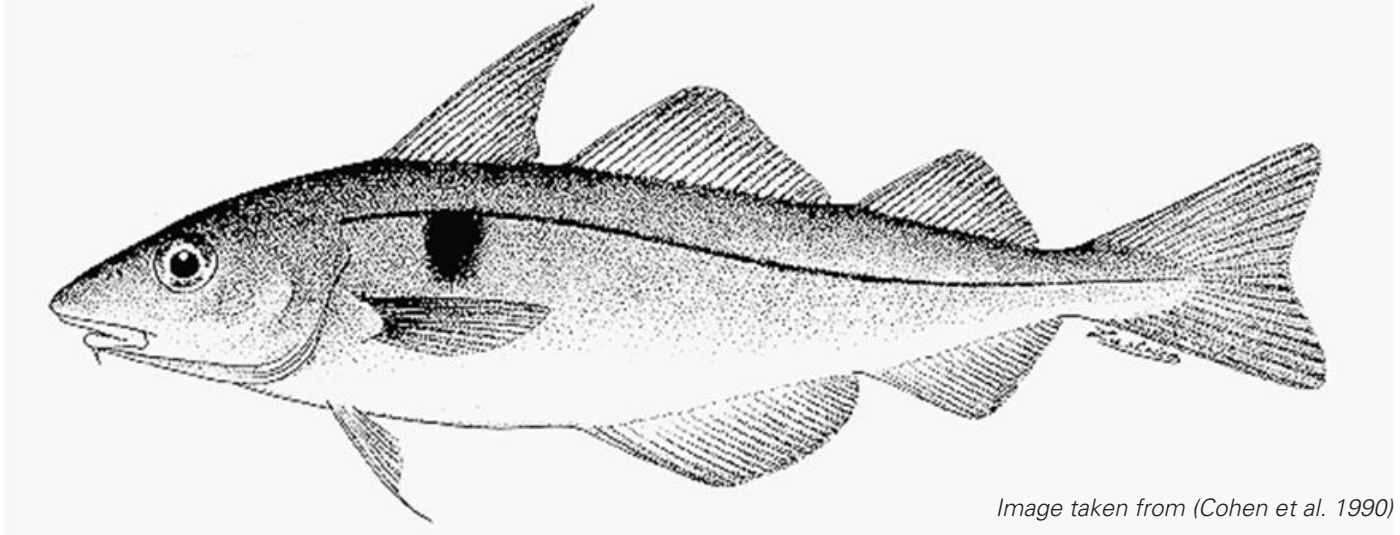


## Haddock (*Melanogrammus aeglefinus*)



*Image taken from (Cohen et al. 1990)*

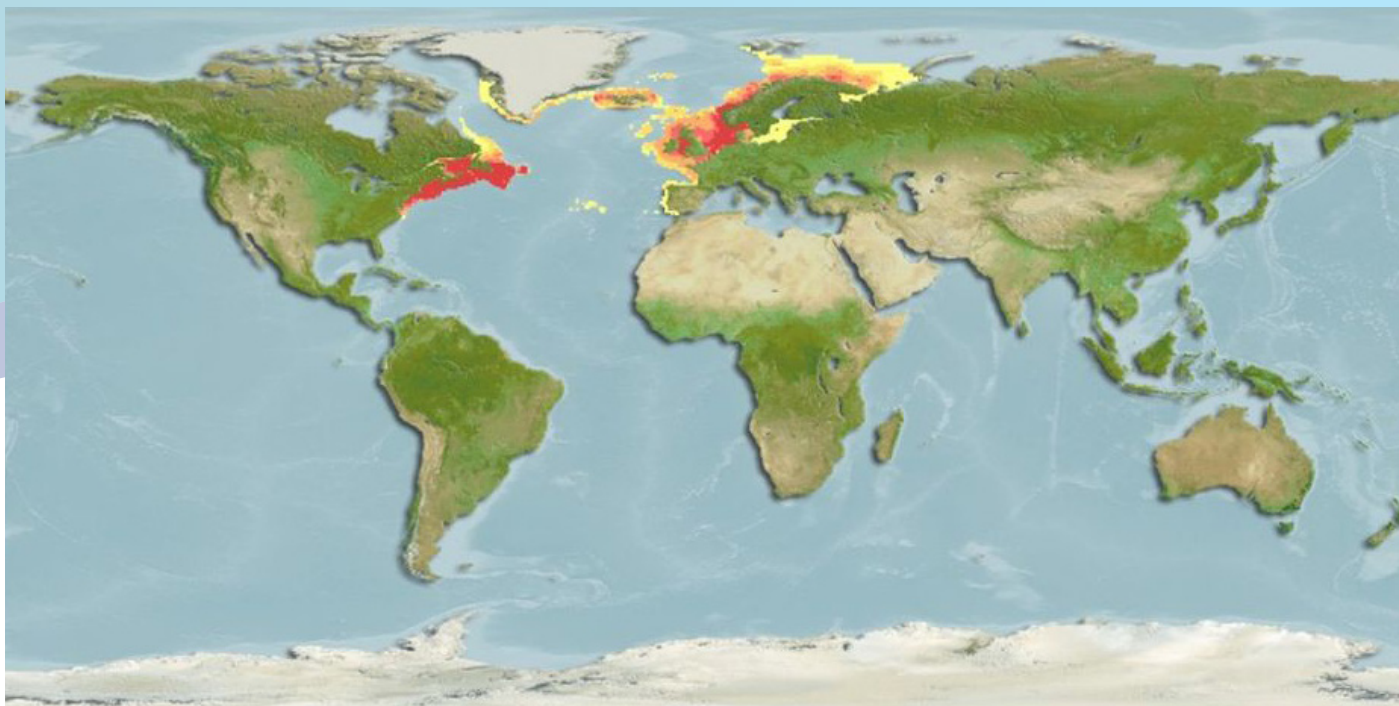
### Introduction

The haddock is a demersal gadoid found throughout the North Atlantic. Adults are found more commonly from 80 to 200 m, over rock, sand, gravel or shells, usually at temperatures between 4° and 10°C. They feed mainly on small bottom-living organisms including crustaceans, molluscs, echinoderms, worms and fishes (Scott 1988). They may also feed on herring spawn, which being laid in benthic mats provides a rich source of energy.

The Irish Sea haddock stock is mainly distributed in the west and south of the Isle of Man, preferring the coarser seabed sediments around the periphery of the muddy Nephrops grounds. Juveniles are taken extensively in the otter trawl fisheries in these areas, leading to substantial discarding (ICES 2015).

Spawning typically occurs in marine waters between 50 and 150 m depth. Spawning occurs between February and May in the Irish Sea, with the main spawning area in the western Irish sea (Armstrong et al. 2011). The young larvae and juveniles feed on copepods and naupli before advancing to crustacea (Rowlands et al. 2008).

Knowledge of basic biology of Irish Sea haddock is expanding through data on growth, maturity and distribution obtained during trawl surveys. Patterns of movement within the Irish Sea and between the Irish Sea and surrounding areas are poorly understood, and it is assumed that the Irish Sea stock is essentially self-sustaining at present. Trends in length and weight-at-age in the stock over time are apparent and reduced growth appears to have coincided with the growth of the stock. This may represent density-dependent growth effects (although other environmental factors may contribute) that will affect any forecast and lead to overoptimistic forecast estimates unless correctly predicted (ICES 2014). Haddock is characterized by sporadic high recruitment even at low spawning-stock levels making any relationship difficult to define. Recent trends within the Irish Sea haddock stock showed that an increase in spawning-stock biomass depends on these impulses of high recruitment, i.e. recruit-stock. (ICES 2014)



Reviewed distribution maps for *Melanogrammus aeglefinus* (Haddock), with modelled year 2100 native range map based on IPCC A2 emissions scenario. [www.aquamaps.org](http://www.aquamaps.org), version of Aug. 2013. Web. Accessed 28 Jan. 2016.

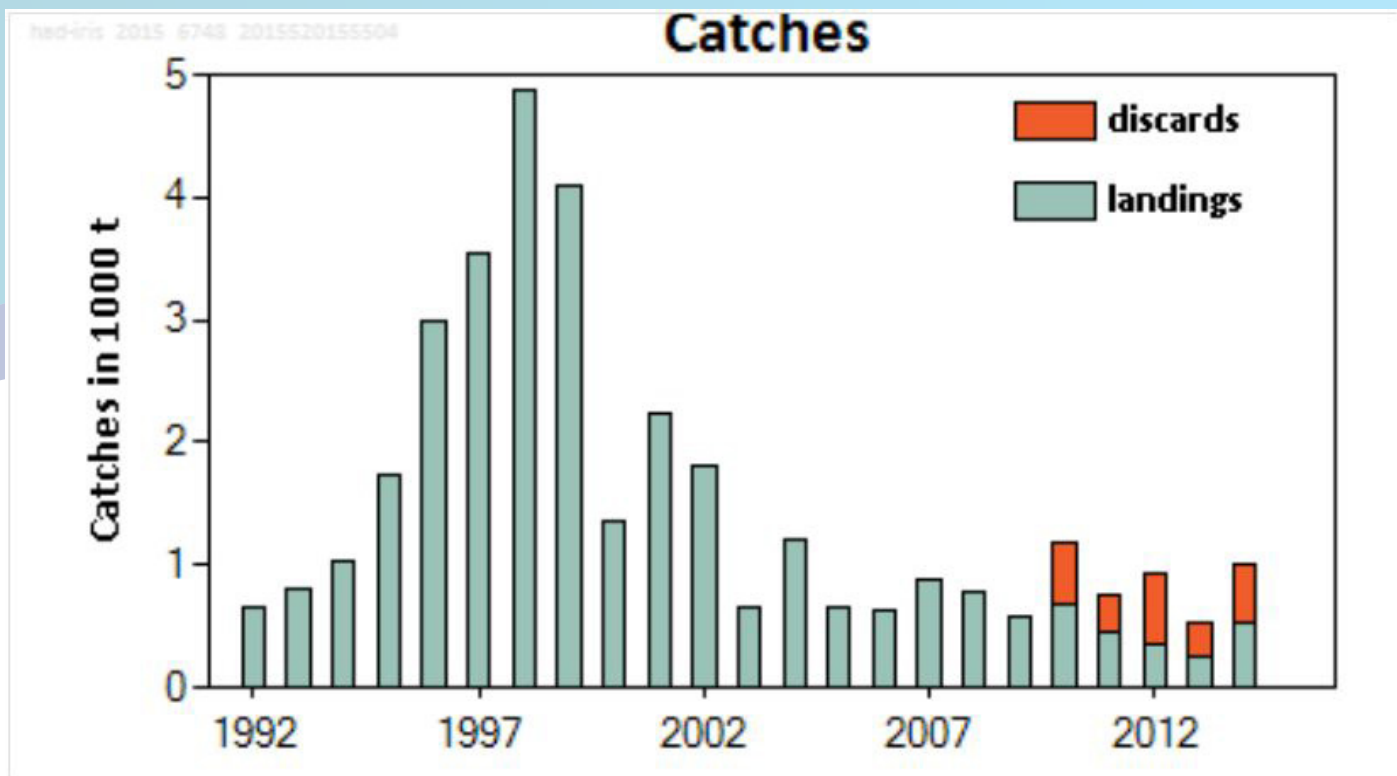
## Stock Status

ICES advises that when the precautionary approach is applied, catches in 2016 should be no more than 1072 tonnes. If this stock is not under the EU landing obligation in 2016 and discard rates do not change from the average of the last three years (2012–2014), this implies landings of no more than 481 tonnes (ICES 2015).

The assessment is indicative of trends. The spawning-stock biomass (SSB) has been fluctuating due to incoming year classes. The recruitment in 2014 is among the highest in the time-series, resulting in an SSB increase in 2015.

## Fishery

Following decades of very low recruitment and biomass, as indicated by very low fishery catches, this stock grew substantially in the 1990s following sudden pulses of recruitment, and has gone from a minor bycatch species to one of the most economically valuable target species in the Irish Sea (ICES 2014). Directed fishing for haddock in the Irish Sea is mainly carried out by UK (Northern Ireland) midwater trawlers, particularly targeting aggregations that can be detected acoustically. These conditions prevail mainly during winter and spring when the hours of darkness are longest, and the fish are aggregating on the spawning grounds in the western Irish Sea. Bycatches of haddock are made in the UK (NI) and Irish Nephrops fisheries.



Haddock catches and discard estimates (ICES 2014)

## Summary of life history and habitat parameters

Species: <i>Melanogrammus aeglefinus</i> (Haddock)				
Life Stage	Size and Growth	Habitat	Substrate	Temperature
Eggs	Haddock eggs 1-1.8mm.	Early stage eggs are buoyant and found near the surface.	Pelagic	Peak spawning occurs when mean surface temperature is 2-10°C. Highest survival rate occurs at 4-10°C (mean 6°C). <sup>2</sup>
Larvae	3-15mm, Size at hatch ranges from 2 -5mm (mean 4 mm). Larval growth generally exceeds 0.2mm d-1 and appears to peak at about 0.5 mm d-1 in June. <sup>2</sup>	Distributed in upper 40m of water column, peak concentration 10-20m.	Pelagic	Larval growth positively correlated with temperatures of about 7-9°C, but may be suppressed at 4°C. Upper lethal = 10°C; lower lethal = 4°C. <sup>2</sup> Field growth max7°C <sup>3</sup>

Species: <i>Melanogrammus aeglefinus</i> (Haddock)				
Juveniles	Remain semi-pelagic until 78mm <sup>4</sup>	Pelagic until settlement on mixed strata. Intermediate depths. Associated with seasonal gyre in Western Irish Sea <sup>5</sup>	Demersal at settlement. Prefer Pebble gravel bottom. <sup>2</sup>	Occur at 4.5-11.0°C. <sup>2</sup>
Adults (feeding)	Mean Llyc = 80.0 cm <sup>3</sup>	Adults are found more commonly from 80 to 200m Brittle star beds <sup>4</sup>	Demersal. Selective as to type of substrate: chiefly broken ground, gravel, pebbles, smooth hard sand and smooth areas between rocky patches. <sup>2</sup> Hard grounds, sand and mud, gravels <sup>4</sup>	Occur at 0-13°C, but are most abundant at 2-9°C and prefer 4- 7°C; mortality at < 1°C; avoid >10°C. <sup>2</sup>
Adults (Spawning)	Mean Llyc = 80.0 cm. Maturity-at-age is considered 0 at age 1, 0.72 at age 2, .97 at age 3 and fully mature at age 4+. <sup>3</sup>	Spawning restricted mainly to western Irish Sea in waters >50m. Spawning occurs later than cod	Pelagic. No extreme migrations, only short inshore/offshore movements. <sup>2</sup>	Spawn at 2-7°C, optimum is 4-6°C. <sup>2</sup>

Fishbase<sup>1</sup>; (Cargnelli et al. 1999)<sup>2</sup>; (ICES 2014)<sup>3</sup>; (Bergmann et al. 2004)<sup>4</sup>; (Dickey-Collas et al. 1997)<sup>5</sup>

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