Cuckoo ray (*Leucoraja naevus*) in Subarea 4 and Division 3.a (North Sea, Skagerrak, and Kattegat)
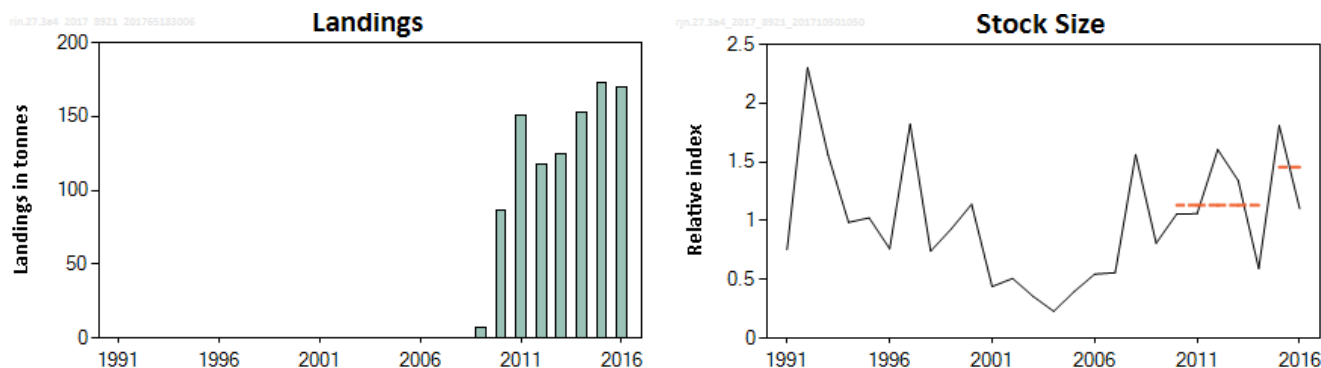
ICES stock advice

ICES advises that when the precautionary approach is applied, landings should be no more than 116 tonnes in each of the years 2018 and 2019. ICES cannot quantify the corresponding catches.

Stock development over time

The stock size indicator has increased after 2003 and has been above the long-term average in the last two years.

Figure 1   Cuckoo ray in Subarea 4 and Division 3.a. Summary of the stock assessment. Left: ICES estimates of species-specific landings of *L. naevus* since 2009. Right: stock size indicator from two trawl surveys (IBTS-Q1 and IBTS-Q3; individuals of ≥ 50 cm total length) relative to the time-series mean. The dotted horizontal lines show the mean stock size indicators for 2015–2016 and 2010–2014.

Stock and exploitation status

Table 1   Cuckoo ray in Subarea 4 and Division 3.a. State of the stock and fishery relative to reference points.

		Fishing pressure				Stock size		
		2014	2015	2016		2014	2015	2016
Maximum sustainable yield	F_{MSY}	?	?	? Undefined	MSY $B_{trigger}$	?	?	? Undefined
Precautionary approach	F_{pa}, F_{lim}	?	?	? Undefined	B_{pa}, B_{lim}	?	?	? Undefined
Management plan	F_{MGT}	-	-	- Not applicable	B_{MGT}	-	-	- Not applicable
Qualitative evaluation	-	?	?	? Unknown	-	↘	↗	↘ Decreasing

Catch options

The ICES framework for category 3 stocks was applied (ICES, 2012). Biomass indices derived from two surveys (IBTS-Q1 and IBTS-Q3) were used to provide an overall stock size indicator.

The previous advised landings for 2016 and 2017 were originally derived using landings statistics from 2012–2014. In 2016, a review of the landing statistics of elasmobranchs (ICES, 2016a) was conducted. As a result, the basis which was used to provide advice in 2015 for 2016 and 2017 has been adjusted to account for the update in the landing statistics in the period 2012–2014.

The advice is based on a comparison of the two latest index values (index A) with the five preceding values (index B), multiplied by recent advised landings for the years 2016–2017. The index is estimated to have increased by more than 20% and thus the uncertainty cap was applied to calculate the landings advice. The stock size relative to candidate reference points is unknown, and so the precautionary buffer is applied in 2017. Discarding is known to take place, but ICES cannot quantify the corresponding catches.

Table 2   Cuckoo ray in Subarea 4 and Division 3.a. The basis for the catch options.*

Index A (2015–2016)		1.46
Index B (2010–2014)		1.13
Index ratio (A/B)		1.29
Uncertainty cap	Applied	1.2
Advised landings for 2016–2017		128 tonnes
Advised landings, adjusted (2016–2017)** [128 t × 0.94]		121 tonnes
Discard rate		Unknown
Precautionary buffer	Applied	0.8
Landings advice***		116 tonnes

* The figures in the table are rounded. Calculations were done with unrounded inputs and computed values may not match exactly when calculated using the rounded figures in the table.
** Advised landings adjusted for the revision of the landings statistics in 2012–2014 (ICES, 2016a).
*** [Advised landings, adjusted (2016, 2017)] × [uncertainty cap] × [precautionary buffer].

Basis of the advice

Table 3   Cuckoo ray in Subarea 4 and Division 3.a. The basis of the advice.

Advice basis	Precautionary approach.
Management plan	ICES is not aware of any agreed precautionary management plan for cuckoo ray in this area.

Quality of the assessment

There is insufficient information to present species-specific landings for this stock prior to 2008 when legal obligations to report the main commercial skates to species level were introduced. A greater proportion of data have been reported to the species level since 2008, but data remain incomplete.

Fishery-independent trawl surveys provide the longest time-series of species-specific information and cover most of the stock area.

Issues relevant for the advice

Discarding is known to occur. Improved estimates of discard rates and discard survival are required.

Reference points

Reference points are not defined for this stock.

Basis of the assessment

Table 5   Cuckoo ray in Subarea 4 and Division 3.a. Basis of the assessment and advice.

ICES stock data category	3 (ICES, 2016b).
Assessment type	Survey-based trends (ICES, 2017).
Input data	ICES estimated landings since 2009. Surveys IBTS-Q1 andIBTS-Q3.
Discards and bycatch	Unknown.
Indicators	None.
Other information	Life history.
Working group	Working Group on Elasmobranch Fishes (WGEF).

Information from stakeholders

There is no additional available information for this stock.

History of the advice, catch, and management

Table 6   Cuckoo ray in Subarea 4 and Division 3.a. ICES advice and species-specific estimates of landings. All weights are in tonnes.

Year	ICES advice	Predicted landings corresp. to advice	ICES species-specific estimates of landings*
2009	*Status quo* catch	-	7
2010	No new advice, same as 2009	-	86
2011	*Status quo* catch	-	151
2012	No new advice, same as 2011	-	117
2013*	No TAC, species-specific measures needed, catch could increase by max. 20%	-	124
2014	No new advice, same as 2013	-	153
2015	No new advice, same as 2014	-	173
2016	Precautionary approach	128	170
2017	Same advice as 2016	128	
2018	Precautionary approach	≤ 116	
2019	Precautionary approach (same advice as 2018)	≤ 116	

* The data were revised in 2016 (ICES, 2016a) and represent minimum estimates, based on reported landings.

History of the catch and landings

Table 7   Cuckoo ray in Subarea 4 and Division 3.a. Catch distribution by fleet in 2016 as estimated by ICES.

Catch (2016)	Landings		Discards
	Bottom trawls 93%	Other 7%	
Unknown tonnes	170 tonnes		Unknown

Table 8   Cuckoo ray in Subarea 4 and Division 3.a. ICES estimates of landings by country (in tonnes). Data revised in 2016 (ICES, 2016a).

Year	Belgium	Denmark	France	UK	Netherlands	Total
2009	1		1.1	4.6	0.4	7.1
2010	3.7		1	81.2	0.3	86.3
2011	5	2	1	143.1		151.1
2012	1.1		0.5	115.5		117.1
2013	0.6	1	0	122.6	0.1	124.4
2014	0.5		0.1	151.7	0.3	152.5
2015	3.1	0.3	0	169		172.5
2016	0.4	1.4	0.2	167.6	0.2	169.7

Summary of the assessment

Table 9   Cuckoo ray in Subarea 4 and Division 3.a. Assessment summary. Biomass indices from two trawl surveys (IBTS-Q1 and IBTS-Q3; all indices in kg h^{-1} and based on individuals of ≥ 50 cm total length) and the stock size indicator (annual mean of the two surveys after they had each been normalized by their long-term means).

Year	IBTS-Q1	IBTS-Q3	Stock size indicator
1991	0.24	0.081	0.755
1992	0.604	0.359	2.303
1993	0.602	0.074	1.559
1994	0.255	0.157	0.986
1995	0.338	0.099	1.024
1996	0.300	0.031	0.762
1997	0.141	0.579	1.821
1998	0.258	0.06	0.742
1999	0.207	0.177	0.929
2000	0.229	0.239	1.140
2001	0.097	0.085	0.441
2002	0.094	0.114	0.509
2003	0.066	0.080	0.357
2004	0.059	0.037	0.230
2005	0.054	0.106	0.397
2006	0.115	0.110	0.546
2007	0.127	0.104	0.558
2008	0.098	0.517	1.563
2009	0.072	0.249	0.809
2010	0.156	0.271	1.057
2011	0.137	0.289	1.060
2012	0.296	0.360	1.606
2013	0.322	0.235	1.341
2014	0.128	0.117	0.594
2015	0.487	0.271	1.809
2016	0.240	0.215	1.102

Sources and references

ICES. 2012. ICES Implementation of Advice for Data-limited Stocks in 2012 in its 2012 Advice. ICES CM 2012/ACOM:68. 42 pp.

ICES. 2016a. Report of the Workshop to compile and refine catch and landings of elasmobranchs (WKSHARK2), 19–22 January 2016, Lisbon, Portugal. ICES CM 2016/ACOM:40. 69 pp.

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