



RESPONSIBLE  
SUPPLY

**IFFO RS**  
Global Standard for Responsible Supply  
of Marine Ingredients

## IFFO RS Limited

**T:** +44 (0) 2030 539 195

**E:** [Standards@iffors.com](mailto:Standards@iffors.com)

**W:** [www.iffors.com](http://www.iffors.com)

Unit C, Printworks | 22 Amelia Street  
London, SE17 3BZ | United Kingdom



# Global Standard for Responsible Supply of Marine Ingredients Fishery Assessment Methodology and Template Report V2.0



RESPONSIBLE  
SUPPLY

## IFFO RS

Global Standard for Responsible Supply  
of Marine Ingredients



<b>Fishery Under Assessment</b>	<b>Thornback ray <i>Raja clavata</i> ICES divisions 4.a-c, 6.a, 7.a, b, d-h, j</b>
<b>Date</b>	<b>February 2018</b>
<b>Assessor</b>	<b>Conor Donnelly</b>

Application details and summary of the assessment outcome				
Name: Pelagia Killybegs, Grimsby, Aberdeen				
Address:				
Country: UK & Ireland		Zip:		
Tel. No.:		Fax. No.:		
Email address:		Applicant Code		
Key Contact:		Title:		
Certification Body Details				
Name of Certification Body:		SAI Global		
Assessor Name	Peer Reviewer	Assessment Days	Initial/Surveillance/Re-approval	Whole fish/ By-product
Conor Donnelly	Deirdre Hoare	1	Surveillance	By-product
Assessment Period	2017-2018			

Scope Details	
Management Authority (Country/State)	EU, Common Fisheries Policy (CFP)
Main Species	Thornback ray <i>Raja clavata</i>
Fishery Location	ICES divisions 4.a-c, 6.a, 7.a, b, d-h, j
Gear Type(s)	All
Outcome of Assessment	
Overall Outcome	Pass
Clauses Failed	None
Peer Review Evaluation	Approve byproduct
Recommendation	Approve

Assessment Determination
<p>Thornback ray are managed within European waters under the Common Fisheries Policy (CFP) and scientific advice on their management provided by ICES.</p> <p>Skates and rays, including thornback ray, are managed under a single TAC (by area) for all species (<a href="#">EC, Council Regulation 2018/120</a>). Several TAC areas exist and the following are relevant for the scope of this by-product assessment (tonnages are 2018 quota):</p> <ul style="list-style-type: none"> <li>• Skates and rays in division 2.a and subarea 4 (1654 tonnes)</li> <li>• Skates and rays in divisions 6.a-b; 7.a-c and 7.e-k (9699 tonnes)</li> <li>• Skates and rays in division 7.d (1276 tonnes)</li> </ul> <p>Scientific advice on thornback ray is provided by ICES for the following ICES areas:</p> <ul style="list-style-type: none"> <li>• Subarea 4 and divisions 3.a, 7.d (North Sea, Skagerrak, Kattegat and Eastern English Channel)</li> <li>• Division 7.e (western English Channel)</li> <li>• Divisions 7.a, f-g (Irish Sea, Bristol Channel and Celtic Sea north)</li> </ul> <p>In the absence of a species-specific management regime, thornback ray were assessed using productivity susceptibility analysis under Clause D. The species was considered vulnerable and required further consideration under clause D.4. There are improvements that could be made to stock management including species-specific management, improved catch and biomass information and definition of reference points. Work is in progress to improve management but stock size indicators show significant increase in stocks over time and landings are mainly within scientific advice. Consequently, it is concluded that potential impacts of the fishery on this species are considered during the management process and there is no substantial evidence that the fishery has a significant negative impact on the species. The stock passes clause D.</p> <p>Thornback ray in Europe is listed as Near Threatened on the IUCN Red List of Threatened Species and is not listed on CITES (<a href="http://www.iucnredlist.org/details/39399/1">http://www.iucnredlist.org/details/39399/1</a>, assessed 2014, accessed 30 April 2018).</p> <p>Thornback ray is recommended for approval as by-product material under the IFFO RS Standard.</p>
Peer Review Comments

Notes for On-site Auditor

## Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	
			A4	
Category B				
Category C				
Category D	Thornback ray <i>Raja clavata</i>	NA	Pass	

[List all Category A and B species. List approximate total % age of landings which are Category C and D species; these do not need to be individually named here]

## HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

### Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for **each** Category A species.
4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** of the minimum requirements.

### By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The ‘% landings’ column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

## SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the ‘target’ or ‘main’ species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the ‘bycatch’ or ‘minor’ species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

**Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).**

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The ‘stock’ column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The ‘management’ column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

### TYPE 1 SPECIES (Representing 95% of the catch or more)

**Category A:** Species-specific management regime in place.

**Category B:** No species-specific management regime in place.

### TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)

**Category C:** Species-specific management regime in place.

**Category D:** No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Thornback ray	<i>Raja clavata</i>	Subarea 4, div. 3.a, 7.d	NA	No species-specific management regime in place	D
		Div. 7.e			
		Div. 7.a, f-g			

## CATEGORY D SPECIES

In a whole fish assessment, Category D species are those which make up less than 5% of landings and are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. In a by-product assessment, Category D species are those which are not subject to a species-specific management regime. In both cases, the comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

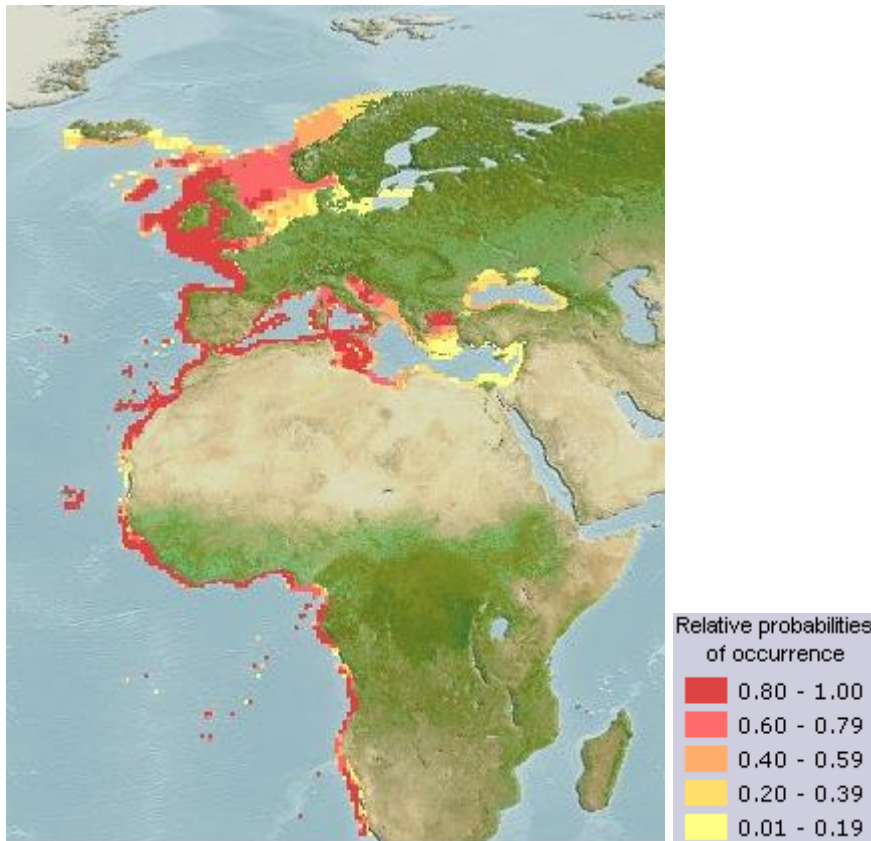
The process for assessing Category D species involves the use of a Productivity-Susceptibility Analysis (PSA) to further subdivide the species into ‘Critical Risk’, ‘Major Risk’ and ‘Minor Risk’ groups. If there are no Category D species in the fishery under assessment, this section can be deleted.

Productivity and susceptibility ratings are calculated using a process derived from the APFIC document “Regional Guidelines for the Management of Tropical Trawl Fisheries, which in turn was derived from papers by Patrick *et al* (2009) and Hobday *et al* (2007). Table D1 should be completed for each Category D species as follows:

- Firstly, the best available information should be used to fill in values for each productivity and susceptibility attribute.
- Table D2 should be used to convert each attribute value into a score between 1 and 3.
- The average score for productivity attributes and the average for susceptibility attributes should be calculated.
- Table D3 should be used to determine whether the species is required to meet the requirements of Table D4. A species which does not need to meet the requirements of D4 is automatically awarded a pass.
- Table D4 should be used to assess those species indicated by Table D3 to determine a pass/fail rating.
- Any Category D species which has been categorised by the IUCN Red List as Endangered or Critically Endangered, or which appears in the CITES appendices, automatically results in a fail.

D1	Species Name:	Thornback ray <i>Raja clavata</i>	
	Productivity Attribute	Value	Score
	Average age at maturity (years)	7.3	3
	Average maximum age (years)	10	2
	Fecundity (eggs/spawning)	170 max usually 48-74eggs	3
	Average maximum size (cm)	101	2
	Average size at maturity (cm)	72.85 (TL)	2
	Reproductive strategy	Paired eggs are laid and deposited on shallow sand, mud, pebble or gravel bottoms	2
	Mean trophic level	3.8	3
	Average Productivity Score		2.43
	Susceptibility Attribute	Value	Score
	Overlap of adult species range with fishery	>50% of stock occurs in area fished	3
	Distribution	Not scored if overlap attribute scored	
	Habitat	demersal	3
	Depth range	5-1020m	3
	Selectivity	Up to 4m in length	3
	Post-capture mortality	Most dead or retained	3
	Average Susceptibility Score		3
	PSA Risk Rating (From Table D3)		D4
	Compliance rating		
References			

**Overlap attribute:**



Reviewed distribution maps for Raja clavata (Thornback ray), with modelled year 2100 native range map based on IPCC A2 emissions scenario. [www.aquamaps.org](http://www.aquamaps.org), version of Aug. 2016. Web. Accessed 30 Apr. 2018.

**Other attributes:**

<https://www.fishbase.de/summary/2059>

*Standard clauses 1.3.2.2*



Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk	Medium productivity/ Medium risk	High productivity/ Low risk
	Score 3	Score 2	Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk	Medium susceptibility/ Medium risk	Low susceptibility/ Low risk
		Score 3	Score 2	Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

**Note:** Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.



D3		Average Susceptibility Score		
		1.00 – 1.75	1.76 – 2.24	2.25 – 3.00
Average Productivity Score	1.00 – 1.75	PASS	PASS	PASS
	1.76 – 2.24	PASS	PASS	TABLE D4
	2.25 – 3.00	PASS	TABLE D4	TABLE D4

D4	Species Name		Thornback ray <i>Raja clavata</i>																																																														
	Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements																																																																
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	Pass																																																														
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	Pass																																																														
Outcome:			Pass																																																														
Evidence																																																																	
<p>Skates and rays are currently managed under a single species TAC. Certain stocks e.g. thornback ray in subarea 4 and 7.d span two TAC areas (Division 2.a and subarea 4 TAC and the division 7.d TAC). Consequently there is a risk of individual species and stocks being overexploited.</p> <p>There is now a legal obligation to declare landings of skates and rays to species level, although ICES note that data remains incomplete (ICES, 2017). The EU’s Science, Technical and Economic Committee for Fisheries (STECF) has received proposals for alternative management systems to the existing TAC scheme for skates and rays which are currently being considered and may come into force in 2018 (Marine Institute, 2017).</p>																																																																	
Subarea 4 and divisions 3.a, 7.d (North Sea, Skagerrak, Kattegat and Eastern English Channel)																																																																	
<p>Landings information is gathered and landings advice provided by ICES. The stock is a category 3 data limited stock with the assessment based on survey trends and no reference points defined. Attempts have been made to define reference points for the subarea 4, divisions 3.a and 7.d stock but further investigation is required. Input data for the assessment is ICES estimated landings and biomass indices from four surveys (IBTS-Q1, IBTS-Q3, CGFS-Q4, and BTS-Eng-Q3) are used to provide an overall index of stock development. ICES note that onboard observer data indicates discarding rates are increasing, due to restrictive quota and increasing stock size so that improved estimates of discard rates and discard survival are required. The stock size indicator has increased consistently over the last five years after two decades of stability (figure 1). Estimated landings in 2016 were less than predicted landings corresponding to ICES advice (ICES, 2016b)</p>																																																																	
<div><div><p>yc27.3a47d_2017_9008_2017031124</p><p>Landings</p><table border="1"><thead><tr><th>Year</th><th>Landings (1000 t)</th></tr></thead><tbody><tr><td>2009</td><td>1.1</td></tr><tr><td>2010</td><td>1.3</td></tr><tr><td>2011</td><td>1.3</td></tr><tr><td>2012</td><td>1.6</td></tr><tr><td>2013</td><td>1.9</td></tr><tr><td>2014</td><td>1.9</td></tr><tr><td>2015</td><td>1.6</td></tr><tr><td>2016</td><td>1.8</td></tr></tbody></table></div><div><p>yc27.3a47d_2017_9008_2017105216</p><p>Stock size indicator</p><table border="1"><thead><tr><th>Year</th><th>Relative index</th></tr></thead><tbody><tr><td>1993</td><td>0.5</td></tr><tr><td>1994</td><td>0.4</td></tr><tr><td>1995</td><td>0.4</td></tr><tr><td>1996</td><td>0.6</td></tr><tr><td>1997</td><td>0.8</td></tr><tr><td>1998</td><td>0.4</td></tr><tr><td>1999</td><td>0.5</td></tr><tr><td>2000</td><td>0.5</td></tr><tr><td>2001</td><td>0.5</td></tr><tr><td>2002</td><td>0.5</td></tr><tr><td>2003</td><td>0.5</td></tr><tr><td>2004</td><td>0.5</td></tr><tr><td>2005</td><td>0.5</td></tr><tr><td>2006</td><td>0.5</td></tr><tr><td>2007</td><td>1.1</td></tr><tr><td>2008</td><td>0.5</td></tr><tr><td>2009</td><td>1.6</td></tr><tr><td>2010</td><td>1.1</td></tr><tr><td>2011</td><td>0.8</td></tr><tr><td>2012</td><td>1.8</td></tr><tr><td>2013</td><td>3.0</td></tr></tbody></table></div></div>				Year	Landings (1000 t)	2009	1.1	2010	1.3	2011	1.3	2012	1.6	2013	1.9	2014	1.9	2015	1.6	2016	1.8	Year	Relative index	1993	0.5	1994	0.4	1995	0.4	1996	0.6	1997	0.8	1998	0.4	1999	0.5	2000	0.5	2001	0.5	2002	0.5	2003	0.5	2004	0.5	2005	0.5	2006	0.5	2007	1.1	2008	0.5	2009	1.6	2010	1.1	2011	0.8	2012	1.8	2013	3.0
Year	Landings (1000 t)																																																																
2009	1.1																																																																
2010	1.3																																																																
2011	1.3																																																																
2012	1.6																																																																
2013	1.9																																																																
2014	1.9																																																																
2015	1.6																																																																
2016	1.8																																																																
Year	Relative index																																																																
1993	0.5																																																																
1994	0.4																																																																
1995	0.4																																																																
1996	0.6																																																																
1997	0.8																																																																
1998	0.4																																																																
1999	0.5																																																																
2000	0.5																																																																
2001	0.5																																																																
2002	0.5																																																																
2003	0.5																																																																
2004	0.5																																																																
2005	0.5																																																																
2006	0.5																																																																
2007	1.1																																																																
2008	0.5																																																																
2009	1.6																																																																
2010	1.1																																																																
2011	0.8																																																																
2012	1.8																																																																
2013	3.0																																																																

**Figure 1.** Thornback ray in Subarea 4 and in divisions 3.a and 7.d. Summary of the stock assessment. Left: ICES estimates of species-specific landings of *R. clavata* since 2009. Right: stock size indicator (the annual mean of the four surveys, IBTS-Q1, IBTS-Q3, CGFS-Q4, and BTS-Eng-Q3, after results from each survey had been normalized by their long-term means, and based on individuals of  $\geq 50$  cm total length). The dotted horizontal lines show the mean stock indicators for 2015–2016 and 2010–2014. Source: ICES, 2017.

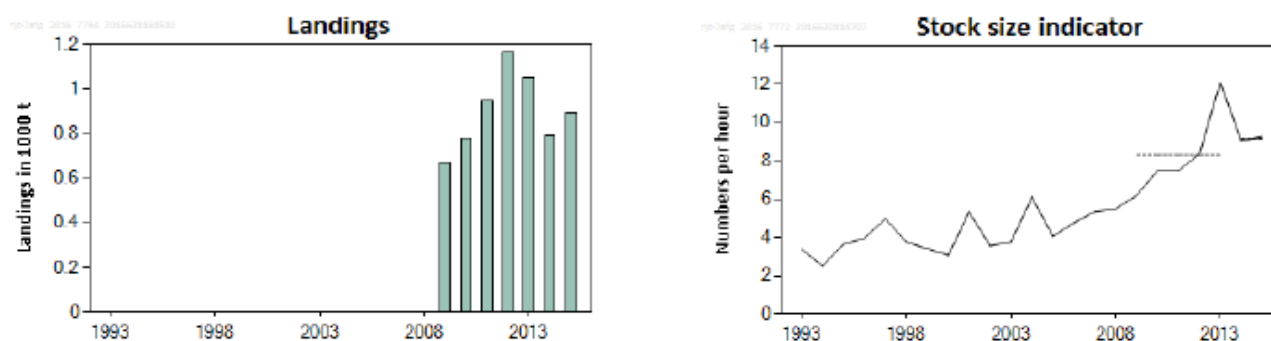
#### Division 7.e (western English Channel)

Landings information is gathered and landings advice provided by ICES. The stock is an ICES category 5 stock without information on abundance or exploitation and no reference points defined. ICES note that the stock structure of thornback ray in the western English Channel is unclear, and it is unclear as to whether it is discrete or associated with the neighbouring stocks in the eastern Channel/southern North Sea or the Bristol Channel/Irish Sea. Until the stock structure is clarified, ICES provides advice separately for Division 7.e (ICES, 2016a).

ICES also note that trawl survey data in Lyme Bay indicated that the relative abundance of this species was stable or increasing over the period 1989–2011. While this survey no longer operates, it is expected that time-series data from recently initiated English and French surveys in this area will provide stock indicators in the near future. The increase in landings from 2009 to 2013 might have also been influenced by the introduction of mandatory species-specific reporting of skate landings. Estimated landings in 2015 were higher than predicted landings corresponding to ICES advice (ICES, 2016a).

#### Divisions 7.a, f-g (Irish Sea, Bristol Channel and Celtic Sea north)

Landings information is gathered and landings advice provided by ICES. The stock is a category 3 data limited stock with the assessment based on survey trends and no reference points defined. Input data is ICES estimated landings and biomass index from the UK (E&W)–BTS–Q3 survey. The stock size indicator shows an increasing trend since 1994 (figure 2). Estimated landings in 2015 were less than predicted landings corresponding to ICES advice (ICES, 2016b).



**Figure 2.** Thornback ray in divisions 7.a, 7.f–g. ICES estimated landings (in tonnes). Right: UK (E&W) – BTS – Q3 survey index (numbers per hour). The dotted horizontal lines show the mean stock indicators for 2014–2015 and 2009–2013. Source: 2016b.

There are improvements that could be made to stock management including species-specific management, improved catch and biomass information and definition of reference points. Work is in progress to improve management. Stock size indicators show significant increase in stocks over time and landings are mainly within scientific advice. **Consequently, it is concluded that potential impacts of the fishery on this species are considered during the management process and there is no substantial evidence that the fishery has a significant negative impact on the species. The stock passes clause D.**

#### References

ICES, 2017. ICES Advice on fishing opportunities, catch, and effort Greater North Sea Ecoregion. Thornback ray (*Raja clavata*) in Subarea 4 and in divisions 3.a and 7.d (North Sea, Skagerrak, Kattegat, and eastern English Channel). Published 6 October 2017. DOI: 10.17895/ices.pub.3174.

<http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/rjc.27.3a47d.pdf>

ICES, 2016a. ICES Advice on fishing opportunities, catch, and effort Celtic Seas Ecoregions. Thornback ray (*Raja clavata*) in Division 7.e (western English Channel). Published 11 October 2016

<http://ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/rjc-echw.pdf>

ICES, 2016b. ICES Advice on fishing opportunities, catch, and effort Celtic Seas Ecoregions. Thornback ray (*Raja clavata*) in divisions 7.a, 7.f–g (Irish Sea, Bristol Channel, Celtic Sea North). Published 11 October 2016.

<http://ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/rjc-7afg.pdf>

Marine Institute, 2017. The Stock Book. Report to the Minister for Agriculture, Food and the Marine. Annual review of fish stocks in 2017 and management advice for 2018. November 2017. Marine Institute, Fisheries Ecosystems Advisory Services, Rinville, Oranmore, Co. Galway, Ireland.

*Standard clause 1.3.2.2*

## SOCIAL CRITERION

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.

## Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

*“The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of  $r_m$  (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of  $K$ ,  $t_m$  and  $t_{max}$  and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, assuming that these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on  $r_m$  (see below) as we are not yet confident with the reliability of the current method for estimating  $r_m$ . If users have independent  $r_m$  or fecundity estimates, they can refer to Table 1 for using this information.”*

Parameter	High	Medium	Low	Very low
Threshold	0.99	0.95	0.85	0.70
$r_{max}$ (1/year)	> 0.5	0.16 – 0.50	0.05 – 0.15	< 0.05
$K$ (1/year)	> 0.3	0.16 – 0.30	0.05 – 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 – 1000	10 – 100	< 10
$t_m$ (years)	< 1	2 – 4	5 – 10	> 10
$t_{max}$ (years)	1 - 3	4 – 10	11 – 30	> 30

Taken from the FishBase manual, “Estimation of Life-History Key Facts”:

<http://www.fishbase.us/manual/English/key%20facts.htm#resilience>

## Appendix B – Background on the 5% catch rule

The proposed fishery assessment methodology uses a species categorisation approach to divide the catch in the assessment fishery into groups. These groups are:

- **Category A:** “Target” species with a species-specific management regime in place.
- **Category B:** “Target” species with no species-specific management regime in place.
- **Category C:** “Non-target” species with a species-specific management regime in place.
- **Category D:** “Non-target” species with no species-specific management regime in place

The distinction between 'target' and 'non-target' species is made to enable the assessment to consider the impact of the fishery on all the species caught regularly, without requiring a full assessment be conducted for each. Thus 'target' species are subjected to a more detailed assessment, while 'non-target' species are considered more briefly. For the purposes of the IFFO RS fishery assessment, 'target' and 'non-target' species are defined by their prevalence in the catch, by weight. Applicants must declare which species are considered 'target' species in the fishery, and the combined weight of these must be at least 95% of the annual catch. The remaining 5% can be made up of 'non-target' species. Note also that ETP species are considered separately, irrespective of their frequency of occurrence in the catch.

The proposed use of 5% as a limit for 'non-target' species is one area in which feedback is being sought via the public consultation. The decision to propose a value of 5% ensures consistency with other fishery assessment programmes, such as the MSC which uses 5% to distinguish between 'main' and 'minor' species (see MSC Standard, SA3.4 and GSA3.4.2); and Seafood Watch, which uses 5% when defining the 'main' species for the assessment (see Seafood Watch Standard, Criterion 2). The value is also consistent with the approach used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.