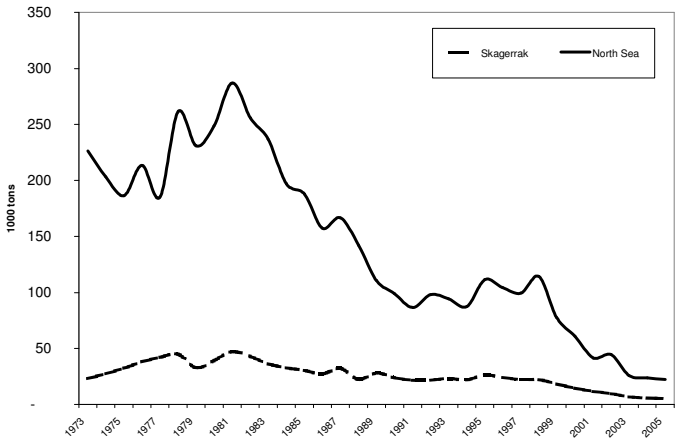
Cod and Mixed Fisheries in the North Sea

Cod on the path to extinction

The cod stocks in the Atlantic have been under immense fishing pressure for decades. The best known collapse of a cod stock is certainly the one of 1992 in the Grand Banks in the Northwest Atlantic, which left 40,000 Canadian fishermen unemployed.[1]
The situation is similarly precarious for stocks on the eastern side of the Atlantic - most cod stocks here are heavily over-exploited with very few stocks still supplying satisfying volumes of catches. The North Sea cod stocks, including the Skagerrak have been hit particularly hard.[2]



Graph 1: Cod catches in the North Sea and Skagerrak from 1973 to 2005 (ICES)

With combined catches from these two areas exceeding 300,000 tons per year in the late 1970's and early 1980's, they have plummeted to around 30,000 tons in recent years. The year 2005, with only 28,000 tons, marked a historical low for cod catches in the two areas.[3] This was due to the precipitous decline of the cod spawning stock, sliding from 250,000 tons in the early 1970s to below 50,000 tons since 2000. As a consequence the EU's scientific advisory board, the International Council for the Exploration of the Sea (ICES) had to conclude, that this stock is 'over-exploited' and being 'harvested unsustainably'. For this reason ICES has recommended a zero quota to be implemented in both the Skagerrak and the North Sea every year since 2003.

Unfortunately just as routinely as ICES has recommended that the cod fishery be closed or that catches should be as low as possible, so has the EU Council ignored this advice. In recent years a combined quota for the two areas has been set at between 20,000 and 50,000 tons.

One reason why the European Council has chosen to ignore the ICES advice is that it faces a dilemma in that cod are fished within a 'mixed demersal fishery'. Apart from the set net fishery, cod is no longer fished by a targeted fishery in either the Skagerrak or the North Sea. Today, cod is one species taken by the bottom trawl fishery, that goes after every fish and crustacean fit for human consumption - including sole, plaice, other whitefish species and the Norwegian Lobster (*Nephrops norvegicus*). To implement a zero quota would require stopping all bottom trawling that takes cod.

Table 1: ICES advice on cod quota and quota finally agreed by the EU Council[4]

[1] WHEN FISHING GROUNDS ARE CLOSED, MPA NEWS Vol. 5, No. 2 August 2003 (http://depts.washington.edu/mpanews/MPA44.htm)
[2] See, e.g., ICES stock adivce October 2006 on Cod in Subarea IV (North Sea), Division VIId (Eastern Channel), and Division IIIa (Skagerrak)
[3] ICES catch statistics via FishStat
[4] EU Commission (http://ec.europa.eu/fisheries/publications/maps_en.htm) & ICES ADVICE 2006, Report of the ICES Advisory Committee on Fishery Management, Advisory Committee on the Marine Environment

Year	ICES advice		Agreed Total Allowable Catch (TAC)	
	Skagerrak	North Sea	Skagerrak	North Sea
2001	Lowest possible catch	Lowest possible catch	7.0	48.6
2002	Lowest possible catch	Lowest possible catch	7.1	49.3
2003	0	0	3.9	27.3
2004	0	0	3.9	27.3
2005	0	0	3.9	27.3
2006	0	0	3.3	23.2
2007	0	0	2.9	19.9

(Figures in thousands of tonnes)

Cod as a target in mixed fisheries

Fishing for cod by Danish vessels is done primarily in a direct fishery for cod with set nets, and in a mixed demersal trawl fishery. Total Danish landings of cod from all areas in 2005 were 28,948 tons. These were supplemented by landings of foreign vessels amounting to 12,072 tons. The Danish catches of cod in the North Sea, and Skagerrak by method are listed in the box below.

Cod caught by Danish vessels in 2005

- **North Sea: 6 288 tons**
- 1958 tons caught by trawlers and 4330 tons by other fishing methods

- **Skagerrak: 3 020 tons**
- 1344 tons caught by trawlers and 1674 by other methods

Denmark, was the second largest fishing nation in the North Sea (ICES area IV) in 2005 accounting for 26% of the total catch of cod. The other major nations were the UK (33%) and Norway (12%). Cod in the Skagerrak is fished almost exclusively Denmark (81%).

Mixed fisheries

Demersal fisheries for human consumption usually either target a mixture of round fish species (cod, haddock, whiting), a mixture of flatfish species (plaice and sole) with a by-catch of round fish, or the “Norwegian Lobster” (*Nephrops norvegicus*) with a by-catch of round fish and flatfish[5].

The fishing grounds where demersal trawling takes place varies year to year and with seasons and is dependent on the location of the primary target species. As cod is widely distributed all over the North Sea, both juveniles and adults are at risk of being caught in the various demersal fisheries[6].

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and Advisory Committee on Ecosystems, 2006, Book 6 North Sea

[5] ICES WGNSSK report 2006, page 69

[6] ICES WGNSSK Report 2006 page 852

Why are mixed fisheries a problem?
Cod quotas are usually fished out long before the quotas on the other species that are targeted in the mixed fishery are reached. Fishermen will still catch cod as they continue fishing and as they cannot legally land these catches, they either discard the cod or land them illegally.

Another concern is the potential by-catch of small juvenile cod. Fishermen are not allowed to land the juvenile cod; hence the discard of these is substantial, especially in years with strong year classes coming in. This is a serious problem especially in most *Nephrops* fisheries, where the smaller mesh sizes lead to high by-catches of juvenile cod[7], though also in the demersal fishery for round fish, by-catch of juvenile cod occurs[8]. Once cod has been on the deck, they will not survive. Therefore discarded cod, which are not landed or subtracted from the quotas, represent a significant mortality to the cod stock, a stock that is already suffering from years of overfishing and mismanagement.

Gear used in mixed fisheries
In recent years, there has been increased concern about the decline of cod stocks in the North Sea and various technical measures have been introduced intended to stem the decline and aid recovery. To decrease the mortality on cod the EU increased the allowed mesh size to 120 mm in the demersal fishery targeting cod for human consumption in 2002[9]. That restriction has not had the desired effect. This can be partly explained by a reallocation of fishing effort from the mixed demersal fishery, to other fisheries where a smaller mesh size is allowed, and for which the limitation of number of days at sea are less restrictive. In particular there has been a shift to fishing *Nephrops* using nets with mesh sizes of between 70 and 90 mm. Fishing vessels targeting *Nephrops* are allowed more days at sea, compared to the mixed demersal fishery fishing which have to use nets with the larger mesh size[10]. The by-catch of cod in this *Nephrops* fishery has proven to be substantial, and ICES regards by-catch of cod as a major problem in most *Nephrops* fisheries, including that in the Skagerrak.[11]

The problem with current management is that it aims to manage each species separately; but as can be seen from the above, this is not possible. Fishing for one species clearly affects other species, and hence management and quota setting cannot be managed separately, as they are today.

Marine Reserves – the key to saving the cod

In order to save the cod from commercial extinction and ensure the long term survival of the fishing communities, a radical change in the way we manage our oceans is needed.

Implementing a zero catch quota for cod in line with the ICES advice must be introduced as an emergency measure, but won't in itself be enough to ensure healthy cod stocks into the future, for cod cannot be considered in isolation from other species and the wider marine environment. Current fisheries management, based on the management of single stocks and under the auspices of Europe's Fisheries Ministers, has failed. In order to rebuild the cod stocks and restore Europe's Seas, protection of the marine environment as a whole must be at the heart of the way we manage our seas.

The demise of the cod is symptomatic of a wider oceans crisis and their disappearance may have unforeseen effects on other species and vice versa. Ocean ecosystems are

[7] ICES advice on *Nephrops* Oct. 2006
[8] ICES WGNSSK Report 2006 section 14
[9] Commission Regulation EC 2056/2001
[10] ICES WGNNSK Report page 77
[11] ICES WGNSSK, section 3

complicated and little understood and the loss of one species may lead to much wider collapse. To ensure the entire marine ecosystem is kept healthy, we must adopt an ecosystem approach based on precaution.

In practice this will require the establishment of a network of large-scale, fully-protected marine reserves with a range of measures ensuring that fisheries and other activities in the surrounding waters are managed on a sustainable basis. These other measures will include the elimination of IUU fishing as a first step, reducing fishing capacity and phasing out destructive fishing gear.

Marine reserves are crucial to implementing the ecosystem approach for a number of reasons. Marine reserves, the equivalent of national parks on land, will protect vulnerable species and ecosystems, allow degraded ones to recover and provide valuable reference areas to see the effects of management measures implemented in the waters outside the reserves.

In the past there were many areas beyond the reach of humans that provided natural refuges, now with the development of new technology and ever more powerful fishing gear these no longer exist. By protecting spawning grounds and other key habitats, cod and other fish stocks have a chance to rebuild and may lead to enhanced catches outside the reserve boundaries.

Also, giving the ocean space to recover will also increase the resilience of marine ecosystems and individual species, such as the cod, to cope with environmental changes brought about by global climate change.

This year Environment Ministers across Europe have an opportunity to bring about these changes by ensuring that the new European marine law that is being developed (the Marine Strategy Directive) includes provisions to establish a network of marine reserves throughout Europe's Seas.

Greenpeace calls for 40% of the North Sea to be designated Marine reserves.