9.4.6 Northeast Atlantic spurdog

State of the stock

The stock is depleted. All experimental assessments indicate that the stock is at a record low level. The frequency of the occurrence of spurdog in trawl surveys has declined and, although large shoals are still caught, the frequency of these has also declined. Survey CPUE also indicates a declining trend. The absolute level of exploitation is unknown but the trends in fishing mortality and the continuous decline in landings indicates that exploitation has been, and continues to be well above sustainable levels.

Single stock exploitation boundaries

The stock is depleted and may be in danger of collapse. Targeted fisheries should not be permitted to continue, and by-catch in mixed fisheries should be reduced to the lowest possible level. The TAC should cover all areas where spurdog are caught in the northeast Atlantic and should be set at zero for 2007.

Exploitation boundaries in relation to high long-term yield, low risk of depletion of production potential and considering ecosystem effects

Spurdog are long-lived, slow-growing, have a high age-at-maturity, and are particularly vulnerable to fishing mortality. Population productivity is low, with low fecundity and a protracted gestation period. In the light of this, the risk of depletion of reproduction potential is high. It is recommended that exploitation of this species should only be allowed when indicators and reference points for stock status and future harvest have been identified and a management strategy, including appropriate monitoring requirements has been decided upon and is implemented.

Management considerations

A long-term management strategy for fisheries on this species would consist of an initial low fishery after the stock has recovered. This initial low fishery level should aim to identify harvest rates that are sustainable in the long term. A gradual expansion of the fishery from the initial low level should only be allowed if harvest rates that are sustainable in the long term are clearly identified and a management strategy has been identified and decided upon. Such gradual expansion should be accompanied by close monitoring, enabling adjustment of the management plan according to the outcome of the fisheries.

Based on tagging results spurdog in the ICES area is considered to be a single stock, ranging from the Barents Sea (ICES Subarea I) to Subarea IX in the south. The TAC area should be extended to cover the full stock distribution.

A large proportion of spurdog are taken as bycatch in mixed demersal trawl fisheries. TACs only regulate the landings. A low TAC on bycatch species could induce more discards. Discard survival is unknown. Because spurdog is caught as a bycatch in demersal fisheries, they would benefit from a reduction in overall demersal fishing effort.

Spurdog forms size- and sex-specific schools and these are subject to directed fisheries specifically targeting large females. Additional management measures which would deter the targeting of mature females could include, for example, a minimum landing length.

Ecosystem considerations

Spurdog is an important component of the pelagic and demersal ecosystems, preying on a variety of pelagic fishes, such as herring.

Factors affecting the fisheries and the stock

Regulations and their effects

There is no international agreement on a TAC that covers the full distribution of northeast Atlantic spurdog.
A TAC has been introduced for the EU waters of Subarea IV and Division IIa in 1999. This TAC has been reduced from 8870 tonnes in 2001 to 1051 tonnes in 2006.

Norway has a 70-cm minimum landing size, but it is not known if this is effective in reducing the exploitation of mature females.

Changes in fishing technology and fishing patterns

Landings increased to more than 60 000 tonnes in the early 1960s, when target fisheries took place in Scotland and Norway. Landings in the Norwegian directed longline fishery decreased during the 1970s. In the 1980s, international landings increased slightly due to directed fisheries by UK (longline) and Irish (gillnet) vessels. Landings declined from the late 1980s again. There has been a reduction in target fisheries, though they still exist in certain areas and at certain times as schools appear, with an increasing proportion of spurdog being taken as a bycatch in mixed demersal trawl fisheries.

The environment

Studies in the Northwest Atlantic indicate that males tend to occupy deeper, more saline water than females, and that spurdog tends to prefer waters of 7–15ºC.

Scientific basis

Data and methods

Survey and landings data are available. A number of different methods have been explored making use of the long time-series of landings data, including surplus production models, separable age-based assessments and length-structured approaches. Survey data have also been analysed in terms of trends in CPUE and frequency of occurrence in survey hauls. All analyses indicate similar stock trends.

Uncertainties in assessment and forecast

Particular problems identified with the data include:

- uncertainties in the historical level of catches due to landings being reported by generic 'dogfish' categories;
- limited catch composition information from countries other than UK;
- the aggregating behaviour of spurdog means that trawl survey catch rates are highly variable, with many zero catches and occasional high catches making CPUE difficult to interpret;
- survey data have not been provided for the whole stock area.

Information from the fishing industry

Those spurdog that are landed are mostly from a mixed demersal fishery. The fishing industry provided anecdotal information that catches recorded as "spurdog and others" mostly consist of spurdog only. Bycatches of spurdog in other fisheries (e.g. pelagic trawl) are likely, but these are generally not landed.

Comparison with previous assessment and advice

In 2005, the advice from ACFM was for a zero TAC for this stock. This was the first year that ACFM had provided advice for this stock. The advice for 2007 is consistent with that for 2006.

Source of information
Report of the Working Group on Elasmobranch Fishes, 2006 (ICES CM 2006/ACFM:31).

Year	ICES Advice	Single-stock exploitation boundaries	Predicted catch corresponding to advice	Predicted catch corresponding to single-stock exploitation boundaries	Agreed TAC[1]	ACFM Landings[2]
1991	None					29.4
1992	None					28.8
1993	None					23.2
1994	None					21
1995	None					20.2
1996	None					16.7
1997	None					15
1998	None					14.1
1999	None				8.9	11.2
2000	None				8.9	15.5*
2001	None				8.9	16.0*
2002	None				7.1	9.3
2003	None				5.6	10.4
2004	None				4.5	6.0
2005	None				1.1	5.6
2006	TAC	F=0	0		1.05	
2007	TAC	F=0	0			

Weights in '000 t.
* May include some misreported deep-sea sharks or other species.
[1)] Landings for total stock area: Subareas I–IX.
[2)] TAC for ICES Subarea IV and Division IIa (EC).

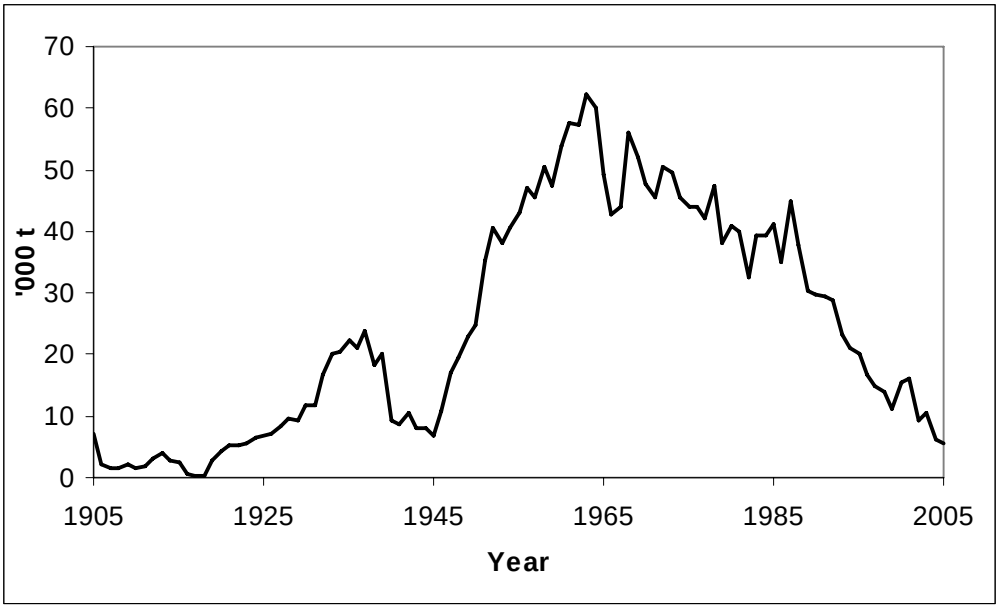

Figure 9.4.6.1 Northeast Atlantic spurdog. WG estimate of landings in the Northeast Atlantic (Subareas I–IX).

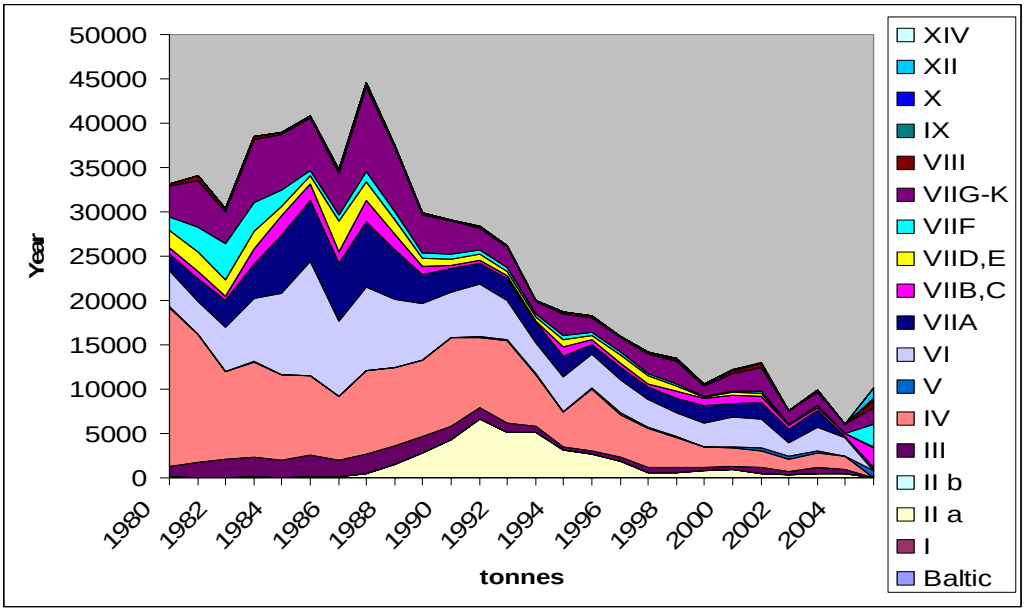

Figure 9.4.6.2 Northeast Atlantic spurdog. Recent landings by area.

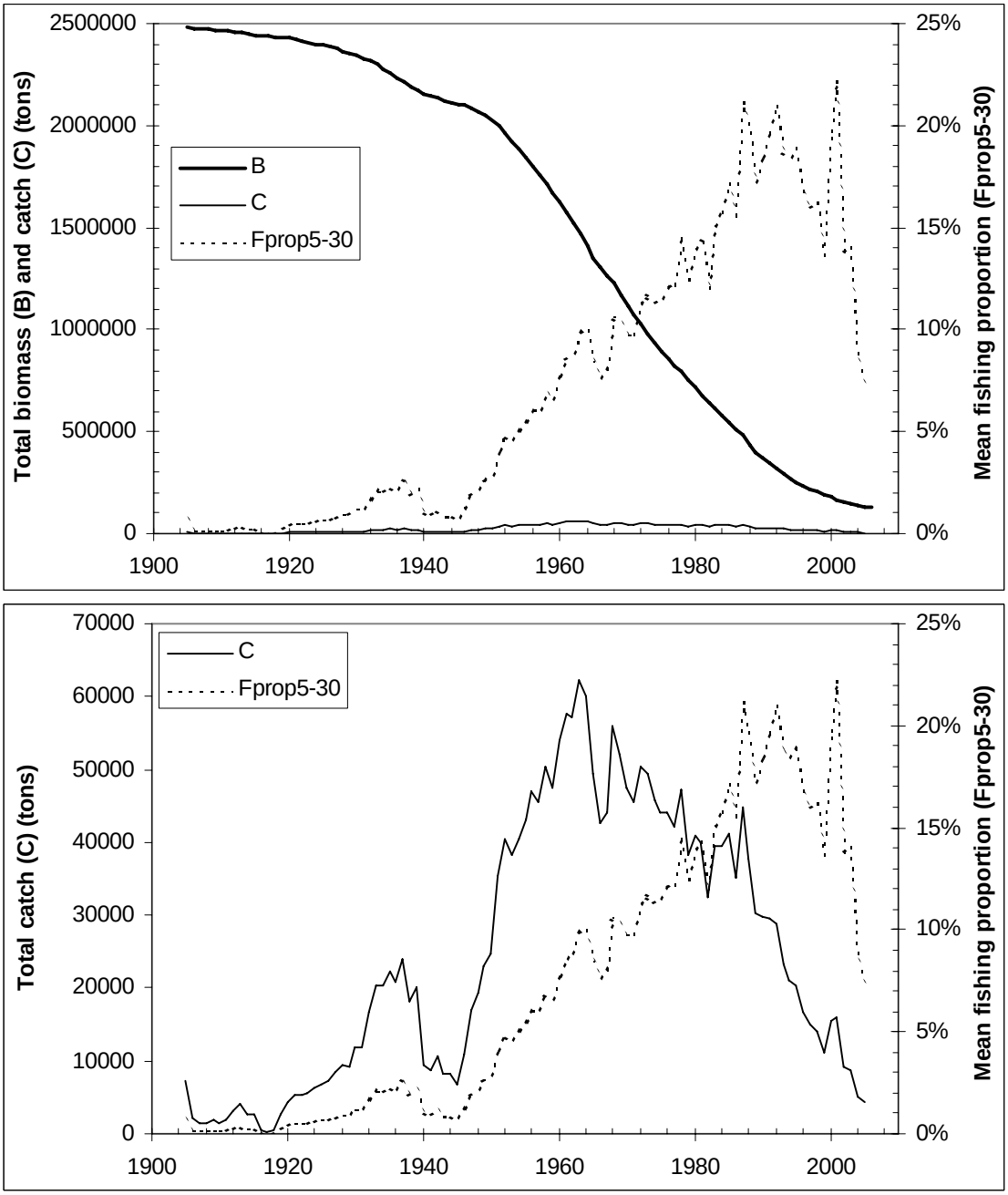

Figure 9.4.6.3 Northeast Atlantic spurdog. Base-case model estimates of total biomass (*B*) and mean fishing proportion ($F_{prop5\text{-}30}$) are shown in the top panel together with observed total annual catch (*C*), with the bottom panel repeating the information, but without the total biomass to show more detail in *C*.