

## NORTH HAKE STOCKS RECOVERS

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North hake fishery (West Scotland and West Ireland, Grand Sole, Biscay Bay) has always been very special in my career. My first studies as fishery biologist in the IEO Laboratory of La Coruña started with this fishery in 1973, 35 years ago, and I have measured thousands of fish during the night landings in the La Coruña fish market. Many year classes were incorporated (and left) the stock since.

In those years total catches were higher than 70 000 t. In the seventies and eighties the spawning stock biomass was well above 200 000 t. However, in the nineties and in the beginning of this century the stock decreased to the lowest level ever recorded, which is considered as a reference point of limit biomass: values lower than this level will produce a high probability of low recruitments, and thus resulting in a progressive worsening of the stock.

In order to recover the stock the EU launched an emergency plan in 2001, followed by a recovery plan in 2004. Its objective was to reach at least 140 000 t, which is the reference point adopted as precautionary biomass. Values higher than this point will produce a high probability of normal or high recruitments.

These EU plans have produced already good results, as it is indicated in the last ICES ACFM report and in the report of the ICES working group that deals with this stock (available in [www.ices.dk](http://www.ices.dk)). These reports indicate that hake stock is recovering, as it is stated in the following conclusions:

1. Hake stock biomass has steadily increased during the last 8 years (since 1999) from 95 000 t to 150 000 t, which means an increase higher than 60%. Current stock biomass is over the precautionary biomass level.
2. Fishing mortality has decreased since 1994-1995 from ca. 0.4 to a value slightly over 0.2 in 2006.
3. This decrease of fishing mortality is a consequence of the evolution of the fishing effort on hake during the latter 20 years. As an example, the fishing effort of the trawl fleet of La Coruña, which is the main one targeting hake, decreased from 80 000 days/100 HP in 1985 to 20 000 days/HP in 2006. Although fleets from other EU countries have grown in this period, the Spanish fleet (the most important one in this fishery) has decreased from more than 400 vessels (trawlers, gill-netters and long-liners) in 1985, to 300 in 1986 (Accession Treaty) and to 182 nowadays.
4. Catch per unit effort (CPUE) of hake has increased from 20 kg/day/100HP in 1985 to 40 kg/day/100HP in 2000, which means a rise of 100% of the biomass index of this stock. These values are calculated from fleet controls in each vessel and each trip, as performed in La Coruña, Ondárroa and Pasajes ports.

5. Average length of landings has increased in the recent years from a little less than 30cm to more than 40cm, which indicates an improvement of the exploitation pattern as a consequence of higher selectivity of the trawling gear. It also reveals a better stock structure, because it occurs in the landings of every gear and every country.
6. Predictions obtained from analysing the evolution of the population indicate that if the recovery plan continues in 2008, a total catch of 54 000t (TAC recommended by ICES) could be obtained, and spawning biomass will continue increasing to reach 160 500t in 2009.
7. Mid-term predictions indicate that if the same exploitation level (fishing effort) and exploitation pattern are maintained (metiers, mesh), spawning stock biomass will keep a progressive increase, at least until 2014.
8. The same analyses predict that if the above mentioned conditions are maintained, the fishing mortality index will continue decreasing from the current level (which is about the precautionary level of 0.25).
9. The current state of the stock and the ICES scientific recommendation for 2008 agree with the recovery plan, and moreover they are within the precaution limits defined in the ICES biological reference points (fishing mortality in agreement with the precautionary approach,  $F_{pa} = 0.25$ ; spawning biomass from precautionary approach,  $B_{pa} = 140\ 000t$ ).
10. This exploitation level seems also adequate for other commercially important species of this mixed fishery, such as monks, megrims and Nephrops. Their stocks show some stability and it is recommended not increasing the fishing effort. There is no doubt that the hake recovery plan and the historical evolution of fishing effort will also benefit these stocks.

EU Commission will continue giving regulations in order to improve the stock to reach levels of Maximum Sustainable Yield (MSY) in 2015, and thus accomplishing the commitment assumed by EU after the Johannesburg Summit of United Nations for Sustainable Development for all fisheries. This will lead to a healthy stock of about 250000t and yearly stable catches around 63 000t, after successive restrictions of fishing activity. These regulations will be discussed during 2008.

In our opinion, as we tried to demonstrate in the above paragraphs, the evolution of the stock and its outlook are positive if no successive weak recruitments occur (originated by unpredictable oceanographic variations). The occurrence of several successive weak recruitments is very unlikely at the light of the state of the spawning stock and its predicted mid-term evolution.

We believe that it is necessary to continue monitoring the fishery by means of annual assessments, analysing the evolution of the fishing mortality index, the spawning stock biomass and the yearly recruitments, and managing the fishery according these results.

At the same time, hopefully the growth pattern of this species will be soon clarified. Hake growth has been object of a great controversy in recent years, and it can largely affect the absolute results of the assessments and consequently the objective reference points may change to a great extent, including the maximum sustainable yield and its corresponding optimum fishing mortality.

During the next years it seems likely that the main problems to the fishery will be related more to the cost-effectiveness of the exploitation rather than the state of the resources. The continue increase of fuel costs and the stability of first sale prices, largely affected by the growing imports of other species of *Merluccius* from long distance fisheries, can still produce new reductions of fishing capacity on European hake in the Northeast Atlantic. In consequence, probably the way to a MSY could be reached without any further restrictions from the fishing authorities.

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