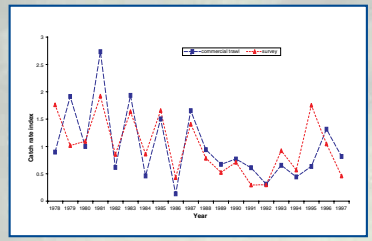
ASSESSING THE STATE OF NORTH SEA COD

In order to provide advice on managing a fish stock such as cod in the North Sea, scientists need to assess the current and historical abundance of the population and estimate the proportion of the population removed by fishing, the fishing rate. They can then assess the implications on the stocks of different TAC options for the coming years.

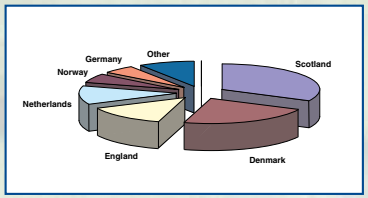
Estimating historical stock abundance

Commercial and research vessel survey fleets from a number of countries are used to indicate trends in stock abundance over time. All indicate that cod stocks have declined since 1980.



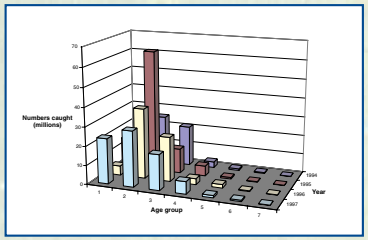
Landings

Although the catch rates provide a relative measure of stock abundance, the absolute numbers in the stock can only be calculated by scaling up to the total amount of fish caught. Information on the total weight caught is collected by all countries participating in the fishery.



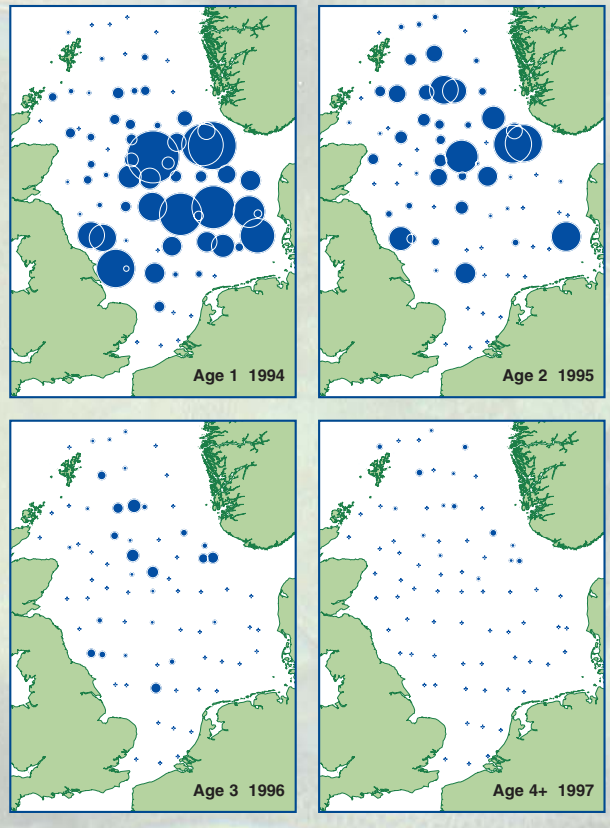
Age compositions

As well as the total landed weight, scientists need to know the numbers of fish caught at each age. In 1997, eight countries which caught 90% of the cod, took 175,000 length measurements and aged 35,000 cod. The numbers of fish at each age in the samples were raised to the total catch.



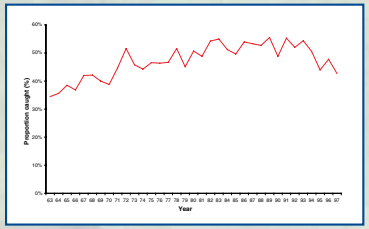
Decrease in numbers at age

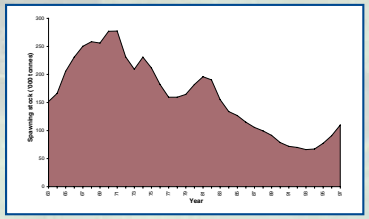
In North Sea cod, few fish survive to age 4 or older and this immediately indicates that fishing is at a high level



Estimating levels of fishing

The catch at age data can be converted into estimates of population size using catch rates from commercial and survey fleets to calibrate the results. The proportions of fish caught annually can also be calculated.



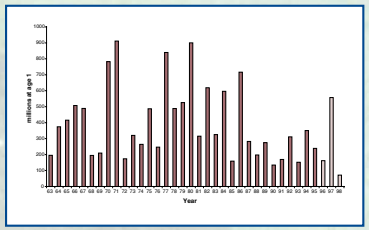


Predicting future catches

The amount of fish caught in future years will depend on

- the level of fishing activity
- the numbers of fish in the current stock
- the "recruitment" of young fish into the fishery.

Managers can get advance warning of the level of recruitment from research vessel surveys and use this to adjust the prediction of catch for up to two years ahead.



The Centre for Environment, Fisheries and Aquaculture Science (CEFAS), Pakefield Road, Lowestoft, Suffolk, NR33 0HT, UK http://www.cefas.co.uk

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