

ECOREGION Widely distributed and migratory stocks
STOCK Spurdog (*Squalus acanthias*) in the Northeast Atlantic

Advice summary for for 2011

Management Objective (s)	Landings in 2011
Transition to an MSY approach with caution at low stock size	n/a
Cautiously avoid impaired recruitment (Precautionary Approach)	Zero catch
Cautiously avoid impaired recruitment and achieve other objective(s) of a management plan (e.g., catch stability)	n/a

Stock status

Fishing mortality	2007	2008	2009
F_{MSY}	Unknown	Unknown	Unknown
F_{PA}/F_{lim}	Unknown	Unknown	Unknown
Spawning Stock Biomass (SSB)			
	2008	2009	2010
$MSY B_{trigger}$	Unknown	Unknown	Unknown
B_{PA}/B_{lim}	Unknown	Unknown	Unknown

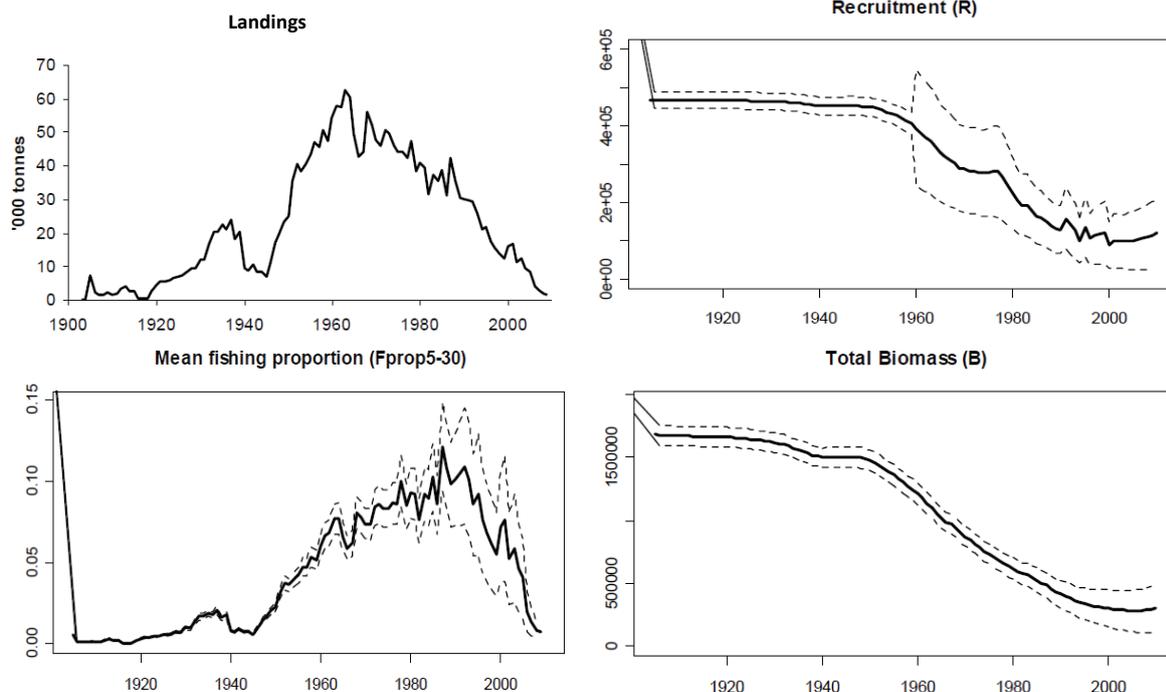


Figure 9.4.6.1 Spurdog in the NE Atlantic. Long term trends in landings (tons), recruitment (number of pups), mean fishing proportion (average ages 5-30) and total biomass (tons). Hashed lines reflect estimates of precision (± 2 standard deviations). The units on the y-axis should be regarded as arbitrary for all plots but the landings.

The assessment is considered uncertain. The assessment suggests that total stock biomass has declined substantially over time and has stabilised somewhat in the recent decade. The exploitation of the stock has reduced substantially in recent years. A failure of recruitment has taken place progressively since the 1960s.

Management plans

No stock specific management plan is currently in place.

In light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) this stock is classified under category 10. This implies zero catches.

Biology

Spurdogs are long-lived, slow growing, have a high age-at-maturity, and are particularly vulnerable to high levels of fishing mortality. Population productivity is low, with low fecundity and a protracted gestation period. In addition, they form size- and sex-specific shoals and therefore aggregations of large fish (i.e. mature females) can easily be targeted by longline and gillnet fisheries.

The fisheries

The majority of spurdog landings in 2009 were as by-catch in mixed demersal trawl and mixed gillnet fisheries operating in Sub-areas IV, VI and VII.

Catch by fleet	Total landings in 2009 were 1522 t (French landings not yet reported, but landings in 2008 were 366 t). There are no estimates of total discards.
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Effects of the fisheries on the ecosystem

Spurdog are largely taken in mixed demersal and gillnet fisheries and there are no impacts specific to the catching of spurdog.

Quality considerations

There are concerns over the quality of the catch data (including total catch and landings length compositions) and in addition trends in survey catch rate are quite uncertain. See supporting information for more details.

Scientific basis

Assessment type	Age-length and sex-structured model (Punt & Walker, 1998)
Input data	GLM standardised Scottish survey index, Scottish survey length frequency data, Total landings and UK (E & W) and UK (Scotland) landings length frequencies
Discards and by-catch	Discards are not included in the assessment
Indicators	Other survey trends UK (E & W) Celtic Seas groundfish survey, Irish Celtic Seas survey, North Sea IBTS
Other information	None
Working group report	WGEF

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Reference points

No reference points are defined for this stock.

Outlook for 2011

The assessment conducted in 2010 is not put forward as a basis for a forecast. This is partly because there is need to explore the model assumptions further and also because interim year catch estimates are required.

MSY considerations

There is insufficient information upon which to apply the MSY framework. The stock appears stable at a low level in the recent period, but this is a short period compared to the longevity of the species. Given the longevity of the species, the failure of recruitment and the likelihood that recovery will be slow, the MSY framework cannot be applied.

PA considerations

There is no additional information to change the perception of the stock, consequently ICES reiterates its advice for 2007-2010, that the stock is depleted and may be in danger of collapse. Targeted fisheries should not be permitted to continue, and bycatch 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.

Policy paper

In light of the EU policy paper on fisheries management (17 May 2010, [COM\(2010\) 241](#)) this stock is classified under category 10. This implies a 25% cut in TAC. Recovery measures should be implemented including effort reductions and introduction of more selective fishing gear. However given that the TAC is currently set at zero, this implies TAC=0.

Additional considerations

Regulations and their effects

An EC TAC covering the entire stock range, was introduced in 2007 and was progressively reduced, and in 2010 the TAC was set to zero. There is a small (10% of the 2009 quota per country) provision for by-catch. In 2009, a maximum landings length (100 cm) has been introduced. There are no estimates of discard survival.

In 2007 Norway introduced a general ban on target fisheries for spurdog, with a derogation for vessels < 15 m (within 4 nm territorial waters). Spurdog caught as bycatch in other fisheries have to be landed and the Directorate of Fisheries in Norway are allowed to stop the fishery when catches reach the 2007 level. Norway has a 70 cm minimum landing size.

The introduction of the U.K. "Buyers and Sellers" regulation and Irish "Sales Note" regulation means that unreported landings are expected to have reduced under these regulations since 2006.

Changes in fishing technology and fishing patterns

Spurdog were historically subject to large targeted fisheries, but are increasingly now taken as a bycatch in mixed trawl fisheries. In these fisheries, measures to reduce overall demersal fishing effort should also benefit spurdog. However, a restrictive TAC in this case would likely result in increased discards of spurdog and so may not have the desired effect on fishing mortality if discard survivorship is low.

Uncertainties in assessment and forecast

ICES has provided estimates of total **landings** of NE Atlantic spurdog and has used these, together with UK length frequency distributions in the assessment of this stock. However, there are still concerns over the quality of these data as a consequence of:

- uncertainty in the historical level of catches because of landings being reported by generic dogfish categories;
- uncertainty over the accuracy of the landings data because of species misreporting;
- lack of commercial length frequency information for countries other than the UK (UK landings are a decreasing proportion of the total and therefore the length frequencies may not be representative of those from the fishery as a whole);
- low levels of sampling of UK landings and lack of length frequency data in recent years when the selection pattern may have changed due to the implementation of a maximum landings length (100 cm);
- lack of discard information.

Survey data are particularly important indicators of abundance trends in stocks such as this one, where an analytical assessment is not available. However, it should be highlighted that:

- the survey data examined by ICES cover only part of the stock distribution and analyses needs be extended to other parts of the stock distribution;
- spurdog survey data are difficult to interpret because of the typically highly skewed distribution of catch-per-unit effort;
- annual survey length frequency distribution data (aggregated over all hauls) may be dominated by data from single large haul.

As well as good commercial and survey data, the analytical assessments require good information on the **biology** of NE Atlantic spurdog. In particular, ICES would like to highlight the need for:

- updated and validated growth parameters, in particular for larger individuals;
- better estimates of natural mortality.

All the uncertainties and caveats that apply to the data should be borne in mind when interpreting the results of the assessment **model**. Furthermore, the following should be noted:

- The model is assumption-rich, and only a limited number of parameters are estimated, implying that uncertainty is likely underestimated in the assessment;
- The model requires projections back in time to a period where only landings data are available (in order to estimate virgin conditions and take early fecundity data into account), which requires assumptions about the nature of fisheries on spurdog back then, but sensitivity tests have shown model results to be fairly robust to alternative assumptions about selectivity;
- The fecundity parameters are highly correlated with each other and confounded to a certain extent with the parameter governing the amount of curvature in the stock-recruit relationship, and additional information on MSY rates for similar species may be useful in dealing with this problem.

Comparison with previous assessment and advice

Previous advice was based on the precautionary approach, on the basis of a depleted model. This year's precautionary advice is a reiteration of this advice. In addition the new MSY advice is given, which allow for some low fishing.

Sources

- ICES. 2010. Report of the Working Group on Elasmobranch Fishes (WGEF), 22–29 June 2010, Horta, Portugal. ICES CM 2010/ACOM:19.
- Punt, A. E. and Walker, T. I. 1998. Stock assessment and risk analysis for the school shark (*Galeorhinus galeus*) off southern Australia. *Marine and Freshwater Research* 48, 719–31.

Table 9.4.6.1. Spurdog in the NE Atlantic. ICES advice, management and landings.

Year	ICES Advice	Predicted catch corresp. to advice	Agreed TAC	ICES Landings ⁽⁴⁾
1991				29.7
1992	None			29.2
1993	None			25.7
1994	None			21.0
1995	None			21.5
1996	None			17.3
1997	None			15.4
1998	None			13.9
1999	None		8.9 ⁽¹⁾	12.2
2000	None		8.9 ⁽¹⁾	15.9
2001	None		8.9 ⁽¹⁾	16.6
2002	None		7.1 ⁽¹⁾	11.0
2003	None		5.6 ⁽¹⁾	12.2
2004	None		4.5 ⁽¹⁾	9.4
2005	None		1.1 ⁽¹⁾	8.4
2006	TAC = 0	0	1.05 ⁽¹⁾	4.1
2007	TAC = 0	0	3.7 ⁽²⁾	2.8
2008	TAC = 0	0	2.6 ⁽³⁾	1.7
2009	TAC = 0	0	1.5 ⁽³⁾	1.5 ⁽⁶⁾
2010	TAC = 0	0	0 ⁽³⁾	
2011	TAC = 0	0		

Weights in '000 t.

⁽¹⁾ TAC for ICES Subarea IV and Division IIa (EC)

⁽²⁾ Combined TAC for ICES Subarea IV and Division IIa (EC) and for ICES Subareas IIIa, I, V, VI, VII, VIII, XII, and XIV (EU and international waters).

⁽³⁾ Combined TAC for ICES Subarea IV and Division IIa (EC) and for ICES Subareas I, III, V, VI, VII, VIII, XII, and XIV (EU and international waters).

⁽⁴⁾ Landings for total stock area: Subareas I-IX.

⁽⁵⁾ May include some misreported deep-sea sharks or other species.

⁽⁶⁾ Preliminary