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Global Standard for Responsible Supply of Marine Ingredients

Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	**Atlantic cod *Gadus morhua* FAO 27.2**
Date	**April 2019**
Assessor	**Jim Daly**

Application details and summary of the assessment outcome				
Name: Thein Quynh Ltd				
Address:				
Country: Vietnam		**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	Vito Romito	0.5	Surveillance 1	By-product
Assessment Period	2018			

Scope Details	
Management Authority (Country/State)	EU, Common Fisheries Policy (CFP)
Main Species	Cod *Gadus morhua*
Fishery Location	FAO 27.2 Norwegian Sea, Spitzbergen and Bear Island
Gear Type(s)	Trawl, longline, gillnet, Danish seine, hook and line
Outcome of Assessment	
Overall Outcome	Pass
Clauses Failed	None
Peer Review Evaluation	Pass
Recommendation	Approve

Assessment Determination

The client sources cod from ICES 27.2. There are currently nine MSC certified (three in assessment) fisheries in the area. The client sources by-product from three of these. One stock is subject to a re-building plan. However ICES strongly recommends the development of a new rebuilding plan for Norwegian coastal cod. Until such a plan is in operation, ICES will continue to provide advice based upon the existing rebuilding plan.

The stocks fall within the management remit of Norway and the Joint Norwegian-Russian Fisheries Commission (JNRFC) and are subject to annual TAC and other management measures. Scientific advice is provided by ICES, the Institute of Marine Research (IMR Norway) and PINRO (Russia). The following stocks are identified in this area:

- Northeast Arctic cod
- Norwegian Coastal cod

The two stocks are subject to species-specific management regimes and so are assessed under clause C. For both stocks, fishery removals are included in the stock assessment **and pass Clause C1.1**. The north east Arctic stock is considered, in its most recent assessment, to have a biomass above the limit reference point **and passes clause C1.2**

The Norwegian coastal cod stock does not have limit reference points defined for it. However, it is subject to a re-building plan. Although the stock is considered still to be well below the re-building target, recruitment and spawning stock biomass have been stable for some time and there has been a declining trend in fishing mortality. A re-building plan is in place and re-building activities on-going with annual monitoring of progress through the MSC surveillance process **so it is considered the stock passes clause C1.2**.

Progress in recovering this stock through the re-building plan should be checked in subsequent by-product assessments. The assessment team also recommend and will verify that the re-building plan includes coastal cod taken as bycatch in Northeast Arctic cod, haddock, and saithe fisheries.

Cod is classified as least concern on the IUCN Red List of Threatened Species and is not currently listed on CITES appendices (accessed 03.04.19).

The North East Arctic and Norwegian Coastal cod stocks are recommended for approval as by-product material under the IFFO RS Standard v 2.0

Peer Review Comments

This by-product assessment considers stocks in the Barents and Norwegian Seas within ICES subareas I and II. These fall within the management remit of Norway (Norwegian coastal waters) and the Joint Norwegian-Russian Fisheries Commission (JNRFC international waters) and are subject to annual TAC and other management measures.

This Northeast Arctic cod stock is an ICES data category 1 stock for which an analytical assessment is possible. The assessment is undertaken using a statistical catch-at-age (SAM) model. Input data includes commercial catches (international landings, ages and length frequencies from catch sampling); 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)); Russian bottom trawl survey, October–December (RU-BTr-Q4)); Joint Ecosystem survey (Eco-NoRu-Q3 (Btr)). Fishery removals of the species in the fishery under assessment are included in the stock assessment process, the species passes Clause C1.1.

The spawning-stock biomass (SSB) has been above MSY Btrigger since 2002. The SSB reached a peak in 2013 and now shows a downward trend. Fishing mortality (F) was reduced from well above Flim in 1997 to below FMSY in 2008. It remained below FMSY until 2017 when it became equal to FMSY. The spawning stock size is above MSY Btrigger, Bpa, and Blim. The stock has full reproductive capacity and is considered, in its most recent assessment, to have a biomass above the limit reference point so it passes clause C1.2

The Norwegian coastal waters cod stock is an ICES data category 3 (data limited) stock. Its assessment is based on survey SSB index and estimates of fishing mortality and relative recruitment from an exploratory VPA assessment. Input data includes catch-at-age and an acoustic survey; commercial catches (landings, age and length frequencies from catch sampling); one survey index (coastal survey, NO coast-Aco-4Q). A Norwegian building plan exists which includes a rebuilding target. Fishery removals of the species in the fishery under assessment are included in the stock assessment process, the species passes Clause C1.1

The Norwegian coastal cod stock does not have limit reference points defined for it. However, it is subject to a re-building plan. Although the stock is considered still to be well below the re-building target, recruitment and spawning stock biomass have been stable for some time and there has been a declining trend in fishing mortality. A re-building plan is in place and re-building activities on-going with annual monitoring of progress through the MSC surveillance process so it is considered the stock passes clause C1.2.

The Peer Reviewer agrees that the North East Arctic and Norwegian Coastal cod stocks should be recommended for approval as by-product material under the IFFO RS Standard v 2.0.

Notes for On-site Auditor

Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A			A1	
			A2	
			A3	

			A4	
Category B				
Category C	Atlantic cod *Gadus morhua*	N/A	Pass	
Category D				

[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*	2 stocks	N/A	Norway-Russian Fisheries Commission, 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 does not meet the minimum requirements of clause C1 should be re-assessed as a Category D species.

Species Name		**Atlantic cod *Gadus morhua***	
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
		Clause outcome:	**Pass**

Evidence

This by-product assessment considers stocks in the Barents and Norwegian Seas within ICES subareas I and II (**Figure 1**). These fall within the management remit of Norway (Norwegian coastal waters) and the Joint Norwegian-Russian Fisheries Commission (JNRFC international waters) and are subject to annual TAC and other management measures:

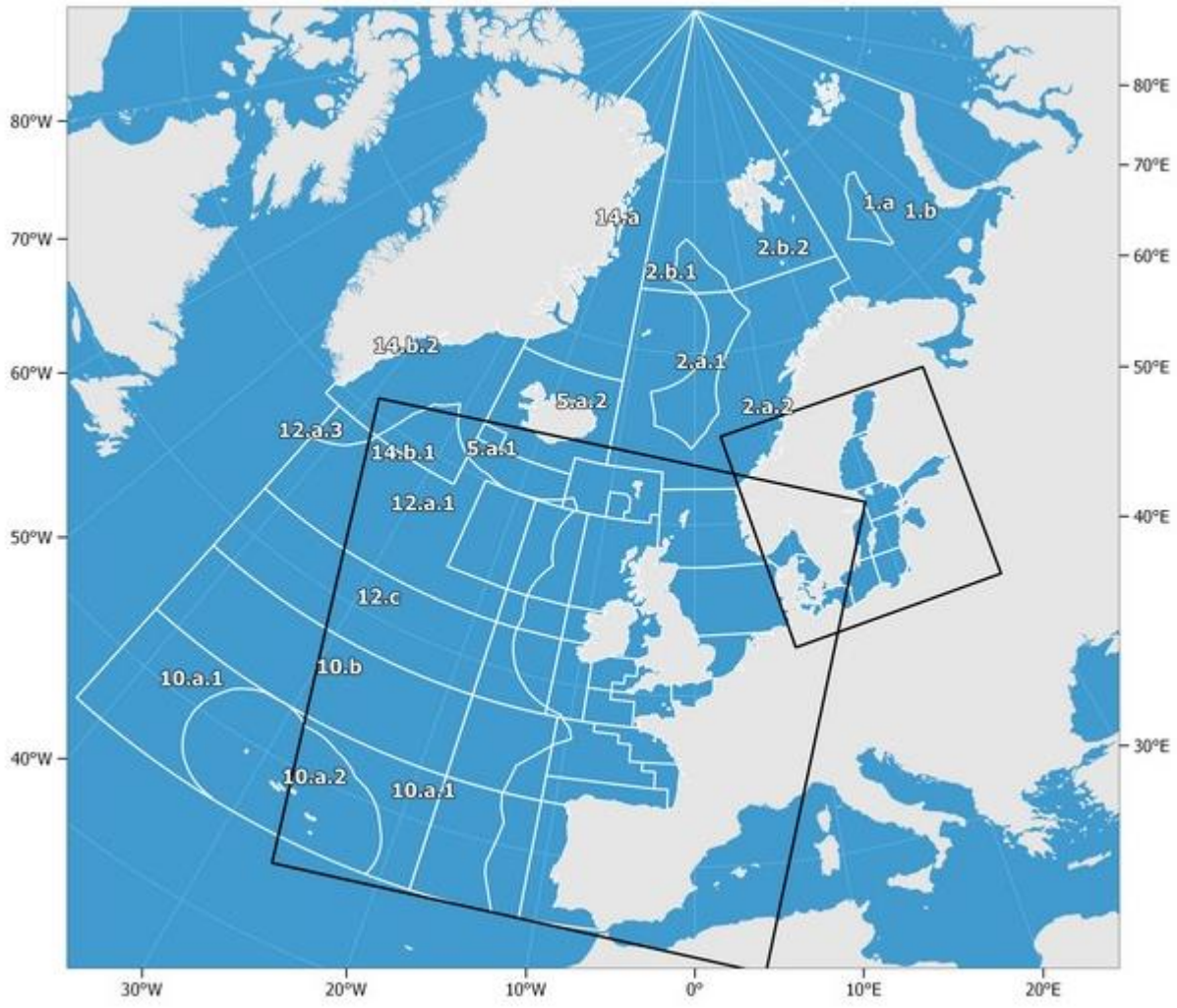

Figure 1: The boundaries of the Atlantic, Northeast (Major Fishing Area 27) corresponding to the ICES fishing areas for statistical purposes. Source: **R1**

Within ICES subareas I and II ICES provides advice on the following stocks:

Northeast Arctic cod:
This cod stock is an ICES data category 1 stock for which an analytical assessment is possible. The assessment is undertaken using a statistical catch-at-age (SAM) model. Input data includes commercial catches (international landings, ages and length frequencies from catch sampling); 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)); Russian bottom trawl survey, October–December (RU-BTr-Q4)); Joint Ecosystem survey (Eco-NoRu-Q3 (Btr)). MSY, precautionary and limit reference points are defined for biomass and fishing mortality.

Fishery removals of the species in the fishery under assessment are included in the stock assessment process, **the species passes Clause C1.1**.

The spawning-stock biomass (SSB) has been above MSY Btrigger since 2002. The SSB reached a peak in 2013 and now shows a downward trend. Fishing mortality (F) was reduced from well above Flim in 1997 to below FMSY in 2008. It remained below FMSY until 2017 when it became equal to FMSY. There has been no strong recruitment since the 2004 and 2005 year classes:

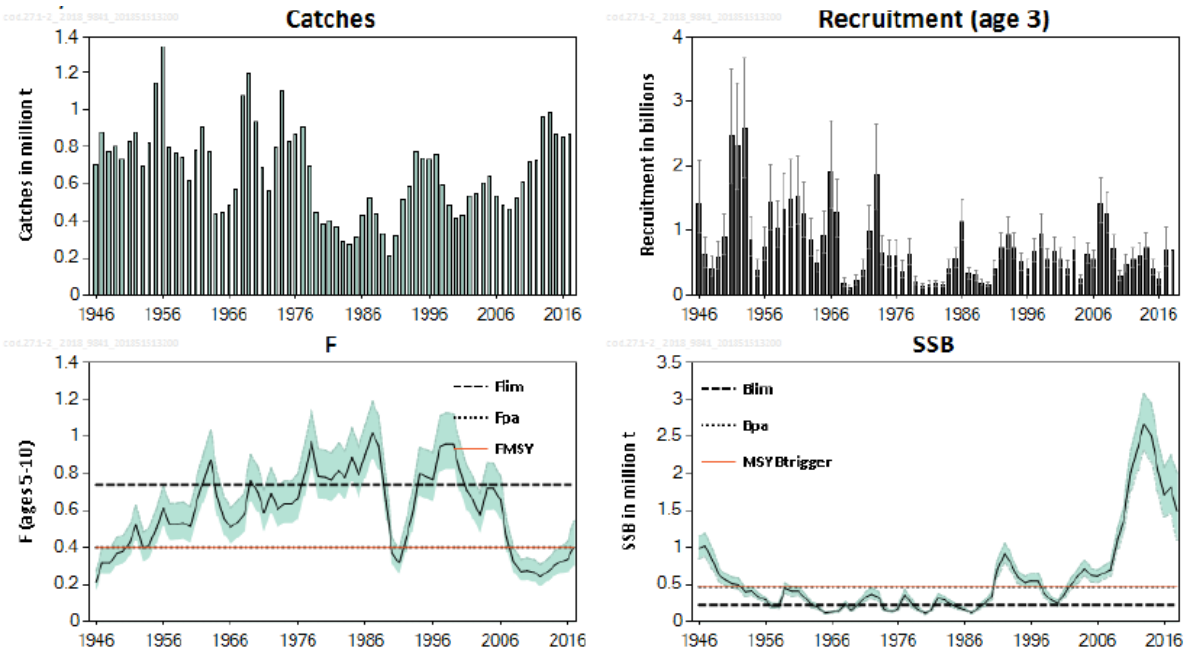

Figure 2 Cod in subareas 1 and 2 (Northeast Arctic). Catch, recruitment, F, and SSB. Recruitment, F, and SSB have confidence intervals (95%) in the plot. For this stock, FMGT = FMSY and SSBMGT = MSY Btrigger = Bpa. **R2**

ICES assesses that fishing pressure on the stock is at Fpa = FMSY and below Flim, while the spawning stock size is above MSY Btrigger, Bpa, and Blim. The stock has full reproductive capacity. The stock is considered, in its most recent assessment, to have a biomass above the limit reference point so it **passes clause C1.2**

Norwegian coastal waters cod

This cod stock is an ICES data category 3 (data limited) stock. Its assessment is based on survey SSB index and estimates of fishing mortality and relative recruitment from an exploratory VPA assessment. Input data includes catch-at-age and an acoustic survey; commercial catches (landings, age and length frequencies from catch sampling); one survey index (coastal survey, NO coast-Aco-4Q). A Norwegian building plan exists which includes a rebuilding target.

Fishery removals of the species in the fishery under assessment are included in the stock assessment process, **the species passes Clause C1.1**

The rebuilding plan is based on the autumn survey results. If the 2018 SSB index is below the 2017 index, application of the rebuilding plan implies that the regulations should ensure that catches in 2019 are consistent with no less than 75% reduction in F relative to the 2009 value. If the 2018 SSB index is above the 2017 index, then the required reduction in F remains at 60% relative to the 2009 value (**R3, R4**).

The survey estimate in 2017 was well below the rebuilding biomass set in the Norwegian rebuilding plan. Both SSB and recruitment have been stable overall in the last two decades. Fishing pressure (F) increased in 2015, 2016, and 2017, after a declining trend over the period 2000‑2014: (**Figure 2**):

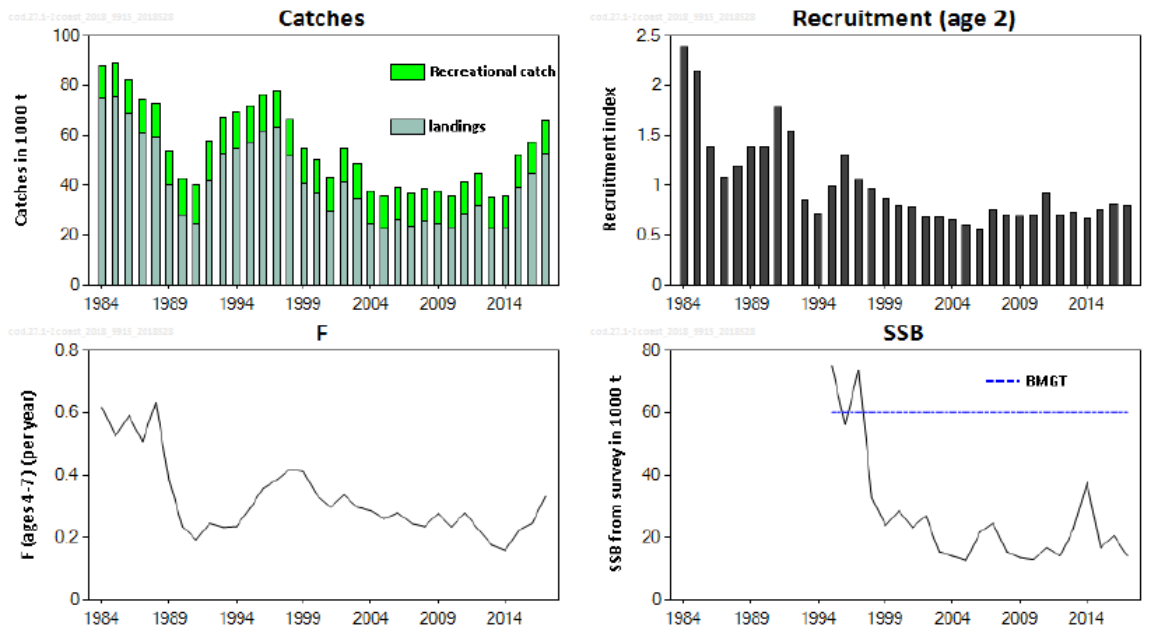

Figure 2 Cod in subareas 1 and 2 (Norwegian coastal waters cod). Summary of the stock assessment. Catches (recreational catches are fixed from 2009 at 12 700 tonnes), the relative recruitment index (long-term average = 1) and F estimate from the exploratory virtual population analysis (VPA) assessment, and the survey spawning-stock biomass (SSB) index (including the rebuilding biomass of 60 000 tonnes in the rebuilding plan). **R2**

The SSB index in 2017 was lower than the index in 2016 (**Figure 2**) so the rebuilding plan moved to step 4: no less than a 60% reduction in F for 2018 relative to the 2009 value (**R3**, **R4)**.

ICES cannot assess the stock and exploitation status relative to MSY and PA reference points because the reference points are undefined.

A number of fisheries are currently (2019 data) MSC certified for northeast Arctic cod; the client sources from three of these: Norges Fiskerlag Norway North East Arctic cod and haddock fishery; FIUN Barents and Norwegian Seas cod fishery; and Arkhangelsk Trawl Fleet Barents Sea cod, haddock and saithe. **R5**

These fisheries mainly target NE arctic cod but there is some overlap of the two stocks such that Norwegian coastal waters cod have now been designated as an IPI (Inseparable or Practically Inseparable) stock in the Norges Fiskerlag fishery. A condition was applied to the Norges Fiskerlag fishery requiring that retained species including Norwegian coastal cod, "are highly likely to be within biologically based limits or if outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding of depleted species" (Lassen and Chaudhury, 2017 **R6**).

The Norges Fiskerlag assessment noted that for Norwegian coastal cod a strategy is in place to allow for recovery and rebuilding with rebuilding progress monitored and reported during the annual MSC surveillance audits. The latest surveillance report notes that the rebuilding plan was developed in 2010 and rebuilding activities are still in place and their effectiveness has yet to be fully evaluated.

Regulatory measures have been introduced to reduce the fishing pressure on coastal cod and enable stock recovery. The aim of the regulatory measures is to move parts of the traditional coastal fishery from the catching of coastal cod in the outer parts of the fjords and the inshore areas, to a cod fishery outside these

areas, where the proportions of northeast Arctic cod is higher and coastal cod is lower. Other measures in place include closures of coastal areas and by-catch restrictions.

The Norges Fiskerlag assessment notes that whilst Norwegian coastal cod is no longer declining the stock has not improved as expected and is not recovered. The assessment includes a recommendation, noting that the IPI designation, which allows coastal cod caught in the north east Arctic cod fishery to enter further MSC certified chains, only applies to one assessment cycle. The recommendation is for the client to address this issue before the next re-certification and suggests Norwegian coastal cod needs to be assessed under Principle 1 at the next re-certification or the catch of coastal cod reduced to 2% or less of the total combined catch. The Norges Fiskerlag certificate is due to expire in October 2020 (Lassen and Chaudhury **R6**).

The Norwegian coastal cod stock does not have limit reference points defined for it. However, it is subject to a re-building plan. Although the stock is considered still to be well below the re-building target, recruitment and spawning stock biomass have been stable for some time and there has been a declining trend in fishing mortality. A re-building plan is in place and re-building activities on-going with annual monitoring of progress through the MSC surveillance process **so it is considered the stock passes clause C1.2.**

References

R1: ICES Statistical Areas: https://www.bing.com/images/search?q=FAO+ICES+STATISTICAL+AREAS+MAP&id=723500135429CD7F05A1BB069397C48D1B8A262F&FORM=IQFRBA

R2: ICES, June 2018. Cod (*Gadus morhua*) in subareas 1 and 2 (Northeast Arctic): http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.1-2.pdf

R3 ICES, 2018 Cod (*Gadus morhua*) in subareas 1 and 2 (Norwegian coastal waters cod). http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/cod.27.1-2coast.pdf

R4 Coastal cod Recovery Plan: ICES. 2010. Request by the Norwegian ministry of fisheries and coastal affairs: Evaluation of a rebuilding plan for coastal cod. *In* Report of the ICES Advisory Committee, 2010. ICES Advice 2010, Book 3, Section 3.3.3.1. 3 pp.

R5 MSC Fishery Certificate: Norway North East Arctic cod and haddock fishery. Certificate number: F-DNV-186569

R6 Lassen, H. & Chaudhury, S. (2017). Surveillance No. 2. Surveillance Report for the Norway North East Arctic cod fishery and Norway North East Arctic haddock fishery. Norges Fiskarlag.

R7 The Joint Norwegian-Russian Fisheries Commission: http://www.jointfish.com/eng/THE-FISHERIES-COMMISSION/STRUCTURE.html

R8 IUCN Red List https://www.iucnredlist.org

Standard clauses 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 rm. 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 approached used in Version 1 of the IFFO RS Standard, in which up to 5% of the raw material could be comprised of 'unassessed' species.