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Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	**Norway Atlantic cod (*Gadus morhua*) in ICES subareas 1 and 2**
Date	**October 2019**
Assessor	**Jim Daly**

Application details and summary of the assessment outcome				
Name: Scanbio Ingredients AS; Vedde AS				
Address:				
Country: Norway		**Zip:**		
Tel. No.:		**Fax. No.:**		
Email address:		**Applicant Code**		
Key Contact:		**Title:**		
Certification Body Details				
Name of Certification Body:		**SAI Global Ltd**		
Assessor Name	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**	**Whole fish/ By-product**
Jim Daly	Sam Dignan	0.5	Surveillance 2	By-product
Assessment Period	2019			

Scope Details		
Management Authority (Country/State)		Norway
Main Species		Cod (*Gadus morhua)*
Stocks:	**1**	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod)
	2	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Artic)
Fishery Location		North-East Atlantic (Norway Coast, Artic)
Gear Type(s)		Demersal trawl gear, gill nets and handlines.

Overall Outcomes:		**Outcome**	**Clause(s) failed**
1	Norwegian Coastal waters Cod subareas 1 and 2	PASS	N/A
2	Northeast Artic Cod subareas 1 and 2	PASS	N/A
Peer Review Evaluation			

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 an IFFO RS raw material. Norway Cod does not appear as Endangered or Critically Endangered on the IUCN Red List, nor does it appear in the CITES appendices; therefore, Norway cod is eligible for approval for use as an IFFO RS raw material.

Two distinct stocks form part of this assessment:

1) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod)
2) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic)

1) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod):
For this stock ICES cannot assess status relative to MSY and PA reference points because target reference points (both biomass and mortality) are undefined. Survey estimates in 2018 were well below the rebuilding biomass target set in the management plan.

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 this risk-based assessment (**Table D4**).

2) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic):
For Northeast Artic Cod fishery removals are included in the stock assessment process and passes Clause C1.1. ICES (2019) assess that spawning stock size is above MSY Btrigger, Bpa, and Blim. The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy) and passes Clause C1.2.

In order to be approved, each stock assessed must pass both Clause C1.1 and C1.2 or Clause D; therefore:

1) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod) is **approved**
2) Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic) is **approved**.

Cod in the assessment area has not yet been assessed for the IUCN Red List. Atlantic Cod (Europe) is assessed as of least concern. Cod is not on the current list of CITES endangered species (websites accessed 26.09.19).

Norwegian Coastal and Northeast Artic Cod from the assessment area are approved by the assessment team for the production of fishmeal and fish oil under the IFFO-RS v 2.0 by-product standard.

Peer Review Comments

The Reviewer agrees with the categorisation of the two stocks under assessment based on the rationale provided. While a biomass target is defined for Cod (Gadus morhua) in subareas 1 and 2 (Norwegian coastal waters cod), there is no defined limit against which the Assessor could have assessed the stock under Clause C1.2; therefore, the assessment of this stock as Category D is appropriate. Conversely, for Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic), a limit reference point is defined and as such it was appropriate to assess it under Category C.

The Reviewer further agrees with the outcomes of this assessment.

The Standard's continual use of species is confusing and taken literally could mean a stock that is doing very badly being approved because the species as a whole is doing alright. The Standard (and Report Templates) should be amended to reflect that an assessment is carried out at the stock, rather than at the species, level.
Notes for On-site Auditor
There are numerous non-approved cod stocks in the Northeast Atlantic; therefore, the auditor should ensure that IFFO-approved products are comprised solely of approved stocks.

Species/Stock-Specific Results

Category	Species/Stock	% landings	Outcome (Pass/Fail)	
A			A1	n/a
			A2	n/a
			A3	n/a
			A4	n/a
B			n/a	
C	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic)	N/A	PASS	
D	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod)	N/A	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
Atlantic cod	*Gadus morhua*	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod)	N/A	JNFRC, Norway	D
Atlantic cod	*Gadus morhua*	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic)	N/A	JNFRC, Norway	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 that does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic)	
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.	PASS

Evidence

C1.1:

Norway and Russia jointly manage cod and other important fish species within the framework of the Joint Norwegian-Russian Fisheries Commission (JNRFC). This assessment covers Norwegian vessels landing cod from sub areas 1 and 2 as outlined in Figure 1 below:

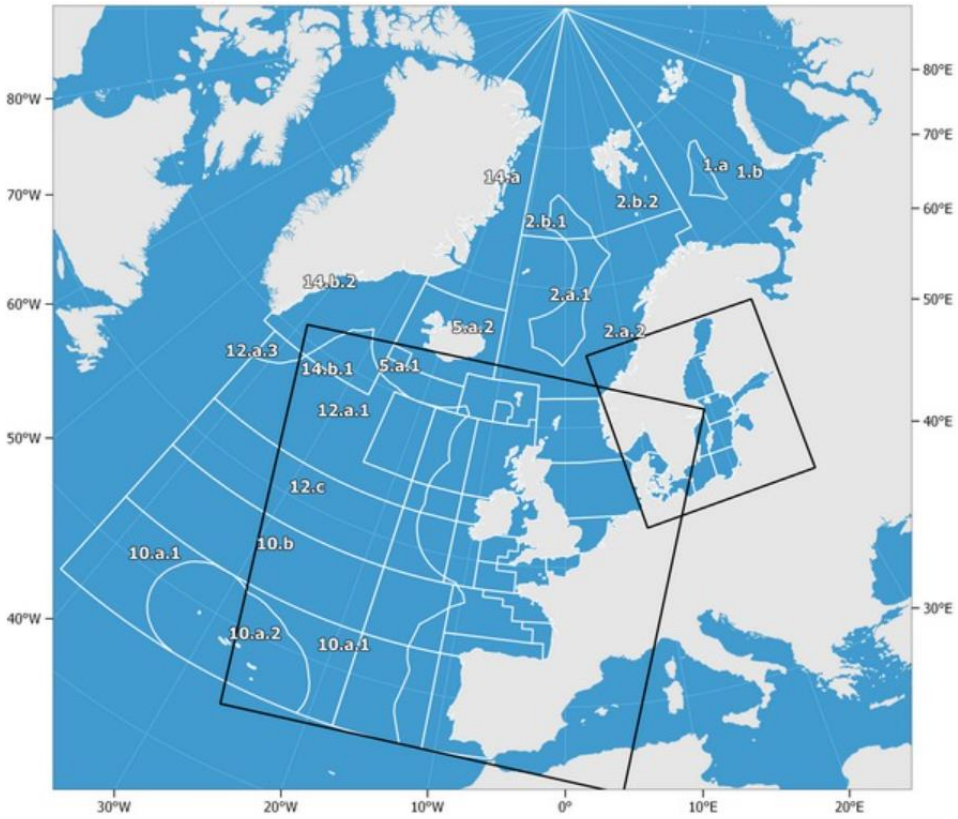

Figure 1: Atlantic, Northeast (Major Fishing Area 27) corresponding to ICES fishing areas for statistical purposes Source FAO **R1**

Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic)

Input data has been derived from commercial catches (international landings, ages and length frequencies) and from four survey indices (Joint bottom trawl survey Barents Sea, Feb-Mar (BS-NoRu-Q1 (BTr)); Joint acoustic survey Barents Sea and Lofoten, Feb-Mar (BS-NoRu-Q1 (Aco)) and a Russian bottom trawl survey, October-December (RU-BTr-Q4)). A Joint Ecosystem survey (Eco-NoRu-Q3 (Btr)) is also undertaken. Annual maturity and natural mortality data are derived from these four surveys. Discarding is considered negligible in recent years (below 5%). Bycatch is included. The stock was last benchmarked in 2017. Therefore, fishery removals are included in the stock assessment process and the stock does **PASS** C1.1.

C1.2:

Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Northeast Arctic):

ICES (2019) assess that fishing pressure on the stock is at Fpa = FMSY and below Flim, while spawning stock size is above MSY Btrigger, Bpa, and Blim:

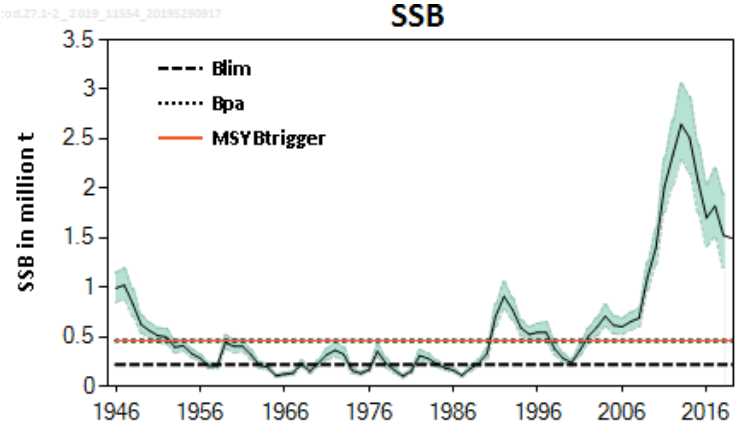

Figure 2: Cod in subareas 1 and 2 (Northeast Arctic). SSB with confidence intervals (95%) in the plot. **R3**

The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy) **and passes Clause C1.2.**

References

R1 FAO Major Fishing Areas: http://www.fao.org/fishery/area/search/en

R2 Cod (*Gadus morhua*) in subareas 1 and 2 (Norwegian coastal waters cod): ICES advice 2019: http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.1-2coast.pdf

R3 Cod (*Gadus morhua*) in subareas 1 and 2 (Northeast Arctic) ICES advice 2019 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/cod.27.1-2.pdf

R4 IUCN Red List https://www.iucnredlist.org

R5 CITES http://checklist.cites.org/#/en

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.

Table D2 - Productivity/Susceptibility attributes and scores

D1	Species Name:	Cod (*Gadus morhua*) in ICES subareas 1 and 2 (Norwegian coastal waters cod)	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)	4.68	3
	Average maximum age (years)	10-30	2
	Fecundity (eggs/spawning)	>10,000	1
	Average maximum size (cm)	200	3
	Average size at maturity (cm)	68.3	2
	Reproductive strategy	Dem spawner	2
	Mean trophic level	4.1	3
	Average Productivity Score		**2.28**
	Susceptibility Attribute	**Value**	**Score**
	Overlap of adult species range with fishery	<25%	1
	Distribution	Not used	
	Habitat	Demersal	3
	Depth range	Not used	
	Selectivity	>2 mesh size	3
	Post-capture mortality	Trawl > 3 hrs	3
	Average Susceptibility Score		**2.5**
	PSA Risk Rating (See Table D4)		**FAIL**
	Compliance rating		**D4**

References

D1 Fishbase COD *G. morhua*

https://www.fishbase.de/Summary/SpeciesSummary.php?ID=69&AT=cod

Standard clauses 1.3.2.2

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	Cod (*Gadus morhua*) in subareas 1 and 2 (Norwegian coastal waters cod)	
	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

Distribution of Atlantic cod (*Gadus morhua*)

Figure 3 Distribution of Atlantic cod *Gadus morhua* (Aquamaps) **DI**

D4.1:

For the Coastal Cod stock a management plan is in place. The plan (put in place in 2011) specifies reductions in fishing mortality relative to F2009. Step 1 of the plan was initiated in 2011. The regulation in 2011 was aimed at a 15% reduction of F relative to F2009. New steps are initiated when annual SSB survey indices are lower than the index in the previous year. The rebuilding plan has now been in operation for eight years. ICES (2019) now strongly recommends the development of a new rebuilding plan for Coastal Cod.

Potential impacts of the fishery on this species are considered during the management process, and reasonable measures taken to minimise these impacts

D4.2:

The assessment (Coastal Cod) is rather uncertain. Reasons for this include:

a. uncertainty in the catch split between Northeast Arctic cod and coastal cod, where coastal cod is the minor fraction of the overall cod catch,
b. highly uncertain data for the recreational catch,
c. uncertainty regarding stock identity among coastal cod sub-stocks, and
d. the survey is considered uncertain since it does not cover the shallow parts of the stock distribution area.

An agreed TAC of 21,000t was announced for the 2019 fishery (R2).

There is no substantial evidence that the fishery has a significant negative impact on the species**.**

References
D1 Fishbase COD *G.morhua*
https://www.fishbase.de/Summary/SpeciesSummary.php?ID=69&AT=cod
Standard clause 1.3.2.2

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.