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

Fishery Under Assessment	**Whiting** **Denmark** **Southern Celtic Seas,** **Western English Channel.**
Date	February 2020
Assessor	Jim Daly
Stock Pass	ICES Divisions 7.b–c and 7.e–k
Stock Fail	

Application details and summary of the assessment outcome				
Name: FF Skagen and others				
Address:				
Country: Denmark		**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	Whiting (*Merlangius merlangus*)
Stock:	Divisions 7.b–c and 7.e–k
Fishery Location	Southern Celtic Seas and Western English Channel.
Gear Type(s)	All Compliant Gear Types
Outcome of Assessment	
Peer Review Evaluation	AGREE
Recommendation	APPROVE

Assessment Determination
If any species is categorised as Endangered or Critically Endangered on IUCN's Red List, or if it appears in the CITES appendices, it cannot be approved for use as IFFO RS raw material. Whiting does not appear as Endangered or Critically Endangered on IUCN's Red List, nor does it appear in CITES appendices; therefore, Whiting is eligible for approval for use as IFFO RS by-product raw material. One stock forms part of this assessment: 1) Divisions 7.b‑c and 7.e‑k Fishery removals of the stock are considered in the various stock assessment processes so the stock **PASSES** Clause C1.1. For Whiting in the assessment area, the most recent estimated spawning stock biomass (SSB_{2020} 23,615t) is not estimated to be above Blim (25,000t); removals are not considered to be negligible therefore, the stock **FAILS** Clause C1.2. According to IFFO RS procedures a stock that does not meet the minimum requirements of a Category C assessment (Clauses C1.1; C1.2) should be re-assessed as Category D. The stock has passed this Category D assessment (**Table D3**). Whiting is **APPROVED** by SAI Global assessors in the assessment area for the production of fishmeal and fish oil under the current 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
Whiting	*Merlangius merlangus*	Divisions 7.b-c and 7.e-k	N/A	EU/Common Fisheries Policy	C

CATEGORY C SPECIES

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment. In a by-product assessment, Category C species are those which are subject to a species-specific management regime and are usually targeted species in fisheries for human consumption.

Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. A Category C species does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		Whiting *Merlangius merlangus*	
C1		**Category C Stock Status - Minimum Requirements**	
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process OR are considered by scientific authorities to be negligible.	**PASS**
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	**FAIL**
Clause outcome:			**FAIL**
C1.1 **Evidence** This assessment covers Whiting from the areas outlined in **Figure 1:**			

Figure 1: MAP of the Assessment Area: Southern Celtic Seas and Western English Channel **R1**

Input data was derived from an Age-based analytical assessment (XSA) using catches in model and forecast. Input data from commercial landings, estimated discards, age composition of catches and one survey index were combined. Discards and bycatch are included in the assessment for the full time-series. This stock was last benchmarked in 2014.

| **C1.2** |
| **Evidence** |
| Spawning-stock biomass (SSB_{2020} 23,615t) has decreased since 2012 and is estimated at below MSY Btrigger since 2017 and below Blim (25,000t) since 2018: **Figure 2:** |
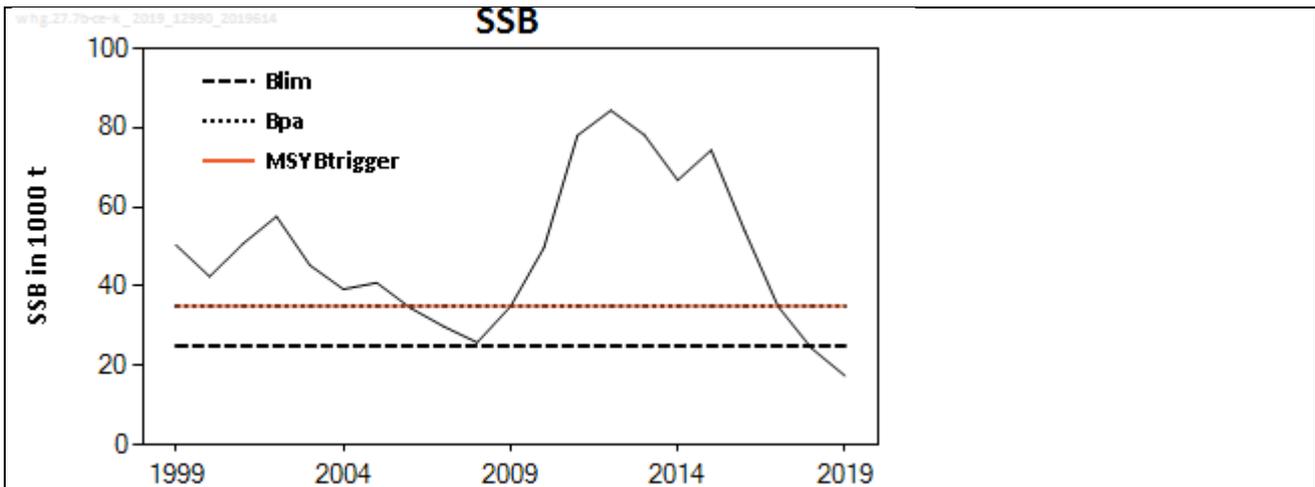
Figure 2: Whiting in divisions 7.b-c and 7.e-k. Summary of the stock assessment **R2.**

ICES assess that fishing pressure on the stock is above FMSY, but below Fpa and Flim; the spawning-stock size is below MSY Btrigger, Bpa, and Blim **(Table 1):**

Table 1: Whiting in divisions 7.b-c and 7.e-k. State of the stock and fishery relative to reference points. **R2**

		Fishing pressure				Stock size			
		2016	2017	2018			2017	2018	2019
Maximum sustainable yield	F_{MSY}	✓	✗	✗ Above		MSY $B_{trigger}$	✗	✗	✗ Below trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably		B_{pa}, B_{lim}	D	✗	✗ Reduced reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Within the range		B_{MGT}	✗	✗	✗ Below trigger

ICES advise that when the EU multiannual plan (MAP) for Western Waters and adjacent waters is applied, catches in 2020 corresponding to F ranges in the MAP are between 4,157t and 6,481t.

References
R1 MAP of the Assessment Area: http://ontheworldmap.com/oceans-and-seas/english-channel/english-channel-physical-map.html
R2 ICES Advice (2019): Whiting (Merlangius merlangus) in divisions 7.b-c and 7.e-k (southern Celtic Seas and western English Channel)
http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/whg.27.7b-ce-k.pdf
R3: Fishbase Whiting:
https://www.fishbase.in/Summary/SpeciesSummary.php?ID=29&AT=Whiting

Standard clauses 1.3.2.2

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:	Whiting *Merlangius merlangus*		
	Productivity Attribute		**Value**	**Score**
	Average age at maturity (years)		**2	2
	Average maximum age (years)		*20	2
	Fecundity (eggs/spawning)		*>10,000	1
	Average maximum size (cm)		*91.5	2
	Average size at maturity (cm)		*27.8	1
	Reproductive strategy		**Egg Scatterers	1
	Mean trophic level		*4.4	3
	Average Productivity Score			**1.71**
	Susceptibility Attribute		**Value**	**Score**
	Overlap of adult species range with fishery		*<25% in area fished	1
	Distribution		Not used	-
	Habitat		Not used	-
	Depth range		*10-200m	3
	Selectivity		*>x2 mesh	3
	Post-capture mortality		*Dead	3
	Average Susceptibility Score			**2.5**
	PSA Risk Rating (From Table D3)			**PASS**

Evidence for Table D1:

* Fishbase **R3;** ** Fishbase Life History Tool **Figure 3**

This assessment covers Whiting from the area outlined in **Figure 1**.

Whiting: Global Distribution

Figure 2: Whiting distribution in the assessment area **R3**

Whiting: Life History Tool

Life History Data on *Merlangius merlangus*
Whiting

Family:	Gadidae — Cods and haddocks
Max. length (Lmax):	91.5 cm TL
L infinity (Linf):	= 42.7 cm TL ⌄ [Recalculate]
K:	0.34 /year Ø' = 2.79 Median Ø' value with related Linf. and K. [Recalculate] Growth & mortality data
to:	-0.44 years Estimated from Linf and K.
Natural mortality (M):	0.47 s.e. 0.31 – 0.71 /year Estimated from Linf., K and annual mean temp. = 9.0 °C [Recalculate]
Life span (approx.):	8.4 years Estimated from Linf., K and t₀. Max. age & size data
Generation time:	2.9 years Estimated from Lopt, Linf., K and t₀.
Age at first maturity (tm):	2.0 years Estimated from Lm, Linf., K and t₀.
L maturity (Lm):	24.3 s.e. 18.2 - 32.6 cm TL Estimated from Linf. Maturity data
L max. yield (Lopt):	29.2 s.e. n.a. - n.a. cm TL Estimated from Linf., K and M.
Length-weight:	42.7 cm TL ⌄ => 572.5 g (wet weight) W = 0.0067 * L ^ 3.02480 [Recalculate] Length-weight data
Nitrogen & protein:	Weight 573 (g) => whole-body nitrogen (N) 15.5 (g) => whole-body crude protein 96.9 (g) [Recalculate]
Reproductive guild:	nonguarders: open water/substratum egg scatterers Reproduction
Fecundity:	330,693 [109,358-1,000,000] Estimated as geometric mean. Fecundity
Relative Yield per Recruit (Y'/R):	0.0497 Estimate Y'/R from M/K, Lc/Linf and E. Lc=17.1 cm TL E=0.50 /year Emsy 0.60 /year Eopt 0.54 /year Fmsy 0.71 /year Fopt 0.55 /year [Recalculate]
Exploitation:	Z= [ ] F= [ ] E= [ ] Estimate Z, F, E from Lc, Lmean, Linf, K, M Lc = 17.1 cm TL Lmean = [ ] cm TL [Recalculate]

Figure 3: Whiting Life History **R3**

Standard clauses 1.3.2.2

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk — Score 3	Medium productivity/ Medium risk — Score 2	High productivity/ Low risk — 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 — Score 3	Medium susceptibility/ Medium risk — Score 2	Low susceptibility/ Low risk — 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