CEFAS
The Centre for Environment, Fisheries & Aquaculture Science

FISHERIES INFORMATION - ANGLERFISH, HAKE AND MEGRIM IN THE SOUTH WEST OF THE BRITISH ISLES

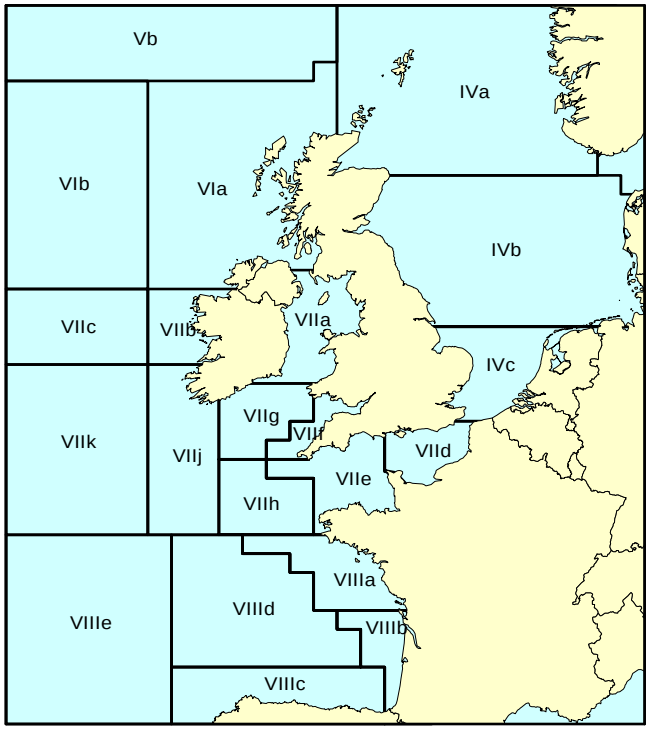
Funded by EU Study Contract 99-009
IMPROVING SAMPLING OF WESTERN AND SOUTHERN EUROPEAN ATLANTIC FISHERIES
- SAMFISH-

July 2000

This leaflet gives up-to-date information on the fisheries and stock status of three commercially important fish, anglerfish, hake and megrim, which are predominantly caught to the south west of the British Isles. There are two species of anglerfish caught in this area– white anglerfish *(Lophius piscatorius)* and black anglerfish *(Lophius budegassa)* – but they are not usually separated by species in landings and consequently the Total Allowable Catch (TAC) is for both species combined. Nevertheless, each species is assessed separately, using data calculated on the basis of species composition in biological samples taken from various fisheries. There are also two species of megrim landed. Megrim *(Lepidorhombus whiffiagonis)* is much more common than the "four-spot megrim" *(Lepidorhombus boscii)*, and only the former is assessed. There is only one species of hake *(Merluccius merluccius)* in European waters, and here we deal only with the northern stock, found in the Celtic Sea, west of Ireland, the English Channel and northern Bay of Biscay. Assessments of all these stocks are carried out in September of each year by the International Council for the Exploration of the Sea (ICES), using the numbers of fish at each age in international landings, commercial catch rates in relation to fishing effort, and data from trawling surveys.

Anglerfish are an important component of the mixed fisheries to the west of Britain and in the northern Bay of Biscay, which also take hake, megrim, sole, cod, plaice and *Nephrops*. A trawl fishery for anglerfish by Spanish and French vessels developed in the Celtic Sea and Bay of Biscay in the 1970s and 1980s. There has also been an expansion of the gill net fishery during the last decade in the Celtic Sea and the northern Bay of Biscay, mainly by vessels based in Spain fishing in medium to deep water.

The three main gear types used by vessels fishing for **hake** are otter-trawls (all countries), fixed-nets (England & Wales, Spain and France) and lines (England & Wales, Spain). Hake are caught throughout the year, the peak landings being made in the summer months. By-catches of mainly juvenile hake are taken in the *Nephrops* fisheries of northern Biscay.



Most UK landings of **megrim** are made by beam trawlers fishing in ICES Divisions VIIe,f,g&h. Otter trawlers account for the majority of Spanish landings from Sub-area VII, the remainder being taken by gill netters prosecuting a mixed fishery for anglerfish, hake and megrim on the shelf edge at about 200 m depth, to the south and west of Ireland. Irish megrim landings are largely made by multi-purpose vessels fishing in Divisions VIIb,c&g for cod and whiting, as well as plaice, sole and anglerfish.

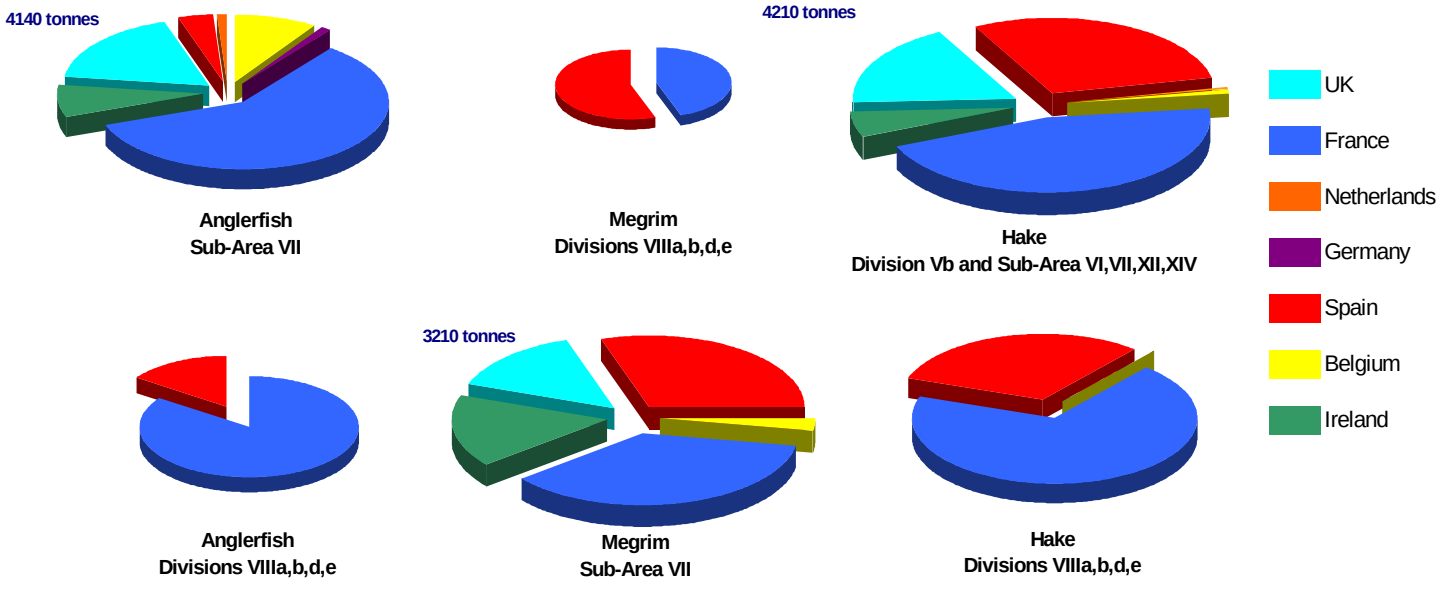
Technical measures in force

The minimum mesh size for beam and otter trawlers is 80 mm in Sub-area VII and 65 mm in Sub-area VIII (Bay of Biscay) . The minimum mesh size for *Nephrops* trawlers is 70 mm in Sub-area VII and 55 mm in Sub-area VIII. *Nephrops* trawlers using "separator trawls" in Sub-area VIII are allowed to use a top cod-end of 65 mm and a bottom cod-end of 50 mm.

The minimum landing sizes

Anglerfish	no restriction
Hake	27 cm
Megrim	20 cm

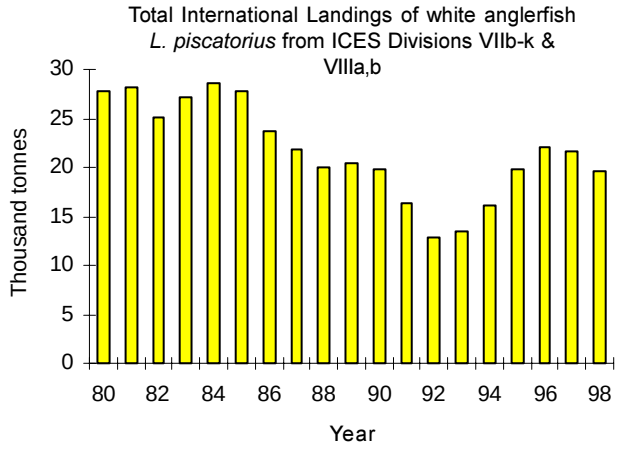
2000 UK quota and other Member States' share of the TAC as decided by the EU Council



ANGLERFISH in ICES Divisions VIIb-k and VIIIa,b

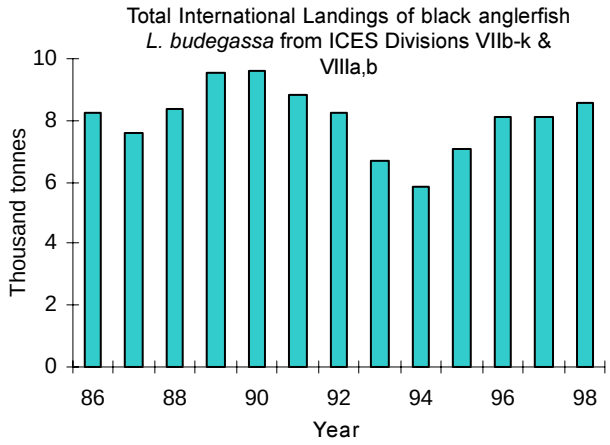
Fishing activity by UK gill-netters and beam trawlers which take anglerfish has remained relatively stable, but otter trawling in medium and deep water has increased throughout the 1990s. Spanish and French trawl effort in Sub-area VII appears to have declined in recent years, although the adoption of twin trawls by some French vessels may have increased the overall effiency of the French fleet. Belgium landings of anglerfish are exclusively by beam trawlers.

Anglerfish landings from ICES Divisions VIIb-k and VIIIa,b comprise two species - white and black anglerfish.



In recent years, France and Spain have reported more than 70% of the total landings of white anglerfish, the remainder being taken by the UK (13%), Ireland (10%) and Belgium (5%). The total international landings declined from 1984 to 1992, but have since increased and remained stable in recent years. Otter-trawls (the principal gear used by French, Spanish and Irish vessels) take about 80% of the total landings, while around 60% of UK landings are by beam trawlers and gill netters, the remainder being landed by otter trawlers.

In recent years, France and Spain have reported more than 80% of total landings of black anglerfish, the remainder being taken by Ireland (around 10%), the UK (5%), and Belgium (less than 1%). Otter trawlers take over 95% of total international landings, which peaked in 1990 and then declined to a low in 1994 before stabilising in recent years at around 8000 t.



The anglerfish stock

White anglerfish are distributed in the north-eastern Atlantic, from the south-western Barents Sea to the Atlantic coast of Spain. Black anglerfish have a more southerly distribution, ranging from the British Isles in the north to Senegal in the south.

Little is known about the location and timing of spawning of either species. Eggs are released in long gelatinous ribbons and these have been recorded in March on the shelf edge in the Celtic Sea, and have also been observed off the Scottish and Cornish coasts between May and July. Juveniles have been caught both in deep water and along the shoreline, and discrete nursery areas have not been identified.

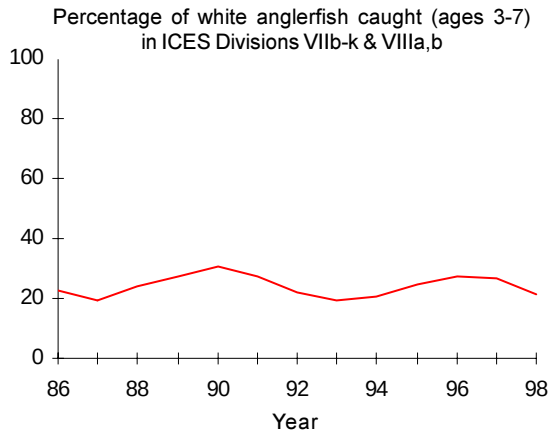
Advice given by ICES Advisory Committee for Fisheries Management in October 1999

ICES considers that these stocks are being harvested outside safe biological limits. The spawning stock biomass (SSB) of both stocks decreased continuously from 1986 until 1993–1995, but have since increased to above the proposed respective biological reference levels. Fishing mortality in 1998 was estimated to be below the average for the time series but still above the proposed precautionary reference level .

ICES recommends that fishing mortality be reduced to below the proposed precautionary reference level for both species. This can be achieved by reducing fishing mortality by at least 20%, corresponding to landings of less than 22,300 t in 2000 for both species combined (14,300 t *L. piscatorius* and 8,000 t *L. budegassa)*. This should bring both stocks to within safe biological limits.

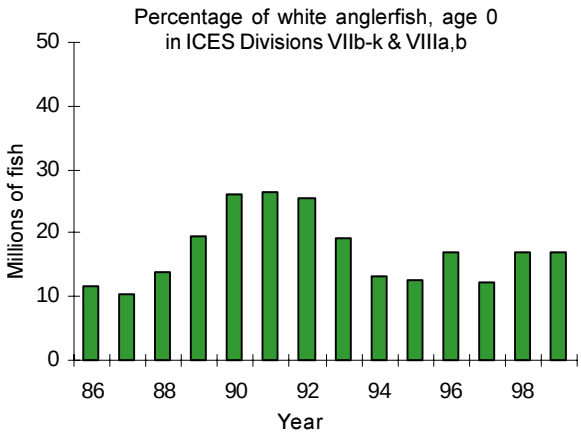
EXPLOITATION

The proportion of the white anglerfish (ages 3 to 7) population caught annually (fishing mortality) has fluctuated at around the level observed in the mid 1980s.



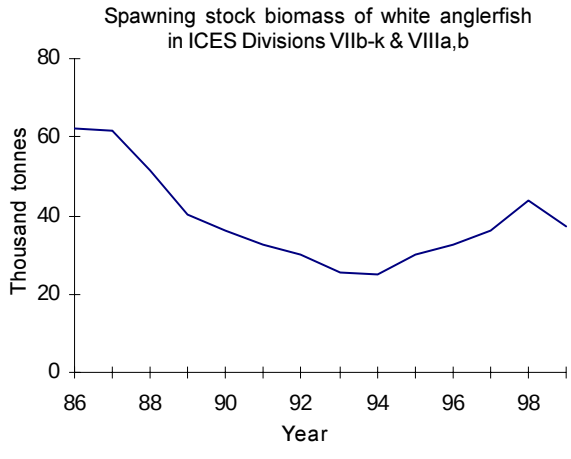
RECRUITMENT

Following high recruitment in 1990-92, there has been a succession of year classes of average abundance.



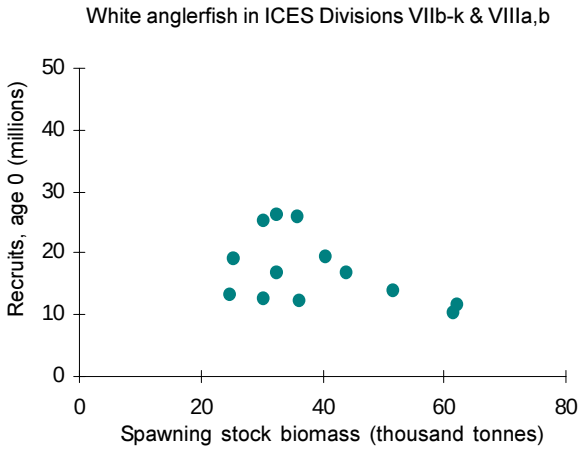
SPAWNING STOCK BIOMASS

The spawning stock biomass (SSB - the weight of all mature fish) of white anglerfish in VIIb-k & VIIIa,b declined until 1994 as a consequence of low recruitment and increasing fishing mortality but has since recovered due to above average recruitment in 1990-92.



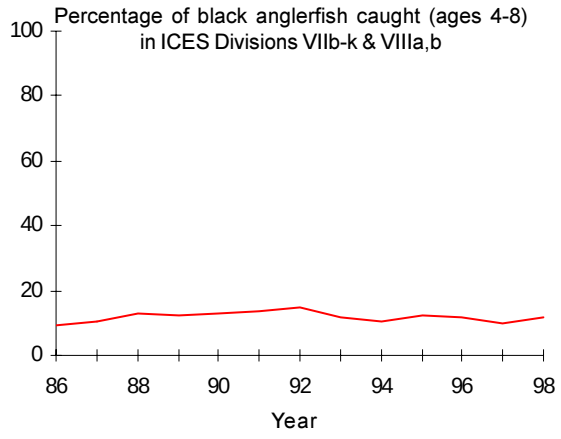
STOCK AND RECRUITMENT

There is no evidence of reduced recruitment of white anglerfish at the lowest SSB levels observed in the short time period for which data are available.



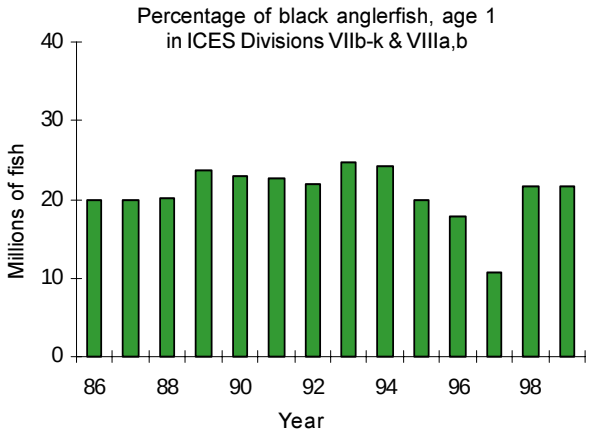
EXPLOITATION

The proportion of the black anglerfish (ages 4-8) population caught annually (fishing mortality) has been stable throughout the period 1986 to date.



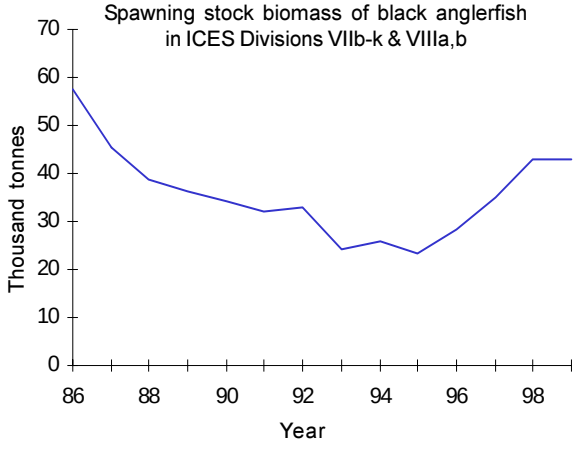
RECRUITMENT

Recruitment in recent years has been stable, apart from a particularly poor year class spawned in 1996.



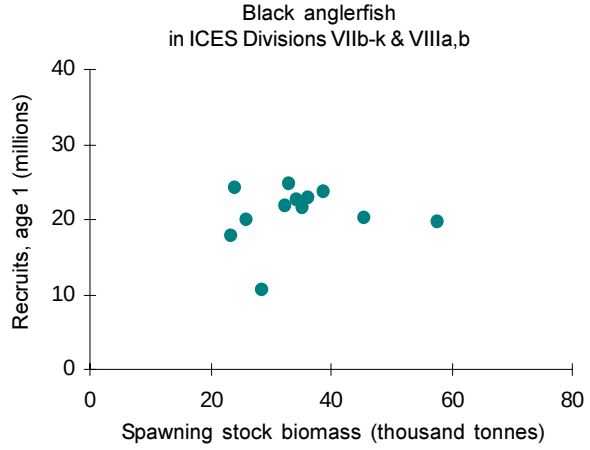
SPAWNING STOCK BIOMASS

The spawning stock biomass (SSB - the weight of all mature fish) of black anglerfish in VIIb-k & VIIIa,b declined until 1995 and has since increased to a level above the average for the time series.



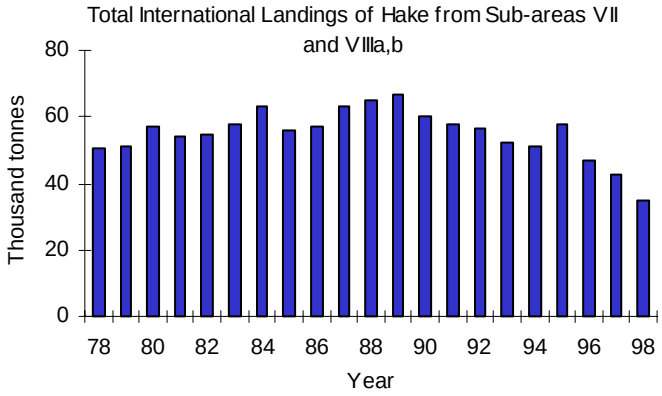
STOCK AND RECRUITMENT

There is no evidence of reduced recruitment of black anglerfish at the lowest SSB levels observed in the short time period for which data are available.



NORTHERN HAKE STOCK

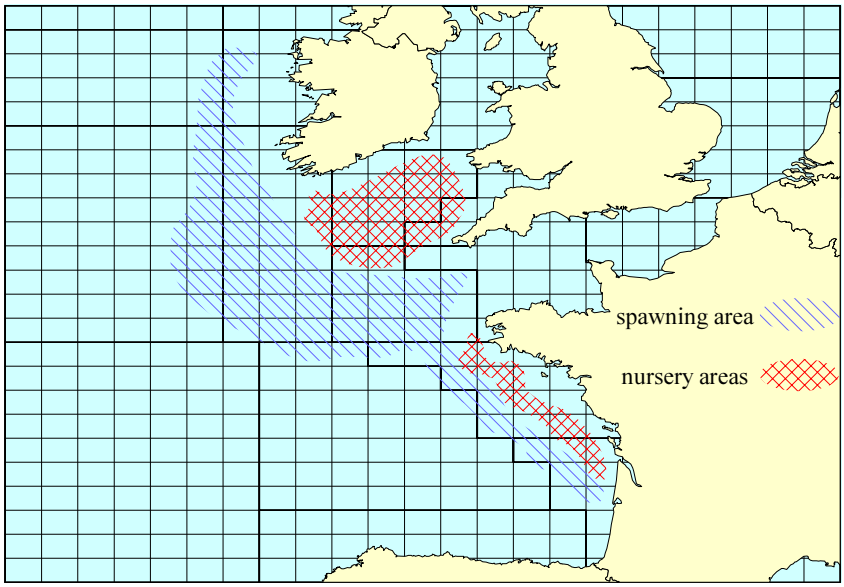
The fisheries taking hake to the south and west of the British Isles mainly involve vessels from Spain and France, which take 55% and 25% of the landings from ICES Sub-area VII & Divisions VIIIa,b respectively. England, Wales, Scotland and Northern Ireland together report about 10% and Ireland 5% of the landings. Landings increased in the late 1980s, but have since declined.



The hake stock

Hake spawn from March through to July along the shelf edge, in depths of between 120-160 m, the main areas being to the south and west of Ireland.

Hake larvae appear to be most abundant along the shelf edge from southern Ireland to the southern Bay of Biscay, where they descend to the seabed (at depths in excess of 200 m) at a length of approximately 4 cm to begin their demersal existence. They move to shallower water (75-120 m) by September and, as one-year-old fish, hake appears to favour habitats with muddy substrates. Two major nursery areas are recognised: one in the Bay of Biscay and one off southern Ireland. When three years old, hake tend to be found in the shallower regions of the Bay of Biscay and Celtic Sea, but as they approach maturity they disperse to offshore regions. Male hake mature at 3-4 years old (27-35 cm) and females when 5-7 years old (50-70 cm).



Advice given by ICES Advisory Committee for Fisheries Management in October 1999

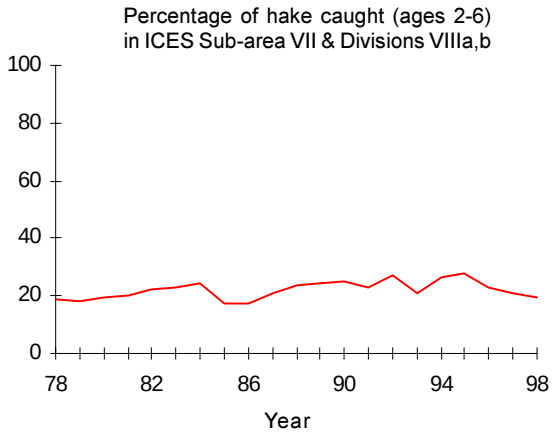
ICES considers that the the northern hake stock is outside safe biological limits. Although fishing mortality has declined during the mid 90s, it remains above the proposed precautionary reference level. SSB declined until the mid 1990s, since when it has remained below the proposed biological reference level. Recruitments in the two last years are the lowest recorded.

In order to prevent a further decline in SSB in the short term, ICES recommends a reduction in fishing mortality of at least 50%, corresponding to landings of less than 20,000 t in 2000. A recovery plan should be implemented for this stock in order to give a high probability of SSB exceeding the biological reference level in the next 5 years. This is not likely to be achieved without at least a 50% reduction in fishing mortality.

Compliance with technical measures regarding mesh sizes of trawls and minimum landing size is known to be poor.

EXPLOITATION

The proportion of the hake (ages 2 to 6) population caught annually (fishing mortality) increased from 1986 to 1995, and has since declined. This does not take into consideration the high exploitation rate of juvenile fish which are discarded from some fisheries.



RECRUITMENT

The abundance of juvenile hake has been relatively stable through the time series until 1996. However, both the 1997 and the 1998 year classes are estimated to be the lowest observed over the period of this assessment.

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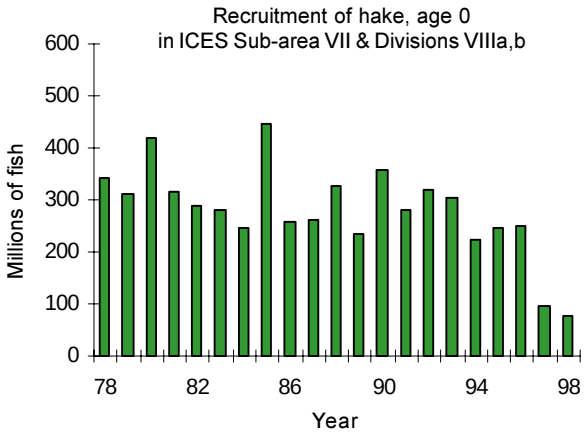
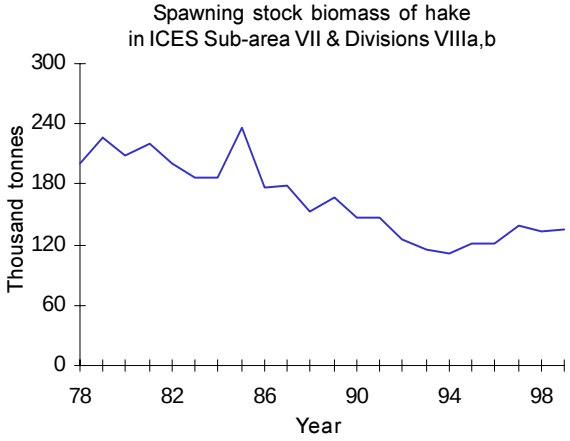


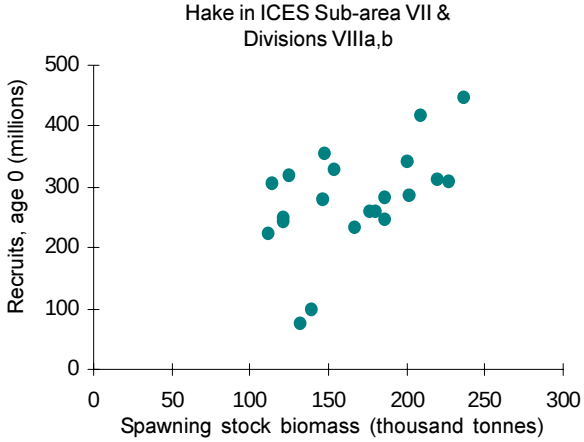
SPAWNING STOCK BIOMASS

The spawning stock biomass (SSB – the weight of all mature fish) of Northern hake decreased continuously between 1985 and 1994 to the lowest observed level. SSB has recovered slightly in recent years but still remains low.



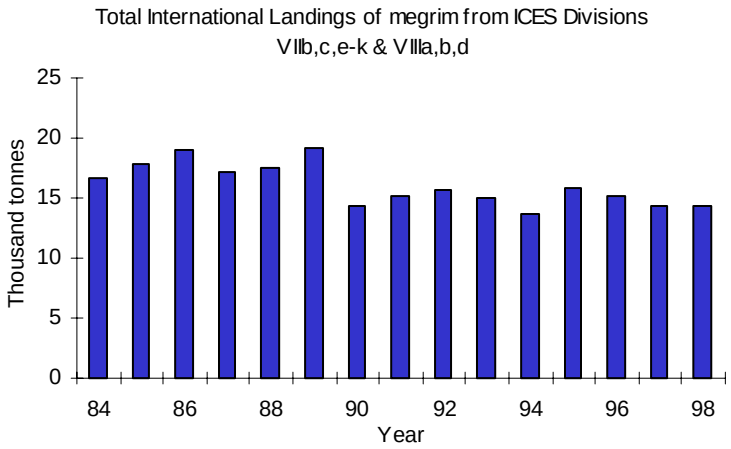
STOCK AND RECRUITMENT

The relationship between the abundance of spawning adults and subsequent recruitment of young hake indicates reduction in recruitment at lower levels of SSB.



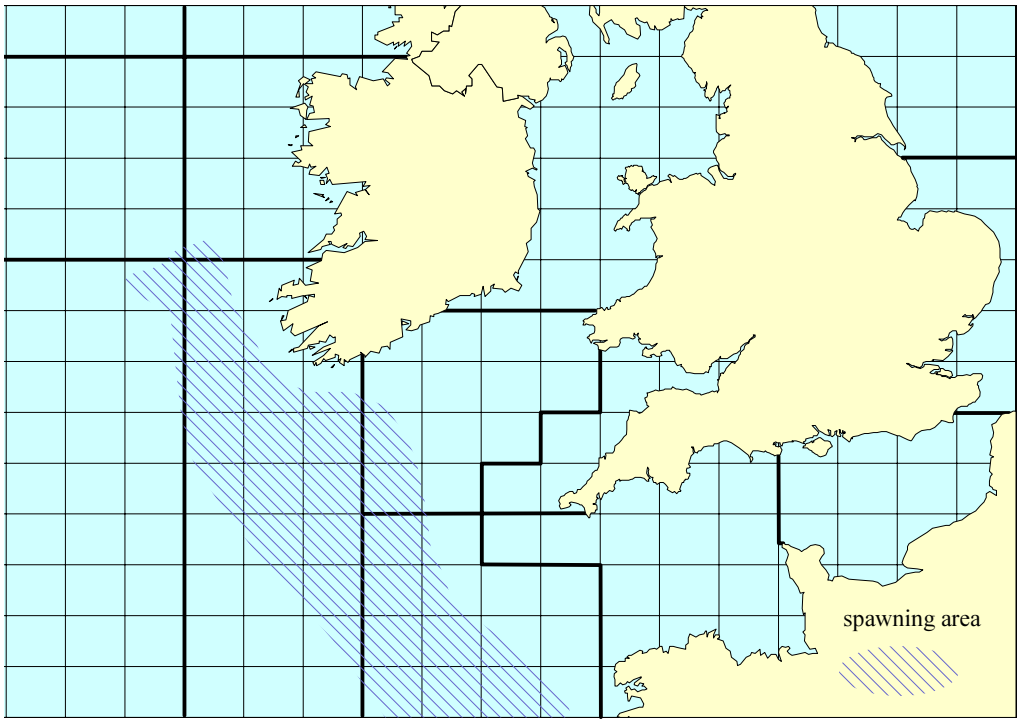
MEGRIM in ICES Divisions VIIb,c,e-k &VIIIa,b,d

Megrim to the west of Britain and in the Bay of Biscay are caught predominantly by Spanish, French, Irish and UK demersal trawlers. In recent years, France and Spain have reported around 60% of the total landings from ICES Divisions VIIb,c,e-k and VIIIa,b,d. For most fleets, megrim is taken as a by-catch with hake, anglerfish, *Nephrops*, cod and whiting. Megrim landings declined slowly over the period 1986-1997. Discards are estimated to be about 15% of the catches by weight.



The megrim stock

Megrim are widely distributed over the whole of sub-areas VII & VIII and are most abundant in the deeper waters of the continental shelf. Spawning takes place between January and April along the edge of the continental shelf to the southwest and west of the British Isles. Little is known about the distribution of juvenile megrim, although research vessel trawling surveys indicate that they do not move far from the spawning grounds on the shelf edge during their first year.



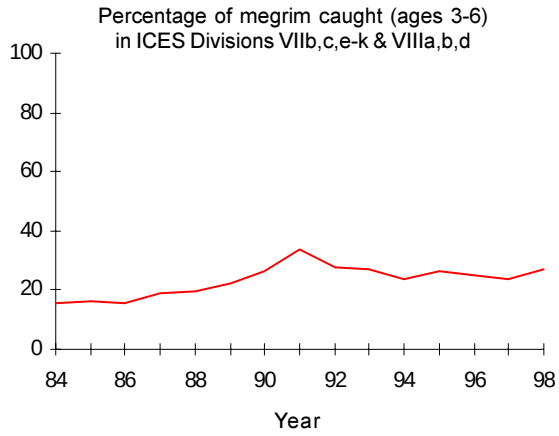
Advice given by ICES Advisory Committee for Fisheries Management in October 1999

ICES considers that the the megrim stock is harvested outside safe biological limits. SSB declined until 1990 and has been stable above the proposed biological reference level since then. The fishing mortality has declined from the 1991 peak, but remains at or above the proposed precautionary reference level. Recruitment has been relatively stable.

ICES recommends that fishing mortality should be reduced to below the proposed precautionary reference level, corresponding to landings of less than 13,500 t in 2000. Taking into account a 5% contribution of *L. boscii* in the landings, the equivalent TAC for the two species combined would be 14,200 t.

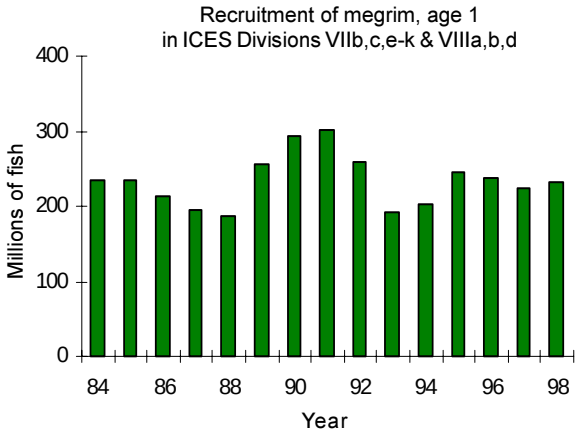
EXPLOITATION

The proportion of the megrim (ages 3 to 6) population caught annually (fishing mortality) increased steadily during the late 1980s and reached a peak in 1991. Since then, fishing mortality has stabilised at a higher level than observed prior to 1989.



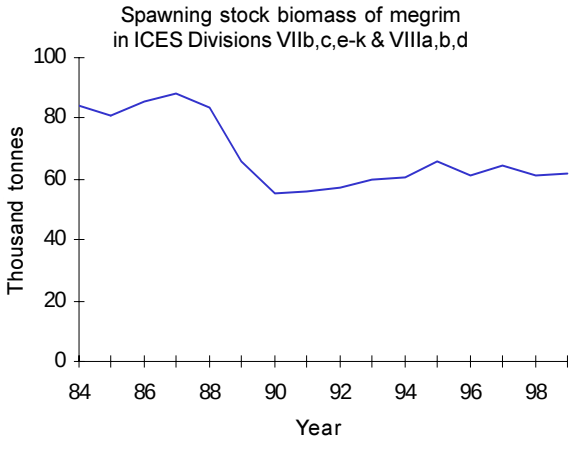
RECRUITMENT

Following the good year-classes of 1988-1991, levels of recruitment of juvenile megrim in VIIb,c,e-k & VIIIa,b,d have been close to the long-term average in recent years.



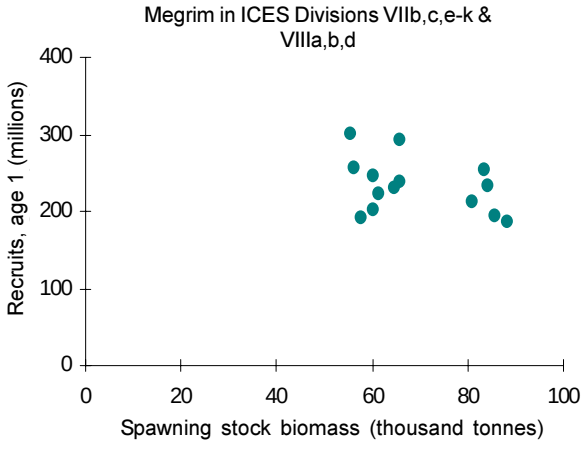
SPAWNING STOCK BIOMASS

The spawning stock biomass (SSB- the weight of all mature fish) of megrim in VIIb,c,e-k & VIIIa,b,d fell to an historic low level in 1990-1991, since when it has shown a slight recovery.



STOCK AND RECRUITMENT

There is no evidence of reduced recruitment of megrim in VIIb,c,e-k & VIIa,b,d at the lowest SSB levels observed in the short time period for which data are available.



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