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Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	**Turbot** ***Scophthalmus maximus***
Date	February 2020
Assessor	Jim Daly
Stock Pass	ICES Division 3a
Stock Fail	

Application details and summary of the assessment outcome				
Name: Pelagia				
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 Ltd**		
Assessor	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**	**Whole fish/ By-product**
Jim Daly	Conor Donnelly	0.5	SURV 2	By-product
Assessment Period	2020			

Scope Details	
Management Authority (Country/State)	EU/Common Fisheries Policy
Main Species	Turbot *Scophthalmus maximus*
Stocks:	ICES 3a
Fishery Location	Skaggerak, Kattegat
Gear Type(s)	All Compliant Gears
Outcome of Assessment	
Peer Review Evaluation	**AGREE**
Recommendations	**APPROVE**

Assessment Determination
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 IFFO RS raw material. Turbot does not appear as Endangered or Critically Endangered on the IUCN Red List, nor does it appear in CITES appendices; therefore, Turbot is eligible for approval for use as IFFO RS raw material. The stock is not subject to a species-specific research and management regime sufficient to pass a Category C assessment. ICES has not been requested to provide advice on fishing opportunities for this stock nor are reference points defined. The stock will be benchmarked in 2020. The comparative lack of scientific information on the status of the population in the assessment area means that a risk-assessment style approach must be taken. The fishery was assessed using the risk-based Productivity, Susceptibility Analysis (PSA) as per IFFO RS v 2.0 procedures for Category D species. The species has passed the risk-based assessment (**Table D4**). Potential impacts of the fishery on this species are considered during the management process, and reasonable measures taken to minimise these impacts. There is no substantial evidence that the fishery has a significant negative impact on the stock. Turbot in the assessment area is approved by SAI Global assessors for the production of fishmeal and fish oil under the IFFO-RS v 2.0 by-products standard.
Peer Review Comments
Notes for On-site Auditor

HOW TO COMPLETE THIS ASSESSMENT REPORT

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
Turbot	*Scophthalmus maximus*	ICES 3a	N/A	EU/Denmark	D

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:	Turbot *Scophthalmus maximus*	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	** 2.2	2
	Average maximum age (years)	*25	2
	Fecundity (eggs/spawning)	**>10,000	1
	Average maximum size (cm)	*100	2
	Average size at maturity (cm)	*34.7	2
	Reproductive strategy	*Eggs pelagic	1
	Mean trophic level	*4.4	3
		Average Productivity Score	**1.86**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	*<25% stock in area	1
	Distribution	Not used	-
	Habitat	Not used	-
	Depth range	*20-70m	3
	Selectivity	***70 mm mesh size minimum	3
	Post-capture mortality	Tows > 3 hours	3
		Average Susceptibility Score	**2.5**
		PSA Risk Rating (From Table D3)	**TABLE D4**

Evidence: Table D1 References:

* Fishbase; ** Fishbase Life History Tool **Figure 3;**

*** COUNCIL REGULATION (EC) No 850/98 **R4**

The stock was assessed in the following area (**Figure 1**):

Figure 1: Assessment area for Turbot ICES 3a stock Skaggerak, Kattegat **R1**

Figure 2 Global Distribution Turbot **R3**

Life History Data on *Scophthalmus maximus*
Turbot

Family:	Scophthalmidae Turbots	
Max. length (Lmax):	100.0 cm SL	
L infinity (Linf):	= 54.6 cm TL	Recalculate
K:	0.31 /year Ø' = 2.97 Median Ø' value with related Linf. and K.	Recalculate Growth & mortality data
to:	-0.45 years Estimated from Linf and K.	
Natural mortality (M):	0.52 s.e. 0.34 - 0.79 /year Estimated from Linf., K and annual mean temp. = 19.0 °C	Recalculate
Life span (approx.):	9.2 years Estimated from Linf., K and to. Max. age & size data	
Generation time:	2.9 years Estimated from Lopt, Linf., K and to.	
Age at first maturity (tm):	2.2 years Estimated from Lm, Linf., K and to.	
L maturity (Lm):	30.3 s.e. 22.6 - 40.6 cm TL Estimated from Linf. Maturity data	
L max. yield (Lopt):	35.0 s.e. n.a. - n.a. cm TL Estimated from Linf., K and M.	
Length-weight:	54.6 cm TL => 3285.6 g (wet weight) W = 0.0130 * L ^ 3.11000	Recalculate Length-weight data
Nitrogen & protein:	Weight 3286 (g) => whole-body nitrogen (N) 93.8 (g) => whole-body crude protein 586.1 (g)	Recalculate
Fecundity:	8,660,254 [5,000,000-15,000,000] Estimated as geometric mean. Fecundity	
Relative Yield per Recruit (Y'/R):	0.0373 Estimate Y'/R from M/K, Lc/Linf and E. Lc= 21.8 cm TL E= 0.50 /year Emsy 0.62 /year Eopt 0.55 /year Fmsy 0.85 /year Fopt 0.64 /year	Recalculate
Exploitation:	Z= F= E= Estimate Z, F, E from Lc, Lmean, Linf, K, M Lc = 21.8 cm TL Lmean = cm TL	Recalculate
Resilience / productivity:	High; decline threshold 0.99 Vulnerable to extinction if decline in biomass or numbers exceeds threshold over the longer of 10 years or 3 generations.	

Figure 3: Turbot Life History Tool **R3**

References

R1: MAP **S**kagerrak Kattegat ICES 3a: Modal shift to Short Sea Shipping in the Sound, Kattegat and Skagerrak 2pp: www.SSPE.se

R2: ICES Advice (2019) Turbot (*Scophthalmus maximus)* in Division 3.a (Skagerrak and Kattegat) http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/tur.27.3a.pdf

R3: FISHBASE: Turbot: https://www.fishbase.in/Summary/SpeciesSummary.php?ID=1348&AT=Turbot

R4: COUNCIL REGULATION (EC) No 850/98 of 30 March 1998 for the conservation of fishery resources through technical measures for the protection of juveniles of marine organism https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A31998R0850

R5: EU (2018). Regulation (EU) 2018/973 of the European Parliament and of the Council of 4 July 2018 establishing a multiannual plan for demersal stocks in the North Sea and the fisheries exploiting those stocks, specifying details of the implementation of the landing obligation in the North Sea and repealing Council Regulations (EC) No 676/2007 and (EC) No 1342/2008. Official Journal of the European Union, L. 179. 13 pp. http://data.europa.eu/eli/reg/2018/973/oj.

R6: ICES. 2019. Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK). ICES Scientific Reports. 1:7. http://doi.org/10.17895/ices.pub.5402

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	Turbot *Scophthalmus maximus*	
	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

D4.1:

Biomass index indicators have been calculated for this stock. The Annual International Bottom Trawl Survey (IBTS Q3) biomass index is variable and has shown an increased level after 2005:

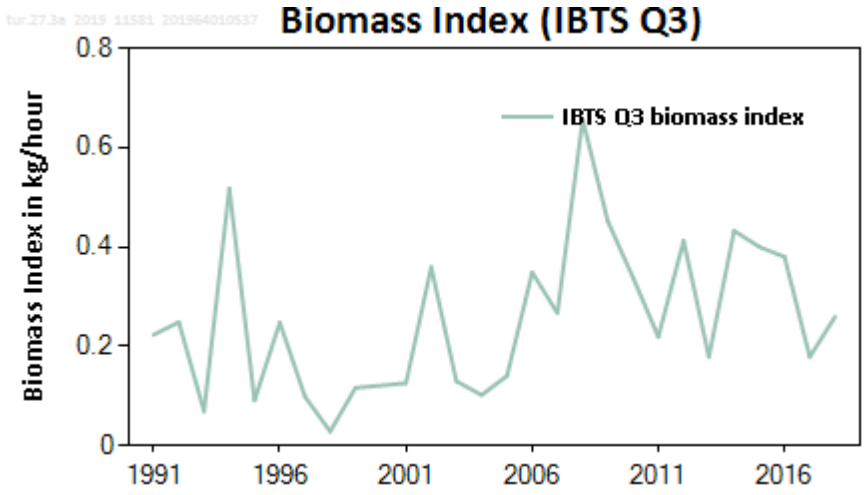

Figure 4: Biomass indices (catch per unit of effort in kg h−1) for Turbot in ICES 3a **R2**

The EU multiannual plan (MAP) for stocks in the North Sea (EU, 2018) and adjacent waters applies to by-catches of this stock. The MAP stipulates that when FMSY ranges are not available, fishing opportunities should be based on best available scientific advice.

There is no minimum landing size (MLS) at EU level, but there is a minimum landing size of 30 cm in Denmark; all recorded discards are below this value. Catches have been quite low in recent years, generally averaging 200t R**6**.

D4.2:

The general perception is that landings have fluctuated without trends over a long period. Survey indices are of poor quality, with low catch rates and large annual fluctuations, and show no clear trends. However, in 2017, length-based indicators (LBI) and exploratory SPiCT runs were run, pointing out that the stock may be

exploited sustainably. In 2019, LBI indicators were not updated due to poorer length information available following a reduced sampling regime since 2017. The stock will be benchmarked in 2020. Turbot is now only caught as by-catch in trawl and gillnet fisheries. Danish catches present throughout the time series have fluctuated without trends around 100‑200 t per year. Total landings in 2018 were 150 tonnes, in the range observed in the 1950s **R6**.
Standard clause 1.3.2.2