

Stock Annex: Anglerfish (*L. piscatorius* and *L. budegassa*) in Divisions 7.b–k and 8.a–b,d

Stock specific documentation of standard assessment procedures used by ICES.

Stock: Anglerfish

Working Group: Working Group on Bay of Biscay and Iberian Ecosystems

Created:

Authors:

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A. General

A.1. Stock definition

ICES assumes since the end of the 1970s three different stocks for assessment and management purposes: Anglerfish in Division 2.a (Norwegian Sea), Division 3.a (Kattegat and Skagerrak), Subarea 4 (North Sea), and Subarea 6 (West of Scotland and Rockall) (*Lophius piscatorius* and *L. budegassa*); Anglerfish in Divisions 7.b–k and 8.a,b,d (*L. piscatorius* and *L. budegassa*) and Anglerfish in Divisions 8.c and 9.a (*L. piscatorius* and *L. budegassa*). These stock definitions apply for both anglerfish species White anglerfish (*L. piscatorius*) and Black anglerfish (*L. budegassa*). In Divisions 7.b–k and 8.a,b,d, the two species are assessed separately but advised as a single stock since the EU gives a unique TAC for both species.

A.2. Fishery

Anglerfish are an important component of mixed fisheries taking hake, megrim, sole, cod, plaice, and *Nephrops*. A trawl fishery by Spanish and French vessels developed in the Celtic Sea and Bay of Biscay in the 1970s, and overall annual landings may have attained 35 000–40 000 t by the early 1980s. Landings decreased between 1981 and 1993 and since 2000, landings show an increasing trend. France and Spain together still report more than 75% of the total landings of both species combined. The remainder is taken by the UK and Ireland (around 10% each) and Belgium (less than 5%). Otter trawls (the main gear used by French, Spanish, and Irish vessels) currently take about 80% of the total landings of *L. piscatorius*, while around 60% of UK landings are by beam trawlers and gillnetters. Over 95% of total international landings of *L. budegassa* are taken by otter trawlers. There has been an expansion of the French gillnet fishery since the early 1990s in the Celtic Sea and in the north of the Bay of Biscay, mainly by vessels landing in Spain and fishing in medium to deep waters. Otter trawling in medium and deep water in ICES Subarea 7 appears to have declined, although the increasing use of twin trawls by French vessels may have increased significantly the overall efficiency of the French fleet.

A.3. Ecosystem aspects

Lophius piscatorius is a Northeastern Atlantic species, with a distribution area from Norway (Barents Sea) to the Straits of Gibraltar (and including the Mediterranean and the

Black Sea). *Lophius budegassa* has a more southern distribution from the British islands and Ireland to Senegal (including the Mediterranean and the Black Sea). Though the Working Group assesses two different stocks for each species (8.c, 9.a stock and 7.b–k, 8abd), the boundaries are not based on biological criteria. Recent studies were carried out in genetic and morphometric analysis (GESSAN, 2002; Duarte *et al.*, 2004; Fariña *et al.*, 2004).

The spawning of the *Lophius* species is very particular, with eggs extruded in a buoyant, gelatinous ribbon that may measure more than 10 m (Afonso-Dias and Hislop, 1996; Hislop *et al.*, 2001; Quincoces *et al.*, 2002). This particular spawning results in a highly clumped distribution of eggs and newly emerged larvae (Hislop *et al.*, 2001) and favourable or unfavourable ecosystem conditions can therefore have important impacts on the recruitment.

B. Data

The particularity of the data gathering processes for anglerfish species is that, except in Spain, anglerfish are sold without any species distinction. The overall catch per species is estimated from the species ratio observed in the biological sampling.

Biological sampling is carried out by the countries contributing most catches, but assumptions about species proportion have to be made for countries reporting raw tonnages for species combined. The amount of tonnage with no biological sampling for species composition has been much reduced since the early 2000s and in 2007 these represented less than 8% of the total *Lophius* landings. In some countries however, anglerfish are landed as tails only and conversion factors have to be used to estimate total length, which still may introduce errors.

Data are supplied from databases maintained by national Government Departments and research institutions. The figures used in assessment are considered as the best available data at the Working Group time of the year. From year to year, and before the Working Group, small revisions of data could occur. In that case, revised data are explained and incorporated into the historical dataseries for assessment.

Data are supplied on electronic files to a stock coordinator nominated by the ICES Hake Monk and Megrim (formerly Southern Self Demersal Stocks) Working Group, who compiles the international landings, discards and catch-at-age data, and maintains the time-series of such data with the amendments proposed by countries.

B.1. Commercial catch

Landings data are supplied from databases maintained by national Government Departments and research institutions. Countries providing landings data by quarter and ICES division are Spain, France, Ireland UK and Belgium.

The derivation used to compute the landings by fishery units and by species is given in the following table.

Anglerfish in Divisions 7.b–k and 8a,b,d; Derivation of the historical length compositions, by fishery unit for *L. piscatorius* and *L. budegassa*, in Divisions 7b–k and in 8a,b,d.

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Ot-her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1986	FR-FU04/Q, IR-FU04 annual tonnage/4	FR-FU05/Q, IR-FU04 annual tonnage/4	FR-FU04+SP-FU04/Q BE annual tonnage/4	?	FR-FU04+SP-FU04/Q EW-FU04 annual tonnage/4	FR-FU05/Q EW-FU05 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU06 annual tonnage/4	-	-		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1987	FR-FU04/Q, IR-FU04 annual tonnage/4	FR-FU05/Q, IR-FU04 annual tonnage/4	FR-FU04+SP-FU04/Q BE annual tonnage/4	?	FR-FU04+SP-FU04/Q EW-FU04 annual tonnage/4	FR-FU05/Q EW-FU05 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU06 annual tonnage/4	-	-		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1988	FR-FU04/Q, IR-FU04 annual tonnage/4	FR-FU05/Q, IR-FU04 annual tonnage/4	FR-FU04+SP-FU04/Q BE annual tonnage/4	?	FR-FU04+SP-FU04/Q EW-FU04 annual tonnage/4	FR-FU05/Q EW-FU05 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU06 annual tonnage/4	-	-		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Ot-her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1989	FR-FU04/Q, IR-FU04 annual tonnage/4	FR-FU05/Q, IR-FU04 annual tonnage/4	FR-FU04+SP-FU04/Q BE annual tonnage/4	?	FR-FU04+S P-FU04/Q EW-FU04 annual tonnage/4	FR-FU05/Q EW-FU05 annual tonnage/4	FR-FU04+S P-FU04/Q EW-FU06 quarterly tonnage/4	-	-		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1990	FR-FU04/Q, IR-FU04 annual tonnage/4	IR-FU05-LD	FR-FU04+SP-FU04/Q BE annual tonnage/4	?	FR-FU04+S P-FU04/Q EW-FU04 annual tonnage/4	FR-FU05/Q EW-FU05 annual tonnage/4	FR-FU04+S P-FU04/Q EW-FU06 quarterly tonnage/4	-	-		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1991	IRL-FU04/Q	IRL-FU05/Q	FR-FU04+SP-FU04/Q BE annual tonnage/4	FR-FU03/Q, EW-FU03 annual tonnage/4	FR-FU04+S P-FU04/Q EW-FU04 annual tonnage/4	EW-FU05/Q	EW-FU06/Q	-	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Other	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1992	FR-FU04+SP-FU04/Q, IR-FU04 quarterly tonnages	FR-FU05/Q+EW-FU05, IR-FU05 quarterly tonnages	FR-FU04+SP-FU04/Q BE annual tonnage/4	FR-FU03/Q, EW-FU03 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	-	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1993	FR-FU04+SP-FU04/Q, IR-FU04 quarterly tonnages	FR-FU05/Q+EW-FU05, IR-FU05 quarterly tonnages	FR-FU04+SP-FU04/Q BE quarterly tonnages	FR-FU03/Q, EW-FU03 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	-	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
1994	IRL-FU04/Q	FR-FU05/Q+EW-FU05, IR-FU05 quarterly tonnages	FR-FU04+SP-FU04/Q BE quarterly tonnages	FR-FU03/Q, EW-FU03 annual tonnage/4	FR-FU04+SP-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	-	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1995	FR-FU04+ SP-FU04/Q, IR-FU04 quarterly tonnages	FR-FU05/Q+ EW-FU05, IR-FU05 quarterly tonnages	EW-FU06/Q/ Q BE quarterly tonnages	EW-FU03	FR-FU04+S P-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	-	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	Total LDs raised to FR species split	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1996	IRL-FU04/Q	FR-FU05/Q+ EW-FU05, IR-FU05 quarterly tonnages	EW-FU06/Q/ Q BE quarterly tonnages	FR-FU03 + EW-FU03 quarterly tonnages 95% allocated to piscatorius - all countries quarterly LDs raised to these tonnages	FR-FU04+S P-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW-FU03 quarterly LDs raised to these tonnages	FR-FU03 + EW-FU03 quarterly LDs raised to these tonnages		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	Total LDs raised to FR species split	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unalloc ated	SP-FU04	SP-FU14
1997	IRL-FU04/Q		EW-FU06/Q/Q BE quarterly tonnages	FR-FU03 + EW-FU03 quarterly tonnages 95% allocated to piscatorius - all countries quarterly LDs raised to these tonnages	FR-FU04+S P-FU04/Q quarterly tonnages	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW-FU03 quarterly tonnages 95% allocated to piscatorius - all countries quarterly LDs raised to these tonnages	FR-FU03 + EW-FU03 quarterly tonnages 95% allocated to piscatorius - all countries quarterly LDs raised to these tonnages		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	Total LDs raised to FR species split	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																			
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	EW-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
1998	IRL-FU04/Q	FR-FU05/Q+ EW-FU05, IR-FU05 quarterly tonnages	EW-FU06/Q/ Q BE quarterly tonnages	FR-FU03/Q, EW-FU03 quarterly tonnage	FR-FU04+S P-FU04/Q EW-FU04 quarterly tonnages	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q	FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	Total LDs raised to EW species split	SP-FU04/Q	SP-FU14/Q
1999	Total LDs and species ratio used	Total LDs and species ratio used	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+F U06 LDs raised to FU04 tonnage, EW 2000 FU04 species ratio	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q	FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Other	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2000	Total LDs and species ratio used	Total LDs and species ratio used	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+F U06 LDs raised to FU04 tonnage, EW 2000 FU04 species ratio	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
2001	Total LDs and species ratio used	Total LDs and species ratio used	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+F U06 LDs raised to FU04 tonnage, EW 2000 FU04 species ratio	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Other	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2002	Total LDs and species ratio used	Total LDs and species ratio used	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+F U06 LDs raised to EW-FU04 quarter ly tonna ges per species	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
2003	Total LDs and species ratio used	Total LDs and species ratio used	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+F U06 LDs raised to EW-FU04 Q2 species split used for tonnage	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2004	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage, EW 2000 FU03 species ratio	FU05+FU06 LDs raised to EW-FU04 quarterly tonnages per species	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
2005	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100% L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used except for Q2 (species ratio provided)	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E-W-Other	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2006	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100 % L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used except for Q2 (species ratio provided)	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW-FU03 species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
2007	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100 % L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW-FU03 species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2008	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100 % L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	FR-FU03/Q		FR-FU04/Q	FR-FU05/Q	FR-FU08/Q		FR-FU09/Q	FR-FU10/Q	FR-FU14/Q	-	SP-FU04/Q	SP-FU14/Q
2009	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100 % L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	-	FR-GNS_DE EF_7/Q	FR-OTB_DE EF_7/Q	-	FR-OTB_CR U_7/Q	FR-GNS_DE F_8/Q	FR-OTB_CR U_8/Q	-	FR-GNS_DE F_8/Q	-	SP-FU04/Q	SP-FU14/Q

COUNTRY/FU																				
Year	IR-FU04	IR-FU05	BE-FU06	EW-FU03	EW-FU04	EW-FU05	EW-FU06	E W-Ot her	FR-FU03 + FU13	FR-FU03	FR-FU04	FR-FU05	FR-FU08	FR-FU13	FR-FU09	FR-FU10	FR-FU14	FR-unallocated	SP-FU04	SP-FU14
2010	IRL-FU04+FU05/Q	IRL-FU04+FU05/Q	Total LDs and species ratio used	FU05+F U06 LDs raised to FU03 tonnage 100 % L. piscatorius assumed	FU05+FU06 LDs raised to EW-FU04 2004 species ratio used	EW-FU05/Q	EW-FU06/Q	Total LDs raised to EW species split	-	FR-GNS_DE EF_7/Q	FR-OTB_DE EF_7/Q	-	FR-OTB_CR U_7/Q	FR-GNS_DE F_8/Q	FR-OTB_CR U_8/Q	-	FR-GNS_DE F_8/Q	-	SP-FU04/Q	SP-FU14/Q

Discards: preliminary information is available but not used due to uncertainties in adequacy of raising methodologies used.

B.2. Biological

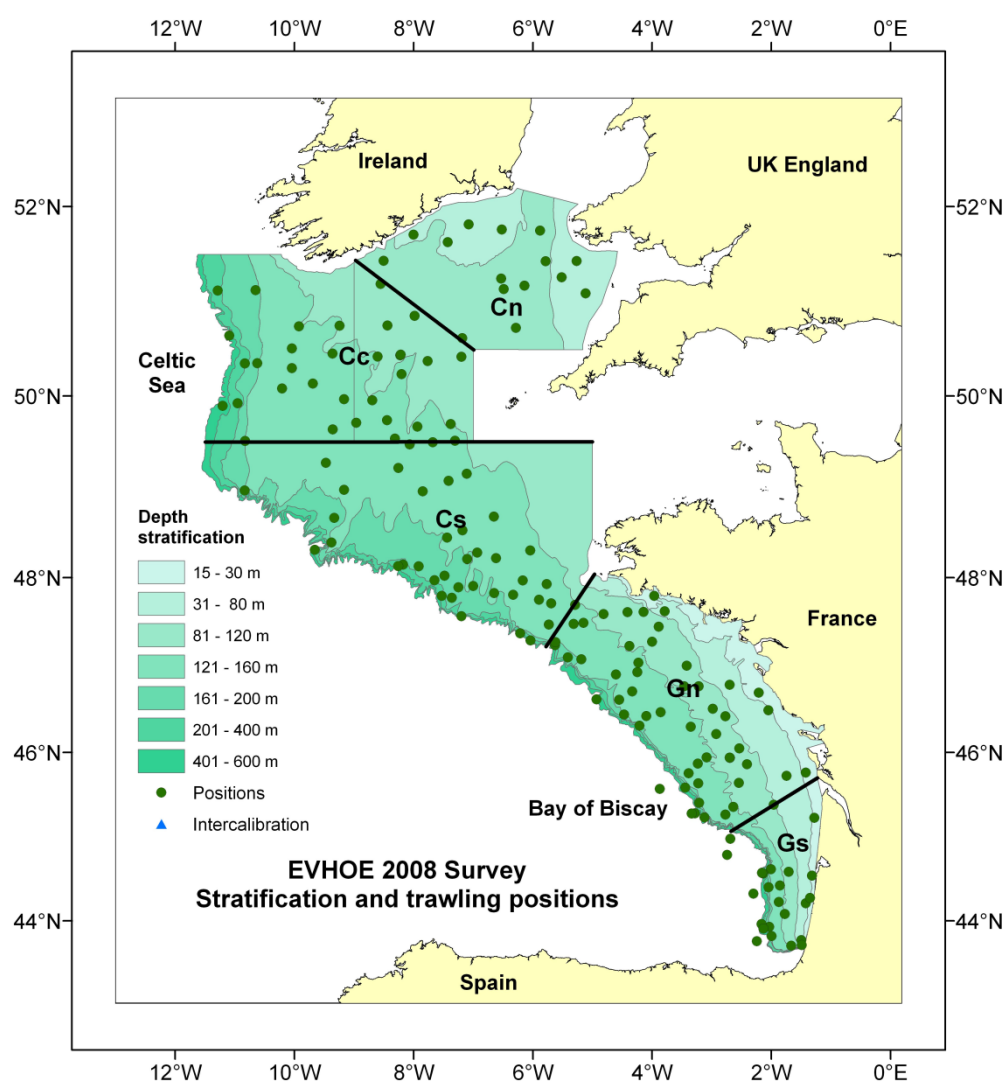
In 2007, WGHMM rejected the XSA age based assessments of both species because of data quality (increased discards not incorporated) and ageing problems clearly identified. Therefore there is no age based data used to assess the stocks. Only length distributions of landings and survey indices are used.

B.3. Surveys

For the first three surveys presented, a full description can be found on the ICES DATRAS website: <http://datras.ices.dk/Home/Descriptions.aspx>.

The French FR-EVHOE survey

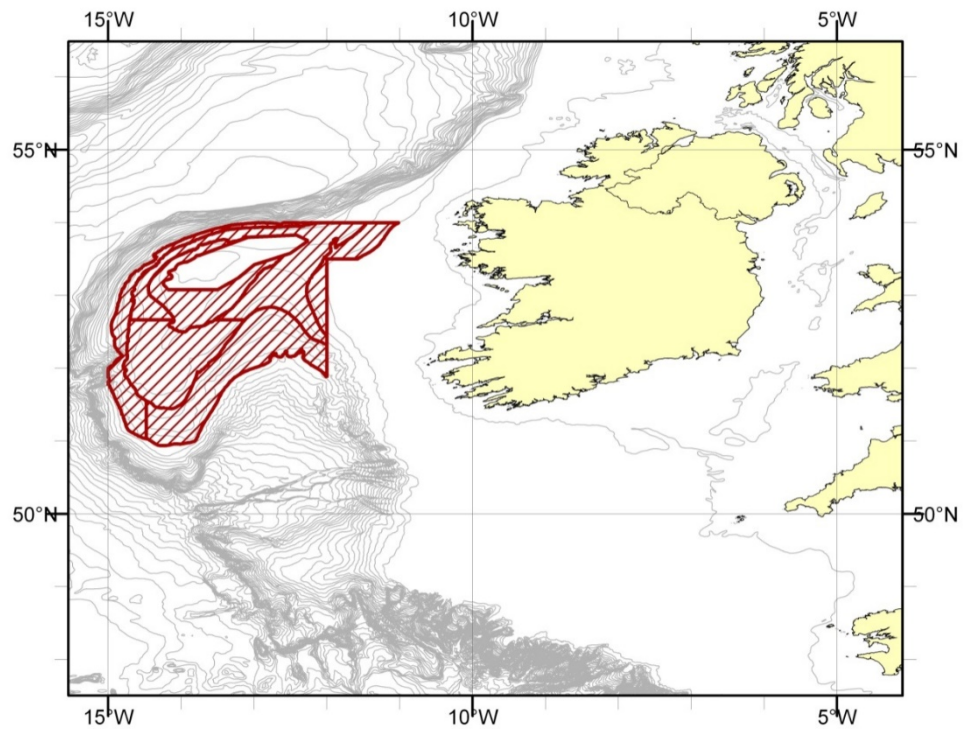
This survey covers the largest proportion of the area of stock distribution. It started in 1997.



Map of Survey Stations completed by the EVHOE Survey in 2008.

The Spanish Porcupine Groundfish Survey (SP-PGFS)

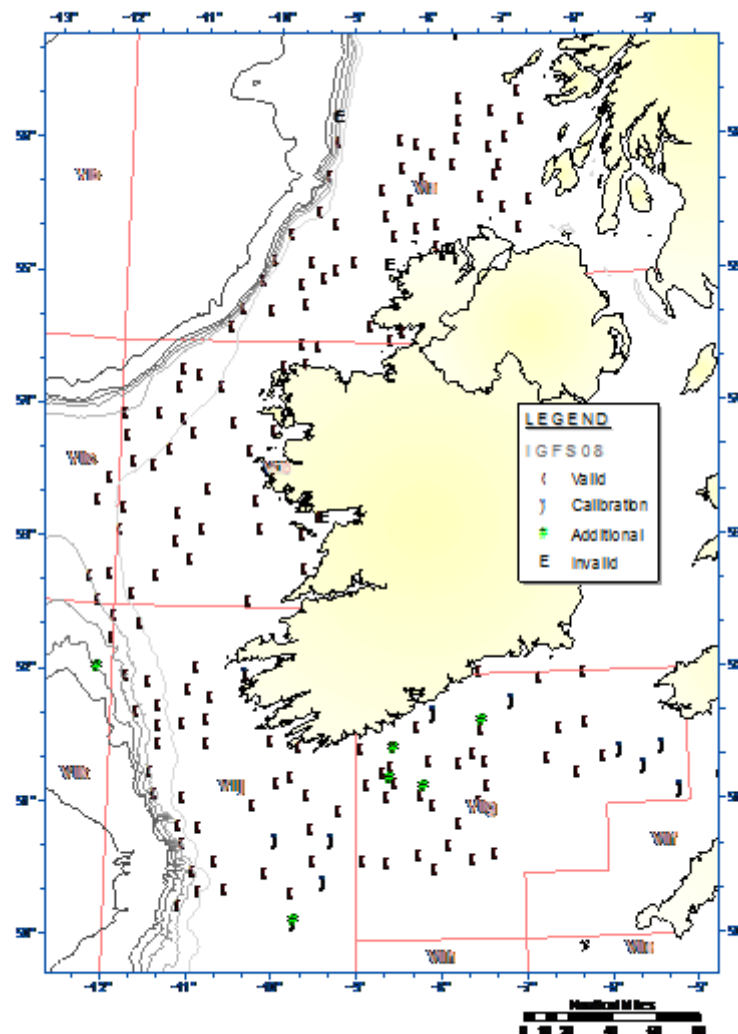
This survey was initiated in 2001 and covers the Porcupine Bank.



Map of area covered by the Porcupine Groundfish Survey.

The Irish Groundfish Survey (IR-IGFS)

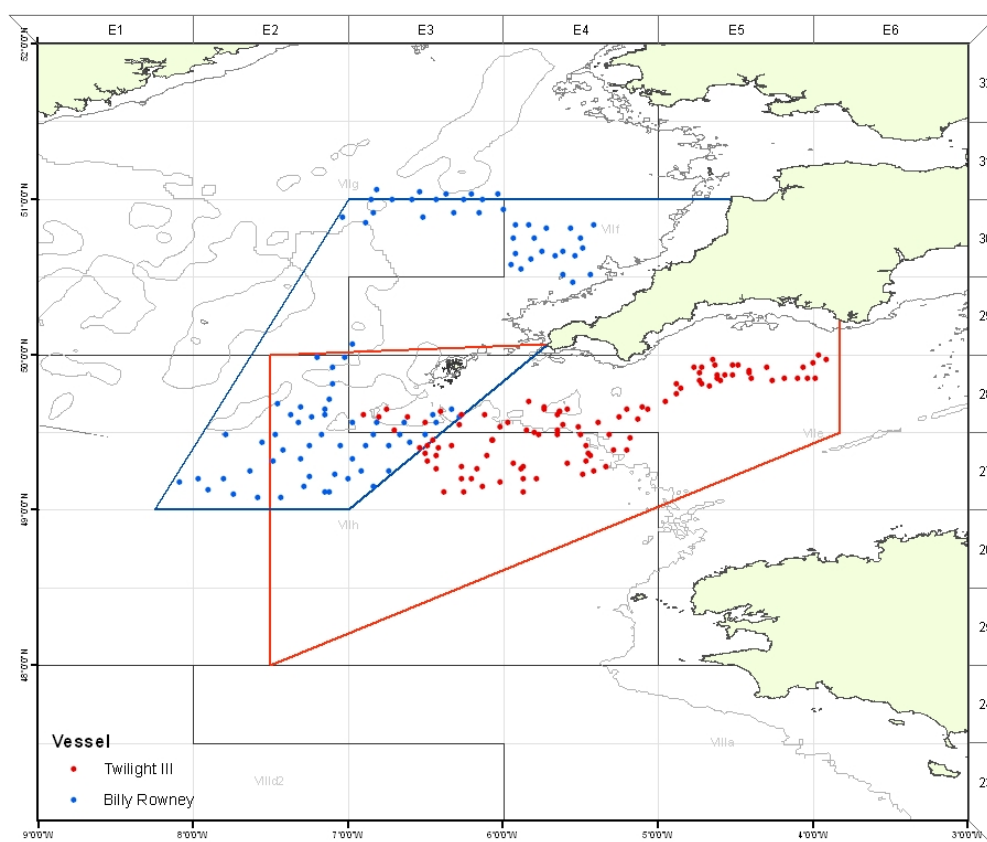
This survey was initiated in 2003 and covers areas around Ireland.



Map of Survey Stations completed by the Irish Groundfish Survey in 2008. Valid = red circles; Invalid = crosses; Intercalibration = blue squares; intercalibration and additional stations not valid for IBTS survey indices = green triangles.

The English Fisheries Science Partnership survey

This survey traverses Areas 7e–h and started in 2003.



Map of Survey Stations completed by the EW-FSP Survey in 2011.

A full description of the survey can be found in Section 2.2.12 of the WGHMM 2011 report.

B.4. Commercial cpue

Effort and lpue data are available for four Spanish trawl fleets (SP-VIGO7, SP-CORUTR7, SP-BAKON7 and SP_BAKON8). The French data for the FR-FU04 and FR-FU14 are also provided. Finally UK provides effort and lpue data for EW-FU06.

B.5. Other relevant data

C. Assessment: data and method

The assessments of the two species (WG 2011) are based on the analysis of lpues (SP-VIGO7, SP-CORUTR7, SP-BAKON7, SP-BAKON8, FR-FU04, FR-FU14 and EW-FU06), surveys indices (FR-EVHOE since 1997, SP-PGFS since 2001, IR-IGFS since 2003 and the EW-FSP since 2003 and length distributions from landings and surveys.

D. Short-term projection

E. Medium-term projections

F. Long-term projections

G. Biological reference points

L. piscatorius: A Stochastic Production Model in Continuous Time (SPiCT) was applied to *L. piscatorius* and was used to determine stock status in WKProxy (2016). The input data were time-series of landings from 1986–2014, LPUE from a Spanish fleet SP-VIGOTR7 from 1986–2014 and an abundance index from the French quarter 4 EVHOE survey for the period 1997–2014. Thus proxies of MSY reference points were defined using the methods developed in WKProxy (2016).

REFERENCE POINT	ESTIMATE	CILOW	CIUPP	EST.IN.LOG
B _{MSYS}	16996.8502	4871.5957	59301.4971	9,7408
F _{MSYS}	0.9605	0.3538	2.6073	-0.0403
MSYs	16325.6385	10645.5610	25036.3952	9.7005

I. budegassa: There are precautionary reference points defined for this stock. However, considering the underestimation of growth that is now obvious for this species, the reference points from earlier assessments are no longer valid. Reference points will have to be redefined based on an approved analytical assessment.

H. Other issues

H.1. Historic development

The analytical assessment was rejected in 2007 and advice was based on analysis of lpues, length frequencies of landings and survey data. In 2008, no new advice was delivered as the information available was considered too weak to provide any advice. The advice given for 2008 was also applicable until 2011. The stocks were reviewed in 2012 by the WKFLAT 2012 not founding an acceptable method for providing analytical assessment and recommended to continue using the analysis of trends for providing non analytical assessment.

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