IFFO RS V2.0

FISHERY ASSESSMENT METHODOLOGY AND TEMPLATE REPORT

Fishery Under Assessment	**Capelin (*Mallotus villosus)***
Date	**November 2017**
Assessor	**Deirdre Hoare**

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Application details and summary of the assessment outcome				
Name:				
Address:				
Country: Norway		**Zip:**		
Tel. No.		**Fax. No.**		
Email address:		**Applicant Code**		
Key Contact:		**Title:**		
Certification Body Details				
Name of Certification Body:		**SAI Global Ireland**		
Assessor Name	**Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**	**Whole fish / By-product**
Deirdre Hoare	Sam Dignan	7	Re-approval	Wholefish
Assessment Period	2016-2017			
Scope Details				
Management Authority (Country/State)		Norway		
Main Species		Capelin (*Mallotus villosus)*		
Fishery Location		ICES subdivisions I & II, excl. IIa west of 5W (Barents sea)		
Gear Type(s)		Pelagic trawl, purse seine		
Outcome of Assessment				
Overall Outcome		Pass		
Clauses Failed		None		
Peer Review Evaluation		Approve		
Recommendation		Approve		

Assessment Determination
The components of the Norwegian capelin fishery which operate for reduction purposes meet the requirements of the raw material sourcing section of the IFFO RS Standard. There is a management, control and enforcement framework in place which has a robust legal basis. Data collection activities are sufficient to provide a scientific basis for the management of the main target species. Capelin is the main reduction target, and the stock is currently estimated to be larger than the target and limit reference points. Available detailed information on bycatch in the Capelin fishery has been limited but is assumed as low. Bycatch of cod and herring occur but no scientific data on quantities could be found, as they are assumed to be low by ICES, an estimate of 1% was used for this assessment. Both Cod and herring have biomass above their limit reference points. There is no evidence of any substantial interactions between the fishery and ETP species or the physical environment.
Peer Review Comments
Notes for On-site Auditor

General Results

General Clause	Outcome (Pass/Fail)
M1 - Management Framework	Pass
M2 - Surveillance, Control and Enforcement	Pass
F1 - Impacts on ETP Species	Pass
F2 - Impacts on Habitats	Pass
F3 - Ecosystem Impacts	Pass

Note: This table should be completed for whole fish assessments only.

Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Capelin	98	A1	Pass
			A2	Pass
			A3	Pass
			A4	Pass
Category B				
Category C	Cod, herring	2	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. All species regularly* caught in the fishery 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. **Type 1 species must represent 95% of the total catch. Type 2 species may represent a maximum of 5% of the 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
Capelin	*Mallotus villosus*	Barents Sea and Norwegian Sea	98	Norway	A
Cod	*Gadus morhua*	Barents Sea and Norwegian Sea	1	Norway	C
Herring	*Clupea herangus*	Barents Sea and Norwegian Sea	1	Norway	C

Category A species are assessed through an examination of the data collection, stock assessment, management measures, and stock status relating to the species. Category B species are assessed using a risk-based assessment covering similar areas. Category C species are assessed on stock status only. Category D species are assessed using a PSA analysis as described in the relevant section of this document.

MANAGEMENT

The two clauses in this section relate to the general management regime applied to the fishery under assessment. A fishery must meet all the minimum requirements in every clause before it can be recommended for approval.

M1	Management Framework – Minimum Requirements		
	M1.1	There is an organisation responsible for managing the fishery	Yes
	M1.2	There is an organisation responsible for collecting data and assessing the fishery	Yes
	M1.3	Fishery management organisations are publicly committed to sustainability	Yes
	M1.4	Fishery management organisations are legally empowered to take management actions	Yes
	M1.5	There is a consultation process through which fishery stakeholders are engaged in decision-making	Yes
	M1.6	The decision-making process is transparent, with processes and results publicly available	Yes
Clause outcome:			Pass

Evidence

The management of fisheries in Norway falls under the jurisdiction of the Ministry of Trade, Industry and Fisheries. The main research body within the Norwegian fisheries management framework is the Institute of Marine Research (IMR). The IMR is the largest marine research institute in Norway, and conducts a variety of scientific research in support of the management process. The main task of the IMR is "providing advice to the Norwegian authorities on aquaculture and on the ecosystems of the Barents Sea, Norwegian Sea, North Sea and the Norwegian coastal zone". IMR scientists also fully participate in the ICES stock assessment and advice working groups for fisheries in which Norway is involved – including sprat.

The Directorate of Fisheries acts as the Ministry's advisory and executive body with the objective to "promote profitable economic activity through sustainable and user-oriented management of marine resources and the marine environment". The Directorate and Ministry develop and apply fishery laws and regulations through an ongoing administrative process referred to as the regulatory chain.

The key legal implement at present is the Marine Resources Act (2008). The Act states that its purpose is "to ensure sustainable and economically profitable management of wild living marine resources and genetic material derived from them, and to promote employment and settlement in coastal communities". The Act also makes explicit the Norwegian commitment to manage fisheries according to the precautionary approach, and to consider the potential impacts of gear on living marine resources. Finally, the Act also outlines the other essential powers described throughout this assessment, including quota-setting, a ban on discarding, licencing, and the prohibition of the use of explosives, poison, and other highly damaging fishing practices.

There is a consultation process through which fishery stakeholders are engaged in decision-making. Norway has a long tradition of corporate policy-and decision-making in the fisheries sector, with continuous consultation and close cooperation between government agencies and usergroup organizations, in particular the Norwegian Fishermen's Association but also the more specialized organizations such as the Fishermen's Sales Organization for Pelagic Fish. As these organizations have regional branches, whose representatives are actively involved in policy-making, local knowledge is also taken into consideration in the management process. The Regulatory Meetings organized twice a year are open to all; user-group organizations attend on a regular basis, various NGOs participate regularly. In addition there is regular day-to-day contact by telephone and email between authorities, user-groups and other interested parties.

The decision-making processes include the allocation of national quotas to fleet groups according to an elaborate distributional scheme based on vessel groups defined by gear and length of the vessels. Further, technical regulations are defined by the Directorate of Fisheries, after consultations with user-groups and other stakeholders, as well as with other nations for shared stocks.

References

Ministry of Trade, Industry and Fisheries, About:
http://www.fisheries.no/About/Fisheries_authorities/the_ministry_of_trade_inustry_and_fisheries

Directorate of Fisheries, About: http://www.fisheries.no/About/Fisheries_authorities/directorate_of_fisheries

Institute of Marine Research, About:
http://www.fisheries.no/About/Research_institutions/Institute_of_Marine_Research

IMR information pamphlet: http://www.imr.no/filarkiv/2003/12/Institute_of_Marine_Research.pdf/en

The regulatory chain of Norwegian fisheries management:
http://www.fisheries.no/resource_management/setting_quotas/The-regulatory-chain

Standard clauses 1.3.1.1, 1.3.1.2

M2	Surveillance, Control and Enforcement - Minimum Requirements		
	M2.1	There is an organisation responsible for monitoring compliance with fishery laws and regulations	Yes
	M2.2	There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken	Yes
	M2.3	There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing	Yes
	M2.4	Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS.	Yes
Clause outcome:			Pass

Evidence

Monitoring, control and surveillance is taken care of through shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the regional sales organizations. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet. Norwegian vessels are required to have electronic logbooks, where real-time catch data are forwarded to the Directorate of Fisheries.

The Norwegian enforcement agencies use a graded sanctioning system, with sanctions ranging from oral warnings, written warnings and administrative fines to formal prosecution. If the fishers do not accept the fines issued by the enforcement or prosecution authority, the case goes to court. The decision of a lower-level court can then be appealed to higher-level courts.

There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing. The Coast Guard carried out 1713 at-sea inspections in 2012. In the vast majority of these inspections, no infringements were discovered. 40 inspections (2 %) resulted in a fine or prosecution. The share of infringements relative to the total number of inspections has remained at this level in recent years. In the Directorate of Fisheries' inspections of vessels engaged in the fishing for Norwegian springspawning herring in 2012 (141 inspections), no fines were issued and only 3 warnings (2 % of inspections). (No figures are provided in the annual report of inspections of vessels engaged in the fishery of North Sea and Skagerrak herring.) The Fishermen's Sales Organization for Pelagic Fish carried out 625 physical inspections in 2012, during which 9 infringements (1 % of inspections) were revealed.

References

Annual Report of the Norwegian Coast Guard 2012
Inspection records of the Directorate of Fisheries 2010–2012

Standard clause 1.3.1.3

CATEGORY A SPECIES

The four clauses in this section apply to Category A species. Clauses A1 - A4 should be completed for **each** Category A species. If there are no Category A species in the fishery under assessment, this section can be deleted. A Category A species must meet the minimum requirements of all four clauses before it can be recommended for approval. If the species fails any of these clauses it should be re-assessed as a Category B species.

Species Name	**Capelin** *(Mallotus villosus)*	
A1	**Data Collection - Minimum Requirements**	
A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	Yes
A1.2	Sufficient additional information is collected to enable an indication of stock status to be estimated.	Yes
Clause outcome:		Pass

Evidence

Landings data are available for both Russian and Norwegian vessels. Most of the Norwegian catch is taken by purse seiners, whereas the Russian catch is taken by trawlers. The ICES AFWG is supplied with catch in numbers and age by length, and also the locations of catches. ICES considers discarding and slippage to be negligible.

A joint Russian-Norwegian trawl-acoustic survey has been conducted in September annually since 1972. The abundance estimate resulting from this survey cruise is considered by ICES to be an absolute estimate of the size of the stock. However, it is recognised that migration during the survey may introduce uncertainty into the results. Natural mortality is estimated using a multi-species model and historical survey estimates. The level of uncertainty in the outputs of the stock assessment appear to be well understood by ICES, which does not report any specific, urgent improvements to the data collection efforts are required.

References

ICES advice 2017 Capelin (Mallotus villosus) in subareas 1 and 2 (Northeast Arctic), excluding Division 2.a west of 5°W (Barents Sea capelin http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cap.27.1-2.pdf

Standard clause 1.3.2.1

A2	**Stock Assessment - Minimum Requirements**	
A2.1	A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock), and considers all fishery removals and the biological characteristics of the species.	Yes
A2.2	The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.	Yes
A2.3	The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.	Yes
A2.4	The assessment is subject to internal or external peer review.	Yes
A2.5	The assessment is freely available to the assessment team.	Yes
Clause outcome:		Pass

Evidence

A stock assessment is conducted annually and considers all fishery removals and the biological characteristics of the species. Stock assessments are carried out by the Institute of Marine Research in Norway and the ICES Arctic Fisheries Working Group (AFWG) which produces the annual capelin advice. The assessment is based on an annual acoustic survey, and according to ICES the survey coverage in 2017 was good and is considered to include almost the entire distribution of the stock.

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy. Capelin is managed with the objective of maintaining SSB above a precautionary level. The single defined reference

point, Blim, is itself based on a precautionary doubling of the historical lowest SSB which produced a good year class. Uncertainty in the acoustic surveys and stock assessments appears to be well understood by ICES, with higher levels of uncertainty leading to more conservative quota advice. The most recent ICES advice, published in October 2017, reports that the September 2017 acoustic survey had good coverage of the spatial distribution of the capelin stock.

Table 1. Capelin in Subareas 1 and 2, excluding Division 2a. west of 5ºW. State of the stock and fishery relative to reference points.

	Fishing pressure				Stock size			
		2015	2016	2017		2016	2017	2018
Maximum Sustainable Yield	F_{MSY}	?	?	? Undefined	MSY $B_{Trigger}$	?	?	? Undefined
Precautionary Approach	F_{pa}, F_{lim}	?	?	? Undefined	B_{lim}	✗	✗	✓ Above
Management plan	F_{MGT}	?	?	? Undefined	B_{MGT}	?	?	? Undefined

ICES advises that when the management plan of the Joint Norwegian–Russian Fisheries Commission (JNRFC) is applied, catches in 2018 should be no more than 205 000 tonnes.

ICES has a quality assurance policy for its Fish Stock Assessments and Management Advice, which includes both internal peer review and external peer review.

Internal peer review: The scientific work in the advisory process must be internally peer reviewed by groups independent of the group which performed the original task. This necessitates a clarification of roles so that, for example, Working Groups which perform assessments are reviewed by a separate group of experts.

External peer review: In order to ensure that the science on which ICES advice is based conforms to the highest international standards there is a need for periodic review by experts from outside the ICES community.
ICES stock assessments are freely available on their website. www.ICES.dk

References

ICES advice 2017 Capelin (Mallotus villosus) in subareas 1 and 2 (Northeast Arctic), excluding Division 2.a west of 5°W (Barents Sea capelin http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cap.27.1-2.pdf
ICES QUALITY ASSURANCE POLICY FOR FISH STOCK ASSESSMENT AND MANAGEMENT ADVICE http://www.iccat.int/Documents/CVSP/CV052_2001/no_5/CV052051753.pdf

Standard clause 1.3.2.2

A3	Harvest Strategy - Minimum Requirements		
	A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted (which may include economic mechanisms).	Yes
	A3.2	Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.	Yes
	A3.3	Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).	Yes
Clause outcome:			Pass

Evidence

The total level of fishing permitted across the entire capelin stock is limited by an annual TAC which is divided between Russia and Norway according to bilateral agreement. The Barents Sea capelin fishery is managed according to an international management plan agreed between Norway and Russia in 2002. The management plan states:

"For capelin, the following harvest rule should be used: The TAC for the following year should be set so that, with 95% probability, at least 200,000 t of capelin (Blim) will be allowed to spawn".

Since 2000 the TAC has been set precisely in line with the ICES advice, which itself has been based on the international management plan since that plan's introduction in November 2002. The fishery has been closed entirely whenever the ICES advice has recommended it. Total commercial landings have also generally been within the TAC since this introduction of the management plan, although in 2014 the quota was exceeded by 736t (around 1%). Additionally, some small catches were taken during the 2004 – 2008 fishery closure for scientific purposes.
ICES has evaluated this plan and concluded that it is consistent with the precautionary approach. The plan has been adhered to according to the stock assessments carried out by ICES, which estimate the level of fishing which can be permitted and still maintain the 200,000t minimum SSB.

B_{lim} was originally calculated using the value of the 1989 spawning stock biomass, which is historically the lowest SSB to have produced an outstanding year class (see graphs in section B1). SSB in 1989 was estimated to be 100,000t, which is considered a good basis for a limit reference point when abundance of young herring, which are predators of capelin, is low. To take into account the variation in herring abundance from year to year, along with other sources of uncertainty, the SSB was doubled to produce the limit reference point used today.

Estimates of SSB in the period before the introduction of the management plan show peaks followed almost immediately by large falls. The only biomass peak since the introduction of the plan has not been immediately followed by such a drop, and although it is too early to know for sure, it does appear that the plan has gone a large way towards stabilising the stock and possibly avoiding the periodical fishery closures which have occurred in the past.

At the 39th Session of the Joint Norwegian–Russian Fisheries Commission in October 2010 it was agreed that this management plan should be used "for five more years" before it is evaluated. In 2015 JNRFC suggested three alternative HCRs for this stock; setting P(SSB < 200 000 t) to 90%, 85%, and 80%, respectively. These options were evaluated by ICES in 2016 (ICES, 2016a), and only the existing HCR was found to be precautionary. Thus, the harvest control rule was not changed at the 46th Session of the Joint Norwegian–Russian Fisheries Commission in 2016 (JNRFC, 2016). It was, however, decided that the harvest control rule should be evaluated again in 2021.

Table 2. Capelin in Subareas 1 and 2, excluding Division 2a. west of 5°W. ICES advice and official landings. All weights are in tonnes.

Year	ICES advice	Recommended TAC	Agreed TAC	ICES catch
1987	Catches at lowest practical level	0	0	0
1988	No catch	0	0	0
1989	No catch	0	0	0
1990	No catch	0	0	0
1991	TAC	1000000	900000	933000
1992	SSB > 4–500 000 t	834000	1100000	1123000
1993	A cautious approach, SSB > 4–500 000 t	600000	630000	586000
1994	No fishing	0	0	0
1995	No fishing	0	0	0
1996	No fishing	0	0	0
1997	No fishing	0	0	1000
1998	No fishing	0	0	3000
1999	SSB > 500 000 t	79000	80000	101000
2000	5% probability of SSB < 200 000 t	435000	435000	414000
2001	5% probability of SSB < 200 000 t	630000	630000	568000
2002	5% probability of SSB < 200 000 t	650000	650000	651000
2003	5% probability of SSB < 200 000 t	310000	310000	282000
2004	No fishing	0	0	0
2005	No fishing	0	0	1000*
2006	No fishing	0	0	0
2007	No fishing	0	0	4000*
2008	No fishing	0	0	12000*
2009	5% probability of SSB < 200 000 t	390000	390000	307000
2010	5% probability of SSB < 200 000 t	360000	360000	323000
2011	5% probability of SSB < 200 000 t	380000	380000	360000
2012	5% probability of SSB < 200 000 t	320000	320000	296000
2013	5% probability of SSB < 200 000 t	200000	200000	177000
2014	5% probability of SSB < 200 000 t	65000	65000	66000
2015	5% probability of SSB < 200 000 t	6000	120000	115000
2016	Zero catch	0	0	0
2017	Zero catch	0	0	0
2018	5% probability of SSB < 200 000 t	205000		

*Research catch.

References

ICES advice 2017 Capelin (Mallotus villosus) in subareas 1 and 2 (Northeast Arctic), excluding Division 2.a west of 5°W (Barents Sea capelin http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cap.27.1-2.pdf

Standard clause 1.3.2.3

A4	Stock Status - Minimum Requirements		
	A4.1	The stock is currently estimated to be below the limit reference point or proxy, but fishery removals are prohibited OR the stock is currently above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR the stock is at or above the target reference point.	Yes
Clause outcome:			Pass

Evidence

The stock is currently above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR the stock is at or above the target reference point.

Historically, capelin in the Barents Sea was subject to both a winter fishery, which targeted schools of pre-spawning capelin, and a summer/autumn fishery on the feeding grounds in the central and northern Barents Sea. Since 2003 the summer/autumn fishery has been closed, and the advice and TACs below refer exclusively to the winter fishery. The 2014 acoustic survey was considered by ICES to have produced a substantial underestimate of the actual stock size, and so ICES applied two potential methods to improve accuracy. The eventual ICES recommendation for the 2015 TAC was 6,000 t. However, the quota was set by managers above this level, at 120,000 t, but below the alternative recommendation of 195,000t rejected by ICES. For 2016 zero catch was recommended by ICES and it

was agreed by Norway and Russia that there should be no fishery for Capelin. Zero catch has again been recommended for 2017.
References ICES advice 2017 Capelin (Mallotus villosus) in subareas 1 and 2 (Northeast Arctic), excluding Division 2.a west of 5°W (Barents Sea capelin http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cap.27.1-2.pdf
Standard clause 1.3.2.4

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		**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.	Yes
	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.	Yes
Clause outcome:			Pass

Evidence

Fishery removals of cod are included in the stock assessment process, data input includes Norwegian commercial catch in tonnes by quarter, area and gear are derived from the sales notes statistics of The Directorate of Fisheries. There is also a joint Russian-Norwegian winter (February) survey, which started in 1981 and covers the ice-free part of the Barents Sea. Both swept area estimates from bottom-trawl and acoustic estimates are produced. A joint Russian-Norwegian Ecosystem survey (August-September) is also conducted. There are also separate Russian and Norwegian surveys conducted.

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, and the most recent estimate is likely to be below FMSY. There has been no strong recruitment since the 2004 and 2005 year classes.

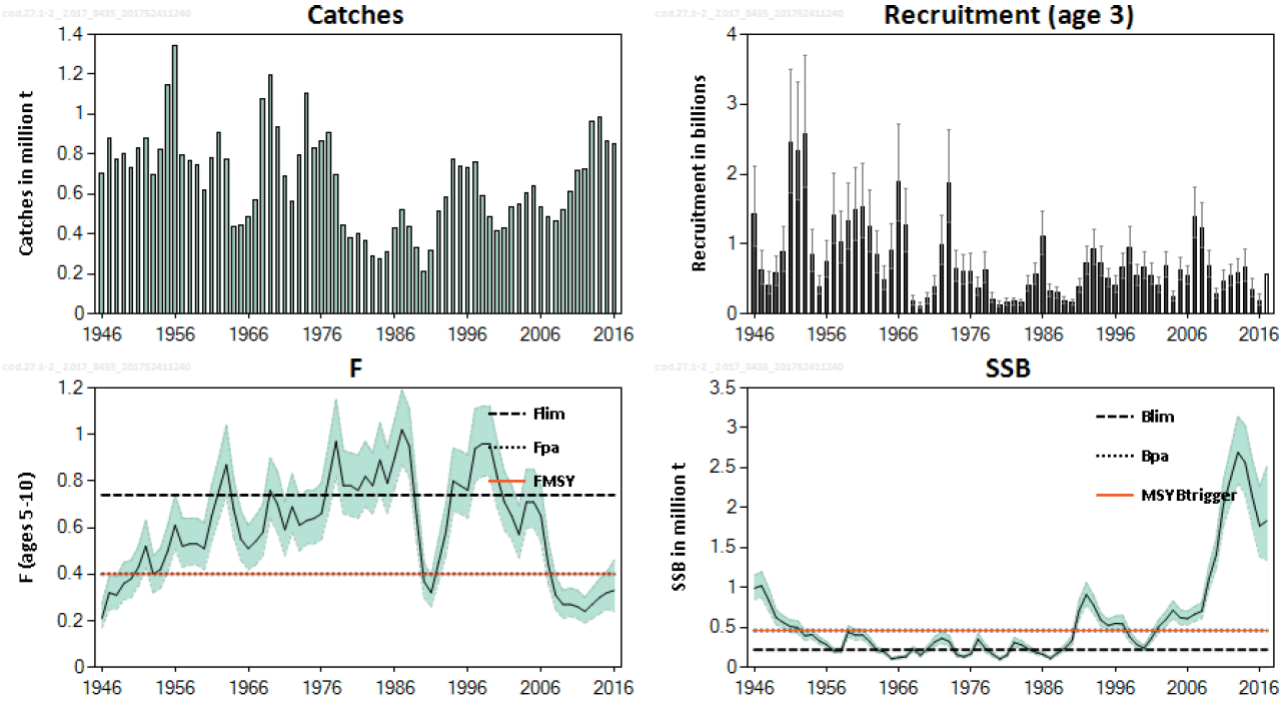

Figure 1. Cod in subareas 1 and 2 (Northeast Arctic). Catch, recruitment, F, and SSB. Recruitment, F, and SSB have confidence intervals (95%) in the plot. For this stock, FMGT = FMSY and SSBMGT = MSY Btrigger = Bpa; therefore, the horizontal lines representing these points in the graph overlap.

References

ICES advice 2017 Cod (Gadus morhua) in subareas 1 and 2 (Northeast Arctic) http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/cod.27.1-2.pdf

Stock annex: Cod (Gadus morhua) in subareas 1 and 2 (North east Arctic) http://ices.dk/sites/pub/Publication%20Reports/Stock%20Annexes/2017/cod.27.1-2_SA.pdf

Standard clauses 1.3.2.1 - 1.3.2.4

Species Name	**Herring** *(Clupea harengus)*	
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.	Yes
	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.	Yes
Clause outcome:		Pass

Evidence

Fishery removals of herring are included in the stock assessment process. Input data includes; Commercial catches-at-age (stock weight-at-age from surveys and since 2009 from catch sampling). Three survey indices: Norwegian acoustic survey on spawning grounds in February/March (NASF, 1994–2005, 2015–2017); International Ecosystem Survey in the Nordic Seas (IESNS) covering the adult stock in the Nordic seas (1996–2017) and the juvenile stock in the Barents Sea (1991– 2017). Maturity ogive variable by year-class strength. Natural mortalities are fixed values from historical analyses (age 2 = 0.9, ages greater than 3 = 0.15).

The stock is declining and estimated to be below MSY Btrigger since 2014, but is above Blim. Fishing mortality has had an overall declining trend since 2010 and was well below FMSY in 2016. Since 1998 four large year classes have been produced (1998, 1999, 2002, and 2004). All year classes since 2005 are estimated to be average or small.

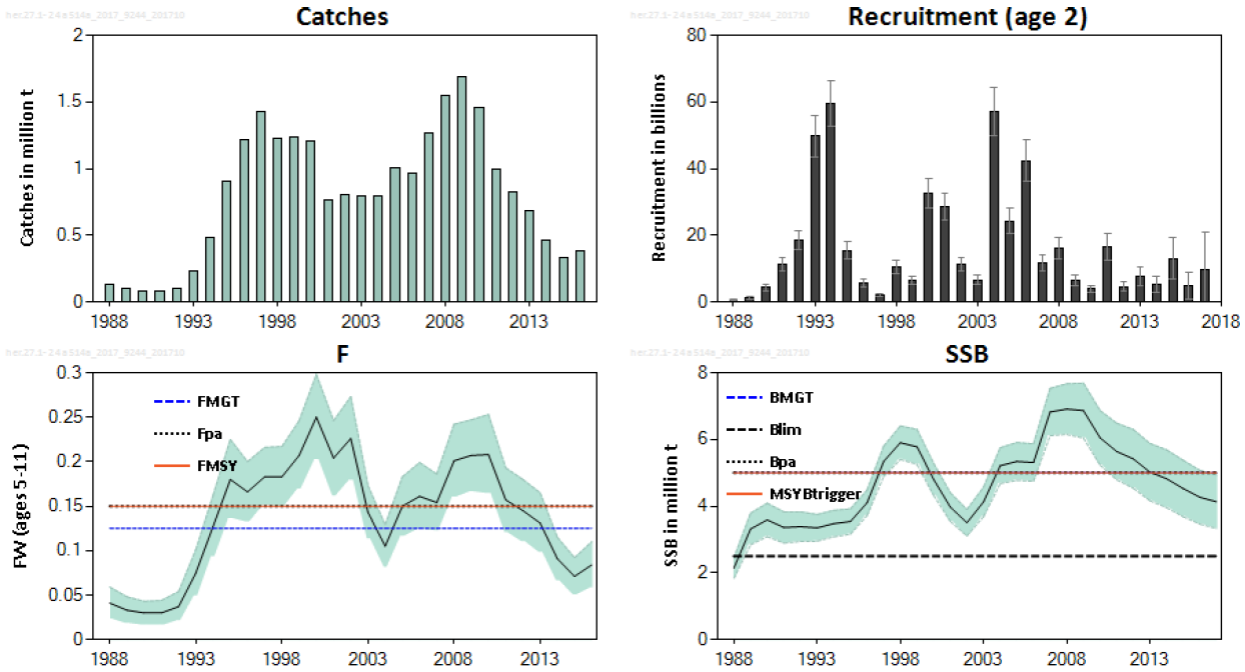

Figure 2. Herring in subareas 1, 2, and 5, and in divisions 4.a and 14.a (Norwegian spring-spawning herring). Summary of the stock assessment. Confidence intervals (95%) are included in the recruitment, fishing mortality, and spawning-stock biomass plots. FW is the fishing mortality weighted by the population numbers.

References

Herring (Clupea harengus) in subareas 1, 2, and 5, and in divisions 4.a and 14.a, Norwegian spring-spawning herring (the Northeast Atlantic and the Arctic Ocean) http://ices.dk/sites/pub/Publication%20Reports/Advice/2017/2017/her.27.1-24a514a.pdf

Standard clauses 1.3.2.1 - 1.3.2.4

FURTHER IMPACTS

The three clauses in this section relate to impacts the fishery may have in other areas. A fishery must meet the minimum requirements of all three clauses before it can be recommended for approval.

F1	Impacts on ETP Species - Minimum Requirements		
	F1.1	Interactions with ETP species are recorded.	Yes
	F1.2	There is no substantial evidence that the fishery has a significant negative effect on ETP species.	Yes
	F1.3	If the fishery is known to interact with ETP species, measures are in place to minimise mortality.	Yes
Clause outcome:			Pass

Evidence

The 2010 Norwegian red list classifies ten species of marine mammals and seventeen of seabirds in the region as Regionally Extinct, Critically Endangered, Endangered or Near Threatened (NBIC, 2010). Blue whale *Balaenoptera musculus* (Reilly et al., 2008a) and fin whale *B. physalus* (Reilly et al., 2013) are classified as "endangered" by IUCN in the region, although blue whale numbers are increasing; beluga *Delphinapterus leucas* (Jefferson et al., 2012a) and narwhal *Monodon monoceros* (Jefferson et al., 2012a) are considered to be near threatened and polar bear *Ursus maritimus* to be vulnerable and decreasing (Schliebe et al., 2008).

Many top predators such as harp seals *Pagophilus groenlandicus*, minke *B. acutorostrata* and humpback whales *Megaptera novaeangliae*, all "Least concern" in the IUCN Red list, are important capelin feeders (Ushakov and Prozorkevich, 2012; Durant et al., 2014; ICES, 2014b). Both harp seal and seabird populations have in the past been affected by low capelin abundances (ICES, 2014a,b). There is however no reported evidence of significant direct impacts of the capelin fishery on any protected species.

Detailed information on ETP species is collected and collated by observers aboard Norwegian reference-fleet vessels, which include both pelagic trawlers and purse seiners (IMR, 2010). The observers collect information on the quantities of all species caught, including, elasmobranchs birds and marine mammals. The reference fleet methodology and data have been subject to review by an international panel (Bowering *et al* 2011). Although the data they reviewed included positive observation of the capture of both bird and mammal species, such captures were limited to demersal fisheries; there was no evidence of captures made by pelagic fishing vessels.

Research by the Norwegian Institute for Nature Research (NINA) and the Institute of Marine Research in Norway suggests that most of the fisheries have a minor impact on bird mortality (ICES AFWG, 2014) and those impacts that do occur are primarily attributable to gillnet fisheries.

There are significant monitoring initiatives related to seabirds, and it is likely that any emerging and significant negative interactions with fisheries will be flagged up. For example, "SEAPOP is a mapping and monitoring programme for seabird populations in Norwegian waters. It focuses particularly on the collection of data that make it possible to model the effects of human activity and distinguish between these and natural variations. This will make it possible to improve the management and protection of seabirds. The Norwegian Government is committed to intensify mapping and monitoring of seabirds in Norwegian waters, along the coast and in Svalbard and Jan Mayen through the SEAPOP programme".

Norway has signed several international agreements and conventions on species protection and management of relevance to the Barents Sea Fisheries:

» the Convention on Biological Diversity (CBD)

» the Convention on Trade in Endangered Species of Wild Animals (CITES)

» the Convention on the Conservation of Migratory Species of Wild Animals (CMS)

» the Agreement on North Atlantic Marine Mammal Commission (NAMMCO)

Norway is also subject to its agreements under OSPAR Annex V ("on the protection and conservation of the ecosystems and Biological Diversity in the maritime area").
The Norwegian Government has established a set of objectives for species management in the Barents Sea – Lofoten area (Report No. 8 (2005-2006) to the Storting). These relate to population viability, genetic diversity, safe biological limits (for harvested species), management of key species in the ecosystem, endangered species for which Norway has special responsibility.

References

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Standard clause 1.3.3.1

F2	**Impacts on Habitats - Minimum Requirements**		
	F2.1	Potential habitat interactions are considered in the management decision-making process.	Yes
	F2.2	There is no substantial evidence that the fishery has a significant negative impact on seabed habitats.	Yes
	F2.3	If the fishery is known to interact with the seabed, there are measures in place to minimise and mitigate negative impacts.	NA
Clause outcome:			Pass

Evidence

The fishery is pelagic (purse seine and pelagic trawl), so little effects on the seafloor or benthic communities are thought to occur. There is no substantial evidence that the fishery has a significant negative impact on seabed habitats.
Trawling has been banned in grounds of prespawning capelin aggregations (ICES, 2009a). Areas may further be closed based on increased bycatch of herring or cod (MFCA, 2008). Several Norwegian marine protected areas exist in the area of capelin's distribution, notably Forlandet National Park and Bjørnøya and Hopen Nature Reserves, but it is unknown if any special fishing regulations are in place (Wood, 2007). Several marine protected areas have now been established to protect coral reefs in the Barents Sea- Lofoten area, and the Norwegian Government has set a target for at least 10 % of coastal and marine areas to be protected by 2020. Four areas have been established just inside the Barents Sea–Lofoten area, and four more are likely to be designated in coming years.

Thirty-six areas are proposed for protection under Norway's marine conservation plan, and other areas where the environment and natural resources are considered valuable or vulnerable are part of a proposed Integrated Management Plan for the Barents Sea–Lofoten Area. These are selected based on the importance of their biological production and biodiversity, in terms of endangered, vulnerable or important species or habitats. Key spawning and egg and larval drift areas for important fish stocks; breeding, moulting and wintering areas for important seabirds and critical benthic fauna habitats are included. To date, eight cold-water reef marine protected areas off the Norwegian coast have been created, in order to mitigate the impact of fisheries on the seabed habitats in the Barents Sea (DOF, 2011). Eighty seven percent of the territorial waters around Svalbard are

protected through under the Svalbard Environmental Protection Act (UNESCO, 2014). The Norwegian Government has set a target for at least 10 % of coastal and marine areas to be protected by 2020.

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Standard clause 1.3.3.2

F3	Ecosystem Impacts - Minimum Requirements		
	F3.1	The broader ecosystem within which the fishery occurs is considered during the management decision-making process.	Yes
	F3.2	There is no substantial evidence that the fishery has a significant negative impact on the ecosystem.	Yes
	F3.3	If one or more of the species identified during species categorisation plays a key role in the ecosystem, additional precaution is included in recommendations relating to the total permissible fishery removals.	Yes
Clause outcome:			Pass

Evidence

Capelin is known to play a key role in the marine ecosystem and is considered by ICES to be the most important pelagic fish in the Barents Sea. Capelin is the main prey item for Northeast cod and is also important to herring, several species of marine mammal, and several other commercial species. The potential impacts of cod predation on capelin are considered as a component of the ICES stock assessment model.

The IMR is among the leading world research institutes and has established a substantial body of data relating to its principal living marine resources dating back more than seventy years. This substantial body of information provides a bedrock upon which to base its long-term objectives for the development of ecosystem models that underpin more holistic, ecosystem-based management plans such as the Barents Sea–Lofoten Management Plan (MFCA, 2012;5 Olsen *et al*., 2007) and the Norwegian Sea management plan (MinEnv, 2009). Following the implementation of the Norwegian North Sea–Skagerrak management plan (Klif, 2012) in 2013, all Norwegian waters are now subject to integrated management plans. These plans seek to balance the needs of all the component parts of the ecosystem, *e.g.* predator–prey interactions, as well as ensuring the long-term sustainability of the commercial fisheries. The Norwegian ecosystem modelling programmes also contribute to the wider research efforts in this field (Bjørge, 2008;9 Hjøllo, 2007). Indeed, considerable research effort has been invested in modelling the interaction of fish species within marine ecosystems.

Norway and Russia requested the evaluation of harvest control rules for Northeast Arctic cod and haddock and for Barents Sea capelin in 2016 and received the following regarding Capelin;

For capelin, the HCRs based on the 90%, 85%, and 80% criteria are not precautionary in the ICES evaluation context by definition; only the rule implemented in the current management plan, corresponding to the 95% criterion, may be precautionary. An examination of the stock dynamics in recent decades, when the current HCR (based on 95% criterion) or the previous HCR (based on a similar escapement strategy) were in operation suggests that these HCRs resulted in sustainable exploitation. The overall effect of allowing a higher probability of SSB < Blim would

be that the fishery would be opened at a lower survey biomass (maturing capelin), the TAC would increase and the resulting spawning biomass would be lower, potentially increasing the risk of recruitment failure. The 2015 survey estimate for capelin was low and would have led to closure of the fishery in 2016 under all suggested HCRs.

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Standard clause 1.3.3.3

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.

Comments on this proposition are welcomed along with any other feedback on the proposed approach.