UoC fleet to design and implement an appropriate discard monitoring programme for the fishery. 2 <sup>nd</sup> year of Certification onwards: work with vessels in the UoC fleet, Cefas and other relevant organisations to implement the discard monitoring programme and report results to relevant parties.

Condition 4	ETP species
2.3.2	Management Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.
SG80 guidepost(s) not met:	There is <u>evidence</u> that the strategy is being implemented successfully.
Score:	70
Rationale	There is a strategy in place for managing this fishery’s impact on cetaceans (EC Regulation 812/2004). The Regulation sets out timescales for taking measures in specific fisheries to deter cetaceans from fishing nets and also requires monitoring of by catch in specific fisheries by observers. This strategy involves the use of acoustic “pingers” to minimise mortality, and is based on scientific advice submitted to the EC which was used to determine the strategy that was most likely to be effective.  The implementation of Regulation 812/2004 in the UK was delayed while trials of different types of pinger and different deployment strategies were carried out. Independent trials (in which the client fleet has participated) have shown that acoustic pingers are highly effective and have been estimated to reduce the bycatch of cetaceans in hake set nets by up to 95%. Operating procedures for the use of the pingers were developed during these pinger trials. The UK Government has subsequently obtained approval from the EC Commission to allow the use of a loud pinger (known as the DDD-03L) which

Condition 4	ETP species
	<p>is favoured by the hake gill net fleet because the trials have shown it to have an effective range of 2km (so that the risks associated with a long hake net can be mitigated with just 2 or 3 pingers). Guidance on the types of pinger that are approved for use in the UK and the relevant operating procedures for each of them have been distributed to fishermen and are available for download from the MMO website.</p> <p>The implementation of the pinger regulations began in September 2013 and, from July 2014, the MMO have required all vessels to achieve compliance with the requirements of Regulation 812/2004. In their assessment of the impacts of the fishery on cetaceans during 2013, SMRU were unable to draw any firm conclusions about whether pingers were having an effect on cetacean bycatch because the full implementation of the strategy was not yet complete. The SMRU assessments of fishing impacts in 2014 and 2015 are likely to provide a clearer picture of whether the strategy (Regulation 812/2004) is being implemented successfully and whether it is achieving its objectives.</p> <p>The fishery meets all of the SG60 requirements, and the first and second of the SG80 requirements. The delays with introduction of pingers within the UK means that the third of the SG80 requirements is not fully met, so a score of 70 is appropriate and a condition has been generated to address this issue. Once there is evidence that the strategy has been fully and effectively implemented it is likely that the SG80 level of performance would be attained quickly.</p>
Condition	Evidence should be provided to demonstrate the successful implementation of the management strategy for reduction of ETP species interactions by all vessels forming part of the unit of certification (irrespective of vessel length).
Annual Milestones	<p>Years 1: Work with the appropriate management authority (MMO) and observers (SMRU) to gather information that demonstrates the effective implementation of ETP bycatch reduction measures (i.e. the use of pingers on nets). Resulting score: 80</p> <p>Years 2-5: Ongoing monitoring of implementation of management measures. Resulting score: 80</p>
Suggested Action	<p>1st year of certification: Work with management body (MMO) to ensure that all vessels in the UoC fleet demonstrably adopt and use pingers on all hake nets.</p> <p>2<sup>nd</sup> year of Certification onwards: work with vessels in the UoC fleet and SMRU to demonstrate ongoing use of pingers and monitor their effectiveness as a management tool.</p>

Condition 5	Ecosystems
2.5.3	Information
	There is adequate knowledge of the impacts of the fishery on the ecosystem.
SG80 guidepost(s) not met:	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).
Score:	75

Condition 5	Ecosystems
<p>Rationale</p>	<p>The key elements of the Celtic Sea ecosystem are understood, and the main effects of the fishery (depletion of target species; effect on non-target species; and effects on ETP species) have been investigated; other effects (on habitats and ecosystems) can be inferred from existing information. The main consequences of these impacts are likely to be a reduction in trophic level due to hake stock depletion; reductions in non-target species abundance; and fishing mortality of cetaceans. Habitats are unlikely to be affected.</p> <p>There has been no multispecies modelling of the Celtic Sea ecosystem, so the functions of these different parts of the ecosystem are not known; and for some impacts (notably discarding of spurdogs), data collection has limitations that prevent an increase in risk level being detected.</p> <p>The fishery meets all of the SG60 requirements, and meets the first, second and fourth of the SG80 requirements.</p>
<p>Condition</p>	<p>Action should be taken to establish a discard monitoring programme for the fishery that is capable of detecting any increase in risk to the main bycatch species.</p>
<p>Annual Milestones</p>	<p>Years 1-2: Design and implement a discard monitoring programme for this fishery. Resulting score: 70</p> <p>Years 2-3: Ongoing implementation of monitoring programme; start of annual reporting. Resulting score: 80</p> <p>Years 4-5: Ongoing monitoring and reporting of discarding from the fishery. Resulting score: 80</p>
<p>Suggested Action</p>	<p>1st and 2nd year of certification: Work with relevant stakeholders (e.g. Cefas) and the UoC fleet to design and implement an appropriate discard monitoring programme for the fishery.</p> <p>2<sup>nd</sup> year of Certification onwards: work with vessels in the UoC fleet, Cefas and other relevant organisations to implement the discard monitoring programme and report results to relevant parties.</p>

## **14.2 Recommendations**

The assessment team has also made a recommendation that would improve the performance of the fishery against the MSC Principles and Criteria. Recommendations do not have to be implemented to maintain certification, and accordingly the action taken and timescales are at the discretion of the client. The certification team's recommendations are that:

1. This fishery is presently in transition from management under a recovery plan to management under a new long-term plan that will set out the harvest control rules for the stock. The details of this plan have not been finalised. It will be appropriate to review the relevant Performance Indicators (notably 1.2.1 and 1.2.2) after this plan is agreed and implemented.

Table 14: Scores for the Cornish Hake Gill Net Fishery. Scores shaded green attain the unconditional pass level. Yellow shading indicates a conditional pass. Red shading would indicate a fail.

Principle	Component	PI No.	Performance Indicator (PI)	Hake
				<i>M. merluccius</i>
One	Outcome	1.1.1	Stock status	100
		1.1.2	Reference points	90
		1.1.3	Stock rebuilding	NA
	Management	1.2.1	Harvest strategy	90
		1.2.2	Harvest control rules & tools	75
		1.2.3	Information & monitoring	80
		1.2.4	Assessment of stock status	90
Two	Retained species	2.1.1	Outcome	85
		2.1.2	Management	90
		2.1.3	Information	90
	Bycatch	2.2.1	Outcome	70
		2.2.2	Management	80
		2.2.3	Information	75
	ETP species	2.3.1	Outcome	90
		2.3.2	Management	70
		2.3.3	Information	80
	Habitats	2.4.1	Outcome	90
		2.4.2	Management	90
		2.4.3	Information	80
	Trophic function	2.5.1	Outcome	80
		2.5.2	Management	90
		2.5.3	Information	75
Three	Governance and policy	3.1.1	Legal & customary framework	100
		3.1.2	Consultation, roles & responsibilities	100
		3.1.3	Long term objectives	100
		3.1.4	Incentives for sustainable fishing	80
	Fishery specific management system	3.2.1	Fishery specific objectives	80
		3.2.2	Decision making processes	90
		3.2.3	Compliance & enforcement	90
		3.2.4	Research plan	80
		3.2.5	Management performance evaluation	80

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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## 15 APPENDIX A: SCORING COMMENT TABLES

### 15.1 Principle One

Principle 1	A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.
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1.1	Management Outcomes:
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1.1.1	Stock Status: The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired.  The stock is at or fluctuating around its target reference point.	There is a <u>high degree of certainty</u> that the stock is above the point where recruitment would be impaired.  There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u> .
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Scoring Comments
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Recruitment overfishing occurs when the number and size of the adult population is reduced to a point where the stock does not have the reproductive capacity to replenish itself. In 2013, the length-based stock assessment carried out by ICES indicated that there is no sign of impaired recruitment (several recent year classes have been above the long-term mean) and that SSB has continued to increase. This was confirmed by the 2014 benchmark assessment. These trends are consistent with other stock indicators such as: increased landings, increasing LPUEs and decreasing effort of some of the main fleets catching hake. Therefore, it was concluded that there is a high degree of certainty that the stock is above the point where recruitment would be impaired.

The position of stock status in relation to the target reference point was scored using the most recent ICES advice (2014), which is consistent with that given in the three previous years. Estimated SSB in 2014 (at 161,707 t) is clearly at an historically high level and is well above both limit Biomass and MSYBtrigger (46,200 t), and fishing mortality has fallen to an historic low (around 0.4), though it remains above the estimate of FMSY (0.27). There is, therefore, a high degree of certainty that the stock has been above its biomass target reference point over recent years.

Score: 100
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The fishery satisfies all of the SG80 and SG100 requirements, and a score of 100 has therefore been awarded.

**Audit Trace References**

ICES, 2013a. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES, 2013b. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Monk and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11

ICES. 2014b. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 7-13 May 2014, Lisbon, Portugal. ICES CM 2014/ACOM:11. 714 pp.

ICES. 2014c. Report of the Benchmark Workshop on Southern Megrim and Hake (WKSOUTH), 3-7 February 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:40.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
1.1.2	Reference Points: Limit and target reference points are appropriate for the stock.	<p>Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.</p>	<p>Reference points are appropriate for the stock and can be estimated.</p> <p>The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.</p> <p>The target reference point is such that the stock is maintained at a level consistent with <math>B_{MSY}</math> or some measure or surrogate with similar intent or outcome.</p> <p>For low trophic level species, the target reference point takes into account the ecological role of the stock.</p>

Scoring Comments
<p>Reference points set by management (i.e. contained in the Hake Recovery Plan, 2004) were estimated using the stock/recruitment relationship with the objective of avoiding recruitment overfishing and maintaining the stock at biomass levels consistent with precautionary limits (i.e. Bpa). The limit reference point is set at Blim, determined as the lowest point at which no effect on recruitment was observed. This provides a low risk of impairing reproductive capacity.</p> <p>However, in light of the ICES review of the stock assessment model for Northern hake, the changed perception of the stock's dynamics now that a length-based model with a higher growth rate has been accepted by ICES, and the adoption by the EC and ICES of the MSY approach to management, ICES now considers (since 2010 advice) that the reference points previously set for this stock are no longer appropriate.</p> <p>This stock was benchmarked by ICES in 2014 and ICES has used this assessment to set new reference points. FMSY has been redefined at 0.27, based on stochastic simulations on a combined stock–recruitment relationship, and Blim is estimated at 33,000 t (a low biomass that was followed by a quick recovery) and MSYBtrigger (=Bpa) at 46,200 t (applying the precautionary approach of <math>1.4 \times Blim</math>).</p> <p>We conclude that the limit reference points will ensure that there is no appreciable risk of impairing reproductive capacity, and that the target reference point (FMSY, rather than MSYBtrigger) will maintain the stock at a level consistent with <math>B_{MSY}</math> or some measure or surrogate with similar intent or outcome. However, in view of the substantial revisions</p>

<sup>6</sup> This scoring guidepost duplicates the SG80 text, and was withdrawn by the MSC in September 2010 (Policy Advisory 18). Duplicate text has also been withdrawn for PIs 1.2.2, 2.5.3, 3.1.1., 3.2.2, 3.2.3.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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to biomass and F levels in the last two assessments (2013, 2014), we consider that the target reference points does not takes into account relevant precautionary issues with a high degree of certainty

Hake are not a low trophic level species.

Score: 90

The fishery satisfies all of the SG60 and SG80 requirements, but fails to satisfy the second SG100 issues. A score of 90 has been awarded.

**Audit Trace References**

ICES, 2010. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Monk and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain.

ICES CM 2010/ACOM:11

ICES, 2013. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES. 2014b. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 7-13 May 2014, Lisbon, Portugal. ICES CM 2014/ACOM:11. 714 pp.

ICES. 2014c. Report of the Benchmark Workshop on Southern Megrim and Hake (WKSOUTH), 3-7 February 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:40

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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1.1.3	<p>Stock Rebuilding: Where the stock is depleted, there is evidence of stock rebuilding.</p>	<p>Where stocks are depleted rebuilding strategies which have a <u>reasonable expectation</u> of success are in place.</p> <p>Monitoring is in place to determine whether they are effective in rebuilding the stock within a <u>specified</u> timeframe.</p>	<p>Where stocks are depleted rebuilding strategies are in place.</p> <p>There is <u>evidence</u> that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a <u>specified</u> timeframe.</p>	<p>Where stocks are depleted, strategies are <u>demonstrated</u> to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the <u>shortest practicable</u> timeframe.</p>
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Scoring Comments
<p>Despite there being no formal replacement of the hake stock recovery plan with a long-term management plan, the stock has clearly fully recovered from the depleted state observed in the 1990s, and this SI is not applicable.</p>
<p>Score: N/A</p>
<p>The stock is not considered to be depleted.</p>
Audit Trace References
<p>Section 5 of this report.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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1.2	Harvest Strategy (management)		
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1.2.1	<p>Harvest Strategy: There is a robust and precautionary harvest strategy in place</p>	<p>The harvest strategy is <u>expected</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy is <u>likely</u> to work based on prior experience or plausible argument.</p> <p><u>Monitoring</u> is in place that is expected to determine whether the harvest strategy is working.</p>	<p>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <u>work together</u> towards achieving management objectives reflected in the target and limit reference points.</p> <p>The harvest strategy may not have been fully tested but monitoring is in place and <u>evidence</u> exists that it is achieving its objectives.</p>	<p>The harvest strategy is responsive to the state of the stock and is <u>designed</u> to achieve stock management objectives reflected in the target and limit reference points.</p> <p>The performance of the harvest strategy has been <u>fully evaluated</u> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</p> <p>The harvest strategy is <u>periodically reviewed and improved</u> as necessary.</p>
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Scoring Comments			
<p>Elements of the harvest strategy are working together to achieve the management objectives. ICES assess the stock annually and provide advice for conservation and management. Following ICES advice on stock status, an annual TAC is set by the European commission. The annual TAC is set following a set of control rules contained in the recovery plan (EC Reg. No. 811/2004, Annex 9.4.10). However, this plan uses target values based on precautionary reference points that are no longer appropriate. MSYBtrigger has been identified for this stock, and the ICES MSY approach has been applied using fishing mortality at <math>F_{MSY}</math> (= 0.27 in 2014) to advise on landings for the coming year.</p> <p>The harvest strategy employed in the recovery plan initiated in 2004 has been tested through successive stock assessments, and has been shown to have achieved its objectives. The stock has reached the highest recorded biomass and fishing mortality has been reduced substantially towards <math>F_{MSY}</math> since 2005. A long-term management plan is under development following the successful recovery of the stock.</p> <p>Evidence that the harvest strategy is periodically reviewed and improved as necessary is the introduction of the recovery plan in 2004 and the current development of the long-term management plan. Since the inception of the EC hake emergency plan in 2000, the harvest strategy has been to strongly reduce mortality of juvenile hake and to achieve a target SSB. This strategy was based on simulations of exploitation patterns in relation to metier catch-length distributions, mortality, growth, size / age at maturity. Harvest rules were set out in this strategy, and were based upon recovering and maintaining the SSB for the stock by managing the TAC. This strategy was reviewed and improved in 2004 and the hake recovery plan (811/2004) requires annual review of the stock harvest, and also identifies when the plan should be reviewed and improved. Proposals for a new management plan for the stock were put forward by the EC in 2009, (COM 2009 122 Final), but have not yet been implemented. The Commission has sought advice from ICES concerning its proposed new strategy adopting the MSY approach. ICES have evaluated the EC proposals and advised on values of F that would achieve the EC's MSY objectives in the light of the latest stock and assessment information. The Commission is currently working to develop a new management plan that is intended to deliver the MSY approach.</p>			

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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The performance of the strategy has been shown to be achieving its objectives. ICES note, however, that they did not evaluate this plan.

**Score: 90**

The harvest strategy meets all of the SG60 and SG80 requirements and most of the SG100 requirements, now that FMSY is firmly based and Biomass reference points are clearly precautionary. A score of 100 could be awarded, but the team consider that a more precautionary score of 90 is appropriate as the strategy has not been fully evaluated (there is no agreed long-term management plan) and there is not yet sufficient evidence to show that it is clearly able to maintain stocks at target levels.

**Audit Trace References**

EC Regulation 811/2004; COM (2009) 122 Final; appropriate section of report.  
 ICES, 2009. ICES Advice 2009. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).  
 ICES, 2013a. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).  
 ICES.2014a. Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.2.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
1.2.2	Harvest control rules and tools: There are well defined and effective harvest control rules in place	<p><u>Generally understood</u> harvest control rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.</p> <p>There is <u>some evidence</u> that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.</p>	<p><u>Well defined</u> harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <p>The <u>selection</u> of the harvest control rules takes into account the <u>main</u> uncertainties.</p> <p><u>Available evidence indicates</u> that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules</p>

Scoring Comments
<p>The existing HCRs are clearly set out in the harvest strategy. In 2004, a recovery plan for the Northern hake stock was implemented (EC Reg. No. 811/2004) with the aim to increase the SSB to above 140,000 t by limiting fishing mortality to 0.25 and by allowing a maximum change in TAC between years of 15%. Together with technical measures that include restricted areas and mesh size controls aimed at protecting juvenile hake, these measures are well defined and aimed at exceeding <math>B_{pa}</math> for the stock. The exploitation rate has been reviewed annually and set at a level that ensures these objectives will be attained and that limit reference points are avoided by a substantial margin. Although the harvest control rules of the recovery plan could be considered as well defined, they are now effectively obsolete, due to the changing perception of the stock (biomass at an historic high, but uncertainty in the absolute value), and a long-term management plan has not yet been implemented. As a consequence, the harvest control rules for the hake fishery are currently ill-defined, though advice is given by ICES according to its MSY approach (i.e. exploit at <math>F_{MSY}</math>). Nevertheless, it is not apparent how the exploitation rate will be reduced if limit reference points are approached, and issue 1of SG 80 is not met and a condition for certification applies.</p> <p>Because the harvest control rule is aimed at achieving MSY, it effectively takes account of the main uncertainties by ensuring that the stock is maintained at a level that ensures a low risk of recruitment overfishing.</p> <p>Since the recovery plan was initiated, fishing mortality has decreased to just above <math>F_{MSY}</math> and the stock biomass has increased to an historic high level: the management objective has been met. During the recovery period, the TAC and other technical measure management tools have been effective in achieving SSB and F targets, but landings</p>

<sup>7</sup> See note 6 *supra*

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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between 2009 and 2012 greatly exceeded the set TAC (55.1 kt). This is reflected in the ICES advice which, on the basis of the MSY approach, is that total catches in 2014 should be no more than 84.1kt and 78.5 kt in 2015. Although this demonstrates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules (landings of 78.5 kt in 2015 are expected to lead to an SSB of 277,000 t in 2015 -an historic high – at a fishing mortality of  $0.27 = F_{MSY}$ ), there has clearly been a problem with setting TACs in line with catch opportunities (due, possibly, to the disconnect between the Recovery Plan measures and the unexpected large increase in biomass since 2008) in recent years.

The design of the HCRs recognises the impact of uncertainties such as discarding, growth, ageing, recruitment and natural mortality. All of these uncertainties have recently been re-evaluated by ICES. Evidence (in the form of sustained increases in SSB and reductions in F) clearly show that these HCRs are effective.

However, the EC Regulation for the stock is due to be replaced (the stock has met the requirements set out in the recovery plan), and though a proposed new regulation has been put forward, this is not yet in force. EU policy guidance might be seen to allow an increase in TAC, which would not be consistent with current ICES advice.

Score: 75

The harvest control rules in force meet all of the SG60 and the second and third SG80 requirements, and also the third of the SG100 requirements. However, there is currently some uncertainty about the design of the future HCR for this stock, as it moves from a recovery plan to management against MSY, and whether the HCR will ensure that the exploitation rate is reduced as limit reference points are approached. A condition is imposed, and it will be important to keep this performance indicator under review as this transition is made, to ensure that the HCRs remain compatible with the MSC requirements.

#### Audit Trace References

EC Regulation 811/2004; COM (2009) 122 Final; Sections 5 and 7.3 of this report.

ICES, 2009. ICES Advice 2009. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES, 2010b. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Monk and Megrin (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11

ICES, 2010a. ICES Advice 2010. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES, 2013a. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES.2014a. Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 1, Section 1.2.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
1.2.3	<p>Information / monitoring: Relevant information is collected to support the harvest strategy</p>	<p><u>Some</u> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.</p> <p>Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.</p>	<p><u>Sufficient</u> relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</p> <p>Stock abundance and fishery removals are <u>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</u>, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.</p> <p>There is good information on all other fishery removals from the stock.</p> <p>A <u>comprehensive range</u> of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.</p> <p><u>All information</u> required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of the inherent <u>uncertainties</u> in the information [data] and the robustness of assessment and management to this uncertainty.</p>

Scoring Comments
<p>Relevant information related to stock structure and stock productivity is available. The distribution of the Northern hake stock is well understood, though the separation of the Northern and Southern hake stocks is based on management considerations rather than being biologically based.</p> <p>Tagging of European hake recently provided a better understanding of the species biology and population dynamics, in particular evidence of faster growth and shorter life span than estimated through the use of ageing techniques (i.e. otolith reading techniques). This has resulted in a shift of assessment methodology (see PI 1.2.4).</p> <p>The fleet composition targeting Northern hake is well understood. The fleet is classified into different categories depending on the gear used and geographic area where the fleet operates for stock assessment purposes.</p> <p>Stock abundance and fishery removal are regularly monitored, though the reduction in the availability of log-book information in recent years for the French fleet added to the inadequacy of the way catch data are collected for the longline fleet means that LPUE cannot be used at present as abundance indices. Consequently, assessment of the stock relies heavily on survey abundance indices, which do not contain information on large fish sizes and lead to some uncertainty associated with estimates of SSB and fishing mortality. Nevertheless, ICES is now much more confident in its length-based assessment of this stock, which has shown consistent trajectories in SSB and F (and estimates of recruitment strength), and is a robust basis for management advice.</p> <p>There is good information on all fishery removals. Landings of hake are recorded through the use of the European logbook and discard data (i.e. data on fish not landed) is</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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collected under the requirements of the EU Data Collection regulation. Since 2008 discards estimates from several fleets were used in the assessment.

Other fishery removals from the stock are generally well monitored, though discard rates of several fleets contributing to hake catches are not known and cannot be incorporated into the stock assessment in a consistent way. In light of these difficulties, ICES did not include discard estimates in the time series of Northern hake catch data in stock assessment conducted between 2003 and 2009, and catch estimates were not presented in 2014 (though landings were).

**Score: 80**

All of the SG60 and SG80 requirements are met by the UoC. Sufficient relevant information related to stock structure and productivity, fleet composition and exploitation dynamics, is available to support the harvest strategy. Similarly, stock abundance and fishery removals by the vessels in the UoC are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule. SG100 is not satisfied, in part because there appears to have been an environmental influence on the stock distribution and productivity of Northern hake, the biological basis for which is not well understood, and discard rates are not well known. It is not obvious that the assessment and management of this fishery are robust to this uncertainty. A score of 80 is therefore given.

**Audit Trace References**

ICES, 2013a. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES, 2013b. Report of the Working Group on the Assessment of the southern Shelf Stocks of Hake, Monk and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM 2010/ACOM:11

ICES. 2014b. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 7–13 May 2014, Lisbon, Portugal. ICES CM 2014/ACOM:11. 714 pp.

SCORING CRITERIA		SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
1.2.4	Assessment of stock status: There is an adequate assessment of the stock status	<p>The assessment estimates stock status relative to reference points.</p> <p>The major sources of uncertainty are identified.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points.</p> <p>The assessment takes uncertainty into account.</p> <p>The stock assessment is subject to peer review.</p>	<p>The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.</p> <p>The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.</p> <p>The assessment has been <u>internally and externally</u> peer reviewed.</p>

Scoring Comments
<p>Since the adoption of a length-based model (Stock Synthesis SS3) for assessment of the Northern hake stock (by the ICES WGHMM), uncertainties associated with the previously used age-based Extended Survivors Analysis (XSA) method have now been largely overcome. The current stock assessment is used to estimate fishing mortality (F) and spawning stock size (SSB) for determination of stock status in relation to MSY and is applied by ICES in giving advice in relation to the harvest control rule. Using a length-based model that employs fishery landings data and survey abundance indices (especially for juveniles) takes into account the major features relevant to the biology of the species (growth, life-stage distribution) and the nature of the fishery.</p> <p>Uncertainties related to biological parameters (i.e. growth) have been discussed extensively and are behind the shift of assessment methodology. Though there is poor quality of some fishery data used for the assessment of the stock (i.e. unreliability of LPUE as an abundance index, in part due to discarding), estimates of SSB and F (strong increase in SSB and strong decrease in F) are used in the scientific advice, which follows ICES' MSY approach and is less dependent on absolute biomass reference levels.</p> <p>The stock assessment is subject to peer review through the working group and benchmarking process. A review is undertaken by the Scientific, Technical and Economic Committee for Fisheries (STECF).</p>
Score: 90
<p>All of the SG80 requirements are met and the recent benchmarking of the assessment methodology and adoption of a more biologically robust length-based model satisfies the first and third SG100 requirement. However, the assessment does not evaluate stock status relative to reference points in a probabilistic way, and has not been externally reviewed. A score of 90 is awarded</p>
Audit Trace References
ICES, 2013b. Report of the Working Group on the Assessment of the Southern Shelf Stocks of Hake, Monk and Megrim (WGHMM). Annex T & Annex C, 5-11 May 2010, Bilbao, Spain. ICES CM

**SCORING CRITERIA****SCORING GUIDEPOST 60****SCORING GUIDEPOST 80****SCORING GUIDEPOST 100**

2010/ACOM:11

ICES, 2013a. ICES Advice 2013. Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa, b, d (Northern Stock).

ICES. 2014b. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 7–13 May 2014, Lisbon, Portugal. ICES CM 2014/ACOM:11. 714 pp.

ICES. 2014c. Report of the Benchmark Workshop on Southern Megrin and Hake (WKSOUTH), 3–7 February 2014, Copenhagen, Denmark. ICES CM 2014/ACOM:40.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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## 15.2 Principle Two

Principle 2	Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends
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2.1	Retained non-target species
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2.1.1	<p><i>Status:</i> The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species.</p>	<p>Main retained species are <u>likely</u> to be within biologically based limits or if outside the limits there are <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.</p> <p>If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.</p>	<p>Main retained species are <u>highly likely</u> to be within biologically based limits, or if outside the limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> management measures in place such that the fishery does not hinder recovery and rebuilding.</p>	<p>There is a <u>high degree of certainty</u> that retained species are within biologically based limits.</p> <p>Target reference points are defined and retained species are at or fluctuating around their target reference points.</p>
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### Scoring Comments

For the purposes of this assessment, “main” species are considered to be those comprising 5% or more of the total catch. “Minor” species making up less than 5% of the catch have been considered here only where they represent a non-trivial proportion of the catch. The retained non-target species of Cornish vessels when targeting hake using 120mm gill nets (the UoC) are judged to be pollack, haddock and cod, whilst monkfish, saithe, megrim, ling and whiting are minor retained species.

ICES have provided advice on the stock status of most of the above species in the UoC area (see ICES, 2013c).

#### Main retained species

**Pollack:** There is insufficient information available to determine whether pollack in the western Channel and Western Approaches may be treated as a single stock. ICES considers that the available information is insufficient to evaluate the exploitation and the trends of pollack in the Celtic Sea ecoregion, and the status of exploited stock is not known. In 2012 ICES estimated that the sustainable catch for subarea VI would be around 160 t and for subarea VII a catch of around 4,000 t would be sustainable. Catches of pollack from subarea VII increased from around 3,900 t in 2008 to 4,800 t in 2013 (ICES WGCSE, 2014).

**Haddock:** ICES (2013) assessment of haddock in Divisions VIIb–k indicated a slowly increasing SSB over the time-series and a sharp increase in 2011 with the maturing of

the strong 2009 cohort, whilst fishing mortality remains above the  $F_{MSY}$  proxy. Recruitment in 2009 was exceptionally good, but has been below average since then

**Cod:** The cod stock in the western Channel, Bristol Channel and Celtic Sea (ICES Divs VIIe-k) is highly dependent on incoming recruitment, and ICES 2013 assessment estimated the 2009 year class to be the strongest since 2000. The SSB is assessed to have increased from below Blim to well above MSY Btrigger since 2010. Recruitment has been highly variable over time with occasional very high recruitment (e.g. 1987 and 2010). Fishing mortality shows a declining trend since 2005 and is now around the  $F_{MSY}$  proxy.

Minor retained species

**Monkfish (anglerfish):** There has been no accepted assessment for monkfish in Divisions VIIb-k and VIIIa,b,d since 2007, and neither the state of the stock (SSB) nor  $F$  in relation to precautionary limits, high long-term yield or an agreed target, is known. However, on the basis of LPUE trends and survey data, ICES suggested that the biomass of has been increasing as a consequence of good recruitment since 2001, an interpretation supported by the industry's observations. In 2013, ICES advised that the long-term trend in biomass of *L. piscatorius* is increasing, and the average stock biomass indicator in the last two years (2011–2012) is 55% higher than the average of the three previous years (2008–2010).

**Saithe:** The saithe stock in the UoC area is included in the ICES assessment of saithe in Subareas IV and VI, and Division IIIa. Recruitment has been below average since 2006 and shows a declining trend in recent year, and the latest SSB estimate is close to Bpa. Fishing mortality has fluctuated around  $F_{MSY}$  since 1997.

**Megrim:** The megrim stock in Divisions VIIb,c,e-k and VIIIa,b,d was benchmarked in 2012, when ICES suggested that the assessment model results can only be interpreted as trends. ICES advice for 2014 is that new data (landings, discards and surveys) continue to indicate an SSB increase of 25% in the last two years (2009–2010) relative to the three previous years (2006–2008), though the stock is below the long term average, and fishing mortality in the last decade has been stable but above long-term average.

**Whiting:** ICES' assessment of the whiting stock in ICES Div VIIe-k shows that SSB has increased since 2008 to well above MSY Btrigger, whilst fishing mortality has been below the  $F_{MSY}$  proxy since 2011.

Ling: ICES' assessment of the ling stock in Divisions IIIa and IVa, and Subareas VI, VII, VIII, IX, XII, and XIV is that stock abundance is stable at the current volume of catch.

Score: 85

The main retained species are within biologically based limits (haddock and cod) or if the status is poorly known (pollack) there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery (total international landings from Sub-area VII have increased since 2008). The SG60 requirements are met. The SG80 requirements are met because most of the retained species are within biologically based limits, and for pollack the regulations in force and the fishing practices adopted by the fishery (specifically targeting hake, resulting in a pollack catch of ~4% of total international landings) comprise a partial strategy of effective measures that ensure this fishery does not hinder recovery and rebuilding. There is not, however, a high degree of certainty that all retained species are within biologically-based limits and only for cod, haddock and possibly saithe could it be said that the stock is fluctuating around its target reference point (this is not defined for most retained species). Since all elements meet SG80 and a few meet SG100 but most do not, a score of 85 is awarded. (ref CR v1.3 at Table C2)

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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**Audit Trace References**

Revoll et al 2006; ICES, 2012b; ICES 2013c, June Advice for Celtic Sea ecoregion: <http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2013/2013/>; ICES 2013f. See Section 6.3.1 of this report.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100	
2.1.2	<p><i>Management strategy:</i> There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.</p>	<p>There are <u>measures</u> in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>partial strategy</u> in place, if necessary that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or species involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being <u>implemented successfully</u>.</p>	<p>There is a <u>strategy</u> in place for managing retained species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and <u>testing</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being <u>implemented successfully</u>, and intended changes are occurring.</p> <p>There is some evidence that the strategy is <u>achieving its overall objective</u>.</p>

Scoring Comments
<p>The main retained non-target species (making up more than 5% of catch) are pollack, haddock and cod. Monkfish, saithe, ling, whiting and megrim are minor retained species, making up less than 5% of the catch.</p> <p>The mesh size used in the fishery is required by EU Regulations to be at least 100 mm throughout the UoC area, and within the Irish Hake box a mesh size of 120 mm is required. The client fleet use nets of 120 mm mesh size or greater, principally to prevent the capture of small hake, but with a consequence (supported by monitoring of catch and landings) that the fleet only catch relatively large fish. In the case of pollack, monkfish, cod, haddock, saithe and megrim, the quantity of non-target species that can be retained is governed by a TAC and quota allocation. There is thus a partial strategy in place for managing the capture of all main retained non-target species and the key minor retained species in this fishery at levels that are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.</p> <p>Evidence from monitoring of catches and landings of the main retained species, from observations that stock biomass indices have been increasing recently, provides an objective basis for confidence that the partial strategy provided by TACs and higher mesh sizes is effective and is being implemented successfully. The fisheries regulations (technical measures) in force are policed at shore and at sea by the MMO. Compliance is reported to be good, providing further evidence that this element of the partial strategy is being implemented successfully.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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For two of the main retained species (haddock and cod), the information from both the fishery (landings taken within quota, TAC uptake in line with TAC allocation; and TAC allocation compatible with scientific advice); and from the species concerned (stock biomass above  $B_{MSYtrigger}$ ) provides both an objective basis for confidence that the management strategy is working and evidence that it is being implemented successfully.

It could also be argued that there is a strategy for managing the catch of all retained species in this fishery, which includes TACs and quotas; a ban on gillnets set at depth greater than 200m along the shelf edge in Divisions VIa,b and VIIb,c,j,k to protect monkfish (since 1<sup>st</sup> February 2006); minimum landing sizes and mesh sizes for most retained species; an EU Council Regulation (EC) No. 1954/2003 established measures for the management of fishing effort in a ‘biologically sensitive area’ in Divisions VIIb, VIIj, VIIg, and VIIIh where effort exerted by the vessels of each EU Member State may not exceed their average annual effort calculated over the period 1998–2002; and the “Trevoise” box to protect spawning cod. This strategy is based on information directly about the fishery and the species involved, and there is good evidence from ICES assessments which supports high confidence that the strategy is being implemented successfully and will work. It is not possible, however, to conclude that the strategy is achieving its overall objective, since there is no explicit objective for management of fisheries in this region (according to ICES).

Score: 90

All of the SG60 and SG80 requirements are met. The second and third of the SG100 requirements are also met. A score of 90 is appropriate.

Audit Trace References

Revoll et al 2006; Regulations 850/98; Regulation 494/2002; Regulation 811/2004; Sections 7.3.1 & 7.3.36.3.1 of this report. Interviews I8 and I13

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.1.3	<p><i>Information / monitoring:</i> Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species.</p>	<p><u>Qualitative information</u> is available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>adequate</u> to <u>qualitatively</u> assess outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage <u>main</u> retained species.</p>	<p><u>Qualitative information</u> and some quantitative information are available on the amount of main retained species taken by the fishery.</p> <p>Information is <u>sufficient</u> to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage <u>main</u> retained species.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p> <p>Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage retained species, and evaluate with a <u>high degree of certainty</u> whether the strategy is achieving its objective.</p> <p>Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.</p>

Scoring Comments
<p>The requirements of the EC CFP Regulations, coupled with specific reporting requirements in the hake recovery plan, and the requirements of the UK “Buyers and Sellers of First Sale Fish” legislation, ensure that records of all fish landings are submitted to regulatory bodies. Landings are inspected and records independently verified by enforcement officers. This provides quantitative, accurate and verifiable information on landings of all retained species by the UoC fleet.</p> <p>This fishery-dependent information is gathered continuously by regulatory bodies throughout the EC; this information is supplemented by fishery-independent groundfish monitoring carried out by scientific institutions in EC Member States.</p> <p>The quality of this information is sufficient to estimate outcome status for the retained species with respect to biologically based limits for most retained species, or at least to indicate trends in abundance; indeed this information informs the ICES stock assessments and advice that determine the EC management strategy for the retained species in the hake fishery.</p> <p>Whilst there is good information available on fishery removals, and the status of the main retained species is known with some confidence, the outcome status for some of the retained species cannot be quantified with a high degree of certainty at present, so it is also not possible to evaluate with a high degree of certainty whether the strategy is achieving its objective.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Score: 90
The strategy in place for monitoring landings of retained species from this fishery and using this information to manage their stocks meets all of the SG60 and SG80 requirements, and also satisfies the first and fourth of the SG100 requirements.
Audit Trace References
Regulation 2371/2002; Regulation 811/2004; Buyers & Sellers Regulations (SI2005 No 1605); MMO, 2010; Sections 7.2.1 & 7.3.3 of this report.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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2.2	Discarded species (also known as “bycatch” or “discards”)		
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2.2.1	<p><i>Status</i> The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.</p>	<p>Main bycatch species are <u>likely</u> to be within biologically based limits, or if outside such limits there are mitigation <u>measures</u> in place that are <u>expected</u> to ensure that the fishery does not hinder recovery and rebuilding.</p> <p>If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.</p>	<p>Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.</p>	<p>There is a <u>high degree of certainty</u> that bycatch species are within biologically based limits.</p>
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Scoring Comments
<p>The MSC consider that “main” bycatch species are those that make up 5% or more of the total catch. The assessment team can also consider other species as “main” bycatch if there is good reason to do so (for instance if their life history or current stock status means that any fishery-related mortality could adversely affect the species concerned). This is particularly important for a number of elasmobranch species that are, technically, not ETP species.</p> <p>For the purposes of this assessment, the recent FSP studies of the Cornish Gill net vessel MV Charisma identified the following bycatch species that either form more the 5% of the catch or which warrant scrutiny within this assessment. Although the catch composition shown in</p> <p>Table 8 are expressed in numbers rather than weight, it is apparent that cod and haddock represent 5% or more of the catch for the FV Charisma (fishing with hake nets) and would therefore be considered as “main” retained species (as above).</p> <p>Of the bycatch species that were discarded, only lesser-spotted dogfish and spurdog would be considered main by catch species, whilst edible crab, mackerel and porbeagle shark are considered minor by-catch species that are caught in more than insignificant quantities.</p> <p><b>Spurdog:</b> The spurdog stock unit extends across the NE Atlantic, and the most recent assessment undertaken by ICES indicates a strong decline in spurdog total biomass to around 15% of pre-exploitation levels, which appears to have been driven by relatively high exploitation levels. Though fishing mortality appears to have declined in recent years, biomass has declined to record low level in recent years and ICES advice is that, to allow the stock to rebuild, catches should be reduced to the lowest possible level in 2013 and 2014.</p>

There has been a ban on landing spurdogs since 2010. Landings data from 2009 (the last full year when landings of spurdogs were permitted, with only a maximum landing size of 100 cm in effect) indicate that the CFPO netting fleet landed a total of 50.8 t of spurdogs. Since fishing practices and gear have not changed significantly since 2009, the assumption is that a quantity of spurdog similar to this is now discarded from the fishery. Variation in length of soak time did not appear to have an impact upon the numbers of spurdog caught nor on survival rates (to discarding), which were consistently high, with 283 (73%) returned to the sea alive. It is reported that spurdog are often found on the same grounds as hake, which limits the potential for mitigation. The fleet report that spurdog capture is sporadic, and that moving nets to avoid the spurdogs is ineffective: by the time that the nets are hauled and the problem has been identified, the spurdog have moved to another area.

**Lesser spotted dogfish:** There is no assessment available for lesser spotted dogfish: this is not a commercially important species and appears from surveys to be abundant. Discards are known to survive well.

**Porbeagle shark:** Assessments of the NE Atlantic porbeagle stock were carried out in 2009 by the joint ICCAT/ICES meeting. The BSP model- demonstrated that the population continued to decline slightly after 1961 and estimated a relative 2008 biomass (to that in 1961) as between 0.54 and 0.78 and the relative 2008 fishing mortality rates (to  $F_{MSY}$ ) of between 0.72 and 1.15. The ASP model estimated the 2008 relative spawning–stock fecundity (to  $SSF_{MSY}$ ) at between 0.21 and 0.43 and the relative fishing mortality rate (to  $F_{MSY}$ ) at between 2.54 and 3.32. The conclusion was that current biomass is below  $B_{MSY}$  and that recent fishing mortality is near or possibly above  $F_{MSY}$ .

ICES continues to advise on the basis of the precautionary approach that no fishing for porbeagle should be permitted, landings of porbeagle should not be allowed, and a rebuilding plan should be developed for this stock. No reference points have been proposed for this. Since 2012, EC Regulations 23/2010, 57/2011 and 44/2012 have prohibited fishing for porbeagle in EU waters and, for EU vessels, to fish for, to retain on board, to tranship and to land porbeagle in international waters. The Norwegian and Faroese fisheries have ceased and have not resumed.

**Mackerel:** The NE Atlantic mackerel stock is estimated to be well above  $B_{MSY_{trigger}}$  and  $B_{pa}$ , though fishing mortality in 2011 was above both  $MSY$  and precautionary levels. No update assessment was available for 2013, but ICES Reported that catches of mackerel have been increasing since 2005 and have been around 900 kt since 2010, and that the mackerel egg survey index show a doubling of the SSB since 2004, and a 30% increase from 2010 to 2013.

**Edible crab:** Cefas uses catch and effort data from the fishery and the size structure of crabs in the landings to estimate exploitation levels and abundance indices and an analytical perspective on stock status including reference points. The status of the stock of edible crab around SW England is good, with spawning stock and exploitation level around the level required to produce  $MSY$ .

Score: 70

Although it is likely that both spurdog and porbeagle sharks are outside  $B_{lim}$ , there has been a management response (setting of a zero TAC, ban on landings etc) to this. Thus, some main bycatch species are likely to be outside biologically based limits, but there is a partial strategy of mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of these very widely dispersed stocks (cover whole of NE Atlantic). However, given the continuing by catch (and associated mortality) of both species in the hake gill net fishery, and the considerable time it will take to show that recovery is occurring, it cannot at the moment be said that they are demonstrably effective. These elements would score 60.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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It is highly likely that lesser spotted dogfish are within biologically safe limits, and mackerel and edible crab are all highly likely to be within biologically safe limits ( $BMSY_{trigger}$ ), with a high degree of certainty for mackerel (these elements would return scores of 80, 100 and 100 respectively).

Since all elements meet SG 60, and some achieve higher performance at or above SG80, but some do not meet SG 80 and require intervention to make sure they get there, a score of 70 is indicated (CR v1.3, Table C2).

**Audit Trace References**

Bendall et al., 2012; Babcock and Cortes 2012; ICES, 2012A; ICES 2013d; IUCN, 2010; section 6.3.2of this assessment

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.2.2	<p><i>Management strategy:</i> There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations.</p>	<p>There are <u>measures</u> in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery.</p> <p>There is <u>some objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or the species involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p> <p>There is a <u>strategy</u> in place for managing and minimising bycatch.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.</p>

Scoring Comments
<p>The use of large mesh nets by the fleet serves as the most effective strategy for reducing bycatch, because nearly all of the fish caught in the fishery can be landed, with the notable exception of spotted dogfish, spurdogs and porbeagle shark which are occasionally caught in the fishery and are now discarded. The quantity of spurdogs previously caught in this fishery and now likely to be discarded is just 50 t, and is thus highly unlikely by itself to hinder the recovery of this NE Atlantic-wide stock.</p> <p>A Europe-wide strategy for preventing the landing of spurdogs was established by the EC in 2010 on the basis of scientific advice from ICES that this would encourage the recovery of the stock. The most recent (2014) ICES advice on spurdog provides an objective basis for confidence that this will work. There is evidence that the UoC fleet is complying with this strategy and that it is being implemented. In 2012, ICES advised on the basis of the precautionary approach that there should be no targeted fishery, that catches in mixed fisheries be reduced to the lowest possible level, and that a rebuilding plan should be developed for this stock. The prohibition of landing catches of spurdog by EU vessels has resulted in landings across all ICES subareas declining in recent years, and those from the Celtic Sea ecoregion (Subareas VI and VII) have declined at a greater rate than those from Subareas II–IV. In 2012, the latter areas accounted for 70% of the total landings of spurdog due to less restriction on the (Norwegian) fishery.</p> <p>Similarly, ICES advises that no fishing for porbeagle should be permitted, landings of porbeagle should not be allowed, and a rebuilding plan should be developed for this stock. No reference points have been proposed for this. Since 2012, EC Regulations 23/2010, 57/2011 and 44/2012 have prohibited fishing for porbeagle in EU waters and, for EU vessels, to fish for, to retain on board, to tranship and to land porbeagle in international waters.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Score: 80

The fishery meets the SG60 and SG80 requirements. There is a partial strategy in place for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. There is some objective basis for confidence that the partial strategy is being implemented effectively and will work, given the total absence of spurdog and porbeagle in landings by the fishery. However, the measures in place are not a strategy, since by catch of these species is not minimised (it is difficult to see how this could be achieved) and, as observed above, it is too early to be able to judge that the partial strategy is achieving its objective. No element of SG 100 is satisfied.

**Audit Trace References**

Bendall et al., 2012; Babcock and Cortes 2012; ICES, 2012A; IUCN, 2010; section 6.3.2of this assessment

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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2.2.3	<p><i>Information / monitoring</i> Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.</p>	<p><u>Qualitative information</u> is available on the amount of main bycatch species affected by the fishery.</p> <p>Information is <u>adequate to broadly understand</u> outcome status with respect to biologically based limits.</p> <p>Information is adequate to support <u>measures</u> to manage bycatch.</p>	<p><u>Qualitative information and some quantitative information</u> are available on the amount of main bycatch species affected by the fishery.</p> <p>Information is sufficient to estimate outcome status with respect to biologically based limits.</p> <p>Information is adequate to support a <u>partial strategy</u> to manage main bycatch species.</p> <p>Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).</p>	<p><u>Accurate and verifiable information</u> is available on the amount of all bycatch and the consequences for the status of affected populations.</p> <p>Information is <u>sufficient</u> to quantitatively estimate outcome status with respect to biologically based limits with a <u>high degree of certainty</u>.</p> <p>Information is adequate to support a <u>comprehensive strategy</u> to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective.</p> <p>Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.</p>
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<p><b>Scoring Comments</b></p>
<p>There is good information about historic landings and on catch composition for this fishery from fishery-independent sources that provides accurate, verifiable and quantitative information about by catch. This enables spurdog to be identified as a main bycatch species and porbeagle as a minor but vulnerable species.</p>
<p>This information has contributed to current understanding of the status of the respective populations, based on which ICES have recommended the strategy of prohibiting spurdog and porbeagle landings as a means of restoring the population, and the EC has implemented these proposals.</p>
<p>Now that spurdog and porbeagle are no longer retained species, the quantity of information recorded by the client fleet will reduce, since this focuses on retained species. It is possible, therefore, that insufficient data will in future be gathered to detect a change in risk to both species, especially since their capture tends to be sporadic.</p>
<p>Score: 75</p>
<p>The fishery meets all of the SG60 requirements and the first 3 of the SG80 requirements. A condition has been generated to address the need for recording information about discarding from the fishery.</p>
<p><b>Audit Trace References</b></p>
<p>Bendall et al., 2012; Babcock and Cortes 2012; ICES, 2012A; ICES 2013d; IUCN, 2010; section 6.3.2of this assessment</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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2.3	Endangered, Threatened and Protected (ETP) species		
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2.3.1	<p><i>Status:</i> The fishery meets national and international requirements for protection of ETP species.</p> <p>The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species.</p>	<p>Known effects of the fishery are <u>likely</u> to be within limits of national and international requirements for protection of ETP species.</p> <p>Known direct effects are <u>unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</p>	<p>The effects of the fishery are known and are <u>highly likely</u> to be within limits of national and international requirements for protection of ETP species.</p> <p>Direct effects are <u>highly unlikely</u> to create <u>unacceptable impacts</u> to ETP species.</p> <p>Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.</p>	<p>There is a <u>high degree of certainty</u> that the effects of the fishery are within limits of national and international requirements for protection of ETP species.</p> <p>There is a <u>high degree of confidence</u> that there are <u>no significant detrimental effects (direct and indirect)</u> of the fishery on ETP species.</p>
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Scoring Comments
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The hake set net fishery is known to catch cetaceans, notably harbour porpoise. In the early 1990s, when the hake netting fishery was at its peak, it was estimated that 2,200 harbour porpoises from a Celtic Sea population of 36,280 were caught in hake nets per year (6% per year). This level of capture was well in excess of the IWC threshold of 1% of the regional population that was a trigger for concern, and above the IWC-ASCOBANS figure of 1.7% per year that is the agreed maximum acceptable fishing-related mortality for a harbour porpoise population.

The intensity of hake net fishing has declined since the early 1990s, and the number of harbour porpoises caught in the fishery has fallen. Recently, the UK Government has commissioned monitoring of the level of cetacean by catch in UK fisheries by SMRU to meet the requirements of EC fisheries and wildlife legislation. Annual reports on cetacean by catch are published on the Defra website. It was estimated that the UK hake fleet porpoise by catch was 231 animals. Total mortality from all UK set net fisheries in VIIa-j (including those for monkfish, pollack, turbot and whitefish) was estimated at 838 animals per annum (SMRU, 2009). ICES have estimated the total by catch of harbour porpoise in the Celtic Sea is around 1,300 animals annually (ICES, 2010e).

The porpoise population in the Celtic Sea in the 1994 was estimated to be 36,280 animals. Recent estimates suggest that the current population is larger (58,400 estimated in 2002 (Hammond et al, 2008); and 80,600 in July 2005 (ICES, 2010e).

Using the most recent information, it appears that the harbour porpoise bycatch by the entire UK hake gill net fleet is likely to be between 22 and 88 animals per year (best and worst case estimates, depending on how effectively pingers are deployed in the fishery) This equates to between 0.03% and 0.11% of the Celtic Sea population per year. The international requirement for protection of small cetaceans set by the IWC and IWC-ASCOBANS is a mortality of no more than 1.7% per year. Published information

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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indicates that catch rates of common dolphin by the hake fleet are around 0.06% of the regional population, also below international requirements.

National (UK) legislation exists to protect cetaceans from intentional and deliberate harm, and also from reckless disturbance. However, any such harm that is an unavoidable consequence of an otherwise legitimate activity is exempt from these measures. International legislation prohibits trade in these species and also sets thresholds for fishing-related mortality. The Cornish hake gill-net fishery is compliant with these national requirements.

The relative stability (and probable increase) in the harbour porpoise population in the Celtic Sea provides a degree of confidence that neither this fishery nor others in the area (or all impacts in-combination) are having an unacceptable effect on cetacean populations.

It is clear that cetaceans are routinely caught in hake gill nets. It is also apparent that this situation is monitored, and that the rate of capture is within international limits defined to prevent a fishery from having an unacceptable direct effect on cetaceans. The target species in the fishery is not a prey item for harbour porpoise or dolphins, so the fishery is considered unlikely to have indirect effects on their populations.

**Score: 90**

The fishery meets all of the SG60 and SG80 requirements: although there is a bycatch of cetaceans in this fishery, it is within international and national limits; is highly unlikely to create unacceptable impacts on populations; and indirect effects are unlikely to arise from the fishery. There is a high degree of certainty that the bycatch rates of harbour porpoise are within international limits and compatible with national requirements, meeting the first of the SG100 requirements.

**Audit Trace References**

Tregenza et al, 1997a,b; SMRU, 2009; SCANS-II, 2008; Ross & Isaac, 2004; Parsons et al, 2009; ICES, 2010d; ICES 2010e; ICES, 2005; CODA, 2009; section 6.4 of this report; Northridge et al, 2012; Northridge et al, 2014.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
<p>2.3.2</p> <p><i>Management strategy</i></p> <p>The fishery has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the fishery does not pose a risk of serious or irreversible harm to ETP species;</li> <li>- ensure the fishery does not hinder recovery of ETP species; and</li> <li>- minimise mortality of ETP species.</li> </ul>	<p>There are <u>measures</u> in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>The measures are <u>considered likely</u> to work, based on <u>plausible argument</u> (e.g. general experience, theory or comparison with similar fisheries/species).</p>	<p>There is a <u>strategy</u> in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</p> <p>There is an <u>objective basis for confidence</u> that the strategy will work, based on <u>some information</u> directly about the fishery and/or the species involved.</p> <p>There is <u>evidence</u> that the strategy is being implemented successfully.</p>	<p>There is a <u>comprehensive strategy</u> in place for managing the fishery’s impact on ETP species, including measures to minimise mortality, that is designed to achieve <u>above</u> national and international requirements for the protection of ETP species.</p> <p>The strategy is mainly based on information directly about the fishery and/or species involved, and a <u>quantitative analysis</u> supports <u>high confidence</u> that the strategy will work.</p> <p>There is <u>clear evidence</u> that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.</p>

Scoring Comments
<p>There is a strategy in place for managing this fishery’s impact on cetaceans (EC Regulation 812/2004). The Regulation sets out timescales for taking measures in specific fisheries to deter cetaceans from fishing nets and also requires monitoring of by catch in specific fisheries by observers. This strategy involves the use of acoustic “pingers” to minimise mortality, and is based on scientific advice submitted to the EC which was used to determine the strategy that was most likely to be effective.</p> <p>The implementation of Regulation 812/2004 in the UK was delayed while trials of different types of pinger and different deployment strategies were carried out. Independent trials (in which the client fleet has participated) have shown that acoustic pingers are highly effective and have been estimated to reduce the bycatch of cetaceans in hake set nets by up to 95%. Operating procedures for the use of the pingers were developed during these pinger trials. The UK Government has subsequently obtained approval from the EC Commission to allow the use of a loud pinger (known as the DDD-03L) which is favoured by the hake gill net fleet because the trials have shown it to have an effective range of 2km (so that the risks associated with a long hake net can be mitigated with just 2 or 3 pingers). Guidance on the types of pinger that are approved for use in the UK and the relevant operating procedures for each of them have been distributed to fishermen and are available for download from the MMO website.</p> <p>The implementation of the pinger regulations began in September 2013 and, from July 2014, the MMO have required all vessels to achieve compliance with the requirements of Regulation 812/2004. In their assessment of the impacts of the fishery on cetaceans during 2013, SMRU were unable to draw any firm conclusions about whether pingers were having an effect on cetacean bycatch because the full implementation of the strategy was not yet complete. The SMRU assessments of fishing impacts in 2014 and 2015 are likely to provide a clearer picture of whether the strategy (Regulation 812/2004) is being implemented successfully and whether it is achieving its objectives.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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<b>Score: 70</b>
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<p>The fishery meets all of the SG60 requirements, and the first and second of the SG80 requirements. The delays with introduction of pingers within the UK means that the third of the SG80 requirements is not fully met, so a score of 70 is appropriate and a condition has been generated to address this issue. Once there is evidence that the strategy has been fully and effectively implemented it is likely that the SG80 level of performance would be attained quickly.</p>
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<b>Audit Trace References</b>
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<p>Regulation 812/2004; EC, 2002; EC, 2009; SMRU, 2009; Kingston &amp; Northridge, 2011; Northridge et al, 2011; MMO, 2014a, b.</p>
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SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.3.3 <i>Information / monitoring</i> Relevant information is collected to support the management of fishery impacts on ETP species, including: - information for the development of the management strategy; - information to assess the effectiveness of the management strategy; and - information to determine the outcome status of ETP species.	Information is <u>adequate</u> to <u>broadly understand</u> the impact of the fishery on ETP species.  Information is adequate to support <u>measures</u> to manage the impacts on ETP species  <u>Information</u> is sufficient to <u>qualitatively</u> estimate the fishery related mortality of ETP species.	Information is <u>sufficient</u> to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a <u>full strategy</u> to manage impacts.  <u>Sufficient data</u> are available to allow fishery related mortality and the impact of fishing to be <u>quantitatively</u> estimated for ETP species.	Information is <u>sufficient</u> to <u>quantitatively</u> estimate outcome status with a high degree of certainty.  Information is adequate to support a <u>comprehensive strategy</u> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.  <u>Accurate and verifiable information</u> is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species

Scoring Comments
<p>EC Regulation 812/2004 has established monitoring requirements that now provide information about fishery-related mortality of cetaceans in this fishery.</p> <p>In the UK, SMRU conducts the monitoring programme required by EC Regulation 812/2004 on behalf of Defra. Member States are required to send a report to the Commission on the observer monitoring schemes for the fisheries specified in the Regulation by 1 June each year. The SMRU reports produced for Defra are available on the Defra website for each year. These reports contain sufficient information to determine whether the fishery may be a threat to the protection of cetaceans, and enable quantitative estimation of the impacts of the fishery on cetaceans.</p> <p>ICES has recently reviewed this information and has been able to present quantitative estimates of cetacean bycatch by species and by region, including estimates of harbour porpoise and common porpoise mortality in the Celtic Sea which covers the UoC area.</p> <p>Concerns about the completeness of the reported information have been raised by the EC, but it also concluded that “<i>France and U.K. are the only Member States providing information on estimated total annual incidental catches</i>”, indicating that the UK and the client fleet are submitting sufficient information about fishery-related mortality of cetaceans.</p>
<p>Score: 80</p>
<p>All of the SG60 and SG80 requirements are fully met.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Audit Trace References
EC, 2009; SMRU, 2009; ICES, 2010d; Northridge et al, 2012; Northridge et al, 2014.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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2.4	Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on habitats		
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2.4.1	<i>Status</i> The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is <u>unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is <u>highly unlikely</u> to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
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Scoring Comments
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The fishery takes place on the continental shelf, where the substrate is muddy and the epibenthos is dominated by hermit crabs, shrimps and echinoderms. Nets are only fished on neap tides, and are set “down tide” rather than across the tide. There is, as a consequence, very little abrasive physical contact between the gear and the seabed, and very little on the seabed that would be harmed by such contact.

Generic studies of the effects of gill nets on the seabed provide some evidence that the fishery is highly unlikely to adversely affect seabed habitats.

Vulnerable and sensitive marine habitats in the UoC area have been identified and protected through the EC Habitats Directive and the UK “Marine Conservation Zone” Project. This has led to the creation of 1 offshore Special Area of Conservation and 3 offshore MCZs in the UoC area. The Haig Fras SAC is not considered to be adversely affected by set nets. Two of these MCZs are not considered to have been adversely affected by, or vulnerable to, fishing with static gear; and although the third contains cold water corals that could be impacted by static gear, it is not fished by the vessels in the UoC fleet.

Based on the evidence available about the habitats in the area fished, the sensitivity of these habitats, the evidence of the pattern of fishing activity by the UoC fleet, and generic information about the effect of bottom set nets and their anchors on the seabed, it is highly unlikely that the fishery will cause serious or irreversible harm to the benthic habitats at the regional or bioregional level. However, no studies have been carried out to investigate the effects of hake set nets from the UoC fleet on the seabed.

Score: 90
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All of the SG60 and SG80 requirements are met, and the SG100 requirement is partially met by the evidence available about the area fished by the UoC and the location of sensitive and vulnerable seabed habitats type of fishing gear; SG100 is not fully met because no studies of the impacts of this specific fishery have been carried out.

Audit Trace References
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Jennings & Kaiser, 1998; Ellis et al 2002; JNCC 2011; JNCC & Natural England, 2012; JNCC, 2014

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
<p>2.4.2</p>	<p><i>Management strategy</i> There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.</p>	<p>There are <u>measures</u> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The measures are considered <u>likely</u> to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</p> <p>There is some <u>objective basis for confidence</u> that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.</p> <p>There is <u>some evidence</u> that the partial strategy is being implemented successfully.</p>

Scoring Comments
<p>Within the EEZ of the EC and its Member States, the EC “Natura 2000” strategy for conserving wildlife habitats and species is designed to prevent serious or irreversible harm to key habitat types. This strategy sets the framework for action at the national and local level by EC Member States through the designation and protection of areas of land and sea.</p> <p>Several Special Areas of Conservation (SAC) have been designated in the inshore waters of the UoC, and the recent designation of the Haig Fras SAC further offshore. The scope of protection of SACs provides for management of impacts of fishing and other human activities to protect both habitats and species. The possibility of managing set nets within Haig Fras SAC has been considered and is thought to be unnecessary for nature conservation purposes (JNCC, 2011).</p> <p>These SACs have been designated following a strategic evaluation of the distribution and relative merit of marine habitat types, and their management is guided by the risk of these habitats being harmed by human activity. Clearly defined legal rules have been set in place to ensure that the process of site designation and subsequent management is objective and transparent.</p> <p>The EC publishes regular updates on progress with the implementation of Natura 2000. While this demonstrates that the strategy is being implemented successfully, it does not prove that intended changes (in terms of improvements to wildlife habitats) are occurring.</p> <p>At the UK level, a series of Marine Conservation Zones were established in 2013 under the Marine and Coastal Access Act 2009. These MCZs were selected on the basis of the best available scientific information, coupled with the risk that they face from human activities.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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There are strategies in place at the national and international (EC) level for the protection of marine habitats and these are based upon information about the habitats and the activities that may affect them. The strategies are clearly being implemented successfully, but it is not yet clear whether intended changes are occurring.

Score: 90

All of the SG60 and SG80 requirements are met, and the first two SG100 requirements are met.

**Audit Trace References**

Directive 92.43.EC; Directive 147/2009/EC; Marine & Coastal Access Act 2009; Finding Sanctuary, 2010; section 6.5 of this report.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.4.3	<p><i>Information / monitoring</i> Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.</p>	<p>There is a basic understanding of the types and distribution of main habitats in the area of the fishery.</p> <p>Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.</p>	<p>The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.</p> <p>Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent, timing and location of use of the fishing gear.</p> <p>Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p> <p>The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.</p> <p>Changes in habitat distributions over time are measured.</p> <p>The physical impacts of the gear on the habitat types have been quantified fully.</p>

Scoring Comments
<p>Sufficient information is available to enable the nature, distribution and vulnerability of benthic habitats to be identified and also to justify their protection in the UoC area, both inshore and offshore. Generic information is also available to enable the likely impacts of the fishery on these habitats to be identified.</p> <p>There is also very reliable information available on the spatial extent, timing and location of fishing gear in the form of VMS (for vessels over 15m), aerial surveillance data for the entire fleet, logbook records (for vessels over 15m), and landings declarations (for all vessels). This information is gathered continuously, along with landings data, and provides a measure of fleet activity that would be sufficient to detect an increase in risks to habitats in the area.</p>
<p><b>Score: 80</b></p>
<p>All of the SG60 and SG80 requirements are fully met.</p>
Audit Trace References
<p>ICES, 2008; Ellis et al, 2002; Heath, 2005; sections 6.5 &amp; 7.3.3.1 of this report; ; JNCC 2011; JNCC &amp; Natural England, 2012; JNCC, 2014</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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2.5	Ecosystem		
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2.5.1	<i>Status</i> The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	The fishery is <u>unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is <u>highly unlikely</u> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <u>evidence</u> that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
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Scoring Comments
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The overall effect of the fisheries in the Celtic Sea on ecosystems has not been assessed; however it is known that the ecosystem is largely driven by benthic production. There is evidence that the main effects of the set-net fishery on this ecosystem has been to reduce the abundance of large hake, and thus the mean trophic level of the fish community in the area; and in the past to have caused a high mortality of cetaceans (and thus to reduce the abundance of predators in the ecosystem).

Recent evidence from the recovery of the hake stock and the much reduced cetacean by catch rate suggests that neither effect has caused serious or irreversible harm to the ecosystem.

Score: 80
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All of the SG60 and SG80 requirements are met; the rapid recovery of the hake stock and the reduced cetacean bycatch rates provide clear evidence that the fishery is highly unlikely to disrupt ecosystems in the area.
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Audit Trace References
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ICES, 2008; ICES, 2010d, 2010e, 2010f; SMRU, 2009; ICES 2010a.
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SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.5.2	<p><i>Management strategy</i></p> <p>There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.</p>	<p>There are <u>measures</u> in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem.</p> <p>The measures are considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p>	<p>There is a <u>partial strategy</u> in place, if necessary, that takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>The partial strategy is considered likely to work, based on <u>plausible argument</u> (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</p> <p>There is <u>some evidence</u> that the measures comprising the partial strategy are being implemented successfully.</p> <p>There is a <u>strategy</u> that consists of a <u>plan</u>, containing measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem.</p> <p>This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.</p> <p>The measures are considered likely to work based on <u>prior experience</u>, plausible argument or <u>information</u> directly from the fishery/ecosystems involved.</p> <p>There is <u>evidence</u> that the measures are being implemented successfully.</p>

Scoring Comments
<p>A strategy for ecosystem management is set out by the EC Treaty and its daughter legislation, notably the CFP, Habitats Directive, and Marine Strategy Framework Directive. The EC is implementing through these Directives and revisions of the CFP to deliver the strategy and to provide an integrated approach to marine ecosystem management. The Commission's actions include measures to reduce overall fishing pressure; protect sensitive habitats and species; and to ensure that natural ecosystem processes are not disrupted. When fully implemented, these will form a full strategy for managing the fishery.</p>
<p>There is good evidence that the measures currently in force are being implemented successfully and that they are working. This evidence is provided by the recovery of the hake stock, evidence of implementation of the cetacean bycatch regulations, and compliance by the client fleet with TAC and quota regulations (see Table 4).</p>
<p>Score: 90</p>
<p>The management regime for the fishery meets all of the SG60 and SG80 requirements, and the third and fourth parts of the SG100 requirement.</p>
Audit Trace References
<p>EC, 2008. Interviews I8 &amp; I13.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
2.5.3	<p><i>Information / monitoring</i> There is adequate knowledge of the impacts of the fishery on the ecosystem.</p>	<p>Information is adequate to <u>identify</u> the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity).</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>have not been investigated in detail</u>.</p>	<p>Information is adequate to <u>broadly understand</u> the key elements of the ecosystem.</p> <p>Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but <u>may not have been investigated in detail</u>.</p> <p>The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are <u>known</u>.</p> <p>Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.</p> <p>Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</p>

**Scoring Comments**

The key elements of the Celtic Sea ecosystem are understood, and the main effects of the fishery (depletion of target species; effect on non-target species; and effects on ETP species) have been investigated; other effects (on habitats and ecosystems) can be inferred from existing information. The main consequences of these impacts are likely to be a reduction in trophic level due to hake stock depletion (but this is not happening); reductions in non-target species abundance; and fishing mortality of cetaceans. Habitats are unlikely to be affected.

<sup>8</sup> See note 6 *supra*

<b>SCORING CRITERIA</b>	<b>SCORING GUIDEPOST 60</b>	<b>SCORING GUIDEPOST 80</b>	<b>SCORING GUIDEPOST 100</b>
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Although the main components of the ecosystem have been identified, and their functions are known, there has been no multispecies modelling of the Celtic Sea ecosystem, so the functions of these different components of the ecosystem have not been quantified, and are thus not understood. For some impacts (notably discarding of spurdog), data collection has limitations that prevent an increase in risk level being detected.

**Score: 75**

The fishery meets all of the SG60 requirements, and meets the first, second, third and fourth of the SG80 requirements. A condition has been generated in response to these findings.

**Audit Trace References**

Section 6 of this report.

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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### 15.3 Principle Three

Principle 3	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable
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3.1	Governance and Policy
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3.1.1	<p>Legal and/or customary framework</p> <p>The management system exists within an appropriate and effective legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> <li>- Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2;</li> <li>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>- Incorporates an appropriate dispute resolution framework.</li> </ul>	<p>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.</p> <p>The management system incorporates or is subject by law to a <u>mechanism</u> for the resolution of legal disputes arising within the system.</p> <p>Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.</p> <p>The management system has a mechanism to <u>generally respect</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p><del>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.<sup>9</sup></del></p> <p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes which is <u>considered to be effective</u> in dealing with most issues and that is appropriate to the context of the fishery.</p> <p>The management system or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges.</p> <p>The management system has a mechanism to <u>observe</u> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>	<p><del>The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.<sup>10</sup></del></p> <p>The management system incorporates or is subject by law to a <u>transparent mechanism</u> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <u>tested and proven to be effective</u>.</p> <p>The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.</p> <p>The management system has a mechanism to <u>formally commit</u> to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.</p>
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<sup>9</sup> See note 6 *supra*

<sup>10</sup> See note 6 *supra*

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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<b>Scoring Comments</b>
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Management of the fishery is conducted under the EC CFP and national legislation. This is all consistent with laws aimed at achieving the MSC Principles 1 and 2 (see section 7.2.1 of this report). The EC CFP states that: *“Access to a fishery should be based on transparent and objective criteria including those of an environmental, social and economic nature. Member States should promote responsible fishing by providing incentives to those operators who fish in the least environmentally damaging way and who provide the greatest benefits for society.”* (33<sup>rd</sup> Recital)

Within the UK and Europe there are well established and transparent mechanisms in place for resolving legal disputes. Transgressions of fisheries regulations are heard in Courts with an independent judiciary that operate according to principles of natural justice to enforce the requirements of both fisheries and environmental legislation. Although there is no evidence of any legal disputes resulting from infringements of fisheries regulations by the unit of certification under assessment, there is good evidence available of the action of the Courts and authorities within the UK and Europe to address transgressions which demonstrates that the system has been tested and proven to be effective.

The management system for the fishery provides opportunities for the industry and managers to collaborate, through POs, the North Western Waters RAC, and ACFA in a proactive manner to avoid disputes arising.

The management system contains formal commitments to the legal rights of people dependent on fishing for food and livelihood. The EC CFP states that: *“In view of the precarious economic state of the fishing industry and the dependence of certain coastal communities on fishing, it is necessary to ensure relative stability of fishing activities by the allocation of fishing opportunities among the Member States, based upon a predictable share of the stocks for each Member State.”* (35<sup>th</sup> Recital).

Score: 100
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The legal and customary framework for the fishery meets all of the SG80 requirements and the first three of the SG100 requirements.

<b>Audit Trace References</b>
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Section 7.2; Council Regulation 1005/2008; Council Regulation 1380/2013; FAO, 1995; European Council, 2009

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
<p>3.1.2 Consultation, roles and responsibilities The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties.</p>	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>generally understood</u>.</p> <p>The management system includes consultation processes that <u>obtain relevant information</u> from the main affected parties, including local knowledge, to inform the management system.</p>	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood for key areas</u> of responsibility and interaction.</p> <p>The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.</p> <p>The consultation process <u>provides opportunity</u> for all interested and affected parties to be involved.</p>	<p>Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <u>explicitly defined and well understood for all areas</u> of responsibility and interaction.</p> <p>The management system includes consultation processes that <u>regularly seek and accept</u> relevant information, including local knowledge. The management system demonstrates consideration of the information and <u>explains how it is used or not used</u>.</p> <p>The consultation process <u>provides opportunity and encouragement</u> for all interested and affected parties to be involved, and <u>facilitates</u> their effective engagement.</p>

Scoring Comments
<p>The management system for this fishery involves scientists, stakeholders and fisheries managers in a process that explicitly defines and explains the respective roles of all parties in all areas of responsibility. Scientific advice from ICES forms the core of the management system, and local knowledge is sought through the involvement of the North Western Waters RAC and ACFA in the management process. The management procedure is described in some detail in section 7.2.2 of this report.</p>
<p>The outcome of meetings of the EC Council of Ministers clearly demonstrates that all of this information is taken into account. Explanations are provided for how information is used. The annual consultation process for TACs at the EC level, and stakeholder engagement in the North Western Waters RAC, and the decadal consultation on the review of the CFP, provide opportunities for stakeholders to engage directly in the management process, and this involvement was facilitated at the EC and national level. The annual consultation on fishing opportunities demonstrates the EC's commitment to this and how it is seeking to make fish stock management more transparent and consistent.</p>
<p>Score: 100</p>
<p>The management system in place meets all of the requirements of SG100.</p>
<p>Audit Trace References</p>
<p>Section 7.2.2; Council Regulation 1380/2013; EC Regulation 43/2009; EC COM(2013) 319 Final</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
3.1.3	<p>Long term objectives The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach.</p>	<p>Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>implicit</u> within management policy.</p>	<p><u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within management policy.</p> <p><u>Clear</u> long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are <u>explicit</u> within <u>and required by</u> management policy.</p>

Scoring Comments
<p>Clear long-term objectives for this fishery are set out in the 2004 Hake recovery plan. These objective set out explicit criteria for determining the TAC for the stock that were based upon the best available information at that time. These objectives guide and are required by the management policy for the fishery.</p>
<p>The EC CFP is consistent with MSC Principles, and its daughter Regulations deliver conservation measures that incorporate the precautionary approach in respect of MSC Principles 1 &amp; 2 (such as setting sustainable TACs for stocks, and prohibiting fishing for species that are endangered, such as the spurdog). The latest CFP review was completed in late 2013 with the agreement of a new CFP Regulation to modernise the management of European Fisheries that makes further commitments to ecosystem management. The new Regulation came into force on 1<sup>st</sup> January 2014.</p>
<p>In summary, the management policy at all levels is explicitly consistent with MSC Principles and the precautionary approach. These long-term objectives have shaped management policy for this fishery.</p>
<p>Score: 100</p>
<p>The fishery meets the SG100 requirements.</p>
<p>Audit Trace References</p>
<p>Section 7.2.3; European Commission (2009c); EC Regulation1380/2013; EC Regulation 811/2004</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
3.1.4	<p>Incentives for sustainable fishing</p> <p>The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.</p>	<p>The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.</p>	<p>The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that negative incentives do not arise.</p>
<p>The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and <u>explicitly considers</u> incentives in a <u>regular review</u> of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.</p>			

Scoring Comments
<p>Economic and social incentives are provided by the management regime through the allocation of catch quotas at a level compatible with sustainable fishery management. This regime is supported by a legal regime that provides an additional incentive to comply with management measures, through the penalties that can be imposed for non-compliance with the CFP. Administrative, technical and quota-related offences can all result in legal action, prosecution and fines. These measures all contribute to sustainable fishing and ecosystem management, and are regularly reviewed as part of the ongoing process of fisheries management established by the CFP.</p>
<p>The EC and Member States provide funding to the fishing industry. Until 2007 this was provided via the Financial Instrument for Fisheries Guidance (FIFG), which was superseded by the European Fisheries Fund (EFF). Concerns were raised by some NGOs that FIFG represented a subsidy to the industry. However the actual aims of FIFG were to “<i>achieve a balance between fisheries resources and their exploitation</i>”. The purpose of the EFF is to both support the industry as it adapts its fleet to make it more competitive and promote measures to protect and enhance the environment. One of the main objectives of the EFF is to “<i>promoting environmentally-friendly fishing and production methods</i>”. It is clear, therefore, that the objectives of both FIFG and EFF are consistent with MSC Principles, and that there are no subsidies that would encourage unsustainable fishing or generate negative incentives</p>
<p>Taken together these measures create incentives for sustainable fishing that are consistent with MSC Principles 1 and 2. There is regular review of management but this does not explicitly consider incentives.</p>
<p>Score: 80</p>
<p>The management system for this fishery meets all of the SG80 requirements. SG100 is not met because there is no evidence of a regular review of management policy that explicitly considers incentives.</p>
<p>Audit Trace References</p>
<p>Section 7.2.4; IEEP, 2002;</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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3.2	Fishery- specific management system		
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3.2.1	<p>Fishery- specific objectives</p> <p>The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</p>	<p>Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>implicit</u> within the fishery's management system.</p>	<p><u>Short and long term objectives</u>, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery's management system.</p>	<p><u>Well defined and measurable short and long term objectives</u>, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <u>explicit</u> within the fishery's management system.</p>
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<b>Scoring Comments</b>
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Well defined and measurable short and long-term objectives are established within the recovery plan for the hake fishery, which demonstrably meet the outcomes expressed by MSC Principle 1 (reference points, harvest strategy and harvest control rule). These long-term objectives are delivered in the short term through the setting of the annual TAC in line with ICES advice.

Short and long term objectives, which are consistent with achieving the outcomes expressed by MSC's Principle 1, are explicit within the fishery's management system, both at the strategic level of the CFP and more specifically for this fishery in the hake recovery plan and the management system (ICES uses the MSY approach to advise on F and annual TACs). The management system includes long-term objectives for exploiting the stock at MSY, under sustainable economic, environmental and social conditions.

In addition the CFP explicitly states that there should be a progressive implementation of an ecosystem-based approach to fisheries management. Long term objectives in terms of stock management, which are explicit in the ICES advice, are expressed in terms of target fishing mortality to achieve a stock status able to support MSY. The shorter term objectives to achieve these are in the form of setting TACs in line with the fishing mortality identified in the management plan, and supporting tools such as minimum landing sizes and mesh size regulations.

A management plan for Hake has been proposed which has two objectives, both relating to the Hake stock, rather than wider eco-system issues. However, it has not yet been agreed or implemented. Whilst the objectives referred to above for target stock management are well defined and measurable, the objectives relating to P2 (e.g. minimising environmental impact, adoption of an ecosystem based approach) are not well defined or measurable. Given that there is no management plan in place, and the lack of well-defined P2 Objectives in the fisheries management system, relying instead on objectives set out in other legislation, for example, Natura 2000, an overall score of 80 is awarded.

Score: 80
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Fishery specific objectives are explicitly defined for the target species, non-target species and ETP species. The fishery therefore meets all of the SG80 requirements for both Principle 1 and Principle 2. The SG100 requirements are not considered to be met for both Principles

<b>Audit Trace References</b>
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Section 7.3.1; European Commission (2009c); EC Regulation 1380/2013; EC Regulation 43/2009
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SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100	
3.2.2	<p>Decision-making processes The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.</p>	<p>There are <u>informal</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to <u>serious issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take <u>some</u> account of the wider implications of decisions.</p>	<p>There are <u>established</u> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.</p> <p>Decision-making processes respond to <u>serious and other important issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p>Decision-making processes use the precautionary approach and are based on best available information.</p> <p><u>Explanations</u> are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>	<p><del>There are <u>established</u> decision making processes that result in measures and strategies to achieve the fishery specific objectives.</del><sup>11</sup></p> <p>Decision-making processes respond to <u>all issues</u> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.</p> <p><del>Decision making processes use the precautionary approach and are based on best available information.</del><sup>12</sup></p> <p><u>Formal reporting</u> to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.</p>

Scoring Comments
<p>The management system is based upon well established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Decisions are based upon the best available information and incorporate a precautionary approach, and take account of all important issues.</p> <p>ICES and the EC Council of Ministers provide formal reports describing how the findings of relevant research have been taken into account, and the management response to these findings. The decision-making process responds to all issues, provides numerous opportunities for stakeholder engagement, and has a track record of delivering timely and adaptive management.</p> <p>The EC recovery plan for Northern hake provides a well established process for determining long-term objectives which address serious and other significant issues.</p>

<sup>11</sup> See note 6 *supra*

<sup>12</sup> See note 6 *supra*

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Score: 90
The performance of the decision-making processes within ICES, and the EC meets all of the SG60 and SG80 requirements; the fourth SG100 requirement is met; the second of the SG100 requirements is not explicitly met by the decision-making processes for this specific fishery..
Audit Trace References
Section 7.3.2; EC Regulation 1830/2013; European Council, 2009

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
3.2.3	<p>Compliance and enforcement</p> <p>Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.</p>	<p>Monitoring, control and surveillance <u>mechanisms</u> exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.</p> <p>Sanctions to deal with non-compliance exist and there is some evidence that they are applied.</p> <p>Fishers are <u>generally thought</u> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.</p>	<p>A monitoring, control and surveillance <u>system</u> has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, <u>are consistently applied</u> and thought to provide effective deterrence.</p> <p><u>Some evidence exists</u> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p> <p>There is no evidence of systematic non-compliance.</p>
			<p>A <u>comprehensive</u> monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.</p> <p>Sanctions to deal with non-compliance exist, are consistently applied and <u>demonstrably</u> provide effective deterrence.</p> <p>There is a <u>high degree of confidence</u> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</p> <p><del>There is no evidence of systematic non-compliance.</del><sup>13</sup></p>

Scoring Comments
<p>There is a high degree of enforcement and control and in this fishery, which has increased recently in response to identification of substantial under-reporting, which recent changes and improvements in overall monitoring, control and surveillance have been designed to address. Enforcement includes use of satellite VMS, patrol vessels and aerial surveillance, checked against landings data and paper trails (such as the new catch certificates required by IUU regulations). All landings are weighed at designated points of landing.</p> <p>Agreements have been reached by the EC to address concerns about IUU fishing. Enforcement, management and compliance information is now being shared between organisations to create a comprehensive monitoring, control and surveillance system.</p> <p>Non-compliance is dealt with by the relevant national authorities through their criminal justice systems, using agreed and tested procedures.</p> <p>The assessment team interviewed the Marine Management Organisation (MMO), which is responsible for inspecting landings by the CFPO vessels in the UK. Compliance by</p>

<sup>13</sup> See note 6 *supra*

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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this fleet with the relevant regulations is reported to be excellent.

The client fleet have provided information on quota uptake by their vessels which demonstrates compliance with quota regulations at the national level (see Table 4).

Score: 90

The fishery meets all of the SG80 requirements and the first and third of the SG100 requirements.

Audit Trace References

Section 7.3.3; EC, 2009a, b; ICES advice 2010; I8, I10, I13

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
3.2.4	<p>Research plan The fishery has a research plan that addresses the information needs of management.</p>	<p><u>Research</u> is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research results are <u>available</u> to interested parties.</p>	<p>A <u>research plan</u> provides the management system with a strategic approach to research and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion.</p> <p>A <u>comprehensive research plan</u> provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and <u>reliable and timely information</u> sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.</p> <p>Research <u>plan</u> and results are <u>disseminated</u> to all interested parties in a <u>timely</u> fashion and are <u>widely and publicly available</u>.</p>

Scoring Comments
<p>Research on the hake fishery is carried out at a national and international level. ICES strategically establishes study groups based on information requirements identified by national delegates, including through industrial representations. Members of ICES working and study groups focus on elements such as species biology and stock assessment, climate change, plankton, multi-species fisheries (ecosystem), etc, review research, identify research requirements and undertake appropriate work in relation to specific requirements identified by the Stock Assessment Working Group or STECF. The key ICES working study groups that have a particular bearing on the fishery under assessment include (but are not limited to): WGWDMS - Working Group on Widely Distributed and Migratory Stocks and WGRED - Working Group for Regional Ecosystem Description. Research is also conducted by national laboratories and universities (often through EC-funded programmes), to supplement scientific understanding relevant to the fishery and the related ecosystem. In England, Cefas plays a key role in fisheries research, contributing significant resources and expertise and is the formal representative of England and Wales on ICES working groups.</p> <p>A research plan has been developed since the late 1990s targeted at the requirements of the fishery, specifically in relation to the depleted state of the Northern hake stock, evaluation and design of management measures required for recovery, and stock assessment, and is resourced to provide relevant and timely information. ICES has also carried out a benchmarking review of assessment methodologies used in the fishery. Other areas of research applied to the hake fishery include the development of cetacean acoustic deterrents (pingers) and discard/bycatch studies. The research carried out provides coherent and strategic advice for the fishery that responds to needs that are identified through the system of internal and external review in the management system. The results provide adequate information to guide the management of the fishery, and priorities for future research are identified for future action.</p> <p>It is EU policy that all research data are made publicly available and disseminated widely. The annual reports of ICES working groups and study groups are publically available on the ICES website. In addition, they are disseminated to interested parties in a timely fashion – in particular to decision-makers and stakeholders in time for annual fishery allocation negotiations. Fishing industry representatives are also able to discuss the reports with scientists, as well as provide input prior to their publication. However, this stops short of being widely and publically available, as the results are not presented in an accessible form (easy to find), to enable all interested parties (including public / consumers) to quickly interpret the findings – without significant prior knowledge or expertise. It can be concluded that there is a strategic approach that delivers reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2. The SG60 and SG80 scoring issues are met, but not the second SG100 scoring issue.</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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It cannot be said that there is a “comprehensive” research plan that provides the management system with a coherent and strategic approach to research across P1, P2 and P3, though a large number of national projects are looking at issues across all 3 principles. Furthermore, input by the catching sector to assist with development of this plan does not appear to be “proactive”. The first SG100 scoring issue is not met

**Score: 80**

A score of 80 is provided since the SG60 and SG80 scoring issues are met, but none of the SG100 scoring issues are met.

**Audit Trace References**

Section 7.3.4; Searchable hub for all ICES expert groups: <http://www.ices.dk/workinggroups/WorkingGroups.aspx>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
<p>3.2.5 Monitoring and management performance evaluation</p> <p>There is a system for monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>	<p>The fishery has in place mechanisms to evaluate <u>some</u> parts of the management system and is subject to <u>occasional internal</u> review.</p>	<p>The fishery has in place mechanisms to evaluate <u>key</u> parts of the management system and is subject to <u>regular internal</u> and <u>occasional external</u> review.</p>	<p>The fishery has in place mechanisms to evaluate <u>all</u> parts of the management system and is subject to <u>regular internal</u> and <u>external</u> review.</p>

Scoring Comments
<p>The management regime for this fishery incorporates measures that allow for review of the EC CFP, and also some specific measures that require review of the hake recovery plan regularly, at least once every three years.</p> <p>ICES held a “benchmarking” workshop to review the assessment of this stock in 2010. This workshop concluded that the age-based approach that had been used should be replaced by a length-based model. The EC took the opportunity of this workshop to provide external review of its latest management proposals for the hake stock, which was published as special advice from ICES in June 2010. The advice concluded that the EC proposals were inappropriate and should be revised.</p> <p>Within the CFP, regular internal review of the management system occurs at every level. At the EC level, policy documents are reviewed internally and by Member States. The resulting policies, operational plans and practices are then subject to wide consultation before implementation, and regular evaluation. These systems also include formal consultation and review processes involving all EC Member State fisheries administrations, and committees such as ACOM, STECF, ACFA dealing with industry concerns at a European level) and, in this case, the North Western Waters RAC to deal with specific technical and management issues and provide an opportunity for external review by stakeholders.</p> <p>The CFP is also subject to a comprehensive decadal review, which provides opportunities for both internal and external participation. The “2012” review of the CFP was completed in late 2013 with the agreement of a new CFP Regulation to modernise the management of European Fisheries. The new Regulation came into force on 1<sup>st</sup> January 2014.</p> <p>There is also an on-going and extensive review of stock assessment and data gathering methodologies at ICES level and at the level of the contributing research institutes. Within ICES, a methods working group keeps methods for fish stock assessment under regular review, and this has recently resulted in changes to the assessment approach for</p>

SCORING CRITERIA	SCORING GUIDEPOST 60	SCORING GUIDEPOST 80	SCORING GUIDEPOST 100
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Northern hake that have improved confidence in the results. In addition, other study and working groups exist to review stock surveys, the precautionary approach, discards, biological sampling, reference points, and recruitment variability.

Score: 80

The fishery meets all of the SG80 requirements.

Audit Trace References

Section 7.3.5; European Commission 2009(c); ICES (2010); WKREF; WKFRAME; EC Regulation 1380/2013.

## 16 APPENDIX B: PEER REVIEW REPORTS

### 16.1 Peer Reviewer Biographies

#### **Dr Don Bowen**

Don is a Research Scientist with the Canadian Department of Fisheries and Oceans based at the Bedford Institute of Oceanography, Nova Scotia and is Leader of the Groundfish and Seals Unit in the Population Ecology Division. His current research is on the population dynamics, foraging ecology, and ecological energetics of pinnipeds with the dual objectives of understanding the diversity of pinniped life histories and the nature of competitive interactions between seals and commercial fisheries. Previously he was Division Chief with the Marine Fish Division, Bedford Institute of Oceanography, responsible for scientific programs associated with the provision of biological advice on commercial fish and marine mammal populations on the Scotian Shelf. He is currently chair of Canada's National Marine Mammal Peer Review Committee and the Special Committee on Seals, United Kingdom, and a member of the Science Advisory Panel of the North Pacific Research Board, Anchorage, Alaska. In addition, he has conducted MSC Principle 2 assessments for a number of groundfish species in the Bering Sea and Gulf of Alaska, including pollock and Pacific cod.

#### **Dr Graham Pilling**

Graham is currently a fisheries scientist at the Secretariat of the Pacific Community, and up to 2010 was a fisheries biologist & advisor and the Head of the Seas and Oceans Group with the Centre for Environment, Fisheries and Aquaculture Science, in Lowestoft, UK. With over sixteen years' experience working in tropical, temperate and polar marine and freshwater ecosystems and fisheries, he has reviewed a considerable number of stock assessments around the world, chaired EU STECF (SGMED) and FAO (GFCM and data poor fisheries) meetings, developed fisheries management plans for Lake Paliastomi, Republic of Georgia, as well as designed and developed models to simulate the long-term impacts of uncertainty in stock biology and assessments on fisheries management, and methods to assess and manage data poor fisheries. In addition, he has acted as a member of the MSC Assessment teams for a large number of fisheries around the world, focusing on Principle 2. He currently provides scientific advice to underpin the decisions of regional and sub-regional tuna management bodies in the South Pacific.

## 16.2 Peer Reviewer A: Comments

### Overall Opinion

<b><i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i></b>	<b>Partial</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<p><u>Justification:</u> The team has come to appropriate conclusions based on the evidence provided, although I have questions on some of the scoring or requests for further clarification in some cases (see comments on individual PIs below).</p>		<p>We have responded to the comments and questions raised by the peer reviewer.</p>		

<b><i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i></b>	<b>Yes/No</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<p><u>Justification:</u> The conditions raised are appropriately written to achieve the SG80 level within the specified timeframe. However, there are some areas of clarification requested:</p> <p>Condition 1: new information is available within the 2014 ICES advice for Hake in Division IIIa, Subareas IV, VI, and VII, and Divisions VIIIa,b,d (Northern stock) from June 2014, providing advice for 2015 based on a benchmarked assessment. <math>F_{MSY}</math>, <math>MSY</math>, <math>B_{trigger}</math>, <math>B_{pa}</math>, and <math>B_{lim}</math> reference points have been recalculated based on that assessment output and the guidelines of WKMSYREF2 (ICES, 2014). Updated estimates of <math>F_{MSY}</math> (now 0.27) and estimates of <math>MSY</math> (<math>B_{trigger}/B_{pa}</math> 46,200 t) and <math>B_{lim}</math> are provided. This may address some of the elements of Condition 1.</p> <p>Condition 5: there is some confusion arising from the report text on whether the use of pingers is anticipated for <u>all</u> vessels within the UoC or just those vessels larger than 12m (most, but not all, of the UoC – see text below). If the latter, I suggest that the condition be expanded so that ALL vessels within the UoC are required to use pingers (given that the two vessels &lt; 12m are within 14cm of that size).</p> <p>Condition 6: while addressing the element of detecting increases in risk at SG80, the condition as written does not appear to meet the shortfall in meeting the third element of SG80, that <i>'the main functions of the Components... are known'</i>? Some adjustment of the text is required to ensure that will be achieved.</p>		<p>Comment noted and background text and scoring comments amended appropriately. This review has increased the scoring of this PI above 80, and the condition has therefore been removed from the assessment.</p> <p>Comment noted. All of the vessels in the UoC, including those smaller than 12m LOA, use pingers. If any vessels ceased to use pingers, the findings of this assessment would require a review that could result in the outcome considered.</p> <p>We have corrected the error in our scoring. The third SG80 requirement is met: it was the third SG100 requirement that is not met.</p>		

If included:

<b><i>Do you think the client action plan is sufficient to close the conditions raised?</i></b>	<b>Yes/No</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<p><u>Justification:</u> The client action plan appropriately details actions that will support meeting the conditions, and evidence is provided that other bodies, including Cefas, are ready to work towards the same. One minor addition is suggested:</p>		<p>Comment noted. No action required.</p>		

<ul style="list-style-type: none"> <li>- For Condition 3, the Client should not only implement a discard monitoring programme (last bullet) but also any required management measures within a partial strategy to ensure the fishery does not pose a risk of serious or irreversible harm.</li> </ul>	<p>Good point. This change has been made.</p>
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### **General Comments on the Assessment Report (optional)**

This assessment has been appropriately harmonised with comparable assessments. This may affect some of the responses to comments made within this review.

Further information for the Unit of Certification is warranted, in particular:

- clear confirmation of the mesh size used. The text suggests that 120mm mesh size or greater is used, but this is first mentioned in Section 7.3.1. The hake plan indicates a minimum of 100mm should be used.
- provides the first statement that the 120mm mesh size or greater is used by the fleet under assessment (this becomes critical as 120mm mesh is assumed when discussing some PIs, while);
- clear indication of the region in which the UoC fishes (currently the region is only indicated vaguely when discussing closed areas, but the hake box is used as an example of relevance to the management system. Does the UoC fish in that area?);
- indication of the depth fished (relevant for the retained species discussion, in particular for monkfish where comments on the depth fished are made, e.g. section 6.3.1.4); and
- the catch relative to the TAC allotted by the Producer Organisation (particularly since the overall TAC has been routinely exceeded, but there is no indication whether the UoC has contributed to that over-catch; e.g. Table 3).

**IFC Comment:** All of these suggestions have been addressed by amendments to the text.

Noting the LOA of the vessels within the UoC, there is a need to clarify whether specific statements relating to certain scoring elements cover the whole of the UoC or only those where their size is greater than stated limits, and hence the implications for the scores. For example, e-logbooks are only required for vessels >15m, VMS also only required for vessels >15m, observer monitoring on vessels of 15m or more, and use of acoustic pingers (for vessels >12m as noted in section 6.4.3.1, although section 6.4.3.6 suggests that ‘all vessels have been expected to comply with the requirements by July 2014’. This should be clarified). This is raised under specific PIs/conditions below.

**IFC Comment:** we have clarified these issues in the report.

During discussions of the hake management plan – which does not appear to have yet been updated – please confirm whether the age range over which F has been averaged. The latest advice appears to average F over lengths 15-80cm, consistent with the length-based assessment approach.

**IFC Comment:** The text has been amended to clarify this

The client landings data (section 6.3.1.1) presents the results from three of the six vessels

for which information was available (based upon consistency in hake-targeting). This suggests that information may be available from less than 50% of the UoC? In turn, the FSP project information was from one of the UoC. I note that species within one of these lists may not be present on the other (e.g. ling being retained within the FSP study, but not within Table 5), and vice versa, suggesting that information gaps may occur. Please clarify whether information was available from all vessels within the UoC? This has relevance for P2 scoring.

**IFC Comment:** The text has been amended to clarify both the source of this information and how it has been used to identify main and minor retained species

Note that in the text of 6.3.1.2 and also in the scoring table, haddock is classed as an 'insignificant minor retained species' although it is correctly classed as a main species in section 6.3.1.6.

**IFC Comment:** we have corrected these errors of terminology in the report.

Section 6.3.1.3 – for pollack, there is little information available on the regulations and fishing practices adopted to form a partial strategy of effective measures to ensure the fishery does not hinder recovery and rebuilding (quoting the scoring justification within the scoring table for PI 2.1.1) More information needs to be provided here – has ICES examined the effectiveness of the previous 4000t TAC? What is the basis for the precautionary TAC of 13,495t in subarea VII? Are survey information available to support the opinion given?

**IFC Comment:** We have clarified these points in the report.

Saithe – as noted, there is no ICES advice for saithe stocks in the Celtic Sea region. I do not think that including the advice for the North Sea stock is relevant in Section 6.3.1.7 or 2.1.1. Is information available from surveys within the UoC region that might provide an indication of biomass trends? Currently the text needs to be expanded to show that the saithe stock is highly likely to be within biologically based limits, even as a minor retained species, given this is used to justify the score given, or the score adjusted.

**IFC Comment:** The text has been clarified to address this issue.

From Section 6.3.2 onwards – there are sporadically missing Figure numbers in the report.

**IFC Comment:** Thanks, we think we have found them all and corrected this.

Section 6.3.2.2 – can more quantitative information be provided on the abundance of lesser spotted dogfish, and its discard survival rate?

**IFC Comment:** there is no quantitative information on lesser spotted dogfish abundance; two references to survival have been provided.

Section 6.3.2.6 – the paragraph appears to end abruptly.

**IFC Comment:** we have corrected the text in response to this comment.

Section 6.4.3.1 – can a reference be provided to support the sentence 'No seals are thought to be caught in hake gill nets'?

**IFC Comment:** the text has been amended and a reference has been added.

Section 7.2.2.1 – the ICES benchmarking process could be mentioned here.

**IFC Comment:** the text has been amended and a reference has been added

Section 7.3.5 – review of ICES assessments. I agree that ICES has external review of their assessment processes. However, can details be provided of a review of the length-based hake assessment model? A benchmarking process was scheduled for 2014?

**IFC Comment:** the text has been amended and a reference has been added.

**Performance Indicator Review**

*Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.*

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	No	Yes	N/A	Based on the information used to score this PI, the conclusion reached is valid. However, as noted above, there is new advice from ICES for the stock in question released in June 2014, which contains updated reference points for the stock. This information may lead to a higher score.	The June 2014 advice has now been incorporated into the background text, and used in the scoring tables. It does lead to a higher score, thankyou.
1.1.2	No	Yes	Yes	Based on the information used to score this PI, the conclusion reached is valid. However, as noted above, there is new advice from ICES for the stock in question released in June 2014, which contains updated reference points for the stock. This information may address the concerns raised and address some of the issues raised within the Condition.	The June 2014 advice has now been incorporated into the background text, and used in the scoring tables. It leads to a higher score, and there is now no need for a condition.
1.1.3	Yes	Yes	N/A		Comment noted. No response required.
1.2.1	No	Yes	N/A	Based on the information used to score this PI, the conclusion reached is valid. However, as noted above, there is new advice from ICES for the stock in question released in	The June 2014 advice has now been incorporated into the background text, and used in the scoring tables. It does not lead to a higher score.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				June 2014, which contains updated reference points for the stock. The new estimate of FMSY is = 0.27, and hence the current target or 0.24 is marginally more precautionary. This information may lead to a higher score.	
1.2.2	Yes	Yes	Yes	I agree with the Condition raised. The latest advice does not appear to include an updated management plan and hence the Condition remains valid.	Comment noted. No response required.
1.2.3	Yes	Partial	N/A	The report and scoring text notes the uncertainty within discard data from a proportion of the fishery (although the previous paragraph is generally positive on this). I do not disagree with the score, but some comment on the potential uncertainty that results within the management system would be useful. In turn, the scoring summary notes 'there appears to have been an environmental influence on the stock distribution and productivity', but this is not indicated within the scoring comments. Please clarify.	This point has now been incorporated into the scoring comments.
1.2.4	Yes	Partial	N/A	A score of 90 is given, although only one of	In light of the 2014 benchmark, we now

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				the SG100 elements is met. Would this imply a score of 85? However, please clarify whether an external review of the assessment has been performed.	consider that two of the SG100 elements are met, and the score remains at 90
2.1.1	Yes	Partial	N/A	<p>Pollack is a main retained species, but there is no information on the status of the stock, nor potential analysis of trends within for example available survey data within the region. The logic used is that there are regulations in force and fishing practices adopted provide a partial strategy that ensure this fishery does not hinder recovery and rebuilding. This may be true, but these are not clearly detailed in the main text, and more information/evidence is needed to support this opinion and hence the scoring, as discussed above.</p> <p>Note that haddock is included as an 'insignificant minor related species' although the catch proportion is ~5% and stated to be a major retained species elsewhere in the report.</p>	<p>Some confusion has arisen in the report, which now shows that pollack, cod and haddock are likely to be the main retained species (it is not possible to quantify this accurately given the nature of the available information) With this clarification, the logic used is consistent with the scoring guidelines at the SG80 level, and the score is therefore justified.</p> <p>ICES have combined the West of Scotland and Celtic Sea saithe stock with the North Sea and Skagerrak. We have referred to this advice because it represents the best available for saithe on the west coast of Britain and Ireland .</p>

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				Note the comment above for saithe – how relevant is the stock assessment for the North Sea region for the status of saithe in the region of the UoC? Is information on trends available from surveys within the area?	
2.1.2	Yes	Partial	N/A	<p>The limited information presented for pollack and saithe on biomass trends conflict with the statement made within the second paragraph of the scoring comments which indicates 'biomass has increased'.</p> <p>The comments on mesh size within the first paragraph are confusing. The argument would be strengthened by concentrating on the mesh size within the UoC which is previously stated to be 120mm or greater.</p> <p>Within the third paragraph, an expansion of the basis for having 'high confidence' of the strategy working would help justify the score given.</p>	<p>We have revised the text to correct this.</p> <p>We have revised the text to address this confusion.</p> <p>We have revised the text to address this.</p>
2.1.3	Yes	Partial	N/A	As noted above, the information presented within the report on retained and bycatch species appears to come from a subset of	Information on catches is gathered from all vessels as part of the statutory requirements; landings of all species are also recorded

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				the UoC. Please confirm that information is available from at least the majority of the UoC, that allows SG100 elements 1 and 4 to be met for species beyond just the main species (i.e. ALL retained species)?	<p>from all vessels on all fishing trips, and this information is used (by ICES) to assess ongoing mortalities of all of the retained non-target species (from all fisheries, not just the UoC). The scoring comments now make this clear.</p> <p>These records are distinct from those obtained by at-sea monitoring of vessels operating in the UoC (presented in section 6.3.1 of the report.</p>
2.2.1	Yes	Yes	Yes	I agree with the Condition raised.	Comment noted. No action required.
2.2.2	Partial	Partial	N/A	Is there further information on the objective basis for the confidence that the partial strategy for spurdog management, which appears primarily operational (noting that in 2.2.1 the difficulties in developing a mitigation strategy are noted) to clarify that the UoC should not hinder recovery? For example, trends in survey data (which may be uncertain if the species is encountered	We have added some additional information from recent ICES advice in response to this comment.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				sporadically), etc? In turn, I believe projections from the ICES 2011 assessment suggest that restricted spurdog landings (e.g. 1000 t) should still allow some population growth (quoted in <a href="http://www.cefas.defra.gov.uk/media/577769/mf047_fsp_report_2012_final_vb.pdf">http://www.cefas.defra.gov.uk/media/577769/mf047_fsp_report_2012_final_vb.pdf</a> )? This information, if correct and still relevant, would further support the scoring given.	
2.2.3	Yes	Yes	Yes	I agree with the Condition raised.	
2.3.1	Yes	Yes	N/A	I assume the numbers presented are average captures? It would be useful to present the confidence intervals around those estimates, e.g. using Table 8?, to demonstrate that the upper levels are still below those recommended by ASCOBANS for example.	The figures are estimates taken from sources cited in this text and in the main part of the report. We have modified the text to indicate that the upper values are the "worst case scenarios",
2.3.2	Yes	Yes	Yes	I agree with the Condition developed. As noted above, please clarify that this includes ALL the vessels within the UoC, not just those vessels >12m.	Comment noted. We have added the clarification about the condition applying to all vessels in the UoC , irrespective of vessel length.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	Yes	N/A		Comment noted. No action required.
2.4.1	Yes	Partial	N/A	Please provide more information on those elements that justify the score of 90 rather than 80, in particular clarify those elements that provide the evidence that 'the fishery is highly unlikely to reduce habitat structure'. Is this the comparison of fishing areas and designated sensitive marine habitats, noting that not all sensitive habitats may have been designated?	We have modified the scoring rationale to address this issue and justify the score awarded.
2.4.2	Yes	Yes	N/A		Comment noted. No action required.
2.4.3	Yes	Yes	N/A	Please clarify whether VMS information is available from all vessels within the UoC (not just those >15m), and if not, confirm that the other information available supports the score given (e.g. logsheets, fishing records, etc).	We have clarified the types of information available for different size classes of vessel.
2.5.1	Yes	Partial	N/A	From the MSC Certification Requirements v1.3, 27.10.7, it's not clear whether	We have reviewed the scoring of this PI and

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				ecosystem PIs can be scored wrt their elements. Based on the information given, I would suggest a score of 80 is warranted. If partial scoring is permitted, please clarify which aspects lead to the score of 90 given.	agree that the score should be reduced to 80.
2.5.2	Yes	Partial	N/A	The compliance with the TAC is noted as part of the scoring comments. From Table 3 of the report, the TAC has been exceeded in the last four of the five years in the fishery as a whole. A request for information on this for the UoC was made above, and that may provide support for the current sentence on TAC compliance.	We have added this information to the report in response to the comment.
2.5.3	Yes	Yes	No	I agree with the Condition raised, but as noted above it does not currently address the shortfall in meeting the third element of SG80, that <i>'the main functions of the Components... are known'</i> ?	We have revised the scoring comments to address this issue.
3.1.1	Yes	Partial	N/A	Given there are three elements to the SG100 score, and the first element of SG60/80/100 is met, a score of 100 is warranted?	Good point. We have corrected this error.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				However, to justify that score, further information on how the system has been <i>'tested and proven to be effective'</i> to meet the second element of SG100 would be helpful.	
3.1.2	Yes	Yes	N/A		Comment noted. No action required.
3.1.3	Yes	Yes	N/A		Comment noted. No action required.
3.1.4	Yes	Yes	N/A		Comment noted. No action required.
3.2.1	Yes	Yes	N/A	I agree with the score, noting that the hake management plan needs updating in the light of the recent analyses, but that the current F-level noted in that plan (0.25) is marginally more precautionary than the recent estimate of $F_{MSY}$ (0.27).	The June 2014 advice has now been incorporated into the background text, and in the scoring tables. Since this PI deals with fishery specific objectives, we think that the actual value of FMSY is much less relevant than the fact that it is being used in management.
3.2.2	Yes	Partial	N/A	While the second element of SG100 is not considered met, the scoring comments suggest it might be. I agree with the score given, but further clarification of the text is needed.	We have clarified this. In doing so we have reduced the score as there are now only 2 SG100 scoring issues, and only one is met (when we originally scored the fishery there were 4 SG100 scoring issues). A score of 90

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
					is awarded.
3.2.3	Yes	Partial	N/A	<p>I note that VMS may not apply to all the vessels within the UoC, although the other enforcement approaches will.</p> <p>Please clarify how the sanctions to deal with non-compliance are 'demonstrably effective', currently the scoring comments indicates the approach, but not the evidence for the effectiveness of that approach.</p> <p>Please clarify which elements of the SG100 are not met.</p>	<p>Comment noted.</p> <p>We have clarified our scoring comments to make it clear that we did not consider that this SI had been met.</p> <p>We have clarified this to specify that the first and third SIs are met.</p>
3.2.4	Yes	Partial	N/A	<p>Please clarify whether a research plan exists (as required under SG80) rather than just research being undertaken.</p> <p>Please clarify why the second element of SG100 is not considered met – the current text suggests it could be?</p>	<p>These issues have been addressed in the scoring comments, noting harmonisation with other hake fisheries assessments.</p>
3.2.5	Yes	Partial	N/A	<p>Please clarify that the external review mentioned in the scoring comments is not considered 'regular' enough to justify an SG100 score.</p>	<p>We consider that the review of the management system (rather than the hake management plan) is not regular enough to justify the SG100 score.</p>



Intertek Fisheries Certification (IFC)

**Any Other Comments**

Comments	Conformity Assessment Body Response

### 16.3 Peer Reviewer B: Comments

#### Overall Opinion

<b><i>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</i></b>	<b>Yes/No</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
	<b>Yes</b>			
<p><i>Justification:</i> Generally I think the assessment is on target and has arrived at an appropriate conclusion with respect to certification. Although I question some of the scores, I expect many of my queries can be addressed by including more specific information to justify the score.</p>		<p>Comment noted. No action required.</p>		

<b><i>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</i></b>	<b>Yes/No</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
	<b>Yes</b>			
<p><i>Justification:</i> I think the conditions raised are appropriate and might suggest additional conditions related to 3.2.1 and 3.2.4. Additional justification of the current passing score would remove the need for conditions here.</p> <p>I would expand Condition 4 to include estimates of the nature and composition of the bycatch at the scale of the fishery as the overall bycatch is poorly estimated currently and so the main species may not be fully known. Also the bycatch program should be ongoing as the nature of the bycatch could change over time.</p>		<p>We have reviewed the scoring and conditions and consider that they are now appropriate</p> <p>The condition requires that a discard monitoring programme is established that is capable of detecting changed in the risk to main bycatch species – it is implicit the catch composition should be recorded. We have, however, made this clearer in the condition as suggested.</p>		

If included:

<b><i>Do you think the client action plan is sufficient to close the conditions raised?</i></b>	<b>Yes/No</b>	<b>Conformity Response</b>	<b>Assessment</b>	<b>Body</b>
<p><i>Justification:</i></p>				

#### **General Comments on the Assessment Report (optional)**

On the whole, the certifier has done a thorough analysis of the fishery. Although official landings in most years since 2001 have been higher than the agreed TAC and the TAC has been set higher than scientific advice, it seems that these problems are not associated with the gill-net fishery. There are some weaknesses in the stock assessment. For example, mean weights-at-age are estimated from a fixed length-weight relationship, the same maturity ogive is used for each year, and there are large uncertainties associated with estimating the most recent recruitment in the assessment, which is based on a single survey. Bycatch for this fishery is poorly estimated, but that is noted in the assessment.

**IFC Comment:** These comments are noted and have been addressed in the comments to individual



Intertek Fisheries Certification (IFC)

performance indicators below.

**Performance Indicator Review**

*Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.*

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.1	Yes	Yes	NA	The certifier concluded that the SC100 was met, but gave a score of 90 to reflect the uncertainty about target reference points for the stock expressed by ICES. Given the evidence, I would have also scored 90, but on the basis that only the first of the SG100 elements was met.	The June 2014 advice has now been incorporated into the background text, and used in the scoring tables. It leads to a score of 100, now that biomass reference points are set.
1.1.2	Yes	Yes	Yes	In light of the change in the assessment method and perception of stock status, former reference points for this stock are no long valid. I concur with the score of 75 and the condition that new reference points will need to be established for this stock.	The June 2014 advice has now been incorporated into the background text, and used in the scoring tables. Now that biomass and fishing mortality reference points are set, based on a benchmark assessment, this leads to a higher score, and there is now no need for a condition.
1.1.3	Yes	Yes	NA	I agreed that all evidence indicates that the stock is no longer depleted and therefore this PI is NA.	Comment noted. No action required.
1.2.1	Yes	Yes	NA	Despite over-runs in the TAC, the harvest strategy seems to have worked to recovery the stock aided considerably by the strong recent recruitment. I concur with the score of	Comment noted. No action required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				90.	
1.2.2	Yes	Yes	Yes	I concur that there is uncertainty about the design of the future HCR for this stock, as it moves from a recovery plan to management against MSY, and whether the HCR will ensure that the exploitation rate is reduced as limit reference points are approached. The score of 75 and condition are considered appropriate to move the score to 80.	Comment noted. No action required.
1.2.3	Yes	No	NA	A score of 80 was given for the PI. My concern here is that total discards from the stock do not appear to be well estimated. This may or may not be a problem for the assessment. Discards have not been used, but it is not clear how much uncertainty this introduces to stock status. Perhaps more detail on the discard issue might resolve this.	This point has now been incorporated into the scoring comments.
1.2.4	Yes	No	NA	The score of 90 is supported, but I would have thought that a score of 80 was more strongly indicated given that the 2013 assessment used a new method for the first time. Therefore, I'm not sure we can be	The June 2014 advice, based on a new benchmark assessment, has now been incorporated into the background text, and this shows that the 2013 assessment is robust in terms of stock status (though

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				confident that this assesemnt method has been tested for this stock and shown to be robust as the 90 would indicate.	revisions on absolute estimates biomass and fishing mortality continue to be substantial). This information is used in the scoring table, and supports a score of 90.
2.1.1	Yes	Yes	NA	A score of 85 was awarded. However, it is not clear from the text how the rather large retained catch of pollock was subject to "fishing practices that comprise a partial strategy of effective measures that ensure this fishery does not hinder recovery and rebuilding." Given that the TAC on pollock is only precautionary, a score of 80 might be more reasonable.	There was some confusion in the text, which has now been amended to clarify the basis for the score.
2.1.2	Yes	Yes	NA	A score of 90 was awarded. This seems reasonable and in fact provides some additional inforamation pertinent to the score of 80-85 in 2.1.1.	Comment noted. No action required.
2.1.3	Yes	Yes	NA	The score of 90 seems well justified	Comment noted. No action required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.1	Yes	Yes	Yes	The score of 70 is well supported given the scant data on the amount and composition of the bycatch in this fishery. As there is no assessment of lesser spotted dogfish, it is not clear how we can be confident that this species is within biological base limits as stated.	Comment noted. No action required, other than to note that many other assessments have noted the widespread abundance of lesser spotted dogfish from surveys etc.
2.2.2	Yes	Yes	NA	With respect to a partial strategy to reduce bycatch, the score of 80 seems well justified.	
2.2.3	Yes	Yes	Yes	A score of 75 is given by the certifier. This score is justified as there is clearly a need to develop additional information of the nature of the bycatch that would be representative of the fleet and the consequences of the bycatch with respect to the affected species.	Comment noted. No action required.
2.3.1	Yes	Yes	NA	The score of 90 on this PI is well justified by the updated information of the level of bycatch relative to the estimated size of the harbour porpoise population and both national and international bycatch limits.	Comment noted. No action required.
2.3.2	Yes	Yes	Yes	A score of 70 is appropriate until such time as there is an evaluation of the effectiveness	Comment noted. No action required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				of pingers in reducing cetacean bycatch.	
2.3.3	Yes	Yes	NA	I concur with the scoring of 80 for this PI. There is a monitoring program that provides quantitative estimates of harbour porpoise bycatch and this information od made available to evaluate the impact of bycatch mortality on the population.	Comment noted. No action required.
2.4.1	Yes	Yes	NA	A score of 90 was given to this PI on the basis that the SG100 level was partially met. But this seems to conflict with the rationale stating that “no studies have been carried out to investigate effects... on the seabed” which would seem to imply there was no evidence and therefore the SG100 was not met. A score of 80 seems more appropriate. On the other hand, there seems to be little likelihood that this gear would cause serious damage to the habitat (as stated by the authors) and therefore one could argue for a score of 100. Perhaps, the authors split the difference because studies have not been done – a reasonable approach.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Yes	Yes	NA	I concur with the assessment and the score of 90.	Comment noted. No action required.
2.4.3	Yes	Yes	NA	I concur with the assessment and score of 80. Although little impact from the fishery is likely, studies have not been done to assess habitat changes over space and time that could be used to test for effects of the fishery on bottom habitat.	Comment noted. No action required.
2.5.1	Yes	No	NA	A score of 90 was awarded this PI, however, I believe 80 might be more appropriate as there does not seem to be evidence that the fishery is highly unlikely to disrupt key elements of the ecosystem until such time as there is a better understanding of ecosystem structure and functioning.	A similar comment was made by the other peer reviewer. We have revised our score to 80.
2.5.2	Yes	No	NA	Again a score of 90 was awarded, but as the strategy is still under development it seems premature to consider elements of the SG100 satisfied. A score of 80 is strongly supported.	We have revised the text to make it clear that the strategy is already being implemented, which justifies the score of 90 we have awarded.
2.5.3	Yes	Yes	Yes	I concur with the score of 70 and the need for	Comment noted. No action required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	<b>Justification</b> Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				enhanced data collection and multispecies ecosystem modelling to increase the score on this PI to 80.	
3.1.1	Yes	Yes	NA	A score of 95 was awarded to PI. It is not clear why a score of 100 was not given as the management system would seem to meet the SG100 level.	Quite correct, our mistake. We have corrected this score.
3.1.2	Yes	Yes	NA	I concur with the score of 100 for this PI.	Comment noted. No action required.
3.1.3	Yes	Yes	NA	I concur with the score of 100 for this PI.	Comment noted. No action required.
3.1.4	Yes	Yes	NA	I concur with the score of 80 for this PI as there is no evidence of regular review of management policy that explicitly considers incentives.	Comment noted. No action required.
3.2.1	Yes	No	NA	Although a score of 80 was given to this PI, it is not clear which short- and long-term objectives explicitly address MSC P2	Comment noted. No action required.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
				principles. More text is need to justify the 80 score.	
3.2.2	Yes	Yes	NA	I concur with the score of 95 for this PI.	Comment noted. No action required.
3.2.3	Yes	Yes	NA	I concur with the score of 90 for this PI.	Comment noted. No action required.
3.2.4	Yes	No	NA	This PI got a score of 80. However, it is not clear from the text how the research plan addresses shortcomings associated with P2 PIs (such as the nature and amount of the bycatch and ecosystem modelling). The current score needs further justification.	These issues have been addressed in the scoring comments, noting harmonisation with other hake fisheries assessments
3.2.5	Yes	Yes	NA	I concur with the score of 80 for this PI.	Comment noted. No action required.



Intertek Fisheries Certification (IFC)

**Any Other Comments**

Comments	Conformity Assessment Body Response



For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1				
2.1.1				
2.2.1				
2.4.1				
2.5.1				

For reports assessing enhanced fisheries:

<i>Does the report clearly evaluate any additional impacts that might arise from enhancement activities?</i>	Yes/No	Conformity Assessment Body Response:
<i>Justification:</i>		

## 17 APPENDIX C: CONDITIONS & CLIENT ACTION PLAN

### 17.1 Conditions

The scores awarded for a number of Performance Indicators were above 60 and below the MSC unconditional pass level of 80. The MSC Certification Requirements specify that conditions of certification shall be raised for all of the Performance Indicators that score between 60 and 80, with the aim of improving the score to 80 or more during the period of certification (5 years).

The conditions of certification for the Performance Indicators that scored between 60 and 80 in this assessment are set out in the following pages, along with the associated client action plan which is designed to bring about the required improvements in the fishery.

### 17.2 Action Plan

#### 17.2.1 Condition 1: Harvest Control Rules & Tools

Condition 1	Harvest Control Rules and Tools
1.2.2	Harvest Control Rules and Tools
	There are well defined and effective harvest control rules in place
SG80 guidepost(s) not met:	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.
Score:	75
Rationale	In 2004, a recovery plan for the Northern hake stock was implemented which included well defined harvest control rules, but these are now effectively obsolete, due to the changing perception of the stock (biomass at an historic high, but uncertainty in the absolute value). A long-term management plan has not yet been implemented. Though advice is given by ICES according to its MSY approach (i.e. exploit at $F_{MSY}$ ), it is not apparent how the exploitation rate will be reduced if limit reference points (which are presently not defined) are approached.
Condition	Support work to develop and adopt well-defined harvest control rules that are consistent with the harvest strategy and ensure that exploitation rates is reduced as limit reference points are approached. The HCR should be contained within a long-term management plan.
Annual Milestones	<p>Years 1-2: Support the adoption of well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rates is reduced as limit reference points are approached. Resulting score: 75</p> <p>Year 3: A new long-term management plan shall be implemented which contains well defined harvest control rules that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. Resulting score: 80</p> <p>Years 4-5: No further action required Resulting score: 80</p>
Client Action	<ul style="list-style-type: none"> <li>CFPO is working closely with the NWW RAC (other Member States involved in</li> </ul>

Condition 1	Harvest Control Rules and Tools
Plan	<p>Hake fisheries) and European Association of Fish Producers Organisation (EAPO) in the development of a long-term management plan for this stock that will include well-defined harvest control rules which are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.</p> <ul style="list-style-type: none"> <li>• CFPO actively participate in meetings with STECF to ensure their knowledge of the fisheries concerned is as accurate as possible, and that management is appropriate.</li> <li>•</li> </ul>
Consultation on Condition	The client has consulted with Cefas about the implementation of the action plan, and a formal letter pledging support has been submitted (see section 17.3).

### 17.2.2 Condition 2: Discarded species - outcome

Condition 2	Discarded species
2.2.1	<p>Outcome</p> <p>The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups.</p>
SG80 guidepost(s) not met:	Main bycatch species are <u>highly likely</u> to be within biologically based limits or if outside such limits there is a <u>partial strategy</u> of <u>demonstrably effective</u> mitigation measures in place such that the fishery does not hinder recovery and rebuilding.
Score:	70
Rationale	<p>Although it is likely that both spurdog and porbeagle sharks are outside <math>B_{lim}</math>, there has been a management response (setting of a zero TAC, ban on landings etc) to this. Thus, some main bycatch species are likely to be outside biologically based limits, but there is a partial strategy of mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of these very widely dispersed stocks (cover whole of NE Atlantic). However, given the continuing by catch (and associated mortality) of both species in the hake gill net fishery, and the considerable time it will take to show that recovery is occurring, it cannot at the moment be said that they are demonstrably effective. These elements would score 60.</p> <p>It is highly likely that lesser spotted dogfish are within biologically safe limits, and mackerel and edible crab are all highly likely to be within biologically safe limits (<math>BMSY_{trigger}</math>), with a high degree of certainty for mackerel (these elements would return scores of 80, 100 and 100 respectively).</p> <p>Since all elements meet SG 60, and some achieve higher performance at or above SG80, but some do not meet SG 80 and require intervention to make sure they get there, a score of 70 is indicated (CR v1.3, Table C2).</p>
Condition	Evidence is required to show that that the partial strategy in place for managing the impact of the fishery on spurdog ensures that the fishery does not hinder the recovery or rebuilding of spurdog stocks. If the current strategy is not effective, then new management measures should be identified and adopted with a view to establishing a more effective regime.
Annual Milestones	<p>Years 1-2: Design and implement a programme of monitoring work that will determine the contribution of this fishery to overall mortality of spurdog. Resulting score: 70</p> <p>Years 2-3: Ongoing implementation of monitoring programme. Resulting score: 70</p>

Condition 2	Discarded species
	<p>Years 4-5: Report results of monitoring programme; implement any new management measures (if necessary) that are likely to improve effectiveness of management strategy.</p> <p>Resulting score: 80</p>
Client Action Plan	<ul style="list-style-type: none"> <li>• CFPO currently lead industry partners with CEFAS in project NEPTUNE looking at Spur-dog and Porbeagle by-catch rates, mitigation strategies and stock data enhancement.</li> <li>• CFPO involved in tagging work with CEFAS on an on-going basis.</li> <li>• CFPO involvement on number of FSP projects in recent years</li> <li>• CFPO vessels have an open door policy with CEFAS discard observers and most if not all vessels in the Group have taken discard observers from time to time.</li> <li>• CFPO will work with CEFAS and vessels to design and implement an appropriate discard monitoring programme for the fishery.</li> <li>• CFPO will test and implement new management measures, if necessary, to mitigate impacts of the fishery on spurdogs.</li> </ul>
Consultation on Condition	The client has consulted with Cefas about the implementation of the action plan, and a formal letter pledging support has been submitted (see section 17.3).

### 17.2.3 Condition 3: Discarded species - information

Condition 3	Discarded species
	Information
2.2.3	Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.
SG80 guidepost(s) not met:	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).
Score:	70
Rationale	<p>There is good information about historic landings and on catch composition for this fishery from fishery-independent sources that provides accurate, verifiable and quantitative information about by catch. This enables spurdog to be identified as a main bycatch species and porbeagle as a minor but vulnerable species.</p> <p>This information has contributed to current understanding of the status of the respective populations, based on which ICES have recommended the strategy of prohibiting spurdog and porbeagle landings as a means of restoring the population, and the EC has implemented these proposals.</p> <p>Now that spurdog and porbeagle are no longer a retained species, the quantity of information recorded by the client fleet will reduce, since this focuses on retained species. It is, therefore possible, that insufficient data will in future be gathered to detect a change in risk to both species, especially since their capture tends to be sporadic.</p> <p>The fishery meets all of the SG60 requirements and the first 3 of the SG80 requirements. A condition has been generated to address the need for recording information about discarding from the fishery.</p>

Condition 3	Discarded species
Condition	Action should be taken to establish a discard monitoring programme for the fishery that is capable of detecting any increase in risk to the main bycatch species.
Annual Milestones	<p>Years 1-2: Design and implement a discard monitoring programme for this fishery. Resulting score: 70</p> <p>Years 2-3: Ongoing implementation of monitoring programme; start of annual reporting. Resulting score: 80</p> <p>Years 4-5: Ongoing monitoring and reporting of discarding from the fishery. Resulting score: 80</p>
Client Action Plan	<ul style="list-style-type: none"> <li>• CFPO will work with CEFAS to design and implement an appropriate discard monitoring programme for the fishery</li> <li>• CFPO will work with CEFAS to ensure that data collected from this discard monitoring programme are collated and the results provided annually to relevant parties.</li> </ul>
Consultation on Condition	The client has consulted with Cefas about the implementation of the action plan, and a formal letter pledging support has been submitted (see section 17.3).

**17.2.4 Condition 4: ETP species**

Condition 4	ETP species
2.3.2	Management
	Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.
SG80 guidepost(s) not met:	There is <u>evidence</u> that the strategy is being implemented successfully.
Score:	70
Rationale	<p>There is a strategy in place for managing this fishery’s impact on cetaceans (EC Regulation 812/2004). The Regulation sets out timescales for taking measures in specific fisheries to deter cetaceans from fishing nets and also requires monitoring of by catch in specific fisheries by observers. This strategy involves the use of acoustic “pingers” to minimise mortality, and is based on scientific advice submitted to the EC which was used to determine the strategy that was most likely to be effective.</p> <p>Independent trials (in which the client fleet has participated) have shown that acoustic pingers are highly effective and have been estimated to reduce the bycatch of cetaceans in hake set nets by up to 95%.</p> <p>The full implementation of this strategy was delayed by concerns about the effectiveness and operational safety of pingers. The industry has worked with Government and observers to trial different pingers, and now that a viable alternative pinger has been found the strategy is now being implemented (through a “soft start” programme with full implementation expected by July 2014).</p> <p>The fishery meets all of the SG60 requirements, and the first and second of the SG80 requirements. The delays with introduction of pingers within the UK means that the third of the SG80 requirements is not fully met, so a score of 70 is appropriate and a condition has been generated to address this issue. If the strategy is fully implemented according to the planned schedule (by July 2014) it is likely that the SG80 level of</p>

Condition 4	ETP species
	performance would be attained quickly.
Condition	Evidence should be provided to demonstrate the successful implementation of the management strategy for reduction of ETP species interactions with the fishery.
Annual Milestones	<p>Years 1: Work with the appropriate management authority (MMO) and observers (SMRU) to gather information that demonstrates the effective implementation of ETP bycatch reduction measures (i.e. the use of pingers on nets). Resulting score: 80</p> <p>Years 2-5: Ongoing monitoring of implementation of management measures. Resulting score: 80</p>
Client Action Plan	<ul style="list-style-type: none"> <li>• CFPO vessels have been involved in acoustic pinger trials for over 10 years. We have worked collaboratively with SMRU on developing and testing various pinger designs/models.</li> <li>• All vessels in the Groups have been issued and actively use DDD acoustic deterrents.</li> <li>• CFPO vessels all have an open door policy on Cetacean Observers and all have carried an observer at least once.</li> <li>• As custodians of the marine environment all of our skippers are committed to minimising any cetacean by-catch and are willing to take all necessary and practicable steps to ensure this.</li> <li>• Monitoring has shown that cetacean by-catch levels are minimal in the fishery, and CFPO will continue to monitor the effectiveness of pingers as a management tool..</li> <li>• CFPO will work with MMO to ensure that the Group demonstrably use pingers on all Hake nets</li> </ul>
Consultation on Condition	The client has consulted with Cefas about the implementation of the action plan, and a formal letter pledging support has been submitted (see section 17.3).

### 17.2.5 Condition 5: Ecosystems

Condition 5	Ecosystems
2.5.3	Information
	There is adequate knowledge of the impacts of the fishery on the ecosystem.
SG80 guidepost(s) not met:	Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).
Score:	75
Rationale	The key elements of the Celtic Sea ecosystem are understood, and the main effects of the fishery (depletion of target species; effect on non-target species; and effects on ETP species) have been investigated; other effects (on habitats and ecosystems) can be inferred from existing information. The main consequences of these impacts are likely to be a reduction in trophic level due to hake stock depletion; reductions in non-target

Condition 5	Ecosystems
	<p>species abundance; and fishing mortality of cetaceans. Habitats are unlikely to be affected.</p> <p>There has been no multispecies modelling of the Celtic Sea ecosystem, so the functions of these different parts of the ecosystem are not known; and for some impacts (notably discarding of spurdogs), data collection has limitations that prevent an increase in risk level being detected.</p> <p>The fishery meets all of the SG60 requirements, and meets the first, second and fourth of the SG80 requirements. The third and fifth of the SG80 requirements are not met, largely because of uncertainty about the discarding of non-target species from the fishery (which links this condition closely to Condition 3).</p>
Condition	<p>Action should be taken to establish a discard monitoring programme for the fishery that is capable of detecting any increase in ecosystem risk level resulting from changes in the quantity and identity of the main bycatch (discarded) species.</p>
Annual Milestones	<p>Years 1-2: Design and implement a discard monitoring programme for this fishery. Resulting score: 70</p> <p>Years 2-3: Ongoing implementation of monitoring programme; start of annual reporting. Resulting score: 80</p> <p>Years 4-5: Ongoing monitoring and reporting of discarding from the fishery. Resulting score: 80</p>
Client Action Plan	<ul style="list-style-type: none"> <li>• CFPO will work with CEFAS and vessels to design and implement an appropriate discard monitoring programme for the fishery</li> <li>• CFPO will work with CEFAS to ensure that data collected from this discard monitoring programme are collated and the results provided annually to relevant parties</li> <li>•</li> </ul>
Consultation on Condition	<p>The client has consulted with Cefas about the implementation of the action plan, and a formal letter pledging support has been submitted (see section 17.3).</p>

**17.3 Letter of support from Cefas for implementation of conditions**

The Centre for Environment, Fisheries and Aquaculture Science  
Lowestoft Laboratory  
Paolfield Road  
Lowestoft  
Suffolk  
NR33 0HT

Paul Trebilcock  
Cornish Fish Producers Organisation Ltd  
{by email: paul@cfpo.org.uk}

20<sup>th</sup> July 2014

Dear Paul,

**RE: Cornish Hake Fishery  
MSC Conditions & Client Action Plan**

I am writing in response to your email of 16<sup>th</sup> July 2014 and following our brief meeting on 17<sup>th</sup> July 2014 regarding the Cornish gill net hake MSC accreditation process.

I can confirm that Cefas is committed to work with you on the issues associated with the conditions 1-6 (coded: 1.1.2, 1.2.2, 2.2.1, 2.2.3, 2.3.2 and 2.5.3) identified in your client action plan. This is principally work that Cefas routinely undertakes for Defra, funded within an MoU (Memorandum of Understanding) contract for the provision of fisheries science services.

Specifically:

1.1.2 – Cefas’ scientists contribute to the annual ICES’ assessment of the hake stock and regularly brief you and other industry representatives on the status of fish stocks managed under the CFP; together with undertaking scientific studies commissioned either by Defra or the fishing industry as required.

1.2.2 – As UK Member of ICES’ ACOM, I regularly brief you and other industry representatives on the status of fish stocks managed under the CFP.

2.2.1 – The work being undertaken in the project NEPTUNE (Shark, Skate and Ray By-catch Fishery), Defra-funded project MB5201, is as described. The project will conclude on the 31<sup>st</sup> March 2015 and Cefas’ scientists are developing a follow-on project. Again, Cefas is committed to working with the CFPO through its normal Defra-funded activities.

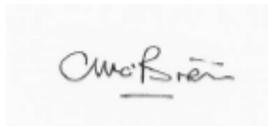
2.3.2 – Although this refers to the MMO explicitly, Cefas has been involved in the development of *pingers* and has regularly been involved in their evaluation

to mitigate by-catch. Again, Cefas is committed to working with the CFPO through its normal Defra-funded activities.

2.5.3 – Cefas developed a mixed fisheries model for the demersal fisheries in the Celtic Sea which was successfully deployed at the last December Fisheries Council 2013 and I am committed to further developing ecosystem models of the region, and to the further development of discard monitoring plans with the CFPO.

In the mean time, if I can be of further assistance then do not hesitate to contact me.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'C. M. O'Brien', is centered on a light grey rectangular background.

Dr Carl M. O'Brien  
Defra Chief Fisheries Science Adviser

Cc: Cheryl Sykes (to log and file)

## 18 APPENDIX D: STAKEHOLDER COMMENTS

The assessment team produced a brief minute of each stakeholder meeting carried out during the assessment and sent them to the relevant stakeholders for approval. The approved versions of these accounts are reproduced here. Reports, papers and other supplementary information provided by stakeholders have been retained by the team and are not reproduced here.

### 18.1 Interview conducted during and after site visit

#### 18.1.1 Nathan de Rozarieux & Paul Trebilcock (Cornish Fish Producers Organisation)

**Meeting date:**

13<sup>th</sup> July 2010

**Status:**

- Cornish Fish Producers Organisation (CFPO) is the client for the assessment and also manages a quota allocation for its members.

**Comments**

The key issues raised during discussions were:

- Fleet activity
  - The UoC fleet has 10 vessels >15m fishing for hake & approx 10 vessels <15m
  - Other nations fishing in this métier – Irish gill netters in Celtic Sea; relatively few Spanish netters now (mainly trawl & line)
  - Fleet now much smaller than in the 1990s (when approx 40 vessels in fleet)
  - Fishery is all offshore in water > 45 fathoms
- Gear
  - Mesh size >120m
  - Vessels may carry up to 20km monofilament net
  - Fish only on neap tides (5-7d trips)
  - Soak times 12-20h, nets hauled each day.
  - Mesh selectivity studies & discard sampling information were available from Cefas
  - Can only fish on neap tides (gear is damaged if left in sea on spring tides)
  - Gear losses negligible (nets always attended, anchored, GPS fixes determine location).
- Regulation of fishery
  - No quota issues – ample quota available, therefore no high grading.
- Stock
  - Client supports ICES view that stock is in good condition following strong recovery under EU recovery plan introduced in 2004 (EU plan was discussed with client)
- Non-target species
  - Cod (>40cm long) are caught in fishery, may have to be discarded at times due to restrictive quota.
  - Spurdogs – large catches sometimes unavoidable (in the past vessels landed up to 17t pa), these can no longer be landed, so are discarded.
  - Small cetacean catch negligible; client involved with trial of new pingers, working with SMRU; observers carried regularly.
  - Cefas observers carried regularly & welcome aboard

- VMS data available & used by Cefas
- Habitats
  - Fishery takes place on soft ground (muddy)
  - Hard ground is avoided – it wears out the fishing gear
- Regulations, Enforcement, Compliance
  - Fishery all >6nm offshore, MMO therefore responsible; controls effectively enforced
  - Landings from all vessels are inspected at Newlyn – this is designated port under the Hake Recovery Plan so that even the 2 Padstow vessels land in Newlyn (if landing over 2t of hake); auction market is at Newlyn
  - Activity of vessels >15m at sea monitored with VMS
  - Landings from all vessels traceable via RBS
  - No problems with u/s fish, mesh size, quota, areas fished.
  - No recent problems with compliance; however a verdict in 2008 dealt with widespread misreporting problems in Newlyn that took place around 2002.
  - Client considers recovery plan to have been successful, to the extent that increased hake catches elsewhere have depressed market value.
- Copies of reports provided:-
  - FSP Mesh selectivity report
  - Annual Fishery Report (industry input to ICES discussions)
  - Landings data of quota species for FV Ajax

### 18.1.2 Alan Dwan, skipper, FV Ajax

#### Meeting date:

13<sup>th</sup> July 2010, Newlyn, Cornwall.

#### Status:

- Mr Dwan is the skipper of the Fishing Vessel Ajax, which fishes for hake using set nets all year round.

#### Comments

The key issue raised during discussions were:

- Background
  - Mr Dwan has been fishing for around 20 years for hake (as well as other species)
  - Feels that operation of the gear has been optimized to select hake, minimise bycatch, maintain fish quality, and reduce capture of ETP species.
- Fishing activity
  - Described fishing pattern in relation to hake movements & spawning; type of ground fished (hard ground wears out the gear, has crab predation problems; and is too close to the shore so seals predation is a problem); depths of water fished (90 fathoms in winter, as shallow as 45m in summer).
  - Explained how & why gear is rigged & deployed (in brief, use mesh size >120mm (recently measured at 127mm by UK & Irish authorities; hanging ratio of 2-2.5:1; maximum soak time 18h; fishes 4 fleets of nets; gear is recovered daily; vessel remains in attendance; trawling vessels in area are alerted to location of gear).
  - Net losses are negligible
  - Vessel's gear is renewed on an ongoing basis (resulting in total replacement each year); old gear is disposed of ashore & recycled.
- Catch composition

- The catch is dominated by hake (>90%). Several non-target species are landed. There are some concerns about:-
- Cod – which are caught in the fishery; some fish are landed, but quota restrictions require discarding of significant quantities of fish (up to 3-600kg per vessel per trip)
- Spurdog – which are unavoidably caught in some areas during August-October, and which have to be discarded (up to 7t per day during this period), in the 29E1 / 29E0 area.
- ETP species
  - Very occasional cetacean bycatch (no more than 1-2 per year)
  - Working with SMRU to trial the use of pingers on nets
  - SMRU observers have been on vessels regularly
- Enforcement
  - Vessels are checked on landing at Newlyn
  - Regularly boarded at sea (approximately monthly) by Irish and UK agencies
  - No undersized fish or mesh size issues

### 18.1.3 Nick Tregenza (Chelonia Ltd) & Tom Hardy (Cornwall Wildlife Trust)

**Meeting date:**

14<sup>th</sup> July 2010

**Status:**

- Chelonia Ltd manufacture cetacean monitoring equipment. Nick Tregenza has studied the status of marine mammal populations and interactions between fisheries and marine mammals for over 20 years.
- Cornwall Wildlife Trust is an environmental NGO. Tom Hardy is studying the use of acoustic ‘pingers’ in the inshore gill net fishery.

**Comments**

The key issues raised during discussions were:

- Harbour porpoise – The Sea Mammal Research Unit, Nick Tregenza, and others have published work on bycatch in the UoC during 1992-94. This provides a quantitative basis for assessing the effect of the fishery on this ETP species, that is in line with other such studies elsewhere and with some subsequent estimates by SMRU. These findings suggest that the take of this ETP species is above internationally agreed safe levels. We consider that this is the ETP species most vulnerable to the effects of this fishery.
- Common dolphins – The same authors have published work on bycatch of this species during the 1992-94 period – this concluded that the effect of the whole Celtic Sea fishery for hake is less than 1% of the common dolphin population per year. The overall take of this species in fisheries is not known, and there is concern that local sub-populations may exist and may be experience higher mortality rates than the overall rate.
- Bottlenose dolphins. There is clear evidence from the UK, Europe and N. America of distinct inshore and offshore forms of this species, with discrete inshore groups being in decline around European coasts. Such an inshore group is present in the SW of England, but the distribution of this fishery suggests that it is unlikely to experience a significant incidental catch of the inshore form of this species.
- Seals – it was thought that seals were not frequently encountered by the UoC fishery; Nick & Tom suggested that the team should contact Sue Sayer (Cornwall Seal Group) to check on this.
- Marine mammal populations – general population trends were discussed, and in particular the effect of PCBs on reproductive success and population status.

- Elasmobranchs – the extent of interactions with elasmobranchs were discussed; the team noted that seasonal bycatch of spurdogs was an issue that they were investigating.
- Sea fans / benthic species – it was noted that the bottom set nets could have an effect on benthic species, and that in the inshore fisheries there was a bycatch of sea fans. The extent of similar interactions in the offshore fishery should be investigated.
- No other ETP bycatch issues were raised.

#### 18.1.4 Sue Sayer, Cornwall Seal Group

**Meeting date:**

27<sup>th</sup> September 2010 (telephone interview)

**Status:**

- Cornwall Seal Group is an environmental NGO that exists to monitor and identify the seals around the Cornish coast and raise awareness of seal conservation issues.

**Comments**

The key issues raised during discussions are summarised below:

- Gill nets are a big issue for seals around Cornwall, but isolating the effects of the hake gill net fishery from other gill net fisheries around the Cornish coast is not possible.
- Cornwall Seal Group has photo ID information recording 118 different seals in Cornwall and the Isles of Scilly that show evidence of entanglement with gill nets (80 of these are in Cornwall; 38 in the Scilly Isles).
- It seems doubtful that seals can survive entanglement with an operational net. It is likely that most seals that become entangled in operational nets will drown.
- Most of the seals showing evidence of entanglement are thought to have become entangled in net that has been lost or discarded and is no longer attached to seabed anchors or other fishing gear.
- Rates of net entanglement around the Cornish coast appear to be very high. In 2004, 5% of the seals at Godrevy showed signs of entanglement (either scarring or were still entangled in the net and carrying it with them). In 2008 this figure was 3.6%. This is the second highest recorded level globally. [these data are from unpublished sources which may be shortly due for publication – Jim is to check with the author prior to using them].
- Monofilament (gill and tangle??) nets are the main type of fishing net that seals become entangled in, though entanglement with other types of fishing net have been observed.
- Survival rates of seals showing signs of entanglement are lower than for other seals. Some seals have survived for several years despite becoming and remaining entangled in netting, which can cause significant tissue damage and other injuries to the animals concerned.
- It is unclear why the level of entanglement around Cornwall is so high. This could be a result of higher local levels of net loss, or netting drifting in from other areas and becoming aggregated in the area (as has been observed elsewhere in the world).
- No seasonality in seal entanglement has currently been identified.
- Observations of tagged seals show that from young age they move around throughout the Celtic Sea, and the same animals have been observed at haul-outs in Cornwall, Ireland, Brittany, Wales and the Isles of Scilly.
- It is likely that grey seals can forage throughout the depth range of the fishery (70-90 fathoms), although the average dive depth for a grey seal is reported to be 120m.

- It is useful to consider levels of incidental capture relative to global populations of species. The main species considered likely to be entangled in fishing nets of any type around the Cornish coast are grey seals, common seals, bottle nosed dolphins, and harbour porpoise. Population estimates are:-
  - Grey seals – 400,000
  - Common seals – 500,000
  - Bottle nosed dolphins – 600,000
  - Harbour porpoise – 700,000
- Given that lost or discarded gill nets are likely to be the prime reason for survivable entanglement in fishing nets by seals, any vessels that participate in the “Fishing for Litter” scheme are likely to help reduce the problem. Other actions that could help to reduce and improve understanding of seal entanglement could include:-
  - Reporting and photographing all marine mammal bycatch incidents
  - Report all net loss at sea
  - Enabling observer participation
  - Using recyclable monofilament and participating in recycling schemes for damaged nets

### 18.1.5 Simon Northridge, Sea Mammal Research Unit

#### Meeting date:

12<sup>th</sup> October 2010 (telephone interview)

#### Status:

- The Sea Mammal Research Unit (SMRU) provides impartial, independent and innovative science that has high relevance to society. It carries out interdisciplinary research into the biology of marine mammals, trains marine mammal scientists through undergraduate and postgraduate teaching and advises governments, non-governmental organizations and industry on conservation issues.

#### Comments

The key issues raised during discussions are summarised below:

#### Overall

- Hake nets have a high CPUE of marine mammals (catch per net per km per hour), probably because the nets are quite tall.
- Rates of gear loss from the fishery are observed to be low, and lost gear is generally found again (data is available for this, and SN agreed to provide it).

#### Harbour porpoise

- Harbour porpoise are the species most frequently caught in hake gill nets.
- It is difficult to measure the significance of an individual fishery’s impact on the harbour porpoise population in the Celtic Sea. It seems likely that the combined effect of impacts from all fishing activities in the area on harbour porpoise exceeds sustainable levels.
- Two surveys of harbour porpoises in the Celtic Sea carried out 10 years apart show no detectable change in the size of the population.
- The use of pingers seems to reduce harbour porpoise capture significantly.

#### Common dolphins

- Catch rates of common dolphins in the fishery are lower than for harbour porpoise.
- The effect of fishing on common dolphins is uncertain. They have a wider range than harbour porpoise, but are less fecund and there are no good population estimates.
- Pingers seem to be effective at reducing common dolphin capture rates.

#### Seals

- Capture rates in the offshore hake gill net fishery are low; the main bycatch issue is in the inshore tangle net fisheries.
- Data from SMRU observers are available on rates of pinniped capture in gill net fisheries.

**Pingers**

- Initial pinger trials had not been very successful and led to the EC granting a derogation from the mandatory use of pingers while new technology was developed.
- SMRU have been working with the CFPO fleet to develop and trial new pinger technology. All of the CFPO vessels over 12m long (22 vessels) have volunteered for these trials. Trial pingers are now being used on 8 vessels.
- Results of the pinger trials have been encouraging. A new, louder, pinger is being used.
- Trials in the hake fishery have proved effective if one pinger is mounted on each end of the net. They appear to be effective over a range of 1.5km.

**Thresholds / standards for protection**

- The EC consider that the threshold for significant effects on harbour porpoise is the loss of 1.7%pa of the population per year.
- The IWC have identified two thresholds: a fishing mortality of 1%pa is a cause for concern; and 2%pa is a trigger for action.

**18.1.6 Colm Lordan, Marine Institute**

**Meeting date:**

12<sup>th</sup> October 2010 (telephone interview)

**Status:**

- The Marine Institute is the national agency responsible for Marine Research, Technology Development and Innovation. It was established in 1991 under the Marine Institute Act.

**Comments**

The key issues raised during discussions are summarised below:

- The Irish gill net fleet hasn't really recovered from the stock decline in the 1990s. The gill net fishery used to account for around 50% of hake landings; between 2004-2006 it was around 20% and is increasing gradually now to 42% and 648 t in 2009. Table below give hake landings by Ireland in tones by gear type and percentage take by gill nets:

Landing Year	GNS - Gillnets (Set)	OTB - Bottom Otter Trawls	SSC - Scottish Seines (Fly-dragging)	Other Gears	% Gill nets
1995	606	787	70	21	41%
1996	306	567	223	30	27%
1997	1,124	793	163	52	53%
1998	589	1,002	174	37	33%
1999	354	1,304	256	110	18%
2000	258	1,014	286	124	15%
2001	123	538	161	87	13%
2002	144	339	136	66	21%
2003	197	501	137	89	21%
2004	209	595	162	103	20%

2005	221	633	124	66	21%
2006	242	662	159	52	22%
2007	378	745	198	110	26%
2008	439	746	178	31	32%
2009	684	761	148	26	42%

- The fishery is also prosecuted by otter trawlers and seiners. Gill netters concentrate on fishing along the shelf edge and in the Celtic Sea. Gill net LPUE has increased in the last few years in the Celtic Sea especially. Otter trawlers fish for hake over a wider area; seiners predominantly in the Celtic Sea.
- The 2010 Irish hake quota was caught by the end of September, so high levels of discarding are to be expected in the last quarter of the year.
- The ICES hake assessment for 2010 has been compromised by incomplete landings data for 2009. In the absence of a formal stock assessment and in view of the current stock status it seems likely that the commission policy statement not the recovery plan will be used as the basis for a 15% increase in TAC.
- Current levels of fishing mortality are probably greater than  $F_{msy}$ . Stock biomass cannot be accurately estimated at present.
- Average landings over the past 3 years have been below the international TAC, owing to reduced quote uptake by some nations fishing the stock. The ICES advice for 2011 based on these average landings would imply a TAC reduction although all the information points to a stock increase.
- A status quo TAC would seem appropriate at this point, while the assessment is reviewed and improved.

### 18.1.1 Al Kingston, SMRU

#### Meeting date:

18<sup>th</sup> February 2014 (telephone interview)

#### Status:

- The Sea Mammal Research Unit (SMRU) is part of the Scottish Oceans Institute at the University of St Andrews. It carries out impartial, independent and innovative research into the biology of marine mammal populations and their interactions with human activities, and provides advice to government, NGOs and industry on sea mammal management and conservation issues.

#### Comments

The key issues raised during discussions are summarised below:

#### SMRU

- SMRU has been monitoring cetacean bycatch in the hake fishery (and other specific UK fisheries) on an ad hoc basis since the 1990's and has managed the broader UK protected species bycatch monitoring programme for Defra since 2005. The results of research, monitoring and mitigation work are published in annual reports to the EU to meet the UK Governments obligations under EC Regulation 812/2004, and in various other contract reports.

#### The hake fishery

- Monitoring of the hake fishery by SMRU observers has fallen since 2009 as the increased CPUE (of hake) in the fishery means that the main vessels involved in the fishery tend to sail with a full crew and often cannot accommodate observers. Some monitoring of other vessels targeting hake for part of a trip has been achieved in the last few years.
- Since September 2013 pingers have been mandatory for all over 12m gill netters operating in most of Subarea VII; the MMO implemented a "soft start" to this requirement during summer 2013, and it appears that most vessels are now using pingers, though this cannot be confirmed by the SMRU.

### **Pingers**

- SMRU have worked with the industry to trial the effectiveness of loud pingers – these offer the advantage that fewer pingers need to be used on each fleet of nets.
- Experimental trials in 2007/08 indicated that the loud pingers were likely to have a range of about 2km. Results from commercial trials conducted between 2008 and 2011 produced a similar estimate and showed that porpoise bycatch would be reduced by about 90% if the loud pingers are used at spacings of no more than 4km. The effect on common dolphin bycatch rates has not been quantified yet.. Observations since 2011 support the earlier findings.
- The loud pingers do not meet the technical specifications under Annex II of the 812/2004 Regulation but are currently permitted for use by UK registered vessels under derogation.
- It is not currently known if routine pinger use will have an adverse effect on cetacean populations by causing displacement of animals from feeding (or other important) areas.
- It is not conclusively known if cetaceans will habituate to the use of pingers over time, which could reduce their effectiveness.
- It is also not known if pingers have a “dinner gong” effect for cetaceans; this is perhaps more likely to occur for pinnipeds which are known to depredate on catches from static nets. Some skippers have raised concerns about this potential effect and it cannot be ruled out, though existing data show no clear evidence of this occurring.

### **Cetaceans**

- Although the capture of cetaceans in hake nets is likely to be below the IWC threshold of 1.7% it was felt that the overall rate of capture in all gears should be considered.
- The most recent reliable survey of cetacean populations in the area is the SCANS II survey from 2005. A SCANS III survey is planned for 2016.

### **Other issues**

- All agreed to send copies of recent research reports to Jim Andrews
- It was suggested that the team should contact Clare Bowers at the MMO for further information about the use of pingers in the hake fleet.
- It was noted that the ICES Working Group on Protected Species Bycatch (WGBYC) has recently commented on the issues associated with the use of pingers on gill nets.



Intertek Fisheries Certification (IFC)

## **18.2 Written submissions received**

Written submissions were invited on this assessment during the consultation on the Public Comment Draft Report (between 12<sup>th</sup> February and 1700GMT on 14<sup>th</sup> March 2015). The only comments received by IFC during this period were from the Marine Stewardship Council, included overleaf.

18.2.1 Marine Stewardship Council comments

www.msc.org



Marine House  
1 Snow Hill  
London EC1A 2DH  
United Kingdom  
Tel: +44 (0)20 7246 8900  
Fax: +44 (0)20 7246 8901

Date 13/03/2015  
**SUBJECT: MSC Review and Report on Compliance with the scheme requirements**  
 Dear Jim Andrews

Please find below the results of our partial review of compliance with scheme requirements.

<b>CAB</b>	Intertek Fisheries Certification Ltd. (IFC)		
<b>Lead Auditor</b>	Jim Andrews		
<b>Fishery Name</b>	Cornish hake gill net		
<b>Document Reviewed</b>	Public Comment Draft Report		

Ref	Type	Page	Requirement	Reference	Details	PI
12237	Minor	99	CR-27.11.1.4 v.1.3	The CAB shall set one or more auditable and verifiable conditions for continuing certification if the fishery achieves a score of less than 80 but more than 60 for any individual PI. (...) 27.11.1.4 The CAB shall draft conditions to specify milestones that spell out: a. The measurable improvements and outcomes (using quantitative metrics) expected each year. b. The specific timeframes over which the milestones and the whole condition must be met. c. The outcome and score that shall be achieved at any interim milestones.	The narrative used to set the milestones does not address the nature of Condition 5, relating to Ecosystem information (2.5.3). Instead, the text on milestones and condition setting relating to Condition 3 seems to be duplicated here.	2.5.3

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www.msc.org						
12238	Major	116	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	The main species, Pollack, biological status is uncertain as outlined in the rationale text. However, there is no description in the rationale of what the partial strategy of effective demonstrable measures are in order to ensure that the UoC does not hinder recovery and rebuilding. MSC suggests that some of the text from the report is provided in the rationale scoring text as well, but is also clarified in terms of the UoC impact in relation to the overall effort on Pollack as well as the UoC compliance with existing management measures, if any. Related to this, the text in the report (pg 42) relating to Pollack also mentions two levels of catch that are deemed to be sustainable for Area VII, 4000t from 2012 and the ICES TAC of 13495 t since 2011. MSC suggests that the current increase in catch from 3900 to 4800 t is clarified in this context and which of these levels set the benchmark for the current management strategies.	2.1.1
12239	Minor	83, 101	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	Scores provided in rationale tables do not match all the scores provided in Table 13 and Table 14. For example, PI 3.1.1. is given a score of 95 in Table 13, but 100 in both Table 14 and the rationale for the PI. A similar situation exists for PI 3.1.4.	3.1.1, 3.1.4
12240	Major	144	CR-27.10.6.1 v.1.3	Rationale shall be presented to support the team's conclusion	PI 3.1.1. Scoring issue b: Information relevant to scoring the fishery at the SG 100 level for this PI is lacking. Additional information is required to justify the score in terms of demonstrating that the resolution mechanism is tested and proven to be effective.	3.1.1
12242	Guidance	92			The PCDR mentions in 13.1.1 that vessels in the fishery may carry and use several types of gear in one trip and that there is catch of hake in wreck and trammel nets, although negligible. Only bottom-set gill nets are included in the UoC. The report does not explain how non-certified hake caught using other methods is segregated from certified hake caught in gill nets.	



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12244	Guidance	92			Although the report describes the risk of vessels catching non-certified hake through gear types outside the UoC (13.1.1), it does not mention the risk of vessels catching non-certified hake outside the geographical boundaries of the UoC.

This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact Sergio Cansado on +626124135 for more information.

Best regards,  
Fisheries Oversight Director  
Dan Hoggarth  
Marine Stewardship Council

cc: Accreditation Services International

### **18.2.1.1 IFC Response to MSC Comments**

#### **Ref 12237: Wording of condition 5**

We have amended the wording of this condition to more closely follow the narrative and metric form of PI 2.5.3; however the trigger for the condition is the lack of information about discarding, which is also addressed in Condition 3, hence the inevitable similarity between the two conditions.

#### **Ref 12238: Status of main retained non-target species**

We have amended the narrative text and the scoring comments under PI2.1.1 to clarify the status of pollack and justify our scoring.

#### **Ref 12239: Scoring transposition errors**

We have corrected the errors in the presentation of the scores in Tables 13 and 14, which are now consistent with one another and with the scores presented in the scoring comment tables.

#### **Ref 12240: Scoring rationale for PI3.1.1**

We have added text to the scoring rationale to justify the scoring of SIb.

#### **Ref 12242: Risk of mixing of MSC and non-MSC fish**

The text has been amended to explain that because hake are not caught in wreck and trammel nets, there is no risk of mixing. The client has been asked to ensure that any hake caught in wreck or trammel nets should be kept separate from hake caught in gill nets.

#### **12244: Risk of fishing outside the UoC area**

Text has been added to clarify that there is no risk of UoC vessels fishing outside the UoC area and thus mixing MSC and non-MSC product.

**19 APPENDIX E: REGISTERED COMPANIES / VESSELS WITHIN UNIT OF CERTIFICATION: ELIGIBLE TO SELL MSC CERTIFIED PRODUCT**

<b>Boat Name</b>	<b>PLN</b>	<b>LOA</b>
Serene Dawn	PW156	11.86*
Gary M	PZ643	11.87*
Ajax	PZ36	18.28
Britannia V	FH121	15.15
Harvest Reaper	PW177	17
Stelissa	PZ498	20.6
Silver Dawn	PZ1196	17.93
Govenek of Ladram	PZ51	22.65
Joy of Ladram	E22	20.4
Ocean Pride	FH24	18.75
Charisma	PW45	16.6
Berlewen	PW1	14.97
Karen of Ladram	PW3	20.84
Ygraine	SS284	11.95*
Trevose	PW64	12.44

## 20 APPENDIX F: SURVEILLANCE FREQUENCY

The MSC Certification Requirements specify that after each certification, surveillance and re-certification the Conformity Assessment Body (CAB) shall determine the level at which subsequent surveillance of the fishery shall be undertaken.

The surveillance level required for this fishery has been calculated using the methodology set out in the MSC Certification Requirements. The fishery has a “surveillance score” of 6 (see Table 15).

Table 15: Calculation of surveillance score for this fishery.

Criteria	Surveillance Score Allocation	Score awarded
1. Default Assessment tree used		
Yes	0	0
No	2	
2. Number of conditions		
Zero conditions	0	
Between 1-5 conditions	1	
More than 5 conditions	2	2
3. Principle level scores		
≥85	0	
≤85	2	2
4. Conditions on outcome PIs?		
Yes	2	2
No	0	
TOTAL		6

The response to this score is set out in Table C4 of the MSC Certification Requirements. Fisheries that score 2 or more have a “Normal” surveillance level, requiring annual assessments throughout the period of certification. Fisheries that score 1 or 0 have the option of “remote” or “reduced” surveillance.

A **Normal** surveillance schedule is therefore appropriate for this fishery, and annual surveillance audits involving meetings with relevant stakeholders.

## **21 APPENDIX G. CLIENT AGREEMENT**

The Conformity Assessment Body, Intertek Fisheries Certification, have received formal acceptance of this Public Certification Report from the Cornish Fish Producers Organisation, and have been assured that:-

1. Cornish Fish Producers Organisation agree to the action plan set out in the responses to the conditions of certification, reproduced in Appendix C of this report.
2. Cornish Fish Producers Organisation agree to make the best possible effort to meet the intent of the conditions of certification.
3. Cornish Fish Producers Organisation agree to the surveillance schedule set out in Appendix F of this report.



Intertek Fisheries Certification (IFC)

## **22 APPENDIX H: OBJECTIONS PROCESS**

No objections were received during the consultation period on the Final Report for this fishery.