EU request on improving the scientific assessment of "data-limited" stocks in the Atlantic

Service summary

Request A: An attempt was made, through a series of separate benchmarks, to move all stocks listed in Table 1 from stock category 3 to stock category 1. This was successful for witch flounder and North Sea turbot, which means that ICES advice in 2019 will be based on both of these stocks being category 1 stocks.

Request B: A robust framework for the data-limited stocks (DLS) maximum sustainable yield (MSY) approach has been developed through a series of workshops, culminating in the "Eighth Workshop on the Development of Quantitative Assessment Methodologies based on LIFE-history traits, exploitation characteristics, and other relevant parameters for data-limited stocks" (WKLIFE VIII). The framework has been used to assess the relative status for stocks in categories 3 and 4 via MSY proxy reference points. In 2019, the DLS MSY framework will expand to include recommended advice strategies for category 3 and 4 stocks where MSY advice is desired.

Request

There are important fish stocks in the Atlantic (ICES areas) for which sufficient scientific data are available, but for which MSY-based assessments have not yet been made. A scientific process by ICES could be organised to improve the scientific assessment of some of these Atlantic fish stocks. ICES is therefore requested to:

1. *Identify stocks for which an MSY-based assessment can be achieved through such an ad hoc process.*
2. *Organise expert groups to use the available data to come to an MSY-based assessment for these stocks.*
3. *For all other stocks, consider requirements in order to provide advice if stocks are within "safe biological limits".*

The work should be split into two or more sets of stocks that can be assessed consecutively. The first set of stocks should be assessed in 2016/17 and for this an offer should be made. Priority would be stocks defined as "target/driver" species under multi-annual plans. More sets of stocks could then possibly be assessed under future arrangements, but the sets of stocks and tentative timelines should be indicated in the present offer.

ICES response to requests 1 and 2

Originally, the ICES response to the requests 1 and 2 involved two main strands of work:

A. *Lifting of relevant category 3 and 4 stocks to category 1.*
B. *Developing an approach to providing MSY advice for category 3 and 4 stocks.*

ICES has revised B given the changes in the AA between EC and ICES in relation to provision of MSY or PA based advice for selected stocks. ICES will continue the work developing an MSY advice for category 3 and 4 stocks, however, for the present offer, the work will be focused on A.

Elaboration on the service

Request A: Lifting of relevant category 3 and 4 stocks to stock category 1.

ICES examined the list of all ICES stocks by ICES data category and assessment type. Stock assessment expert groups were asked to determine the potential or necessity to improve the assessment, and thus the category, for individual stocks through a benchmark. This list was then reviewed by ACOM and the clients in order to provide a focused list of stocks that could be benchmarked to raise the assessments from stock categories 3 or 4 to category 1. The stocks identified as viable candidates are listed in Table 1, showing the result of the benchmark process.

Table 1   Results of trying to lift relevant stocks from ICES data category 3 and 4 stocks to category 1 via ICES benchmarks. Assessment models: SAM = state–space assessment model; SPiCT = stochastic surplus production model in continuous time; XSA = extended survivor analysis; EqSim = stochastic equilibrium reference point software. Other parameters: CPUE = catch per unit of effort; Z = mean length-based mortality estimator; YPR = yield per recruit.

ICES stock description	Current ICES stock code	2016 ICES data category	Current ICES data category	Current assessment method	Current advice type	MSY proxy reference points used in advice		Citation
						Fishing pressure	Stock size	
Cod (*Gadus morhua*) in Subdivision 21 (Kattegat)	cod.27.21	3	3	Age-based analytical assessment (SAM), considered indicative of trends only	PA	-	-	ICES (2017a)
Cod (*Gadus morhua*) in subdivisions 25–32, eastern Baltic stock (eastern Baltic Sea)	cod.27.25-32	3	3	Relative results of SPiCT	PA	Relative value (F/F_{MSY}) from the assessment model	Relative value (B/B_{MSY}) from the assessment model	ICES (2017b)
Plaice (*Pleuronectes platessa*) in subdivisions 24–32 (Baltic Sea, excluding the Sound and Belt Seas)	ple.27.24-32	3	3	Relative results of SPiCT	PA	Relative value (F/F_{MSY}) from the assessment model	Relative value (B/B_{MSY}) from the assessment model	ICES (2018a)
Lemon sole (*Microstomus kitt*) in Subarea 4 and divisions 3.a and 7.d (North Sea, Skagerrak and Kattegat, eastern English Channel)	lem.27.3a47d	3	3	Survey trends-based assessment	PA	F_{MSY} (estimated by SPiCT from model parameters, using data from 1968–2017)	$0.5 \times B_{MSY}$ (estimated by SPiCT from model parameters, using data from 1968–2017)	ICES (2017c)
Witch (*Glyptocephalus cynoglossus*) in Subarea 4 and divisions 3.a and 7.d (North Sea, Skagerrak and Kattegat, eastern English Channel)	wit.27.3a47d	3	1	Survey trends-based assessment	PA	F_{MSY}	B_{MSY}	ICES (2017c, 2018b)
Norway lobster (*Nephrops norvegicus*) in Division 9.a, Functional Units 28–29 (Atlantic Iberian waters East, and southwestern and southern Portugal)	nep.fu.2829	3	3	Trends from standardized commercial CPUE	PA	$F_{0.1}$ from a length-based analysis, estimated using the mean-length Z method and assuming knife-edge length selection	-	ICES (2017d)

ICES stock description	Current ICES stock code	2016 ICES data category	Current ICES data category	Current assessment method	Current advice type	MSY proxy reference points used in advice		Citation
						Fishing pressure	Stock size	
Anglerfish (*Lophius budegassa, Lophius piscatorius*) in subareas 4 and 6, and in Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)	anf.27.3a46	3	3	Survey trends-based assessment	PA	-	-	ICES (2018c)
Black-bellied anglerfish (*Lophius budegassa*) in Subarea 7 and divisions 8.a–b and 8.d (Celtic Seas, Bay of Biscay)	ank.27.78abd	3	3	Survey trends-based assessment	PA	1 Relative value (F/F_{MSY}) from YPR and mean length-based Z	-	ICES (2018c, 2018d)
Plaice (*Pleuronectes platessa*) in Division 7.e (western English Channel)	ple.27.7e*	3	3	Age-based analytical assessment (XSA), considered indicative of trends only	PA	EqSim run with segmented regression with breakpoint at B_{loss}. F_{MSY} was taken as the peak of the median landings yield curve	B_{pa}	ICES (2018e)
Turbot (*Scophthalmus maximus*) in Subarea 4 (North Sea)	tur.27.4	3	1	Age-based assessment indicative of trends (SAM)	PA	F_{MSY}	B_{MSY}	ICES (2018f)

* Plaice in Division 7.e has reference points for the MSY approach as well as the precautionary approach (PA).

Request B: Developing an approach to providing MSY advice for category 3 and 4 stocks.

ICES developed a framework for estimating MSY proxy reference points for category 3 and 4 stocks at the "Sixth Workshop on the Development of Quantitative Assessment Methodologies based on LIFE-history traits, exploitation characteristics, and other relevant parameters for data-limited stocks" (WKLIFE VI; ICES, 2016) and the "Workshop to consider MSY proxies for stocks in ICES category 3 and 4 stocks in Western Waters" (WKProxy; ICES, 2015), both of which were peer-reviewed by RGProxy. In 2017 and 2018, the framework was applied to assess the state of the stock relative to MSY objectives and to decide whether or not to apply the precautionary buffer (WKMSYCat34; ICES, 2017e).

As a result of WKLIFE VIII, ICES identified suitable harvest approaches for several of the proxy methods, which will form the basis of ICES technical guidelines for providing advice of category 3 and 4 stocks for which MSY advice is desired. The guidelines establish a new layer of the DLS MSY framework, and will enable ICES to produce catch advice for data-limited stocks in 2019.

Basis of the service

Request A

ICES stock assessment expert groups were requested to identify, at their 2017 meetings, category 3 and 4 stocks for which the data and other available information were deemed sufficient to allow a full analytical assessment (stock category 1). The following stocks were identified as candidate stocks to raise from stock category 3 to stock category 1:

- Kattegat cod
- Eastern Baltic cod
- Plaice in the Baltic Sea, subdivisions 24–32
- Lemon sole, North Sea
- Witch flounder, North Sea
- *Nephrops* in Atlantic Iberian waters East and in southwestern and southern Portugal
- Anglerfish in subareas 4 and 6, and in Division 3.a
- Black-bellied anglerfish in divisions 7.b–k, 8.a–b, and 8.d
- Plaice, western English Channel
- Turbot, North Sea

DG MARE was then requested to evaluate this list and identify the stocks for which a lifting to category 1 was considered relevant. Based on DG MARE's evaluation ICES initiated the work to develop analytical assessments, including catch forecasts, for the relevant stocks. The work was organized in benchmark processes, involving data evaluation workshops and assessment workshops. The workshops were peer reviewed following ICES normal practise.

Request B

ICES established three workshops to build upon the proxy framework: WKMSYcat34, WKLIFE VII, and WKLIFE VIII. The first workshop developed advice rules with the objective of providing MSY advice for stocks in categories 3 and 4 (ICES, 2017e). WKLIFE VII began the preliminary testing of these advice rules (ICES, 2017f). The final workshop, WKLIFE VIII, continued the extensive testing and provided peer-reviewed (RGLIFE VIII) recommendations for harvest rules when using proxy methods (ICES, 2018g). Based on the above recommendations, ICES will produce technical guidelines for the advice rules for stocks in categories 3 and 4 that will be implemented for the 2019 advice season.

Sources and references

ICES. 2015. Report of the Workshop to consider MSY proxies for stocks in ICES category 3 and 4 stocks in Western Waters (WKProxy), 3–6 November 2015, Copenhagen, Denmark. ICES CM 2015/ACOM:61. 183 pp.

ICES. 2016. Report of the ICES Workshop on the Development of Quantitative Assessment Methodologies based on Life-history traits, exploitation characteristics, and other relevant parameters for stocks in categories 3–6 (WKLIFE VI), 3–7 October 2016, Lisbon, Portugal. ICES CM 2016/ACOM:59. 106 pp.

ICES. 2017a. Report of the Benchmark Workshop on Baltic Stocks (WKBALT), 7–10 February 2017, Copenhagen, Denmark. ICES CM 2017/ACOM:30. 108 pp.

ICES. 2017b. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 19–26 April 2017, ICES Headquarters, Copenhagen, Denmark. ICES CM 2017/ACOM:11. 810 pp.

ICES. 2017c. Report of the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK), 26 April–5 May 2017, ICES Headquarters, Copenhagen, Denmark. ICES CM 2017/ACOM:21. 1248 pp.

ICES. 2017d. Report of the Working Group for the Bay of Biscay and the Iberian waters Ecoregion (WGBIE), 4–9 May 2017, Cadiz, Spain. ICES CM 2017/ACOM:12. 552 pp.

ICES. 2017e. Report of the Workshop on the Development of the ICES approach to providing MSY advice for category 3 and 4 stocks (WKMSYCat34), 6–10 March 2017, Copenhagen, Denmark. ICES CM 2017/ACOM:47. 57 pp.

ICES. 2017f. Report from the Workshop on the Development of Quantitative Assessment Methodologies based on Life-history traits, exploitation characteristics, and other relevant parameters for stocks in categories 3–6 (WKLIFE VII), 2–6 October 2017, Lisbon, Portugal. ICES CM 2017/ACOM:43. 223 pp.

ICES. 2018a. Report of the Baltic Fisheries Assessment Working Group (WGBFAS), 6–13 April 2018, ICES Headquarters, Copenhagen, Denmark. ICES CM 2018/ACOM:11. 748 pp.

ICES. 2018b. Report of the Benchmark Workshop on North Sea stocks (WKNSEA 2018), 5–9 February 2018, Copenhagen, Denmark. ICES CM 2018/ACOM:33. 636 pp.

ICES. 2018c. Report of the Benchmark Workshop on Anglerfish Stocks in the ICES Area (WKANGLER), 12–16 February 2018, Copenhagen, Denmark. ICES CM 2018/ACOM:31. 180 pp.

ICES. 2018d. Report of the Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), 3–10 May 2018, ICES HQ, Copenhagen, Denmark. ICES CM 2018/ACOM:12. 642 pp.

ICES. 2018e. Report of the Working Group for the Celtic Seas Ecoregion (WGCSE), 9–18 May 2018, ICES Headquarters, Copenhagen, Denmark. ICES CM 2018/ACOM:13. 26 pp.

ICES. 2018f. Report of the InterBenchmark Protocol for turbot in the North Sea 2018 (IBPTurbot), 30–31 July, 2018, IJmuiden, Netherlands. ICES CM 2018/ACOM:50. 74 pp.

ICES. 2018g. Report of the Eighth Workshop on the Development of Quantitative Assessment Methodologies based on LIFE-history traits, exploitation characteristics, and other relevant parameters for data-limited stocks (WKLIFE VIII), 8–12 October 2018, Lisbon, Portugal. ICES CM 2018/ACOM:40. 172 pp.