

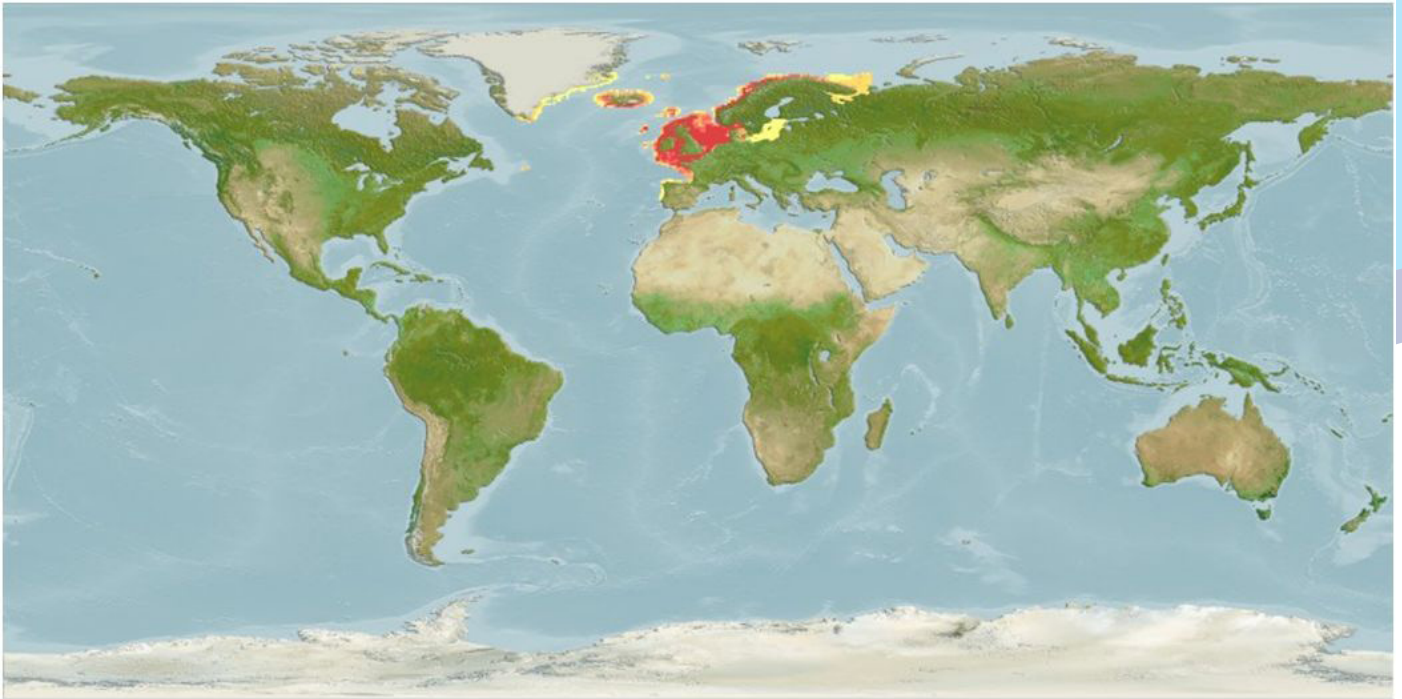
(Bauchot 1987)

Introduction

Sole are widespread throughout the North Eastern Atlantic and Mediterranean Sea, southward to Senegal (Quéro 1986).

Sole occur throughout the Irish Sea, being more abundant in depths less than 60 m. Adults are usually solitary, burrowing into sandy and muddy bottoms. They prefer temperatures in the range of 8.0-24.0°C, retreating to deeper water during winter (Frimodt 1995). Juveniles are found during the first 2 to 3 years in coastal nurseries (bays and nurseries) before migrating to deeper waters (ICES 2012). Adults feed on worms, molluscs and small crustaceans at night.

Spawning takes place in shallow coastal waters at temperatures of 6 - 12°C. Reproduction starts after 3-5 years of age, when 25-30cm size is reached. Spawning happens mainly during the months of February-May (for example, off the coasts of Galicia), although in warmer areas (such as the Mediterranean), it can occur at the beginning of the winter. Incubation lasts about 5 days (at 12°C) and larval phase 35 days (at 18°C). Tagging studies of sole in the Irish Sea and Bristol Channel show mainly local recruitment and limited movement of sole outside the management areas (Horwood, 1993; Williams, 1965). Therefore, the management unit is considered to correspond to the stock unit for Irish Sea sole (ICES 2015).



Reviewed distribution map for *Solea solea* (Common sole), with modelled year 2100 native range map based on IPCC A2 emissions scenario. www.aquamaps.org, version of Aug. 2013. Web. Accessed 28 Jan. 2016.

Summary of life history and habitat parameters

Species: <i>Solea solea</i> (Sole)				
Life Stage	Size and Growth	Habitat	Substrate	Temperature
Eggs	0.95-1.58mm in diameter with oil globules. Stage-duration temperature dependent ¹	Pelagic		Temperatures <7°C lead to low viability. Robust to low salinities ¹
Larvae	Hatch at 3mm, metamorphosis at 12mm	Pelagic until 10mm then move towards bottom ¹		
Juveniles		Demersal. Shallow estuaries ¹ Juveniles are found during the first 2 to 3 years in coastal areas. Juvenile sole (0-group, 1-group and 2-group) were found almost exclusively in the shallow (<20 m deep) parts of the north-east Irish Sea ⁴ nurseries (bays and nurseries) before migrating to deeper waters ²	Fine Sand to mud ¹	Associated with low salinities and river estuaries ¹ however on a small scale associated with higher end of salinities in these areas.

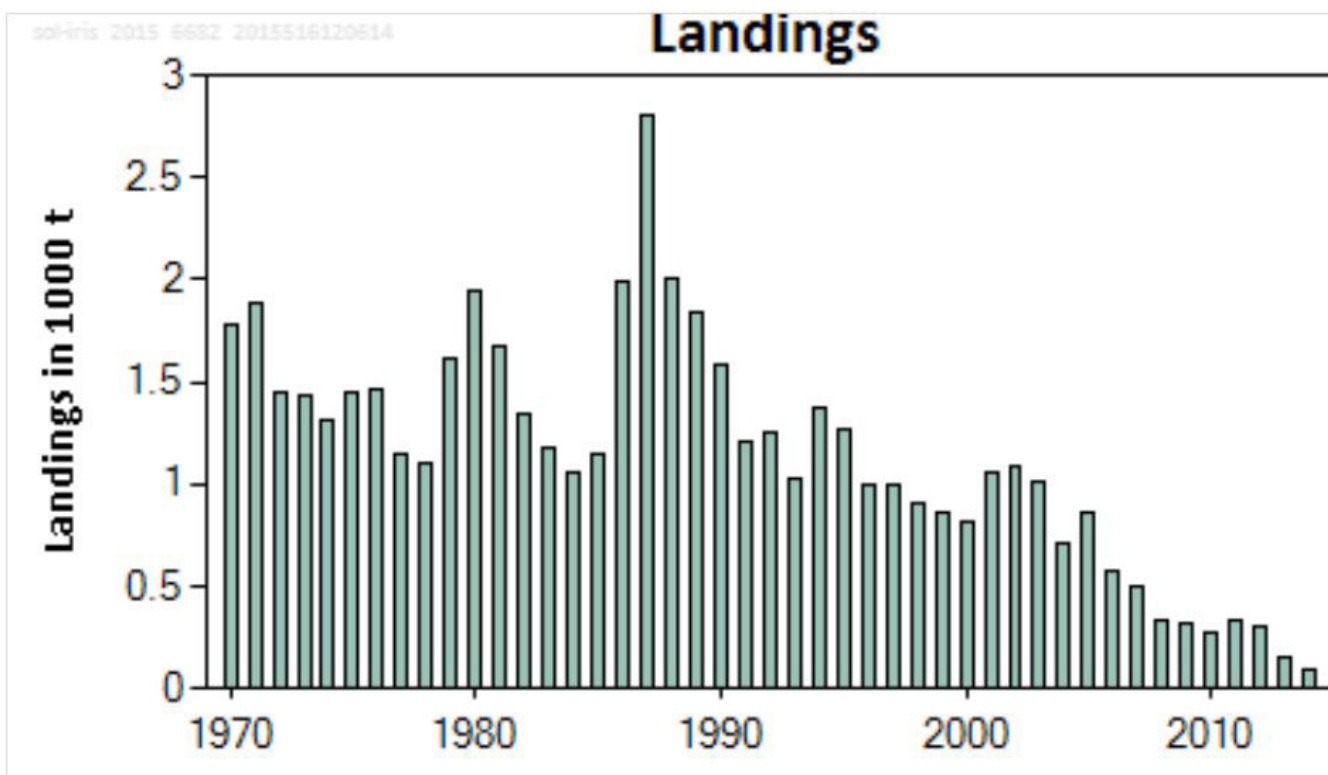
Species: *Solea solea* (Sole)

Adults (feeding)		Demersal. 1-150m, common 10-60m ² Sole occur throughout the Irish Sea, but are found more abundant in depth less than 60 m. ³	They burrow into sandy and muddy bottoms. ²	Retreat to deeper water during winter to avoid low temps. Adults occur at a temperature range of 8.0-24.0°C ²
Adults (Spawning)	Maturity: Lm 30.3 Reproduction starts after 3-5 years of age, when 25-30cm size is reached. ²	In the north-east Irish Sea, sole spawning grounds are generally in waters of <40 m depth and within an extensive area of relatively shallow and gently shelving sediments close to the coastal nursery grounds ⁴	Over sandy and gravel grounds ¹	Spawning observed to take place at temperatures of 6 - 12°C ²

(Horwood 1993)¹; fishbase²; (ICES 2014)³;(Symonds and Rogers 1995)⁴;

Fishery

There are three main countries fishing for sole in the Irish Sea; Belgium, taking the bulk of the landings, Ireland and UK. Northern Ireland, Scotland, Isle of Man and France take the remainder. Belgian beam trawlers operating in the Eastern part (Liverpool Bay and Morecambe Bay) and South Western part of the Irish Sea. The UK trawl fleet operates predominantly in the eastern part of the Irish Sea. Sole catches from Ireland are mainly coming from bycatches in the Nephrops fishery (operation in the northwest of the Irish Sea). Discards are estimated to be minor (ICES 2015).



Landings in Irish Sea ICES Division VIIA 1970-2014 (ICES 2015)

Stock Status

Spawning stock biomass (SSB) has continuously declined in the period 2001–2009 and has been below Blim since 2005. The fishing mortality (F) has shown a declining trend since the late 1980s and is at present below FMSY. Recent recruitments have been the lowest in the time series.

ICES advises that when the MSY approach is applied, there should be no directed fisheries and all catches should be minimized in 2016.

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