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PUBLIC CERTIFICATION REPORT

Re assessment of the Russian Federation Barents Sea cod, haddock and saithe fishery

Group of fishing companies
JSC "Strelets", JSC "Taurus", JSC "Eridan"

Authors: Anna Kiseleva, John Nichols, John Hambrey and Geir Hønneland
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Task and objective: To re assess the Russian Federation Barents Sea cod, haddock and saithe fishery against the FCR V2.0 using the default assessment tree from CR v1. 3.

Prepared by:	Verified by:	
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Reference to part of this report which may lead to misinterpretation is not permissible.

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1	20190102	Public Comment Draft Report			
2	20190225	Final Report	Team	Sandhya Chaudhury	
3	20190402	Public Certification Report	Team	Sigrun Bekkevold	

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ABBREVIATIONS & ACRONYMS

ACOM	Advisory Committee on fisheries Management (ICES)
CAB	Conformity Assessment Body
CFP	Common Fisheries Policy
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EC	European Commission
EEZ	Exclusive Economic Zone
EMODnet	European Marine Observation and Data Network
ERS	Electronic Recording and Reporting System
EU	European Union
FAO	Food and Agriculture Organization
GT	Gross Tonnage
HCR	Harvest Control Rule
IBWSS	International Blue Whiting Spawning Stock Survey
ICES	International Council for the Exploration of the Sea
ICJ	International Court of Justice
ISBF	Introduced Species Based Fisheries
ITLOS	International Tribunal for the Law of the Sea
IUCN	International Union for Conservationof Nature
IWC	International Whale Commission
LTMS	Long-Term Management Strategy
MCS	Monitoring, Control and Surveillance
NAMMCO	North Atlantic Marine Mammal Commission
NEAFC	The North East Atlantic Fisheries Commission
NEA	North East Atlantic
NE	North East
NGO	Non-Governmental Organisation
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of
PCA	Permanent Court of Arbitration
RAC	Regional Advisory Council
RSW	Refrigerated SeaWater
SAM	State-Space Assessment Model
SIMWG	Stock Identification Methods Working Group (ICES)
TAC	Total Allowable Catch
TBC	To be confirmed
UK	United Kingdom
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNFSA	United Nations Fish Stocks Agreement
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
WGIPS	Working Group on International Pelagic Surveys (ICES)
WGWIDE	Working Group on Widely Distributed Stocks (ICES)
WWF	World Wildlife Fund

ABBREVIATIONS REGARDING STOCK ASSESSMENT

Blim	Minimum biomass below which recruitment is expected to be impaired or the stock dynamics are unknown.
Bmsy	Biomass corresponding to the maximum sustainable yield (biological reference point); the peak value on a domed yield-per-recruit curve.
Bpa	Precautionary biomass below which SSB should not be allowed to fall to safeguard it against falling to Blim.
Btrigger	Value of spawning stock biomass (SSB) that triggers a specific management action.
CI	Confidence Interval
Cpue	Catch per unit effort: The quantity of fish caught (in number or in weight) with one standard unit of fishing effort; e.g. number of fish taken per 1000 hooks per day or weight of fish taken per hour of trawling. Cpue is often considered an index of fish biomass (or abundance). Sometimes referred to as catch rate.
F	Instantaneous rate of fishing mortality
Flim	Limit reference point for fishing mortality (mean over defined age range)
Fpa	Precautionary buffer to preclude true fishing mortality being at Flim when the perceived fishing mortality is at Fpa.
Fmax	F where total yield or yield per recruit is highest (biological reference point)
Fmsy	F giving maximum sustainable yield (biological reference point)
HCR	Harvest Control Rules
MSY	Maximum Sustainable Yield
MSY Btrigger	Precautionary biomass level at which the management plan initiates specific harvest control rules to minimise the risk of further decline in biomass and concomitant risk to recruitment.
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
yr	Year

1 EXECUTIVE SUMMARY

This assessment was carried out by the team Anna Kiseleva, John Nichols, John Hambrey and Geir Hønneland. The default assessment tree contained in the MSC Certification Requirements v1.3 was applied to the re-assessment of these fisheries. The team met with stakeholders and the client during an onsite visit in Murmansk, January 2018.

In general, and measured against the MSC standard, no particular weaknesses were identified. There were no conditions identified for these fisheries reflecting the general strength of the client's operation.

The conclusion of the assessment is that the fisheries are eligible for continued certification.

2 AUTHORSHIP AND PEER REVIEWERS

2.1.1 Names, qualifications and affiliations of team members

Anna Kiseleva - DNV GL Team-leader and Chain of Custody expert. Anna is a senior assessor and a Global service responsible for MSC Fisheries at DNV GL Business Assurance. She holds MSc degree in International fisheries management from the University of Tromsø and MSc degree in Business Management from Murmansk State Technical University. She has over 10 years of experience in the global seafood industry incl. assessment services consultancy and project management. She is an experienced project management with proven ability to lead cross-disciplinary teams. She has been involved in the delivery of the MSC Fisheries assessment services since 2008. She was a team leader for the client's fisheries currently undergoing re-assessment since 2013. Anna's qualifications meet the competence criteria defined in the MSC Certification requirements v.2.0, annex PC, for the Team-Leader and Chain of custody responsible. She passed MSC Fisheries team leader training course, including traceability module for CR v. 1.3 and v.2.0. She has no conflicts of interest in relation to the UoAs under her responsibility.

John Nichols – Principle 1 expert. Dr. John Nichols is a retired UK government fisheries biologist with 42 years' research experience in plankton ecosystems in the North Atlantic specializing in the taxonomy of North Atlantic & NW European plankton including phytoplankton, micro and meso-plankton, ichythoplankton and young fish. He has been a member of ICES working groups on herring, mackerel, horse mackerel, sardine and anchovy assessments; and mackerel and horse mackerel egg surveys. He was also a member of ICES study groups on herring larval surveys and plankton sampling. He was scientist in charge of numerous research vessel surveys for fish stock assessment purposes and directly involved in the assessment of pelagic and western demersal fish stocks from 1994 to 2000.

Since retirement from his government post he has participated in numerous MSC assessments and re-assessments as the Principle 1 expert. The assessments include Norway North East Arctic and North Sea saithe, Faroe Islands saithe, Russian Federation Barents Sea cod and haddock, Norway North East Arctic cod and haddock.

He meets the competence criteria in the MSC Certification requirements v.2.0, annex PC and has substantial and appropriate skills related to Principle 1. He is trained as a team member, incl. RBF, according to v. 2.0 and team leader according to v. 1.3. John has no conflicts of interest in relation to the UoAs under his responsibility.

John Hambrey - Principle 2 expert John has a strong academic background in both ecology and economics, he has devoted his professional career to promoting sustainable natural resources management with a particular focus on marine and coastal environments, fisheries and aquaculture. He is an experienced researcher, chairperson, facilitator and writer.

His relevant skills and experience include:

- MSC Principle 2 certifications including Barents Sea Cod, Haddock and Saithe; Dutch Razor shell, Greenland shrimp; Norwegian and Danish Nephrops; Norwegian Mussel; South African Hake; Miscellaneous English inshore fisheries (pre-assessments). Also, peer review of two Barents Sea Trawl Fisheries.
- Synthesis and analysis of scientific and resource user information in support of policy development
- Public consultation and workshop facilitation in support of improved natural resources conservation and management;
- Facilitation of agency and industry led codes of conduct and practice;
- Sector, regional and enterprise level social, economic and environmental assessment;
- Decision analysis

He has worked throughout the UK, Europe, Asia, the Pacific, and Africa for a wide variety of national and international agencies, development banks, business corporations and non-governmental organisations.

He meets the competence criteria in the MSC Certification requirements v.2.0, annex PC and has substantial and appropriate skills related to Principle 2. He is trained as a team leader according to v. 2.0 and v. 1.3. John has no conflicts of interest in relation to the UoA under his responsibility.

Geir Hønneland - Principle 3 Geir Hønneland is Research Director of the Fridtjof Nansen Institute in Oslo, Norway, and adjunct professor at the University of Tromsø, Norway. He holds a Ph.D in political science from the University of Oslo and has primarily studied international fisheries management (with a main emphasis on compliance issues), international environmental politics and international Arctic politics more widely. Among his recent books are Arctic Politics, the Law of the Sea and Russian Identity (Palgrave, 2014), Making Fishery Agreements Work (Edward Elgar, 2012), International Environmental Agreements (Routledge, 2011), Arctic Politics and International Cooperation (Routledge, 2007) and Law and Politics in Ocean Governance: The UN Fish Stocks Agreement and Regional Fisheries Management Regimes (Martinus Nijhoff, 2006). He worked in the Norwegian Coast Guard from 1988 to 1994, where he was certified as fisheries inspector.
Geir also has a wide range of evaluation and consultancy experience, e.g. for the FAO and OECD, relating to responsible fisheries management.

He has been involved in MSC assessments since 2009 (covering cod, haddock and herring fisheries in the North East Atlantic and krill in the Southern Ocean).
He has also wide experience as peer reviewer, including for shrimp fisheries in the North-East Atlantic and for other Swedish fisheries.

He meets the competence criteria in the MSC Certification requirements v.2.0, annex PC, concerning knowledge of the country, language and local fishery, and has substantial and appropriate skills related to Principle 3. He is trained as a team leader according to v. 1.3 and v.2.0. Geir has no conflicts of interest in relation to the UoAs under his responsibility.

Stefan Midteide, DNV GL project manager: Stefan Midteide is principle consultant and project manager within MSC Fishery at DNV GL. His core competencies are project management, sustainability

assessments, risk assessment responsible supply chain management, responsible investment and implementation of sustainability policies. He has 9 years' experience as sustainability consultant and project manager. He has participated and managed project across a wide range and industries, seafoods and aquaculture, power, telecom, food retail, finance, technology, defence, pharmaceutical retail, public sector. Stefan holds degrees from the Nottingham University Business School (MBA), London School of Economics (M.Sc. Development Studies) and the University of Oslo (Cand Polit, Economic Geography).

His qualifications meet the competence criteria defined in the MSC Certification requirements v.2.0, annex PC. Midteide has no conflicts of interest in relation to the UoA under his responsibility

2.1.2 Peer reviewers

Peer reviewers are appointed by the MSC Peer review college and are anonymous.

3 DESCRIPTION OF THE FISHERY

3.1 Unit(s) of Certification and scope of certification sought

The report shall include a statement of the CAB's determination that the fishery is within scope of the MSC certification sought.

3.1.1 The unit of certification for the assessment.

Unit of Assessment 1: Barents Sea cod

Species	Cod (*Gadus morhua*)
Geographical area	ICES Sub-areas I and II. FAO 27. Primarily Norwegian EEZ and Svalbard FPZ.
Method of capture	Bottom trawl
Stock	Barents Sea Cod
Management	Federal Agency of Fisheries (Russian Federation), Norwegian Ministry of Fisheries and Coastal Affairs (Norwegian EEZ and Svalbard FPZ) Joint Russian-Norwegian Fisheries Commission, NEAFC, PINRO, IMR and ICES.
Client group	The client group is represented (per 22.09.2017) by the following ship owners: • JSC Strelets with vessel Strelets (M-0269) • JSC Eridan with vessel Korund (M-0245) • JSC Taurus with vessel Taurus (MK-0411)

Unit of Assessment 2: Barents Sea haddock

Species	Haddock (Melanogrammus aeglefinus)
Geographical area	ICES Sub-areas I and II. FAO 27. Primarily Norwegian EEZ and Svalbard FPZ.
Method of capture	Bottom trawl
Stock	Barents Sea haddock
Management	Federal Agency of Fisheries (Russian Federation), Norwegian Ministry of Fisheries and Coastal Affairs (Norwegian EEZ and Svalbard FPZ) Joint Russian-Norwegian Fisheries Commission, NEAFC, PINRO, IMR and ICES.
Client group	The client group is represented (per 22.09.2017) by the following ship owners: • JSC Strelets with vessel Strelets (M-0269) • JSC Eridan with vessel Korund (M-0245) • JSC Taurus with vessel Taurus (MK-0411)

Unit of Assessment 3: North East Arctic saithe

This unit of assessment has been introduced for the first time during the reassessment. Targeted eligibility date will be the date of the public certification report.

Species	Saithe (Pollachius virens)
Geographical area	ICES Sub-areas I and II. FAO 27. Primarily Norwegian EEZ and Svalbard FPZ.
Method of capture	Bottom trawl
Stock	North-East Arctic saithe
Management	The NEA saithe stock is managed by Norwegian Authorities, but the vessels operate under fisheries management protocols of the Russian Federation.
Client group	The client group is represented (per 22.09.2017) by the following ship owners: • JSC Strelets with vessel Strelets (M-0269) • JSC Eridan with vessel Korund (M-0245) • JSC Taurus with vessel Taurus (MK-0411)

A note on the naming of the Unit of assessment for cod and haddock: UoA refers to *Barents Sea* Cod and *Barents Sea* Haddock. The more precise naming of the actual stocks assessed in this fishery are the *North-east Arctic* cod and haddock stocks. This is the term used by ICES. This is also the name referred to in the P1 section of this report. These stocks are spread more widely than just the Barents Sea.

3.1.2 Description of eligible fishers

This assessment is limited exclusively to the client group and their affiliated companies. New vessels owned by the client group and their affiliated companies will automatically (subject to full compliance with MSC standard) be eligible to share the MSC certificate. Shall a new vessel be added to a client certificate; a revised vessel list will be uploaded to www.msc.org.

3.1.3 Scope of Assessment in Relation to Enhanced Fisheries

There is no enhancement in the UoC.

3.1.4 Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

The scope of assessment does not include ISBF.

3.2 Overview of the fishery

3.2.1 The client group

The clients were before 2012 a part of the larger company – Murmansk Trawl Fleet (MTF). MTF was considered as one of the largest fishing companies in the former Soviet Union. Its official birthday dates back to 19th of March 1920. During the first years, the fleet was based in Arkhangelsk and operated from spring till autumn. Transfer of the fishing fleet to Murmansk in 1924-1926 allowed fishermen to fish all year round. By the end of 1941 MTF owned more than 70 vessels. After WWII the fleet was enlarged even further and by 1960 accounted for more than 250 vessels.

In 1992 MTF was reorganized and a new Joint Stock Company MTF had emerged. The MTF group consisted of different affiliated companies including "MTF1", "MTF2", "MTF3" and "MTF4". In 2012 a new reorganization has started and MTF1,2,3,4 companies gained their independence from the parent JSC MTF company and in 2013 were renamed as specified below:

ZAO Strelets - former Joint Stock Company Murmansk Trawl Fleet -1

ZAO Eridan - former Joint Stock Company Murmansk Trawl Fleet – 4

ZAO Feniks - former Joint Stock Company Murmansk Trawl Fleet – 2

ZAO Taurus - former Joint Stock Company Murmansk Trawl Fleet – 3.

In 2013, the group joined their forces and were certified according to MSC Fisheries under coordination of ZAO Strelets and ZAO Eridan.

The group of companies currently consist of JSC «Eridan», JSC «Strelets», JSC «Taurus» and as a group of companies are referred to as F.E.S.T. See also http://www.fest.msk.ru/en/main/about/. The client group is currently represented by ship owners/ vessels specified below.

ZAO Strelets (former Joint Stock Company Murmansk Trawl Fleet -1), **Strelets (M-0269)**; Gross tonnage: 2001 ton. Length: 57,8 m. Year: 2003

ZAO Eridan (former Joint Stock Company Murmansk Trawl Fleet - 4) **Korund (M-0254),** Gross tonnage: 1198 ton. Length: 54,8 m. Year: 1988

ZAO Taurus (former Joint Stock Company Murmansk Trawl Fleet – 3), **Taurus (MK-0411)**, Gross tonnage: 2403 ton. Length: 63,85 m. Year: 2013, RS Id. No. 120791, IMO No. 9657961. Port of registry: Murmansk

3.2.2 General overview of the Barents Sea Cod (North East Arctic Cod) Fishery

The North-East Arctic cod fishery is conducted both with an international trawler fleet and with coastal vessels using traditional fishing gears. Cod is a target species in a mixed fishery taking haddock and saithe as major by-catch species. Two species of redfish, *Sebastes marinus* and *S. mentella*, are also taken as by-catch. Quotas were introduced in 1978 for the trawler fleets and in 1989 for the coastal fleets. In addition to quotas, the fishery is regulated by a minimum catch size, a minimum mesh size in trawls and Danish seines, a maximum by-catch of undersized fish, a maximum by-catch of non-target species, closure of areas having high densities of juveniles and by seasonal and area restrictions. Since 1997 sorting grids have been mandatory for all trawl fisheries in most of the Barents Sea and Svalbard area. From 2011 the minimum mesh size for bottom trawl fisheries for cod and haddock for the whole of the Barents Sea, changed to 130mm. Prior to that it was 135mm in the Norwegian EEZ and 125mm in the Russian EEZ. From 1 January 2011, the minimum landing size was also changed to 44cm in all areas. Previously the minimum size was 42cm in the Russian EEZ and 47cm in the Norwegian EEZ. These changes were part of a harmonisation of the regulations in each EEZ and included changes to the percentage of undersized fish permitted in the catch.

Historically the cod fishery in the North-East Arctic was dominated by Norway, the United Kingdom and Russia through to the late 1970s. Following the establishment of 200 nautical mile exclusive economic zones in the early 1980s, the fishery became dominated by Norway and Russia through to the present time. Over the past fifteen years Norway has taken an average of 45% of the catch, Russia 42% and other countries 13%. The total recorded landings of North East Arctic cod in 2016 were 849,422t. Norway took 348,949t (41%) and Russia took 394,107t (46.4%) The remaining 12.5% was shared between the Faroe Islands, France, Germany, Greenland, Iceland, Spain and the UK (ICES, 2017a,b).

3.2.3 General overview of the Barents Sea Haddock (North East Arctic Haddock Fishery

The demersal fisheries in the Barents Sea are highly mixed, and haddock is fished together with cod (particularly), but also together with saithe. The North East Arctic haddock fishery is mainly a bottom trawl fishery and is generally a by-catch of the much larger cod fishery over the same areas. About 75% of the catch is taken by trawl and the rest by other gears such as longline and gillnet (ICES, 2016a; 2017a). There are some directed trawl and longline fisheries specifically for haddock particularly in years of high fishable stock abundance.

A raft of enforcement measures exist to protect the stock and to ensure sustainability of the fishery. These include minimum landing size, minimum mesh size for trawls and Danish Seines, maximum by-catch of undersized fish, maximum by-catch of non-target species, flexible area closures when large numbers of juveniles occur and other seasonal and area closures. Technical regulations for demersal fisheries were harmonized from January 2011 so that they are now the same in both the Norwegian and Russian EEZs (ICES, 2012). Before 2011 the minimum landing size was 39cm from within the Russian EEZ and 44cm from within the Norwegian EEZ. Up to 2010 the minimum mesh size was 135mm in the Norwegian EEZ and 125mm in the Russian EEZ. From 2011 the minimum landing size is 40cm and the minimum mesh size for the whole of the Barents Sea is 130mm.

Annual quotas have been in place for trawl fisheries since 1978 and Norway sets separate quotas for the trawl fishery and for other gears. There is a total ban on discarding over the whole of the area together with a maximum by-catch of undersized fish.

Illegal and unreported landings have been a problem in this fishery, linked strongly to practices within the cod fishery. The ICES AFWG had no information on the extent of the problem before 2002 (ICES, 2009; ICES, 2010).From 2002 to 2007 the AFWG estimate of landings exceeded the official landings figures by an average of 16% each year and was as high as 25% in 2005.This problem was addressed by more rigorous enforcement measures, including inspections at sea and designated landing points. As a result, the problem was gradually reduced and in 2008 the ICES estimated catch exceeded the official landings by just 4%. Since 2008 the AFWG no longer consider that illegal and unreported landings to be a significant issue (ICES, 2012).

3.2.4 General overview of Barents Sea Saithe fishery

The fishery is executed with a range of gears, including trawl, purse seine, gillnets and longline, Norway is taken the main share of the catch but about 15% of the total catch is taken by other non-Norwegian fleets.

Landings of saithe fluctuated between 100,000 t – 250,000 t, dropping to a low level of 67,396 t in 1986. Since then, saithe landings have generally increased, reaching almost 200,000t in 2007 before declining to 131,827 t in 2013 followed by an increase.

Fishing takes place all year using demersal otter trawl of cod-end mesh size 130mm, purse seine, longline, gillnets and other gears including pots. The gill net fishery is most intense during winter, purse seine in the summer months while the trawl fishery takes place more evenly all year around.

3.3 Principle One: Target Species Background

The fisheries for cod, haddock and saithe in the Barents Sea target the following stocks

- North East Arctic Cod (*Gadus morhua*)
- North East Arctic Haddock (Melanogrammus aeglefinus)
- North East Arctic Saithe (Pollachius virens)

3.3.1 North East Arctic cod

3.3.1.1 Biology and life history

The North Atlantic cod is a demersal living roundfish of the order Gadidae. It is widespread across the shelf areas of the temperate North Atlantic from Newfoundland north to Greenland, around Iceland and in the Barents Sea, and in the North Sea, English Channel and to the west of the British Isles and in the Irish Sea (Wheeler, 1969). It also occurs in the Skagerrak, Kattegat and in the Baltic Sea. It is found in depths ranging from the shoreline out to 600m. It is a highly migratory fish and there are individual tagging records showing fish that have travelled across the Atlantic Ocean. Population studies have shown that stocks within certain areas have separate and clearly identifiable spawning areas. The population in the Barents Sea and Norwegian Sea, in ICES sub-areas I and II, is sufficiently discreet to be managed as a separate stock, the North East Arctic cod stock. The only potential complication is the presence of a coastal population of fjord cod which mixes with the North East Arctic cod at various stages in its life history. These coastal cod generally only occur within 12nml of the coast and can be identified by morphometric characteristics, in particular in the otolith (Berg et al., 2005). For management and stock assessment purposes all cod caught between latitudes 62°N and 67°N for the whole of the year and between 67oN and 69oN for the second half of the year are considered to be from the Norwegian coastal cod stock.

Cod spawn over much of the continental shelf areas of northern Europe generally in depths of less than 200m. North East Arctic cod become mature at between 5 and 10 years old which is two to three years later than populations further south in the North Sea. There is a suggestion that the mean age at maturity may be reducing which could be a response to environmental change and/or to fishing pressure. However, examination of survey data over the past 25 years provides no strong evidence of this (ICES, 2014). An average female produces around 500 ripe oocytes per gram of body weight which equates to around 5 million eggs for a 100cm long female. The spawning areas of the North East Arctic cod extend along the northern part of the Norwegian coast from Finmark to Stad, but the most important spawning grounds are off the Lofoten archipelago. Spawning occurs from February through to April. The egg and larval stages are planktonic and subject to the North Atlantic drift which distributes them, via the Spitsbergen and North Cape currents, northwards over the whole of the North-Wast Arctic basin. The juveniles become demersal at around 7cm in length when they are about 6 months old. From an early demersal stage cod are generally opportunistic feeders and will take crustaceans, molluscs, other invertebrates and fish of any kind. In the north-east Arctic capelin and herring are important sources of food for cod and year to year fluctuations in their abundance can have a significant effect on the growth rates and age-at- maturity of cod.

3.3.1.2 The Fishery

The North East Arctic cod fishery is conducted both with an international trawler fleet and with coastal vessels using traditional fishing gears. Cod is a target species in a mixed fishery taking haddock and saithe as major by-catch species. Two species of redfish, *Sebastes marinus* and *S. mentella*, are also taken as by-catch. Quotas were introduced in 1978 for the trawler fleets and in 1989 for the coastal fleets. In addition to quotas, the fishery is regulated by a minimum catch size, a minimum mesh size in trawls and Danish seines, a maximum by-catch of undersized fish, a maximum by-catch of non-target species, closure of areas having high densities of juveniles and by seasonal and area restrictions. Since 1997 sorting grids have been mandatory for all trawl fisheries in most of the Barents Sea and Svalbard area. From 2011 the minimum mesh size for bottom trawl fisheries for cod and haddock for the whole of the Barents Sea, changed to 130mm. Prior to that it was 135mm in the Norwegian EEZ and 125mm in the Russian EEZ. From 1 January 2011, the minimum landing size was also changed to 44cm in all areas. Previously the minimum size was 42cm in the Russian EEZ and 47cm in the Norwegian EEZ. These changes were part of a harmonisation of the regulations in each EEZ and included changes to the percentage of undersized fish permitted in the catch.

Historically the cod fishery in the North East Arctic was dominated by Norway, the United Kingdom and Russia through to the late 1970s. Following the establishment of 200 nautical mile exclusive economic zones in the early 1980s, the fishery became dominated by Norway and Russia through to the present time. Over the past fifteen years Norway has taken an average of 45% of the catch, Russia 42% and other countries 13%. The total recorded landings of North East Arctic cod in 2016 were 849,422t. Norway took 348,949t (41%) and Russia took 394,107t (46.4%) The remaining 12.5% was shared between the Faroe Islands, France, Germany, Greenland, Iceland, Spain and the UK (ICES, 2017a,b).

The figure below shows the historical pattern of landings of North East Arctic cod over the period 1946 to 2016. Through to the early 1960s landings generally fluctuated between 600,000 and 800,000 t with the exception of two years, 1955 and 1956 when landings went over one million t to a high of 1.3 million t in 1956. From a subsequent low of 438,000t in 1964 landings rapidly increased to over a million t in 1968 and 1969. Landings then fluctuated but remained above half a million t after which there was a steady decline to less than 300,000t in 1984. After a small and very short recovery, landings fell rapidly to the lowest recorded level, in the time series, of 212,000t in 1990. Landings have steadily increased over v years to reach a peak of 986,449t in 2014 (ICES, 2017b).

In the past, there have been reports of unreported catches through discarding etc. However, the assessment working group now consider that the landings data, since 2009, are very close to the actual catches. This assumption is based on an analysis carried out by the Norwegian-Russian group on the estimation of total catch (ICES, 2015a).

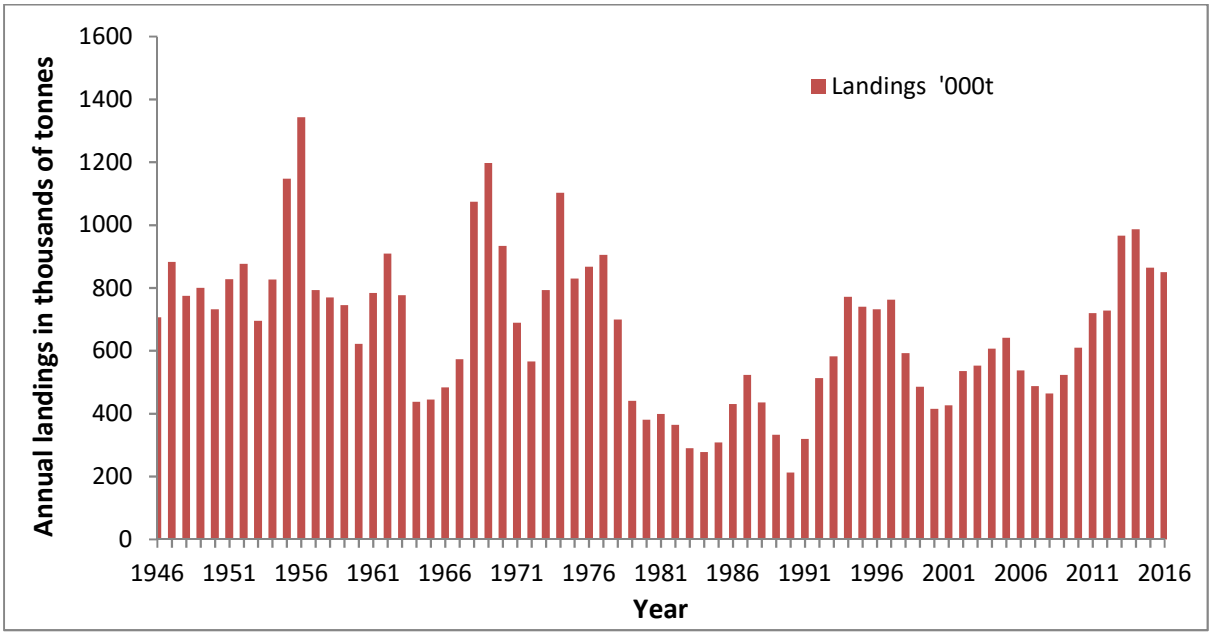

Figure 1 Annual Landings of North East Arctic Cod in thousands of tonnes over the period 1946 to 2016 (ICES, 2017b)

The total landings, by each country, of North East Arctic cod in ICES sub-Areas I and II from 2012 to 2016 are shown in the table below. The total catches include a small quantity of 'others' totalling 15,139t in 2016 which includes unspecified EU catches (ICES, 2017b).

Year	Faroes	France	Greenland	Germany	Norway	Spain	UK	Russia	Iceland	others	Total
2012	17,523	2,841	8,520	8,500	315,739	12,814	11,166	329,943	9,536	11,081	727,663
2013	13,833	7,858	7,885	8,010	438,734	15,042	12,536	432,314	14,734	15,263	966,209
2014	33,298	8,149	10,864	6,225	431,846	16,378	14,762	433,479	18,205	13,243	986,449
2015	26,568	7,480	7,055	6,427	377,983	19,905	11,778	381,778	16,120	9,880	864,384
2016	24,084	7,946	8,607	6,336	348,959	14,640	13,583	394,107	16,031	15,139	849,422

Table 1 Landings of North East Arctic cod (tonnes) by country from ICES sub-Areas I and II from 2012 to 2016. The 2016 figures are provisional (ICES 2017b).

3.3.1.3 Stock Assessment

At the ICES Inter-Benchmark meeting in April 2017 (ICES, 2017c0 the stock assessment model was changed from XSA to the State-space Assessment Model (SAM) (Nielsen, A.C and C.W. Berg, 2014) . The meeting also recommended a change in the Recruitment Model and the inclusion of a wider age range in the assessment. This resulted in a change in the perception of spawning stock biomass compared to the results of the 2016 assessment (ICES, 2016a). The figure below shows the comparison between the estimates of SSB in 2016 using the XSA model and 2017 using SAM. The retrospective differences have gradually increased from +24% in 2012 to +64% in 2016.

A natural mortality (M) of 0.2 + cannibalism was used in the model. Cannibalism is assumed to only affect natural mortality of ages 3-6 years. In addition, cannibalism was taken into account.

The method used for calculation of the prey consumption by cod described by Bogstad and Mehl (1997) is used to calculate the consumption of cod by cod for use in cod stock assessment. The consumption is calculated based on cod stomach content data taken from the joint PINRO-IMR stomach content

database (methods described in Mehl and Yaragina 1992). On average about 9000 cod stomachs from the Barents Sea have been analysed annually in the period 1984—2016.

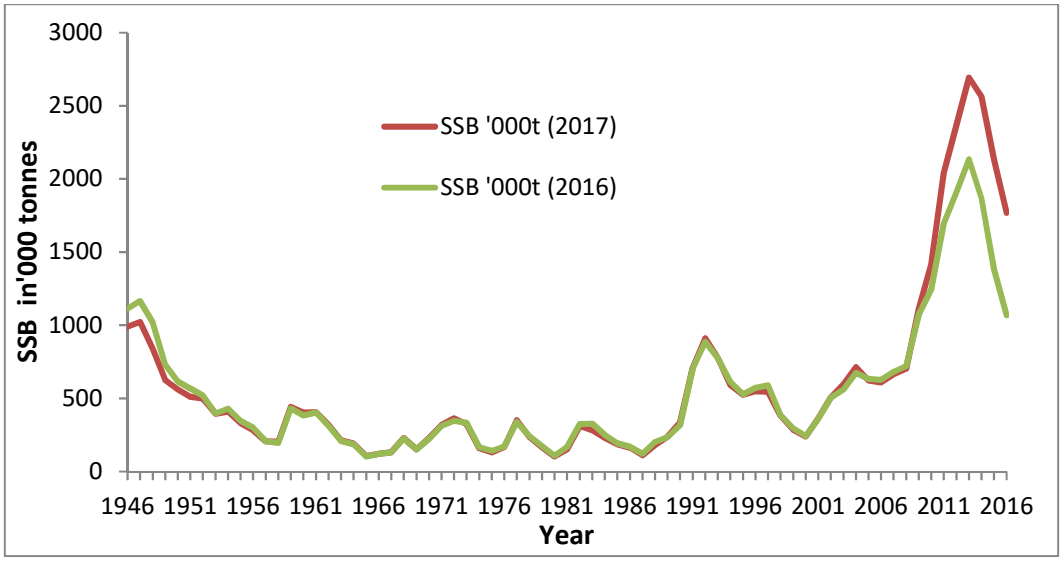

Figure 2 The annual estimates of spawning stock biomass of North East Arctic cod over the period 1946 to 2016. The green line is the estimate from the XSA assessment model used up to 2016 and the red line is the estimate in 2017 from the new State-Space Assessment Model (SAM) (ICES, 2017b).

The estimate of spawning stock biomass at spawning time in 2016 was 1,769,635 (1,387,517 / 2,256,988 -/+95% CI). It is estimated to have increased to 1,835,962t at spawning time in 2017 an increase of 66,327tt since 2016 (ICES, 2017b). The figure below shows the estimate of SSB dating back to 1946 together with the 95% high and low confidence intervals produced by the new assessment model, up to 2016. The reference points for MSY B trigger / Bpa / Management plan and the biomass limit reference points are also shown (ICES, 2017b).

The retrospective estimate of spawning stock biomass shows that it has not been below the biomass limit level (220kt) since 1988, although the assessment shows that it came very close to Blim in 2000 (239,875t) with the lower 95% CI below Blim. SSB has been above the MSY B trigger/Bpa/ Mgt level (460kt) since 2003. It is currently almost four times that upper reference level (ICES, 2017b)

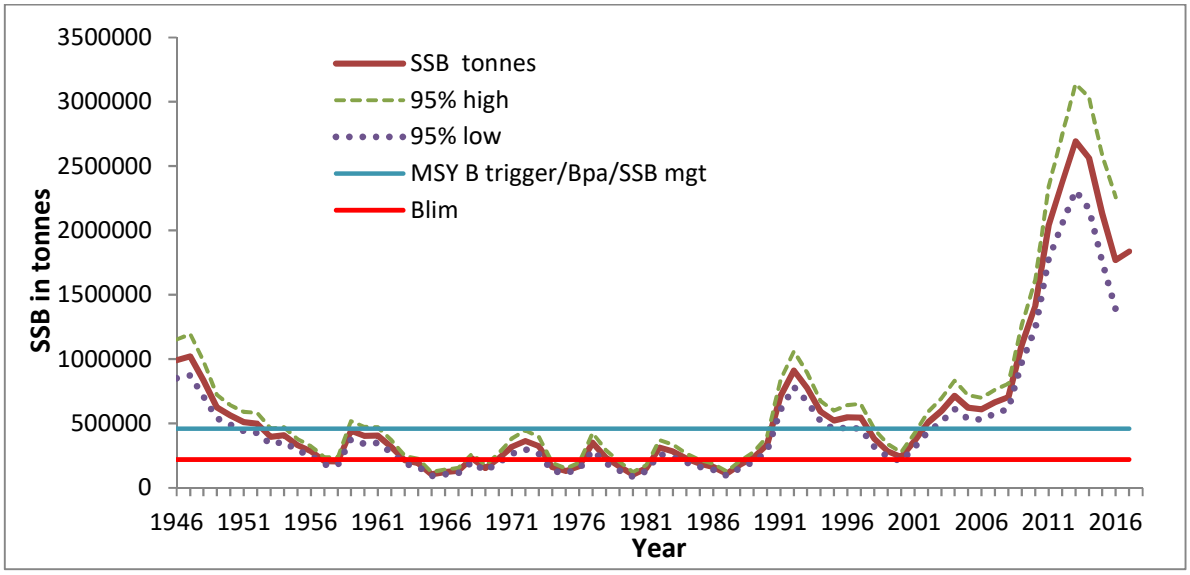

Figure 3 The annual estimate of Spawning stock biomass of North East Arctic cod over the period 1946 to 2016 (red line). The upper and lower 95% confidence intervals on the estimates are also shown. The biomass limit reference point and the reference point for MSY B trigger/Bpa and the SSB management level are also shown (ICES, 2017b).

3.3.1.4 Fishing mortality

Fishing mortality (F), based on ages 5-10yrs in the stock, over the period 1946 to 2016 is shown in the figure below. The 95% high and low confidence intervals of the estimates are also shown together with the Fmsy/precautionary approach/Fmgt and the Flim reference points. Fishing mortality has been below the management plan / MSY level (F 0.4) since 2008 and has stabilised at around F 0.32 over the past three years. It has not been above the F limit level (0.74) since 2000 (ICES, 2017b).

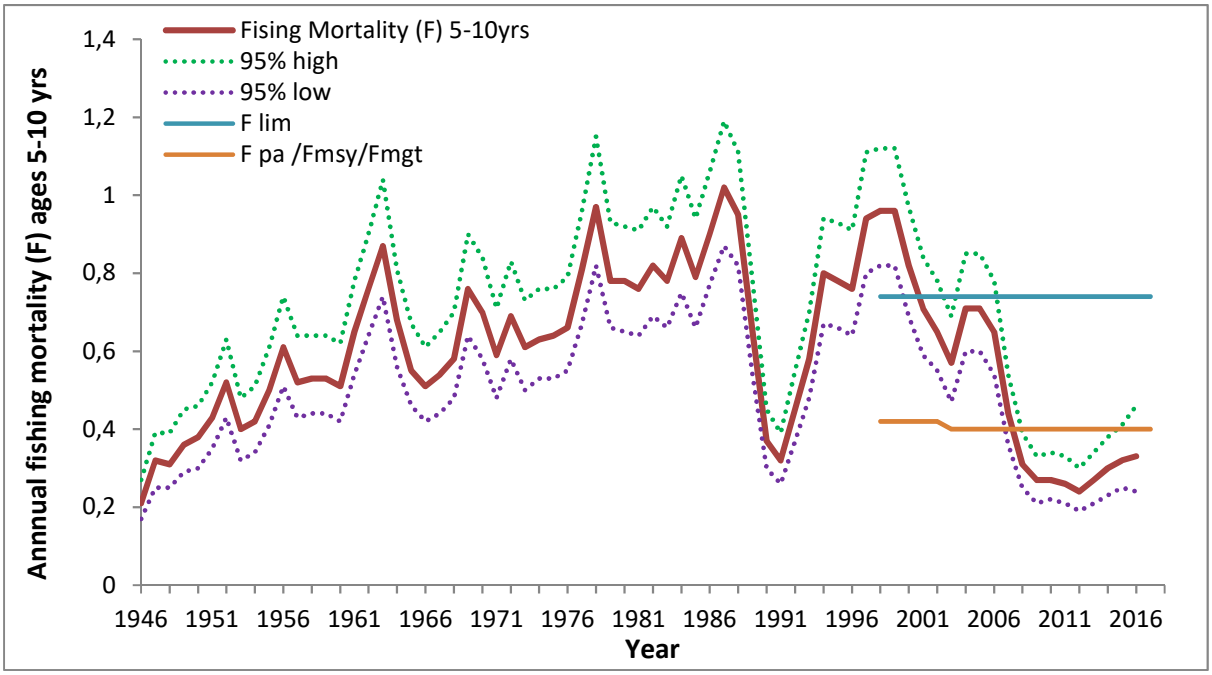

Figure 4 Annual fishing mortality (F), on North East Arctic cod, based on ages 5 to 10 years, over the period 1946 to 2016. The 95% confidence limits on the estimates, from the State Space assessment model, are also shown. The current limit (Flim), and the precautionary (Fpa) / maximum sustainable yield (Fmsy) / management (Fmgt) reference levels are also shown (ICES, 2017b).

3.3.1.5 Recruitment

The annual pattern of recruitment at age three years, over the period 1946 to 2017 is shown in the figure below Estimation of recruitment is via a sophisticated modelling procedure using the surveys and which takes into account a number of ecosystem variables including predation and cannibalism. The new SAM stock assessment model provides 95%, high and low confidence estimates.The pattern of recruitment is a typical fluctuating one for this stock with the last big year classes produced in 2004 and 2005. The 2013 year class (3ysr old in 2016) is one of the lowest in the time series but recruitment is predicted to show a marginal improvement in 2017 (ICES, 2017a,b).

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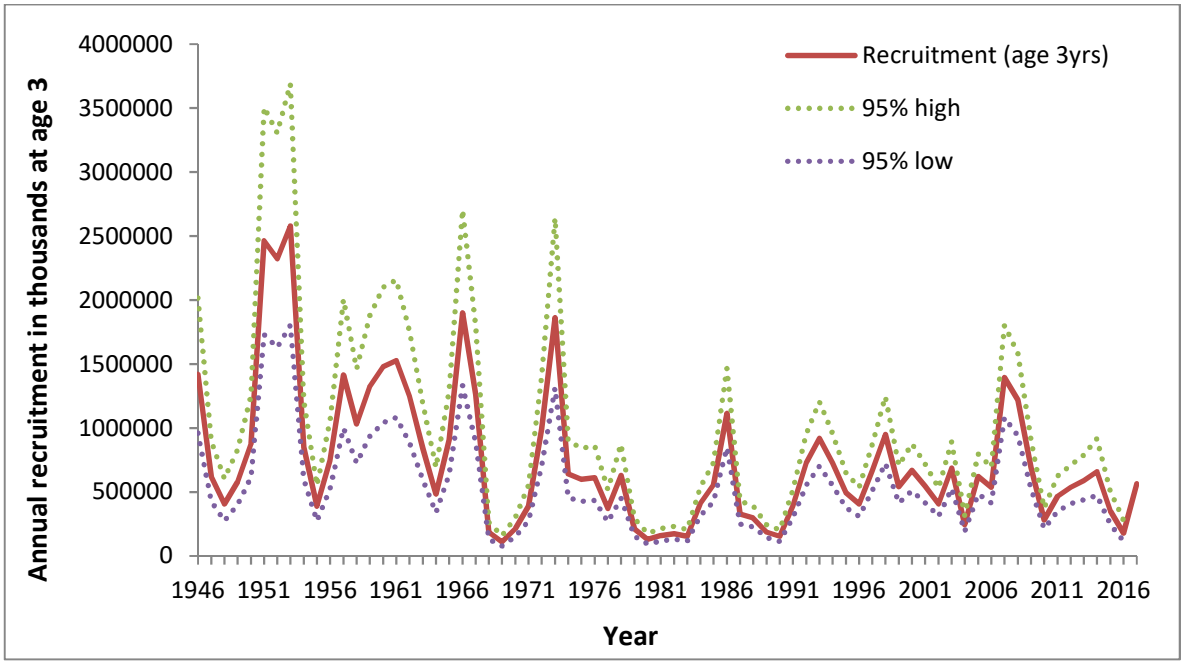


Figure 5 Annual recruitment at age 3 years, of North East Arctic cod, over the period 1946 to 2017. The 95% confidence limits on the estimates, from the State Space assessment model, are also shown (ICES, 2017b).

3.3.1.6 Management advice

Up to the 2016 fishery the ICES advisory committee (ACOM) continued to advise on the harvest rules resulting from the original JRNFC agreement in 2002 which was first applied for setting quotas in 2004 and evaluated by ICES as precautionary in 2005. In November 2015, a first Workshop was held I Murmansk on Management Plan evaluation of NEA cod and haddock and Barents Sea capelin ICES, 2015c). A second evaluation Workshop, on the same theme, was held in Kirkenes in January 2016 (ICES, 2016b). Following those Workshops Norway and Russia made a request to ICES for the evaluation of alternative harvest control rules for North East Arctic cod, haddock and capelin (ICES, 2016c). For cod ICES investigated and evaluated a series of ten harvest control rules including the existing one. ICES concluded that they were all in accordance with the ICES standard that the annual probability of SSB being below the biomass limit level should be no more that 5%.

A new Management Plan (text Table below) was subsequently agreed by the Joint Russian–Norwegian Fisheries Commission (JRNFC) at their 46th meeting in October 2016. This formed the basis for the agreed TAC for 2017 although ICES continued to provide advice on the basis of the original plan. The ICES advice for the fishery in 2018 was provided on the basis of the new Management plan (ICES,

2017b). ICES advises that when the Joint Russian–Norwegian Fisheries Commission management plan is applied, catches in 2018 should be no more than 712 000 tonnes (F 0.44). This would result in a 21% reduction in SSB in 2019, relative to 2018, to 1,187,128t. Bycatch of coastal cod and golden redfish (*Sebastes norvegicus*) should be kept as low as possible. Other catch options provided by the ICES advisory committee (ACOM) were for the precautionary approach (Fpa 0.4) and Fmsy (F0.4) which would generate a catch in 2018 of 653,971t and an SSB in 2019 of 1,238,434t (ICES, 2017b).

Advice basis	Joint Russian–Norwegian Fisheries Commission management plan
Management Plan	At the 46th meeting of the Joint Russian–Norwegian Fisheries Commission (JRNFC) in October 2016, the previously used management plan was amended, and the current plan is as follows: The TAC is calculated as the average catch predicted for the coming 3 years using the target level of exploitation (Ftr). The target level of exploitation is calculated according to the spawning-stock biomass (SSB) in the first year of the forecast as follows: - if SSB < Bpa, then Ftr = SSB / Bpa × Fmsy; - if Bpa ≤ SSB ≤ 2×Bpa, then Ftr = Fmsy; - if 2×Bpa < SSB < 3×Bpa, then Ftr = Fmsy × (1 + 0.5 × (SSB - 2×Bpa) / Bpa); - if SSB ≥ 3×Bpa, then Ftr = 1.5 × Fmsy; where Fmsy=0.40 and Bpa=460 000 tonnes. If the spawning–stock biomass in the present year, the previous year, and each of the three years of prediction is above Bpa, the TAC should not be changed by more than +/- 20% compared with the previous year's TAC. In this case, Ftr should however not be below 0.30. In 2014, JNRFC decided that from 2015 onwards, Norway and Russia can transfer to or borrow from the following year up to 10% of the country's quota. ICES evaluated this harvest control rule in 2016 (ICES, 2016a) and concluded that it is precautionary.

The figure below shows the performance of the management regime in terms of compliance with the ICES advice and subsequently agreed TAC. The 2017 TAC was set according to the new management plan agreed by JNRFC in October 2016.

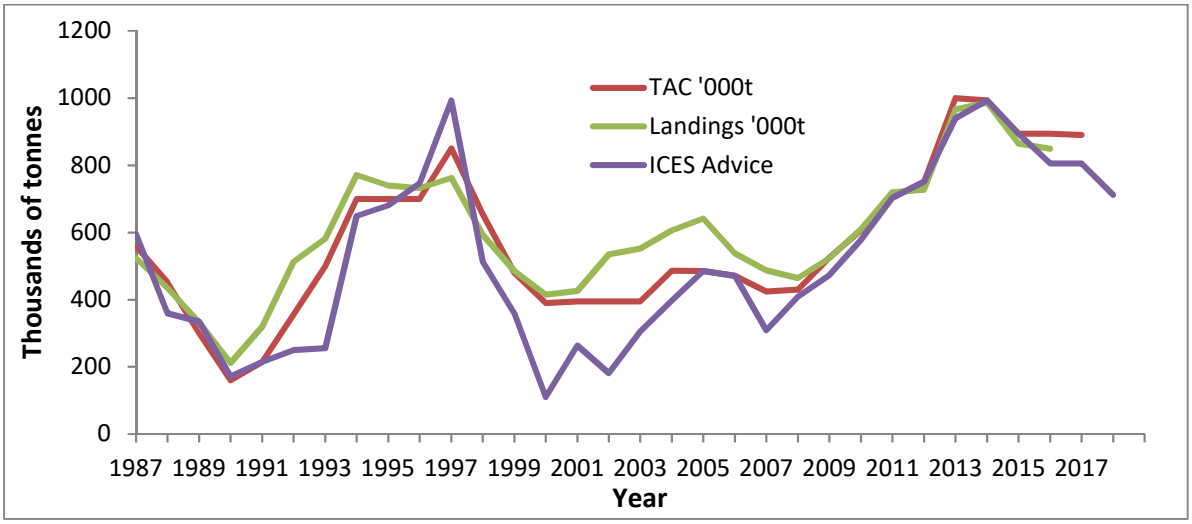


Figure 6 The ICES advised catch, the agreed TAC and the actual landings over the period 1987 to 2016 with the advised catch and ICES advice for 2017 and the ICES advice for 2018 (ICES, 2017b)

3.3.1.7 Summary of stock status

The figure below provides a summary of the stock status relative to all the biological reference points (ICES, 2017b).

In terms of the fishing pressure on the stock ICES considers the stock to be harvested sustainably with fishing mortality below the management plan level and below maximum sustainable yield (ICES, 2017b). In terms of the spawning stock status ICES considers the stock to be in full reproductive capacity with SSB above both the management plan and maximum sustainable yield levels (ICES, 2017b)

	Fishing pressure				Stock size			
		2014	2015	2016		2015	2016	2017
Maximum Sustainable Yield	F_{MSY}	✓	✓	✓ Below	MSY $B_{Trigger}$	✓	✓	✓ Above trigger
Precautionary Approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Below	B_{MGT}	✓	✓	✓ Above

Figure 7 A summary of stock status of NEA cod relative to SSB (2015 to 2017) and Fishing Mortality (2014 to 2016) (ICES, 2017b)

3.3.2 North East Arctic haddock

3.3.2.1 Biology and life history

In the North East Atlantic, haddock are widely distributed from the Celtic Sea, Irish Sea, central and northern North Sea northwards through the Norwegian Sea, Faroe Islands, Iceland and the Barents Sea. They only rarely occur as far south as the English Channel and northern Biscay (Wheeler, 1969). It is a demersal, bottom living fish, inhabiting depths between 40m and 150m and rarely found in temperatures < 2oC. The species is not continuously distributed throughout its geographic range but forms local

populations which are sufficiently isolated at spawning times to be considered and managed as separate stocks.

The North East Arctic Haddock stock is distributed in the Barents Sea and adjacent waters, mainly in waters above 2°C. Tagging carried out in 1953–1964 showed that North East Arctic haddock inhabit the continental shelf of the Barents Sea, adjacent waters and the polar front. The main spawning grounds are located along the Norwegian coast and the area between 70°30' and 73°N along the continental slope in depths between 50m and 150m. Spawning also occurs as far south as 62°N. Larvae are dispersed in the central and southern Barents Sea by warm currents. The 0-group haddock drift from the spawning grounds eastwards and northwards and during the international 0-group survey in August it is observed over wide areas in the Barents Sea. Until maturity, haddock are mostly distributed in the southern Barents Sea, their nursery area. Having matured, haddock migrate to the Norwegian Sea (ICES, 2015a).

Fecundity is high ranging from one hundred thousand to one million eggs per female depending on the size and age of the female. The eggs are planktonic and, because they are of similar size, are difficult to distinguish from cod eggs until late embryonic development (Russell, 1976). The larvae and early juvenile stages are also planktonic and off Norway they are subjected to the residual drift which takes them to their nursery areas in the southern Barents Sea. Maturing and mature fish tend to migrate back from these nursery areas to the Norwegian Sea. The spawning success of haddock is characterised throughout its distribution by large fluctuations in subsequent recruitment and the strength of the year class. Year class strength, measured at age three, may vary by up to two orders of magnitude between good and poor year classes. No other teleost species, in the North East Atlantic, epitomises the enigma of recruitment variability as well as haddock (Nichols, pers.comm). The mechanisms which generate such volatility in juvenile haddock survival rates and subsequent year class strength are difficult to understand or explain. For the North East Arctic haddock there is no clear relationship between spawning stock size and subsequent recruitment. However, research has shown that water temperature during the first and second years of the North East Arctic haddock life cycle is a fairly reliable indicator of year-class strength. If mean annual water temperature in the bottom layer during the first two years of haddock life does not exceed 3.75° C (Kola - section), then the probability that strong year-classes will appear is very low even if other factors, such as food availability, are favourable. Steep rises or falls in water temperature also have a marked effect on the abundance of year classes (ICES 2014, Annexe 4). Variation in the recruitment of haddock has also been associated with the changes in the influx of Atlantic waters to the large areas of the Barents Sea shelf (ICES, 2014, annexe 4).

Once they become demersal, during the first year of their life, haddock are predominantly benthic feeders taking echinoderms, polychatetes, ophiuroids and gastropods although they can at times feed opportunistically on capelin, capelin eggs, herring and even euphausids. Haddock growth rates are variable over their distribution range and generally dictated by population abundance, the availability of the main prey species and water temperature. They will generally grow to <20 cm during their first year, up to 30cm (1.5kg) in their second year and attain their maximum length of around 80cm (3kg) at ten years old. (ICES 2014, Annexe 4). Similar to cod, annual consumption of haddock by marine mammals, mostly seals and whales, depends on the stock size of capelin which is their main prey. In years when the capelin stock is large, the importance of haddock in the diet of marine mammals is minimal, while under a reduced capelin stock, a considerable increase in the consumption of haddock by marine mammals is observed.

3.3.2.2 The Fishery

The demersal fisheries in the Barents Sea are highly mixed, and haddock is fished together with cod (particularly), but also together with saithe. The North East Arctic haddock fishery is mainly a bottom trawl fishery and is generally a by-catch of the much larger cod fishery over the same areas. About 75% of the catch is taken by trawl and the rest by other gears such as longline and gillnet (ICES, 2016a; 2017a). There are some directed trawl and longline fisheries specifically for haddock particularly in years of high fishable stock abundance.

A raft of enforcement measures exists to protect the stock and to ensure sustainability of the fishery. These include minimum landing size, minimum mesh size for trawls and Danish Seines, maximum by-catch of undersized fish, maximum by-catch of non-target species, flexible area closures when large numbers of juveniles occur and other seasonal and area closures. Technical regulations for demersal fisheries were harmonized from January 2011 so that they are now the same in both the Norwegian and Russian EEZs (ICES, 2012). Before 2011 the minimum landing size was 39cm from within the Russian EEZ and 44cm from within the Norwegian EEZ. Up to 2010 the minimum mesh size was 135mm in the Norwegian EEZ and 125mm in the Russian EEZ. From 2011 the minimum landing size is 40cm and the minimum mesh size for the whole of the Barents Sea is 130mm.

Annual quotas have been in place for trawl fisheries since 1978 and Norway sets separate quotas for the trawl fishery and for other gears. There is a total ban on discarding over the whole of the area together with a maximum by-catch of undersized fish.

Illegal and unreported landings have been a problem in this fishery, linked strongly to practices within the cod fishery. The ICES AFWG had no information on the extent of the problem before 2002 (ICES, 2009; ICES, 2010). From 2002 to 2007 the AFWG estimate of landings exceeded the official landings figures by an average of 16% each year and was as high as 25% in 2005.This problem was addressed by more rigorous enforcement measures, including inspections at sea and designated landing points. As a result, the problem was gradually reduced and in 2008 the ICES estimated catch exceeded the official landings by just 4%. Since 2008 the AFWG no longer consider that illegal and unreported landings to be a significant issue (ICES, 2012).

The figure below shows the pattern of haddock landings over the period 1950 to 2016 (ICES, 2017d). The historic high catch level of 322,226 t in 1973 divides the time-series into two periods. In the first period, highs were close to 200,000 t around 1956, 1961 and 1968, and lows were between 75,000 and 100,000 t in 1959, 1964 and 1971. The second period showed a steady decline from the peak in 1973 down to the historically low level of 20,945 t in 1984. Afterwards, landings rapidly increased to 155,000 t in 1987 before declining to 27,000 t in 1990. After a steady increase in landings up to 178,000 t in 1996 there was a further decline to 69,000t in 2000. This was followed by a steady increase in landings up to a peak of 315,627t in 2012. Landings in 2016 were 233,416t which was an increase of 38,660t over the previous year.

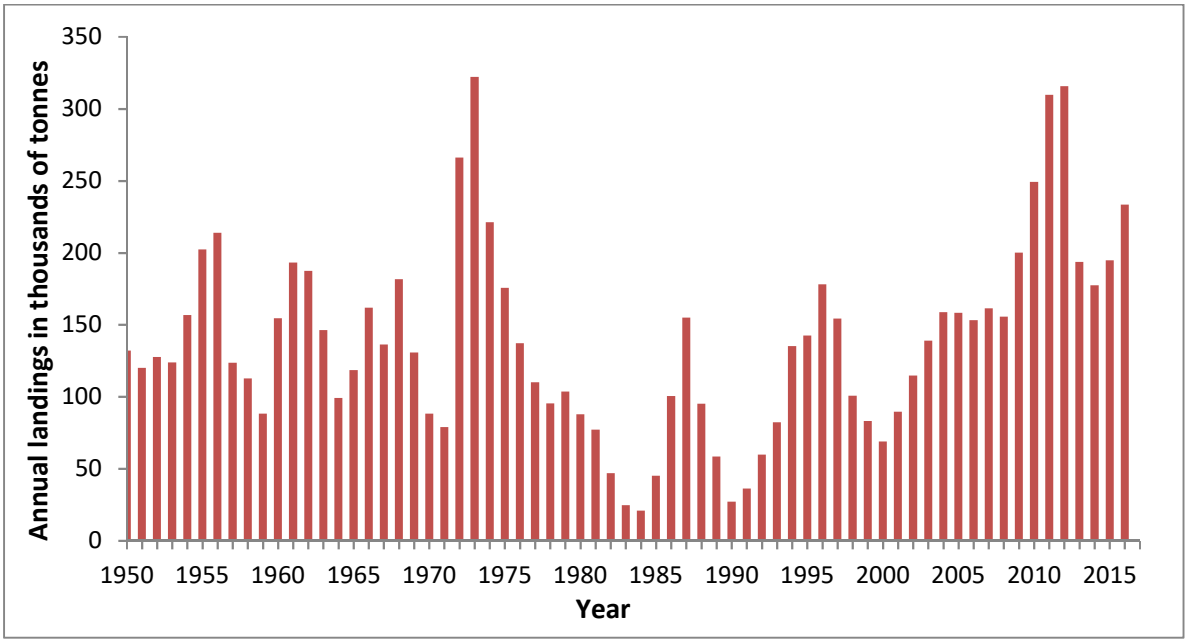


Figure 8 Annual Landings of North East Arctic haddock in thousands of tonnes over the period 1950 to 2016 (ICES, 2017d)

The total landings (tonnes) of North East Arctic haddock, by each country, in ICES sub-Areas I and Divisions IIa and IIb from 2012 to 2016 are shown in the text Table below.

Year	Faroes	France	Greenland	Germany	Norway	UK	Russia	Spain	Others	Total
2012	2055	322	3984	1111	159,602	833	143,886	441	3393	315,627
2013	1886	342	1795	500	99,215	639	85,668	439	3260	193,724
2014	1470	198	1150	340	91,306	355	78,725	187	3791	177,522
2015	2459	145	1047	124	95,094	450	91,864	246	3327	194,756
2016*	2560	340	1401	170	108,718	575	115,710	200	3838	233,416

*Provisional figures

3.3.3 Stock Assessment

The benchmark Workshop on Arctic stocks, in 2015 (ICES, 2015b) concluded that for North East Arctic haddock the State Space assessment model, SAM (Nielsen, A.C and C.W. Berg, 2014), should replace XSA as the main assessment model. For this stock, XSA has been shown to be very sensitive to the choice of settings, especially use or non- use of population shrinkage. SAM is a statistically based and in general more appropriate model which is now widely used for other stocks within the ICES area including the North East Arctic cod (ICES, 2015)

The assessment uses:

- Commercial landings data allocated to ages 1–14 from 1950 to 2013. These data come from the ICES database with landings reported by 13 countries including sampled information from Norway, Russia, and Germany.

- Catch in numbers-at-age and weights-at-age are compiled by port sampling program for Norway and by data from fishing vessels for Russia, and applied to the remaining landings by area. Details about how the landings data were derived and processed are described in the stock annexes (ICES, 2015a: ICES, 2017a).
- Four fishery independent survey tuning indices. The Joint Barents Sea winter survey (bottom trawl) and acoustics in the first quarter, the Russian bottom trawl survey in the fourth quarter and the International 0-group survey and joint ecosystem survey in the third quarter.
- Annual maturity data from surveys is collected on the trawl surveys and natural mortalities from cod consumption of ages 1–6 haddock are available from 1984. Cod is the main predator on haddock, and predation by cod on young haddock is included in the assessment as an additional mortality. This is found to improve the assessment. Predation by cod removes on average about the same biomass as the fishery, but predation mainly takes place on ages 1–3, while the fishery starts at age 3.

The SAM assessment therefore includes data both from the fishery and from fishery independent abundance surveys. The fisheries data used in the assessment are derived from the combined fisheries that target NEA haddock.

The figure below shows the annual estimates of SSB over the period 1950 to 2016. The high and low 95% confidence interval estimates are also shown. The biomass limit and the maximum sustainable yield (B trigger) and SSB management plan levels are also included.

The SSB at spawning time in 2016 was estimated at 675,068t (95% C: +909,423 / -501,105t). It is predicted to have decreased to 537,865t in 2017. SSB has been above the current MSY B trigger / Management and Bpa level of 80,000t since 1989 and has not been below the biomass limit level of 50,000t during the time series dating back to 1950. The exceptionally strong year classes of 2004–2006 have contributed to the strong increase in all-time high levels of SSB seen in later years; however, the SSB in 2017 is declining (ICES advice 2017d)

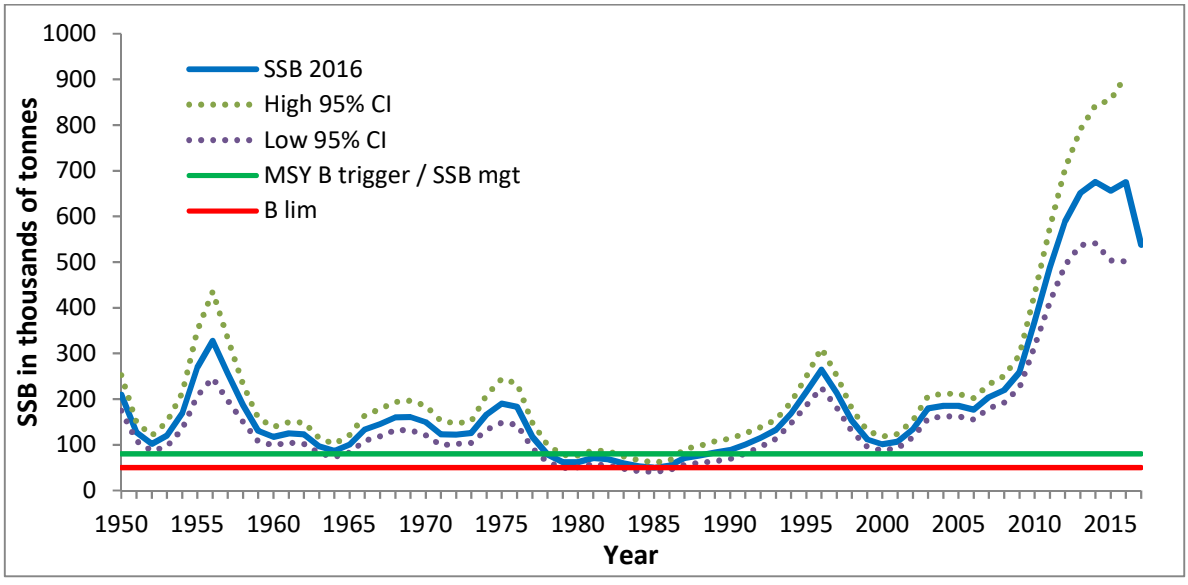


Figure 9 The annual estimate of Spawning stock biomass of North East Arctic haddock over the period 1950 to 2016 . The predicted value for 2017 is also included. The upper and lower 95% confidence

intervals on the estimates are also shown. The biomass limit reference point and the reference point for MSY B trigger and the SSB management level are also shown (ICES, 2017d).

3.3.4 Fishing mortality

Fishing mortality (F), based on ages 4-7yrs in the stock, over the period 1950 to 2016 is shown in the figure below. The 95% high and low confidence intervals of the estimates are also shown together with the Fmsy/F management (F0.35), F Precautionary approach (F 0.47 and the Flim (F0.77) reference points.

Fishing mortality in 2016 was F0.2 (95% CI: +0.26 / -0.15). Fishing mortality has been below the management plan / MSY level (F 0.35) since 1984 and below F precautionary approach level (F0.47) since 1980. Fishing mortality has not fallen below the limit level of F0.77 throughout the current time series dating back to 1950 (ICES, 2017d).

The exploitation rate of haddock has been variable. The highest fishing mortalities for haddock have occurred at low to intermediate stock levels and historically show little relationship with the exploitation rate of cod, despite haddock being primarily caught as bycatch in the cod fishery. The more restrictive quota regulations introduced around 1990 have resulted in a more stable pattern in the exploitation rate. The fishing pressure is currently well below Fmsy.

The technical basis for the biological reference points for SSB and F are listed in the ICES advice sheet (ICES, 2017d)

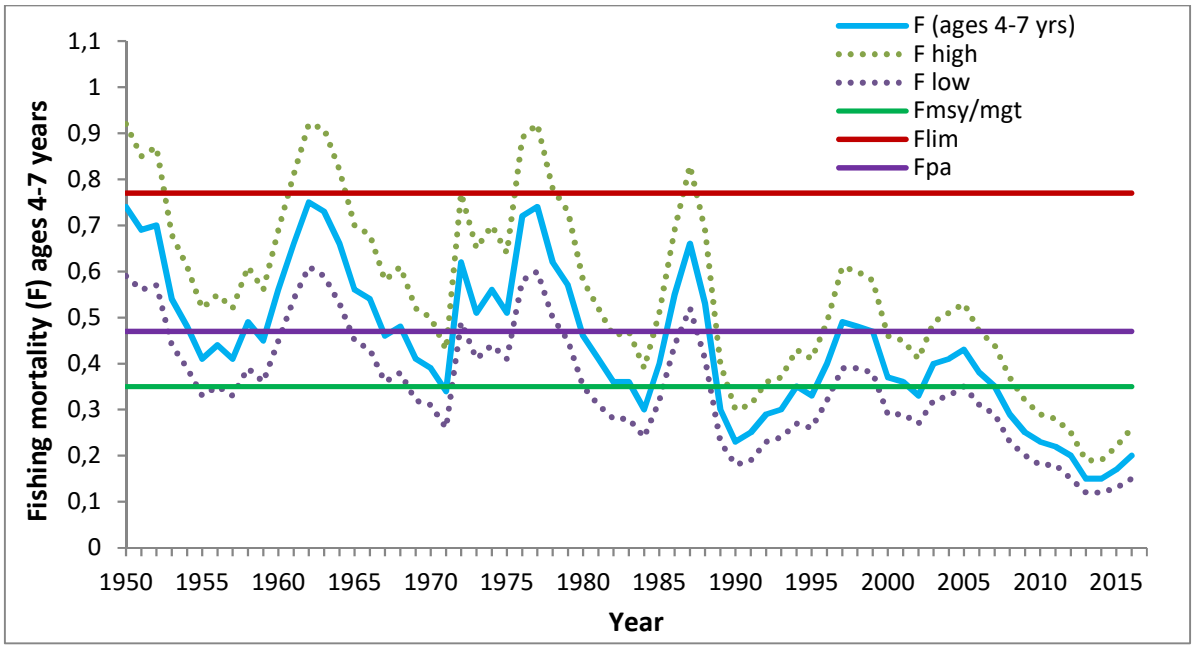


Figure 10 Annual fishing mortality (F), on North East Arctic haddock, based on ages 4 to 7 years, over the period 1950 to 2016. The 95% confidence limits on the estimates, from the State Space assessment model, are also shown. The current limit (Flim), and the precautionary (Fpa) / maximum sustainable yield (Fmsy) / management (Fmgt) reference levels are also shown (ICES, 2017d).

3.3.5 Recruitment

Annual recruitment for the NEA haddock stock is based on numbers of 3 years old fish from the assessment. The figure below shows the pattern of recruitment to the stock over the period 1950 to 2016 (1947 to 2013 year classes). As noted in section 3.3.2.1 the recruitment pattern is typical of haddock stocks where recruitment can vary by up to two orders of magnitude between very good and poor year classes. This pattern is typified in the recruitment t over recent years where there are strong year classes from 2004 to 2006 followed by a series of average or poor year classes.

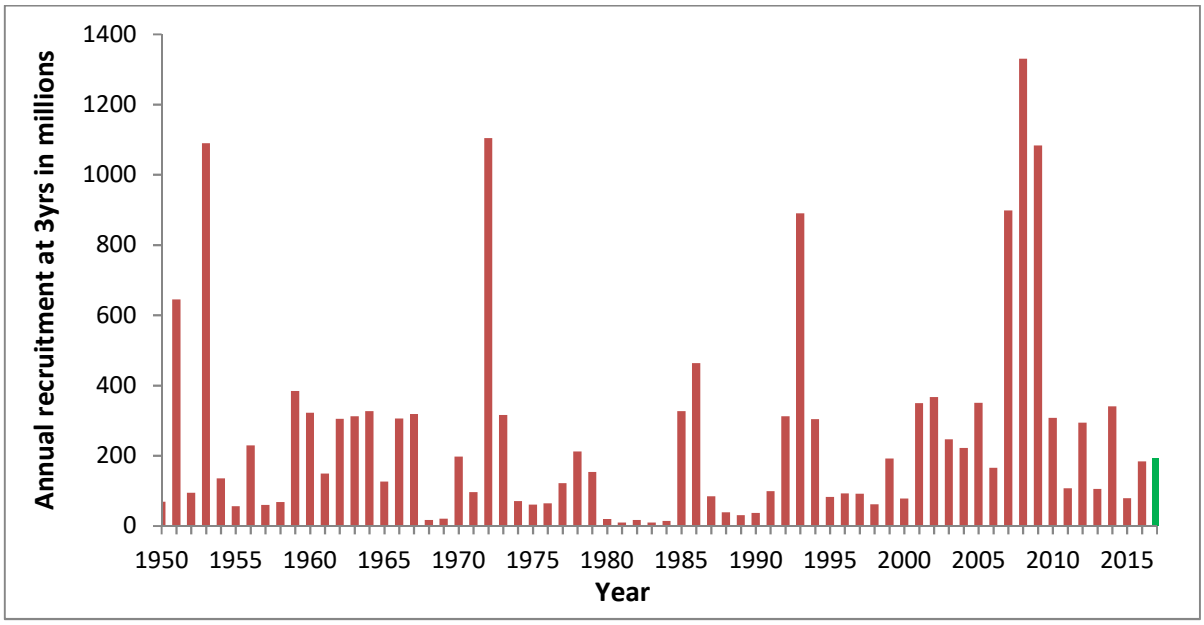


Figure 11 Annual recruitment at age 3 years, of North East Arctic haddock, over the period 1950 to 2017. (ICES, 2017d)

3.3.6 Management advice

Management advice is issued through ICES (2017d) and is delivered annually. The advice is based on the Joint Russian–Norwegian Fisheries Commission management plan (text Table below). The fishing mortality (Fmsy / Fmgt), which provides a predicted catch based on the advice from the plan, is F0.35. The initial ICES advice for the 2016 fishery was revised following a request from Norway and Russia (ICES 2015d). For the fishery in 2017 the predicted catch corresponding to the advice (ICES, 2016d) was 233,000t which was the eventually agreed TAC for 2017. The catch corresponding to the advice for the 2018 fishery is 202,305t. The advice for 2018 (ICES, 2017d) is based on the assumption that catches in 2017 are equal to the TAC (233 000 tonnes), but fishing opportunities for 2016 (TAC plus transfers from 2015) were not fully taken. Parties have transferred the unused part (about 30 000 t) of their haddock quotas in 2016 to 2017, so the out-take in 2017 could be higher than the TAC, although catches equal to the TAC are considered to be more likely (ICES advice, 2017d)

Advice basis	**Joint Russian–Norwegian Fisheries Commission management plan.**
Management plan	**The current HCR for haddock is as follows (see details in Protocol of the 46th Session of the Joint Russian–Norwegian Fisheries Commission, 14 October 2011):** ***– TAC for the next year will be set at level corresponding to FMSY.*** ***– The TAC should not be changed by more than ±25% compared with the previous year TAC.*** ***– If the spawning stock falls below Bpa, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from FMSY at Bpa to F= 0 at SSB equal to zero. At SSB-levels below Bpa in any of the operational years (current year and a year ahead) there should be no limitations on the year-to-year variations in TAC.*** **At the 46th Session of the Joint Russian–Norwegian Fisheries Commission in 2016 it was decided to keep the existing HCR for haddock for the next five years.** **Quota flexibility: In 2014, JNRFC decided that from 2015 onwards, Norway and Russia can transfer to or borrow from the following year up to 10% of the country's quota.** **ICES evaluated this HCR in 2016 (ICES, 2016a) and concluded that it is precautionary.**

The figure below shows the performance of the management regime in terms of compliance with the advised and agreed TAC over the period 1987 to 2016. Generally the compliance has been good with the exception of 2014 and 2015 where the landings exceeded the advised catch by around 30,000t.

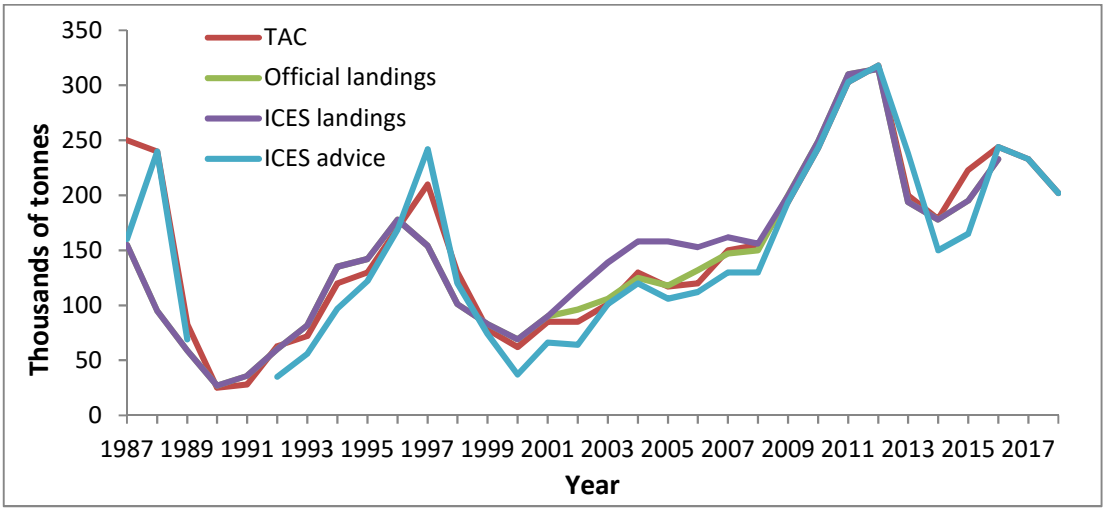


Figure 12 The ICES advised catch, the agreed TAC and the actual landings over the period 1987 to 2016 with the advised catch and ICES advice for 2017 (ICES, 2016d) and the ICES advice for 2018 (ICES, 2017d).

3.3.6.1 Summary of stock status

The spawning-stock biomass (SSB) has been above MSY $B_{trigger}$ since 1989 and been increasing since 2000 reaching a time series maximum in 2014 of 675,563t (95% C!: 843,617t/540,987t). Fishing mortality (F) was around F_{MSY} from the mid-1990s to 2011, but has declined substantially since then. Recruitment-at-age 3 has been at or above the long-term average since 2000. The very strong year classes 2004-2006 are still dominating the spawning stock; there have been no strong year classes observed since then.

The text able below is the stock status summary from the 2017 ICES advice (ICES, 2017d). ICES considers the stock to be at full reproductive capacity and is being harvested sustainably.

	Fishing pressure				Stock size			
		2014	2015	2016		2015	2016	2017
Maximum Sustainable Yield	F_{MSY}	✓	✓	✓ Below	MSY $B_{Trigger}$	✓	✓	✓ Above trigger
Precautionary Approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓ Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Below	B_{MGT}	✓	✓	✓ Above

Figure 13 A summary of stock status relative to SSB (2015 to 2017) and Fishing Mortality (2014 to 2016) (ICES, 2017d)

3.3.7 North East Arctic saithe

3.3.7.1 Biology and life history

Saithe is regarded as a semi-pelagic fish living and foraging at depths from near surface down to 300 metres. It is generally encountered swimming in shoals which in good feeding conditions can be very large. Saithe are voracious predators, mainly piscivores, which seek out and feed on shoals of herring, capelin, sprat and other young fishes. As opportunistic predators, they may occasionally feed on shellfish and are also known to take Euphausids (krill) when encountered in large swarms. It is one of the gadoid family and is only found in the North Atlantic. They grow to a maximum length of around 130cm.

In the North Eastern Atlantic ICES recognises the existence of four separate stock groupings for assessment purposes. They are the North Sea, Skagerrak and Kattegat, West of Scotland group; The Faroese stock: the Icelandic stock and the North East Arctic stock, which is the one which the Unit of Certification exploits.

The North East Arctic Saithe is distributed along the Norwegian coastal region from the Kola Peninsula and south to latitude 620 North, the border with the North Sea (Wheeler, 1969). This marks the division between NEA saithe and North Sea saithe for administrative purposes.

It is recognised, from tagging, that there is occasional migration of small numbers of NEA saithe into the northern North Sea. The small numbers involved do not impact on the integrity of the NEA stock.

NEA saithe spawn along the coastal Banks from the Lofoten Islands and South into the northern North Sea, from February through to March. The eggs and larvae are planktonic. The eggs, although smaller than cod and haddock eggs, have no distinguishable features in the early development stages (Russell, 1976). The larvae however have a characteristic post anal pigmentation pattern and can be easily identified (Russell, 1976). From their spawning grounds the eggs and larvae are subjected to the residual North Atlantic drift which takes them back northwards. As the larvae develop into the early 'o' group phase they tend to move into the inshore areas in April- June and are found in large numbers as juveniles in coastal waters often in fairly shallow areas. As they develop they tend to move back offshore and from age 2yrs they move into deeper waters and are subsequently found in shoals in the typical saithe feeding and fishing areas where they recruit to the fishable stock. Saithe begin to mature at age 5yrs when about 50% are mature and by age 7yrs close to 100% are mature. Average fecundity is around 800,000 oocytes for a female of 60cm length (ICES, 2017a stock annexe).

3.3.7.2 The fishery

The main fleets targeting saithe include trawl, purse seine, gillnet, hand line and Danish seine (ICES, 2017a). The figure below shows the annual landing of NEA saithe over the period 1960 to 2016. Landings of saithe were highest in 1970-1976 with an average of 239,000 t and a maximum of 264,762 t in 1970. This period was followed by a sharp decline to a level of about 160,000 t in the years 1978-1984, while in 1985 to 1991 the landings ranged from 67,000-123,000 t. After 1991 landings increased, ranging between 136,000 t (in 2000) and 212,000 t (in 2006), followed by a decline to 132,000 t in 2015. In 2016 landings increased to 140,392t.

The 2017 Arctic Fisheries Working Group (ICES, 2017a) reports that discarding, although illegal, does still occur in the saithe fishery, but is not considered a major problem in the assessment. Due to its near-shore distribution saithe is virtually inaccessible for commercial gears during the first couple of

years of life and there are no reports indicating overall high discard rates in the Norwegian fisheries. There are reported incidents of slipping in the purse seine fishery, mainly related to minimum landing size. Observations from non-Norwegian commercial trawlers indicate that discarding may occur when vessels targeting other species catch saithe, for which they may not have a quota or have filled it. However, there are no quantitative estimates of the level of discarding available (ICES, 2017a)

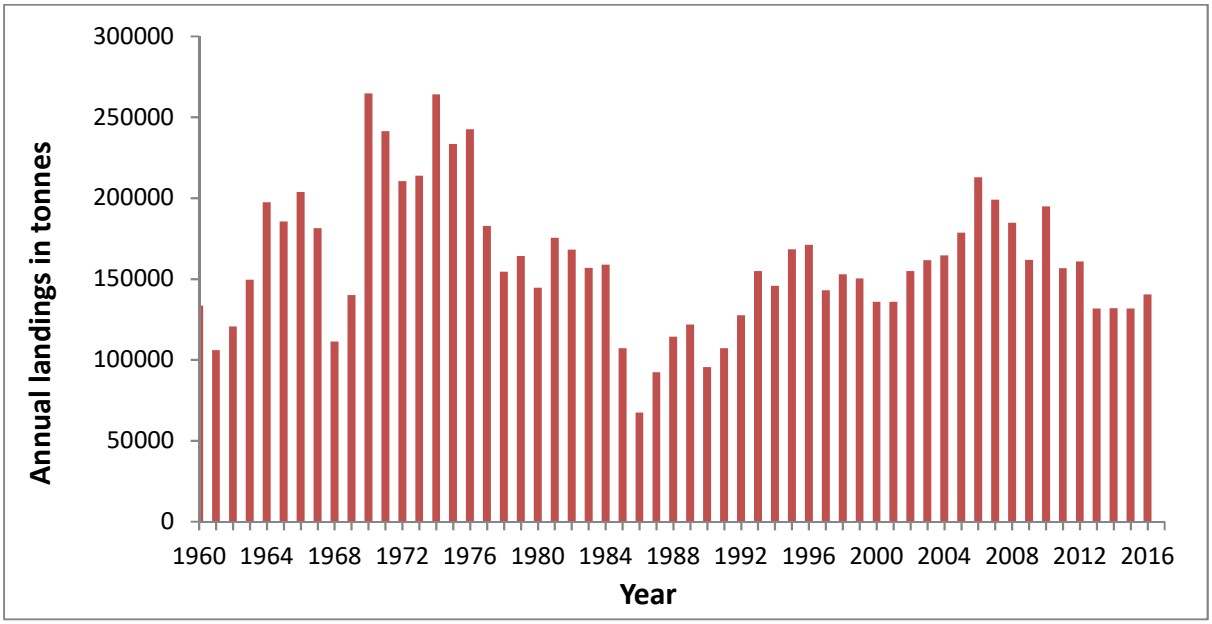


Figure 14 Annual Landings of North East Arctic saithe in tonnes over the period 1960 to 2016 (ICES, 2017e)

The total landings (tonnes) of North East Arctic saithe, by each country, in ICES sub-Areas I and Divisions IIa and IIb from 2012 to 2016 are shown in the text Table below (ICES,2017e).

Year	Faroes	France	Greenland	Germany	Norway	UK	Russia	Iceland	Total
2012	146	781	658	1371	143,145	1000	13,607	126	160,865
2013	80	1901	972	1326	111,962	433	14,796	290	131,806
2014	273	1674	407	259	115,798	518	12,396	659	132,005
2015	576	514	393	424	114,830	400	13,181	249	131,765
2016*	1139	526	613	952	120,740	301	15,203	301	140,392

*Provisional figures

3.3.7.3 Stock Assessment

In 2013 the ICES assessment working groups' analytical assessment of the stock (ICES, 2013), using the extended survivors analysis model (XSA), was not accepted by the ICES advisory committee. All issues were then dealt with in a benchmark process. The Inter-Benchmark Protocol (IBP) on North East Arctic Saithe (ICES CM 2014b) decided to change the assessment model from XSA to the state–space assessment model SAM (Nielsen and Berg, 2014) and to leave out the cpue time-series. This state space model is now widely used throughout the ICES area as a replacement both for XSA and for the integrated catch assessment model used for some pelagic species. For the North East Arctic saithe the

shift from XSA to SAM resulted in only minor changes in estimated fishing mortality, spawning-stock biomass, and recruitment.

For the 2017 assessment of the stock status in 2016 the data that were available included: commercial catches (international landings, ages and length frequencies from Norwegian, German, and Russian catch sampling); one survey index. Maturity data are based on otoliths from commercial catches and surveys for 1985–2006, constant (2005–2007 average) for later years. Discarding is considered negligible. Bycatch is included (ICES, 2017a).

The figure below shows the ICES annual estimates of SSB over the period 1960to 2016 with the predicted value for 2017 included. The upper and lower 95% confidence intervals on the estimates, from the SAM model, are also shown. The SSB at spawning time in 2016 was estimated at 473,544t (95%CI: 637,494t / 351,758t). It is predicted to have decreased to 465,149t in 2017. SSB has been above the current Precautionary approach, Management level of 220,000t since 1996 and has not been below the biomass limit level of 136,000t since 1994 (ICES, 2017e)

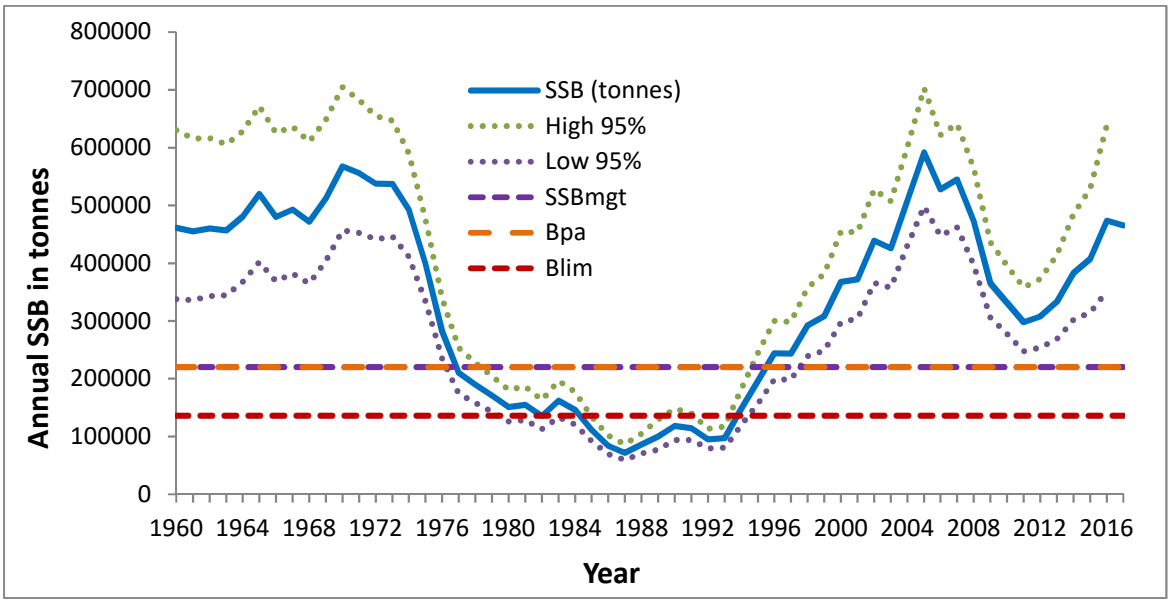


Figure 15 The annual estimate of Spawning stock biomass of North East Arctic saithe over the period 1960 to 2016. The predicted value for 2017 is also included. The upper and lower 95% confidence intervals on the estimates are also shown. The biomass limit reference point and the biomass precautionary approach and the SSB management level are also shown (ICES, 2017e).

3.3.7.4 Fishing mortality

Fishing mortality (F), based on ages 4-7yrs in the stock, over the period 1956 to 2016 is shown in the figure below. The 95% high and low confidence intervals of the estimates are also shown together with the F managemengt (F0.32), F Precautionary approach (F 0.35 and the Flim (F0.58) reference points.

Fishing mortality in 2016 was F0.228 (95% CI: 0.325 / 0.159). Fishing mortality has been consistently below below the management plan level since 1998 with the exception of a short period from 2009 to 2012 when it increased to F0.374 (ICES, 2017e).

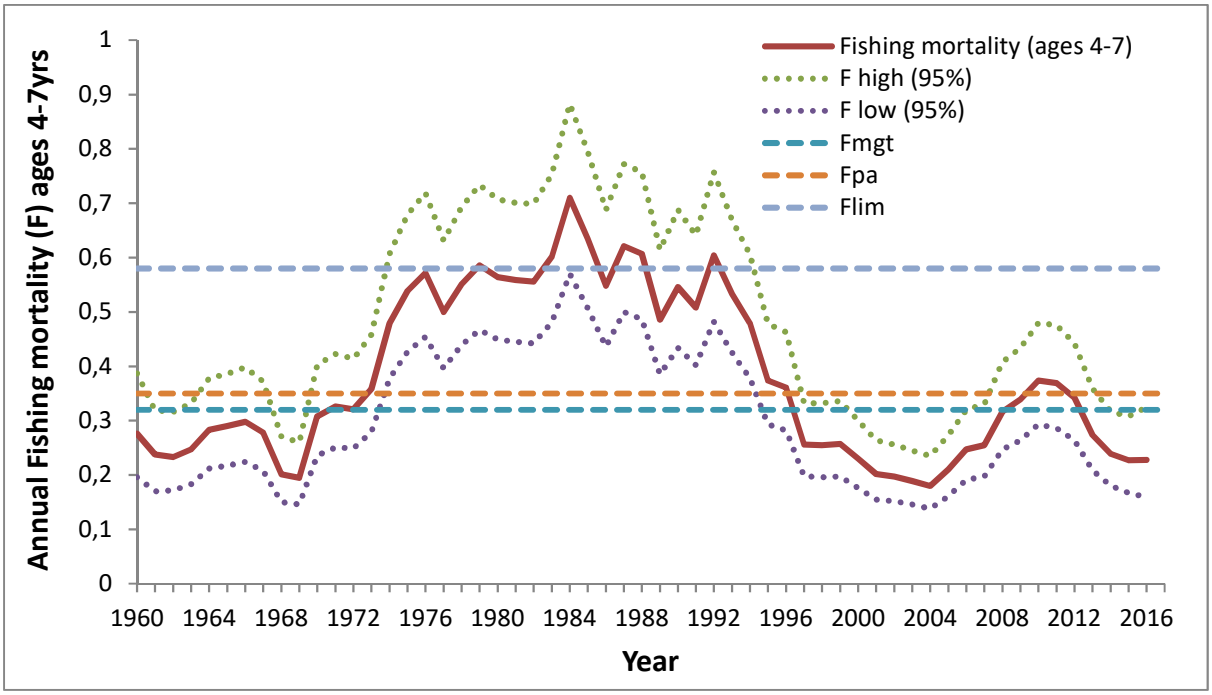


Figure 16 Annual fishing mortality (F), on North East Arctic saithe, based on ages 4 to 7 years, over the period 1960 to 2016. The 95% confidence limits on the estimates, from the State Space assessment model, are also shown. The current limit (Flim), and the precautionary (Fpa) management (Fmgt) reference levels are also shown (ICES, 2017e).

3.3.7.5 Recruitment

The figure below shows the ICES estimates of recruitment of saithe at age 3yrs, for the period 1960 to 2016, estimated from the stock assessment modelling. The 2017 value is the geometric mean of the whole time- series. The figure shows the same recruitment estimates but with the 95% upper and lower confidence levels also shown.

The 2007- year class is strong, the 2008 and 2009 year classes are below average strength, the 2010- year class is above average strength while the 2011- year class is below average. The 2013- year class shows some improvement to just above the geometric mean.

Owing to the near-shore distribution of juvenile saithe, obtaining early estimates of recruitment for ages 0-2 has not been possible so far. The survey recruitment indices are strongly dependent on the extent to which 2-4 year- old saithe have migrated from the coastal areas and become available to the acoustic saithe survey on the banks, and this varies between years. Also, observations from an observer programme, established in 2000 to start a 0-group index series did not seem to reflect the dynamics in year class strength very well.

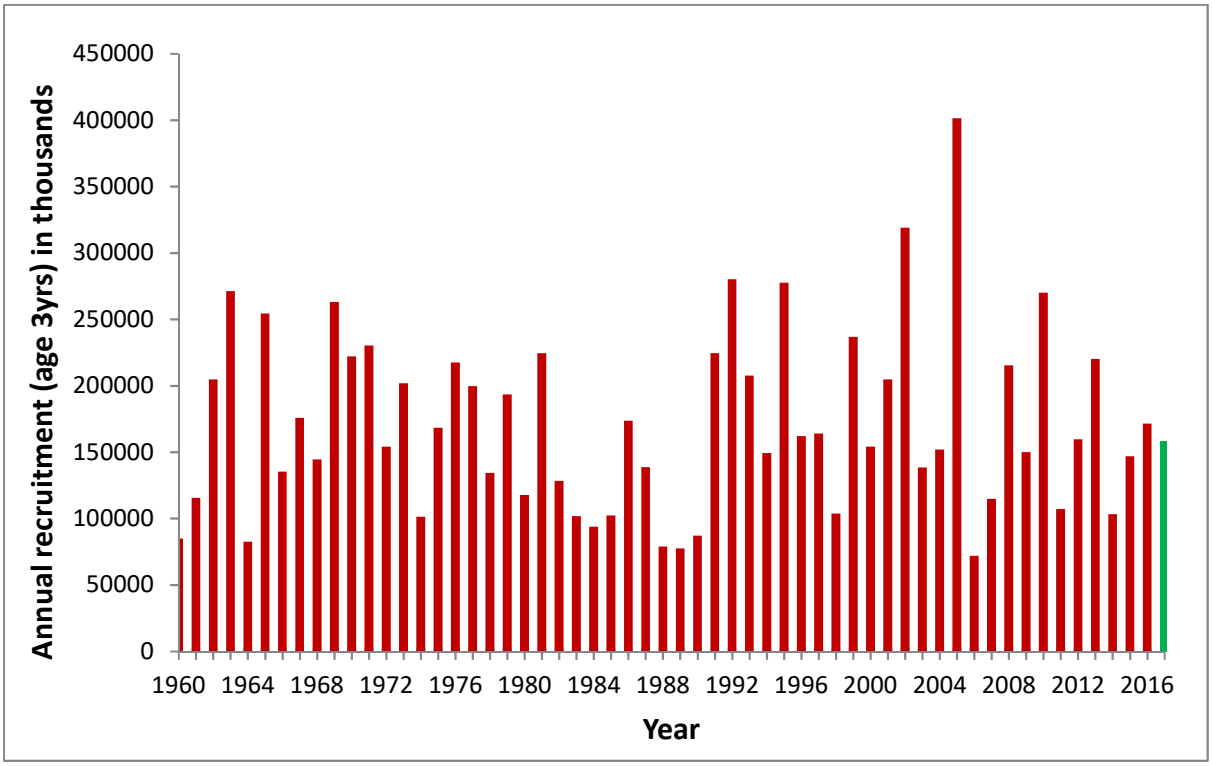


Figure 17 Annual recruitment at age 3 years, of North East Arctic saithe, over the period 1960 to 2017. (ICES, 2017e)

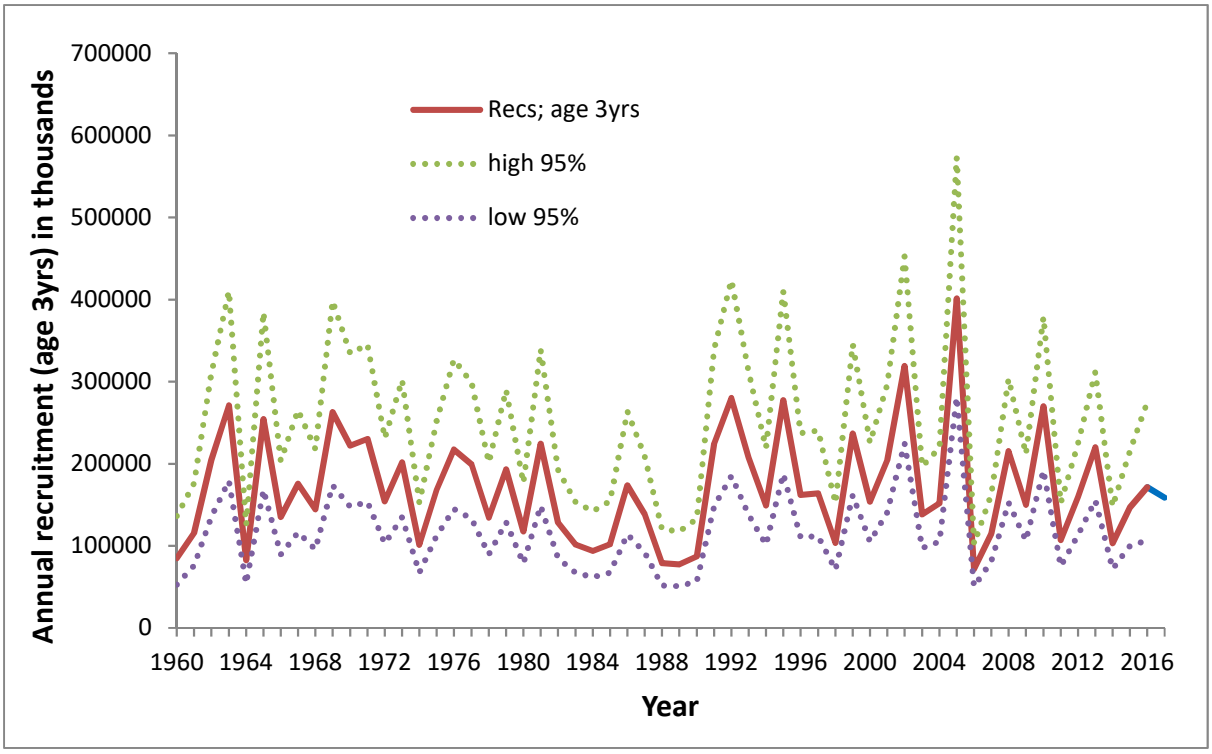


Figure 18 Annual recruitment at age 3 years, of North East Arctic saithe, over the period 1960 to 2017 with the 95% confidence interval estimates from the SAM model. (ICES, 2017e)

3.3.7.6 Management advice

The NEA saithe stock is managed by Norway according to a management plan (text Table below) adopted by Norwegian Government and that has been evaluated by ICES in 2011 as being precautionary, ICES (2011, a,b). Management of Saithe in Sub-areas 1 and 2 is by TAC and technical measures. For 2017, the Norwegian Ministry of Trade, Industry and Fisheries set the TAC according to the advice from ICES, i.e. 150,000 t an increase over the 2016 TAC of 140,000 t. The advised TAC for 2018, based on the management plan, is for a TAC of 172,500t. The TAC advice takes into account the potential impact on the Coastal cod and *Sebastes norvegicus* stocks (ICES, 2017e).

The HCR has not yet been evaluated for the new assessment model that the NEA saithe Inter-benchmark Protocol decided to use in 2014 (ICES, 2014b).

Advice basis	Norwegian management plan.
Management plan	The harvest control rule, as revised in 2013 and communicated to ICES by the Norwegian Ministry of Fisheries and Coastal Affairs, contains the following elements: Estimate the average TAC level for the coming 3 years based on FMP = 0.32. TAC for the next year will be set to this level as a starting value for the 3-year period. The year after, the TAC calculation for the next 3 years is repeated based on the updated information about the stock development. However, the TAC should not be changed by more than +/− 15% compared with the previous year's TAC. If the spawning–stock biomass (SSB) in the beginning of the year for which the quota is set (first year of prediction), is below Bpa, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from FMP at SSB = Bpa to 0 at SSB equal to zero. At SSB levels below Bpa in any of the operational years (current year and 3 years of prediction) there should be no limitations on the year-to-year variations in TAC. The harvest control rule (HCR) was last evaluated by ICES in 2011 (ICES, 2011), with FMP = 0.35. The evaluation concluded that the HCR is precautionary. The FMP was lowered to the current value of 0.32 by Norwegian authorities in 2013. The inter-benchmark for this stock in 2014 did not result in significantly different estimates of stock dynamics and the former HCR evaluation is still considered valid.

3.3.7.7 Summary of stock status

The 2017 assessment (ICES, 2017a) showed that the SSB has been above Bpa since 1996, declined considerably from 2007 to 2011, then increased again and in 2017 estimated to be well above Bpa at 465,149t. The fishing mortality was below Fpa from 1997 to 2009, started to increase in 2005 and was above Fpa from 2010 to 2012, but is presently estimated to be below Fpa. The 2007- year class is strong, the 2008 and 2009 year classes are below average strength, the 2010- year class is above average strength while the 2011- year class is below average (ICES, 2017e).

Maximum sustainable yield reference points for fishing mortality and SSB have not been established. The text Table below summarises the State of the stock and fishery relative to reference points (ICES,

2017e). ICES considers the stock to be harvested sustainably and with fishing pressure below the management plan level. In terms of SSB the stock is considered to be in full reproductive capacity.

	Fishing pressure					Stock size				
		2013	2014	2015			2014	2015	2016	
Maximum Sustainable Yield	F_{MSY}	?	?	?	Undefined	MSY $B_{Trigger}$	?	?	?	Undefined
Precautionary Approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓	Below	B_{MGT}	✓	✓	✓	Above

3.4 Principle Two: Ecosystem Background

Principle 2 of the Marine Stewardship Council standard states that:

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent ecologically related species) on which the fishery depends.

The following section of the report highlights some of the key characteristics of the fishery under assessment with regard to its wider impact on the ecosystem.

3.4.1 The nature and status of the Barents and Norwegian Sea ecosystem

Data and analysis relating to the Barents Sea ecosystem is collected under the Joint Norwegian-Russian Environmental Status Report for the Barents Sea (which issues annual Barents Sea ecosystem status reports, trends, highlights, and expected future situation) and work undertaken as part of implementing the Integrated Management Plan for the Barents Sea-Lofoten area. A major book was published in 2011 that reviewed information on the Barents Sea ecosystem (Jakobsen and Ozhigin 2011). ICES working groups provide annual assessments of the state of the Barents Sea Ecosystem (Arctic Fisheries Working Group; WG for Regional Ecosystem Description). A new working group on integrated assessment in the Barents Sea (WGIBAR) has now been established (ICES 2015). The Barents Portal provides a wide range of summaries of important ecosystem assessments and trend analyses

The length of time series for some of this information is impressive and amongst the highest in the world. Specific surveys include:

- Norwegian/Russian winter survey. Cod distribution. Since 1981
- Lofoten survey. Cod distribution and spawning. Since 1985
- Norwegian coastal surveys. Saithe. 1985 to 2002
- Joint Norwegian/Russian ecosystem autumn survey. Physical and chemical oceanography, plankton, benthos, fish, shellfish, sea mammals and birds. Since 1972
- Russian autumn-winter trawl-acoustic survey. Young and adult stages of bottom fish; oceanography and meso- and macro-zooplankton. Since 1946
- Norwegian Greenland halibut survey. Continental slope from 68 to 80ºN. Since 1994, but inconsistent in recent years
- Russian young herring survey. Since 1991.

The Norwegian Institute of Marine Research (IMR) has developed an aggregated spatial database for ecosystem datasets in the Barents Sea, accessed through http://maps.imr.no/geoserver/web/ as well as an atlas of fish species (Wienerroither et al 2011).

Several ecosystem modelling studies have been undertaken for the Barents Sea, which have explored for example the trophic relations between fish species, and links between capelin, cod, seabirds, and marine mammals. These include ecopath type studies by Blanchard et al (2002); EcoCod (which seeks to estimate cod MSY taking into account a range of ecosystem factors), Gadget (multispecies interactions between cod, herring, capelin, minke whale, krill) in the Barents Sea; Biofrost (multispecies model for

Barents Sea – addressing primarily cod / capelin dynamics); STOCOBAR (Stock of cod in the Barents Sea). Broader ecosystem models include NORWECOM.E2E which includes plankton and fish and is under development and semi-operational, and both PINRO and IMR have developed hydrodynamic models that complement these mainly biologically based models (ICES, 2014a).

Main features

The Barents Sea Ecosystem encompasses the North East Atlantic, the Arctic shelf seas north of the Arctic Circle, the White Sea, the western part of the Kara Sea and the waters surrounding the archipelagos of Svalbard, Franz Josef Land and Novaya Zemlya and covers an area of roughly 1.4million km^2. It is typified by boundaries: between warm Atlantic and cold polar water; between the relatively flat and shallow shelf area of the Barents Sea and the slopes and underwater canyons of the shelf edge; and between ice covered and open water. It is these boundaries and the mixing zones associated with them that to a large measure underpin the exceptional productivity of the area in terms of plankton, fisheries, seabirds and sea mammals.

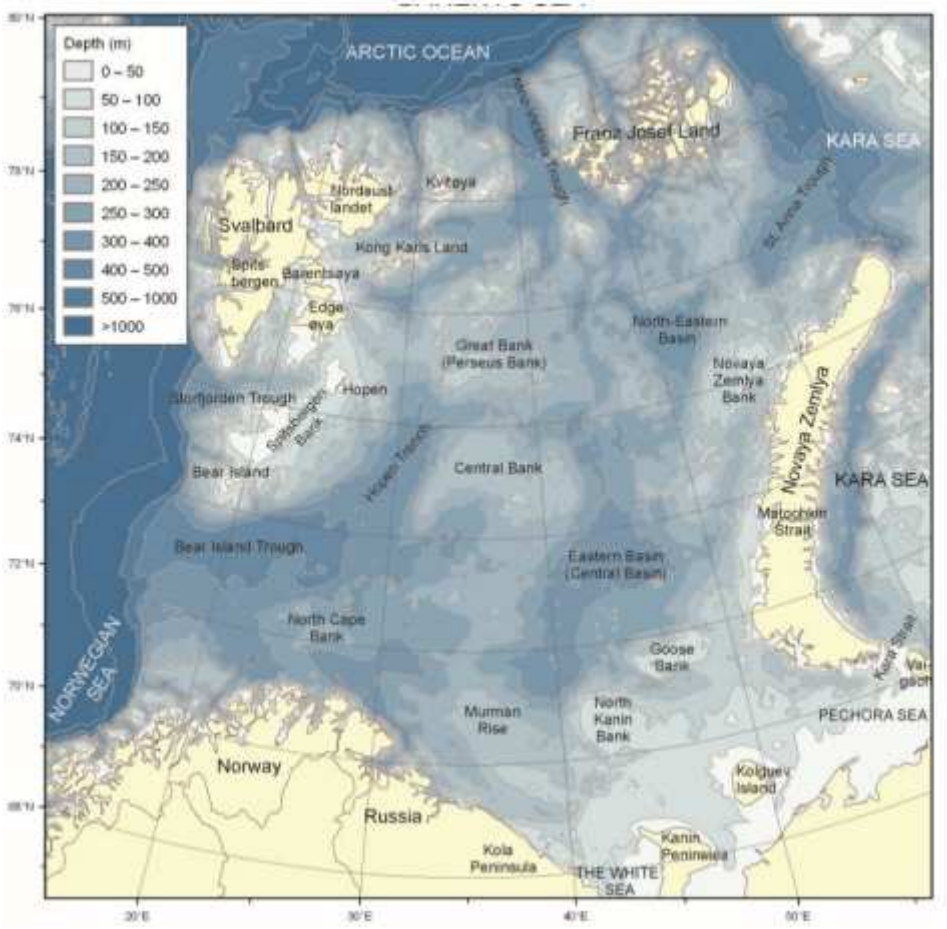


Figure 19 Main topographic features of the Barents Sea (source: Wienerroither *et al*, 2011)

Key features of the Barents Sea ecosystem may be summarized as follows:

- A varied topography including troughs and basins 300-500m deep, separated by shallower banks 100-200m depth. Several troughs to the west allow the ingress of Atlantic waters to the central Barents Sea;

- High productivity and biodiversity associated with polar front, sea ice edge, continental slope to the west, and complex topography within the central part of the sea;
- A spring bloom dominated by diatoms and flagellates (phytoplankton), and calanoid copepods and krill (zooplankton). Amphipods and schyphozoa (jellyfish) are also abundant - the latter competing directly with fish.
- Overall productivity and composition varies significantly from year to year according to climatic and oceanographic conditions;
- Large year to year variations in recruitment of most fish species related to changes in circulations patterns, food availability etc.;
- Longer term changes or cycles in productivity and community structure thought to be associated primarily with climate[1] but also related to oceanographic cycles, and anthropogenic impacts including trawling;
- Relatively short and simple food chains, but complex relationships/feedback between major fish and crustacean species (cod, haddock, herring, capelin, polar cod, northern shrimp) with predator-prey relationships shifting according to opportunity and life cycle stage;
- Capelin is a key species, being a major predator of zooplankton and major prey species of other fish (especially cod), birds and mammals. It has suffered three major collapses in the last 25 years, though the causes are poorly understood, but stock has been relatively steady in more recent years;
- Important nursery areas in the Barents Sea for Norwegian spring spawning herring;
- Highly concentrated fishing pressure based on known movement and aggregation of cod and haddock; also, significant fisheries for capelin, herring, polar cod (little current activity), scallop, shrimp and king crab, and more modest/variable fisheries for mackerel and blue whiting in SA II;
- A mosaic of benthic habitats varying according to depth, temperature, salinity (varying according to shifts in overlying arctic or Atlantic water), topography, sediments, and current strength, but broadly divided between the continental shelf slope habitats along the western boundary, and the shelf habitats (banks, slopes and troughs) further east;
- Deep water coral reefs along the Norwegian coast including the Røst Reef, the world's largest coldwater coral reef, located off Loføten;
- More than 3,050 benthic invertebrate species recorded, with decreasing species richness from West to East;
- Summer population of around 20-25 million seabirds (more than 40 species in 1600 colonies) that harvest approximately 1.2 million tonnes of biomass annually and are instrumental in significant transfers of nutrients. There has been a decline in seabird numbers over the last decade, but the causes are not understood;
- Significant marine mammal populations, including minke, humpback and fin whale (which breed further south but forage in the Barents Sea) beluga and narwhal (which breed in the area), harp,

[1] for example, cooling favours capelin and other arctic species while warming favours cod, herring and other atlantic species

common, grey, bearded, hooded and ringed seals. Minke whale are hunted and subject to a quota;

- Relatively pollution free;
- Presence of several alien species, including the introduced red king crab and the invasive snow crab;
- Increasing gas and oil extraction activity.

Pressures, trends and impacts

Pressures

ICES (2016) identify 7 main pressures on the Barents Sea ecosystem: selective extraction of species; abrasion, pollution; death or injury by collision; marine litter; substrate loss and smothering and underwater noise. Fisheries may contribute to any of these, although the main issues for fisheries are selective extraction of species and abrasion.

Overall health

The various assessments all suggest that the Barents Sea Ecosystem is relatively healthy, and that current fishing activities are not disrupting ecosystem structure and function. The high stocks of key species at different trophic levels (cod/ haddock and capelin) suggest that the fish related elements of the ecosystem are broadly speaking in good shape. Climate change (the last decade was the warmest on record) is likely having an impact on productivity and species composition – both directly and through reduced extent of sea-ice. Shorter term oscillations are however also significant. In 2014, north-westerly winds associated with a winter NAO index moving to a positive value resulted in the widest summer ice cover for 20 years. In contrast, ice cover in 2012 was the lowest ever recorded.

Phytoplankton

According to ICES (2016) there has been a moderate increase in net primary production since 1997, most likely caused changes in climate and associated increases in the area and duration of open water each year.

Zooplankton

There has been a decrease in mesozooplankton biomass (2012 to 2014) and a decline in the proportion of large mesozooplankton; but overall plankton productivity has remained relatively stable.The mean biomass in the Western Barents Sea is at the lowest since the early 1990s, while average mesozooplankton biomass in the North Eastern Barents Sea is relatively high The high biomass of Capelin (Mallotus villosus) - at more than 3 million tonnes over the last seven years - has contributed to a high predation pressure on plankton, and there is some evidence of reduced growth in capelin. The decrease of mesozooplankton has in turn led to a decrease in biomass of the planktonic amphipod, Themisto libellula, and a strong decline and recruitment failure of polar cod (Boreogadus saida), which is heavily dependent on T libellula and copepods as prey species. The cod stock has extended northwards further impacting the foodweb, e.g. through predation on polar cod.

The estimated jellyfish (mostly Cyanea capillata) biomass in 2014 was close to the record-high biomass of near 5 million tonnes observed in 2001.

Benthos and shellfish.

Deep-water (northern) shrimp appears to have expanded towards the north-east since 2004. Invasive Snow crabs (Chionoecetes opilio), continue to increase in abundance in eastern and central areas and are now expanding westwards, while Red king crabs (Paralithodes camtchaticus) are now well established along the mainland Russian and Norwegian coast, although high fishing pressure appears to have reduced abundance and reproduction in recent years.

Fishing has undoubtedly led to changes in benthic habitat (which are reviewed in detail below) but there is no evidence that these changes have led to changes in overall ecosystem functioning, losses of productivity or ecosystem services.

Fisheries.

In 2014, total catch of about 1300 thousand tonnes was reported of capelin, cod, haddock, redfish Sebastes spp., Greenland halibut, and deep-water (northern) shrimp (Pandalus borealis). This is down from the peak of over 1.5m tonnes recorded in 2011. Cod abundance is high and distribution has expanded northward since 2004. Haddock spawning-stock biomass has been above a safe biological reference point since 1990 and is increasing. Halibut abundance has slightly increased along the western coast in the Barents Sea region. The saithe stock is stable. The stock of polar cod on the other hand is at its lowest level since 1990. Herring stock (Clupea harengus) remains low and is currently half that present from 1999 to 2013, associated with very few young herring entering the Barents Sea in recent years. Capelin stock size has been stable. The beaked redfish stock appears to be recovering from historic lows. The golden redfish stock size is in a poor state.

The ratio of pelagic to demersal fish has been relatively stable in recent years, with the biomass of the main demersal stocks about equal to the biomass of pelagic stock. As the cod stock increased however, the condition (blubber thickness) of the two other main fish predators in the Barents Sea (minke whales and harp seals) declined.

Seabirds.

There has been a decline in seabird populations (similar to that throughout the NE Atlantic), but the reasons for this are unclear (local food shortage; increased predation; historic bycatch in drift net and long-line fisheries, climate change) but are not attributed to current fishing activity.

Marine mammals

There is limited information on the trends in cetaceans. Humpbacks are believed to be recovering from past overexploitation. Recent evidence shows that grey seal is recovering from past hunting; the status of walrus is unclear. Numbers of polar bears increased in the last quarter of the 20th century, but trends since 2000 are unclear.

3.4.2 Retained species and bycatch

As for the other Barents Sea trawl fisheries, the FEST fleet catch and retain very few non-target species. This relates in large measure to the dense shoals of target fish that are found at the present time, and to

the management measures discussed at the end of this section. Furthermore, the discard ban on listed species, applicable in both Norwegian and Russian zones, means that discarding is limited to uncommon and commercially unimportant species and to the benthos.

According to information made available by the client from vessel log books and catch records, over the past 3 years the following species have been caught by the fleet in the proportions and quantities indicated in the table below. The trend in catch composition is illustrated in the tables below

Species	quantity (t) 2015-2017	percentage
Gadus morhua	117,218	77.2%
Melanogrammus aeglifinus	27,064	17.8%
Pollachius virens	3,255	2.1%
Redfish (2 spp)	1,067	0.7%
Anarhicas denticulatus	873	0.6%
Reinhardtius hippoglossoides	879	0.6%
Anarchichas minor	617	0.4%
Anarchichas lupus	309	0.2%
Hippoglossoides platessoides	530	0.3%
Pleuronectes platessa	6	0.0%
Total all species (3 years 2015-27)	151,818	100%

Table 2 Catch and catch composition of the FEST group fleet 2015-2017
Note: amber indicates significant concern over status.

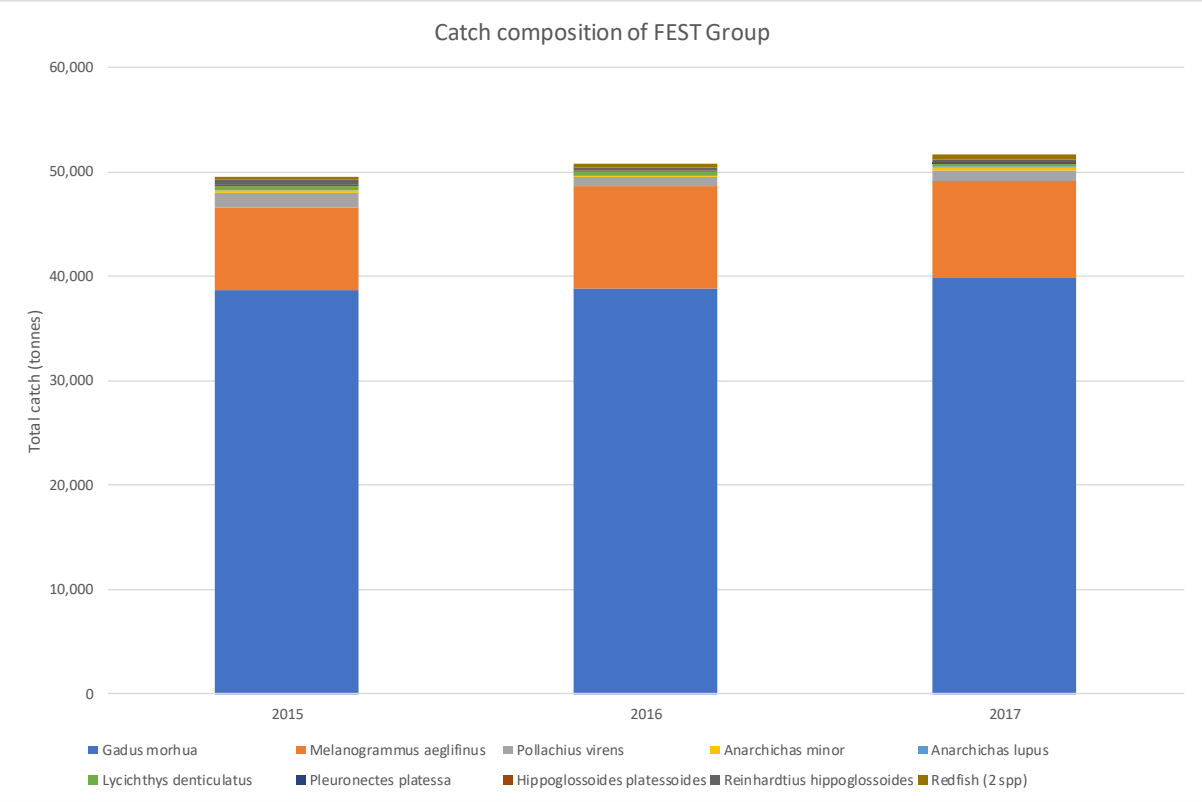


Figure 20 Trend in FEST group catch composition.

Redfish

Two species of redfish are caught: Beaked redfish *(Sebastes mentella) and* **Golden redfish** *(Sebastes norvegicus,* previously *marinus).* Both species are slow growing, long lived and vulnerable to overfishing. Fishing vessels often do not distinguish between the two species at sea, though they are distinguished at the point of sale. To date we lack an accurate breakdown of the two species, but the company estimates the proportion to be roughly 90% S. mentella and 10% S. norvegicus. The quantity and proportion of redfish bycatch has increased in recent years.

	2015	2016	2017
Quantity (tonnes)	210	322	535
Percentage of UoC catch	0.4%	0.6%	1%

Table 3 Catch and proportion of 2 species of redfish in UoC catch

The UoC caught 210 tonnes of both species in 2015, 322 tonnes in 2016, and 535 tonnes in 2017, corresponding to 1% of the catch in 2017. The company is allocated a quota of 857t of redfish (both species) 800t of which is allocated to one vessel – Taurus.

Beaked redfish (*Sebastes mentella*) Norwegian-Barents Sea stock in sub-areas 1 and 2

This is a long-lived (75 yrs or more) deep sea fish, and therefore vulnerable to overfishing. It is classed in *Fishbase* as of very low reslilience and high vulnerability. It is a benthic and bathypelagic species, found mostly offshore, and in particular along the continental slope between 300 and 1000 m. It is found throughout the N Atlantic from the Davis Strait to the Barents Sea and from 62ºN to the arctic ice edge. It is gregarious throughout life, feeding on euphausiids, hyperiids, cephalopods, chaetognaths and small fishes. It is ovoviviparous. Juveniles are mainly distributed in the Barents Sea and Svalbard areas.

Exploitation patterns

Beaked redfish are caught along the continental slope from the NW of Norway to the west of Svalbard (mainly between 400 and 1,000m), with some also along the edge of the Tromsø plateau. A pelagic fishery for more mature redfish in the international zone to the NW of the Norwegian EEZ was developed in the early 2000s, prosecuted mainly by Russian vessels. In 2013, this fishery had a TAC of 19,500 metric tons, of which about 9,300 metric tons were landed (Nedreas et al 2015)[2]. The number of vessels engaged has declined in recent years. In 2014 new regulations were introduced allowing for a directed fishery for up to 17,280 tonnes (of which 500t in bycatch of other fisheries) in the Norwegian Economic Zone north of N 65°20', in the Fisheries zone around Jan Mayen, and in the Fisheries protection zone around Svalbard.

[2] Nedreaas K, Smirnov, O, and Russkikh , A.2015. Beaked redfish (Sebastes mentella). http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/627-beaked-redfish-sebastes-mentella

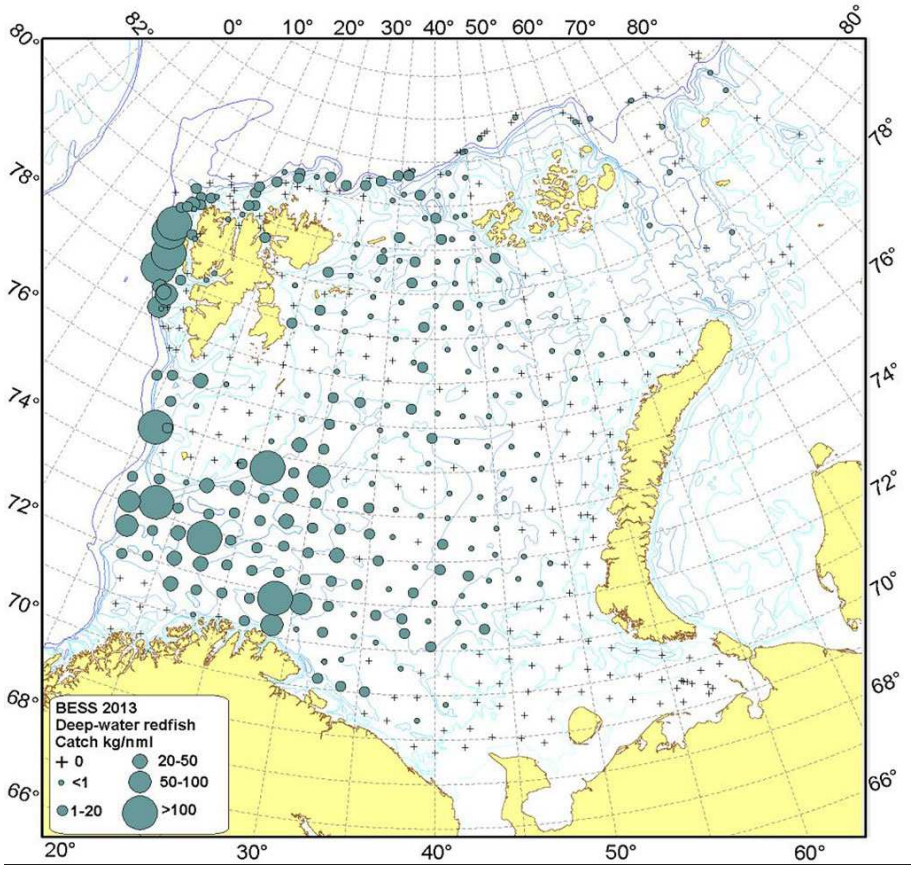


Figure 21 Distribution of beaked (deep-water) redfish (*S.mentella*) in Barents Sea
Source:
http://www.barentsportal.com/barentsportal/images/stories/barentsportal/biotic_components/biodiversity/fish_species/fs_figure_4343.jpg

Estimated total landings in sub areas 1 and 2 in 2015 were around 25,000 tonnes, and in 2016 34,000t. The majority of the catch (80%) is taken in the NEZ and Svalbaard. (ICES 2017) primarily by Norwegian (17,631t) and Russian (8,419t) vessels.

Status

There was low recruitment between 1998 and 2005, but strong year classes were recorded 2006 to 2013. Since 1997 fishing mortality has been at a low level (close to natural mortality) although it has increased in the last four years (ICES 2017). Data from the Russian winter Barents Sea survey indicates a few good year classes 1988- 1990 before a recruitment collapse in 1991 and very low stock levels for about fifteen years. However, since 2007-2008 both recruitment and the number of larger *S. mentella* has been at a fairly high level. In 2015 the estimated indices for 20-39 cm *S. mentella* were considerably higher than in previous years, and in 2016 the same was found for 20- 34 cm long fish.

Total Stock Biomass (TSB) increased from 1992 to 2005 and Spawning Stock Biomass increased from 1992 to 2005, and stabilized thereafter. Total stock biomass is now fluctuating around one million tonnes with some decline in SSB in recent years due to weak year-classes (1996-2003) entering the mature stock. SSB estimate for 2016 is 857,406t. In the medium term, projections indicate increase in SSB to 1.4 Mt by 2022.

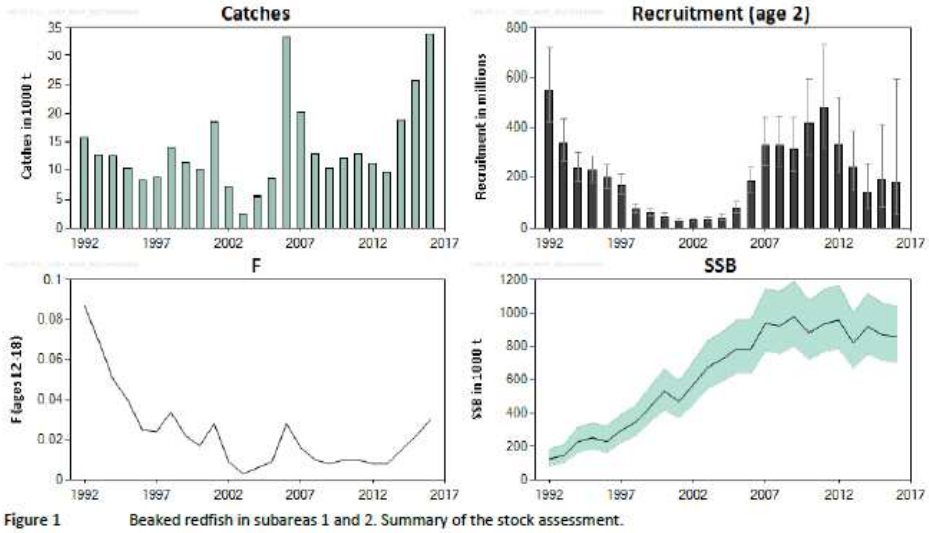


Figure 1 Beaked redfish in subareas 1 and 2. Summary of the stock assessment.

Figure 22 Stock summary from ICES 2017 advice on deepwater/beaked redfish

Both catch and fishing mortality (now at 0.03) has increased, and recruitment has been lower in recent years than for the period 2007-12. (ICES 2017)

Uncertainties and concerns: Recruitment estimates are highly uncertain, and juveniles may be subject to heavy predation from the high cod population. Cyclic recruitment of this kind requires a conservative management approach (ICES 2017a). A decrease in F is recommended if weaker year classes are detected. The survey series used in the assessment model does not cover the known geographical distribution of the adult population. Furthermore, fish over age 19 compose most of the catch, but age data are not available for these fish. The overall estimated biomass level is therefore rather uncertain. (ICES 2017a).

Management.

The fishery in international waters is managed by the North-East Atlantic Fisheries Commission (NEAFC), and a TAC of 30,000t has been agreed by Norwegian and Russian Authorities for their areas of jurisdiction in sub areas 1 and 2. However, there is still **no agreed management plan nor reference points for this species**. In its latest (June 2017) advice ICES (2017a) recommends that when the precautionary approach is applied, catches in 2018 should be less than 32,658 tonnes, similar to the catch in 2016, and corresponding to F 0.03.

The UoC is allocated a total quota of 857t of redfish (both species)

Golden redfish (*Sebastes norvegicus*) in ICES Sub-areas 1 and 2:

Golden redfish are also long lived viviparous species with low resilience and high to very high vulnerability (Fishbase). ICES assumes 50% maturity at age 12 in its models.

Distribution

Adults are found off the coast at depths of 100 to 1000m but more commonly 100-400m, with larger fish generally found at the deeper ends of the range. Juveniles inhabit fjords, bays and inshore waters. The species is widely distributed from the Grand Banks to the inner parts of the Barents Sea.

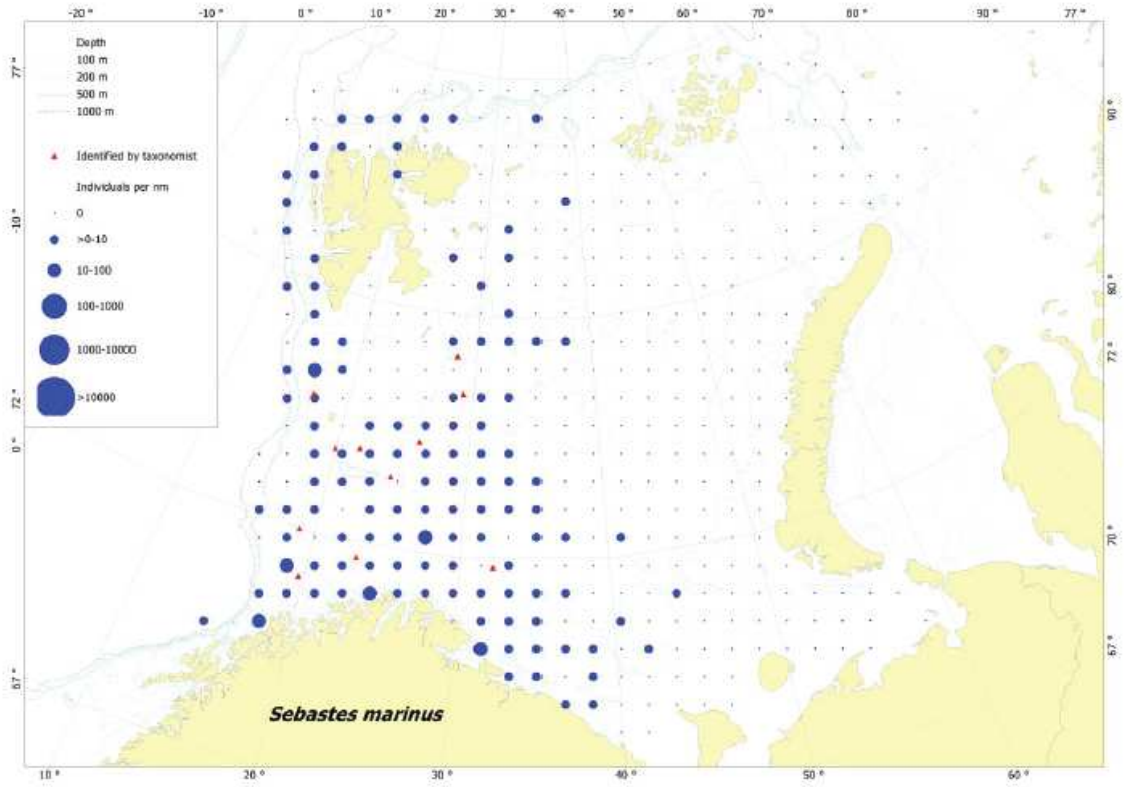


Figure 23 Distribution and abundance of *Sebastes norvegicus (x marinus*) in the Barents Sea. Source: Wienerroither 2011.

Exploitation patterns

This fish tends to be caught in shallower waters than *S mentella*, and is most frequently encountered in coastal areas in the Norwegian EEZ, although it is widely distributed throughout the Barents Sea.

As can be seen in the figure from the latest (2016) ICES assessment, catches peaked in the 50s and 70s and bar minor recoveries in mid 80s and mid- 90s, show a steady downward trend. In 2014 landings decreased to 4,436 t, followed by a further decrease 3,633 t in 2015 probably resulting from stronger regulation. The fish are mainly caught by Norwegian and Russian vessels (69% and 18% respectively). According to PINRO the Russian fleet has caught only around 200t in recent years.

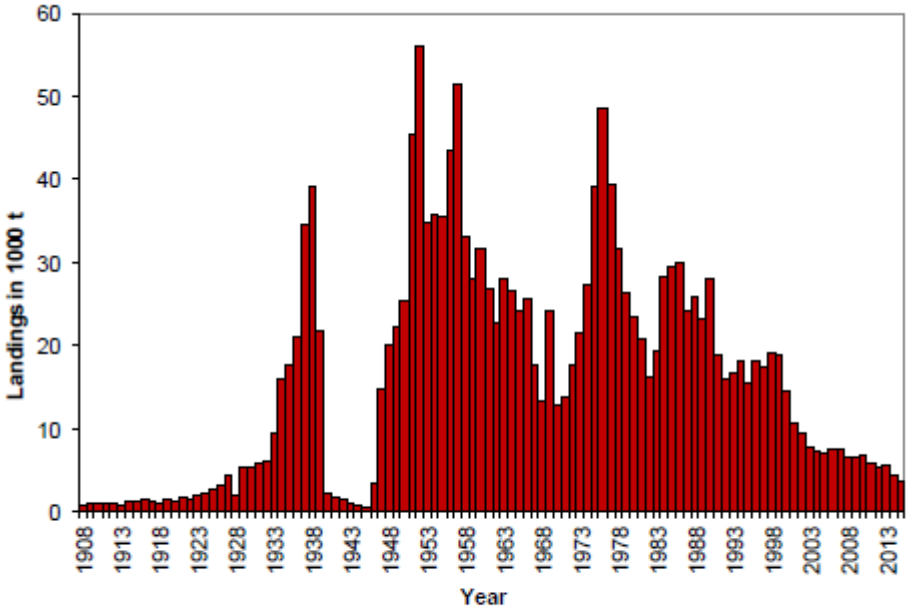


Figure 7.1. *Sebastes norvegicus* in Sub-areas 1 and 2. Total international landings 19082015 (in thousand tonnes).

Figure 24 Landings of *Sebastes Norvegicus* in sub areas I and II

The bulk of the fish are taken as bycatch in the Norwegian gill net and long line fisheries.

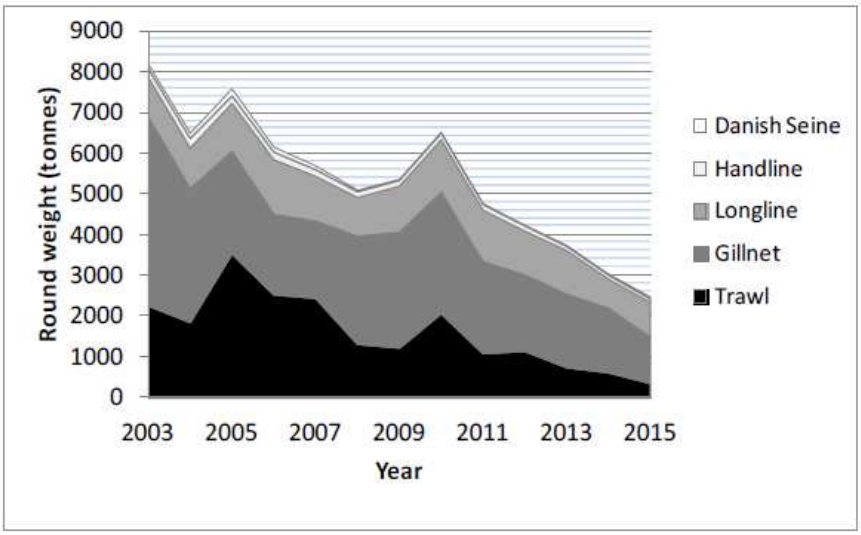


Figure 7.2b. Interannual changes in the Norwegian catches by fleet of *S. norvegicus* fisheries (2003-2015).

Figure 25 Contribution and trend of different Norwegian fisheries to Sebastes norvegicus catch. Source ICES AFWG 2016 report (ICES 2016a).

With regards to the Russian fleet, the greatest proportion of total catch is taken as bycatch in the trawl fishery, although the redfish proportion of individual vessel catch is higher in the (smaller) longline

fishery. By way of example, the total bycatch in the Russian trawl fishery in 2013 was 700 tonnes and for the longline fishery 60 tonnes. The main part of the *S norvegicus* catch is taken in the Norwegian EEZ and near the Svalbard, while the catch in the Russian zone is insignificant.

Historically significant quantities were also taken in the shrimp fisheries, but since 2006, the maximum legal bycatch of redfish juveniles in the international North East Arctic shrimp fisheries has been reduced from ten to three redfish per 10 kg shrimp.

Survey information and quality

In addition to catch and sales data, the following information sources are available to assess redfish stocks:

- Winter Norwegian Barents Sea (Division 2.a) bottom-trawl survey from 1986 to 2016 (joint with Russia some of the years since 2000) in fishing depths of 100—500 m.
- Norwegian Svalbard (Division 2.b) bottom-trawl survey (August-September) from 1985 to 2015 in fishing depths of 100—500 m (depths down to 800 m incl. in the swept-area). Since 2005 this is part of the Ecosystem survey
- Norwegian Coastal and Fjord survey 1995—2010 from Finn-mark to Møre – catch rate data

The difficulty separating the two species of redfish juveniles introduces significant uncertainty into any stock assessment, especially with regard to recruitment.

Status

The stock is in a poor state. Estimated SSB has been decreasing since the 1990's and is currently at the lowest level in the time-series. Estimates of fishing mortality have been increasing since 2005; the current F is the highest level in the time-series. According to the ICES gadget model the total-stock biomass (3+) of *S. norvegicus* has decreased from about 151 000 tonnes in 1992—1993 to around 20 000 tonnes in 2015. Due to the improved recent recruitment, the total biomass is beginning to stabilize, although the SSB is continuing to decline.

Abundance indices (derived from bottom-trawl surveys covering the Barents Sea and the Svalbard areas) over the commercial size range (> 25 cm) have declined since 1998. Abundance of pre-recruits (<25cm) steadily decreased from 1991 and dropped to very low levels after 2000, but some increase is apparent from 2008 onwards. Although this could arise from species misidentification (the young of these species are extremely similar), there is some confirmation of increases in individuals of size 15 cm and greater suggesting this may be a real trend (ICES AFWG report 2016)

The recruitment to the stock has been very poor for a long period. However, this appears to have improved in recent years, although still below the long-term average, and somewhat uncertain.

The current fishing mortality is estimated to 0.27 which is well above a sustainable level for a redfish species. Furthermore, this estimate assumes the 2003 year-class being strong, and the mortality estimate would be higher if this were not the case.

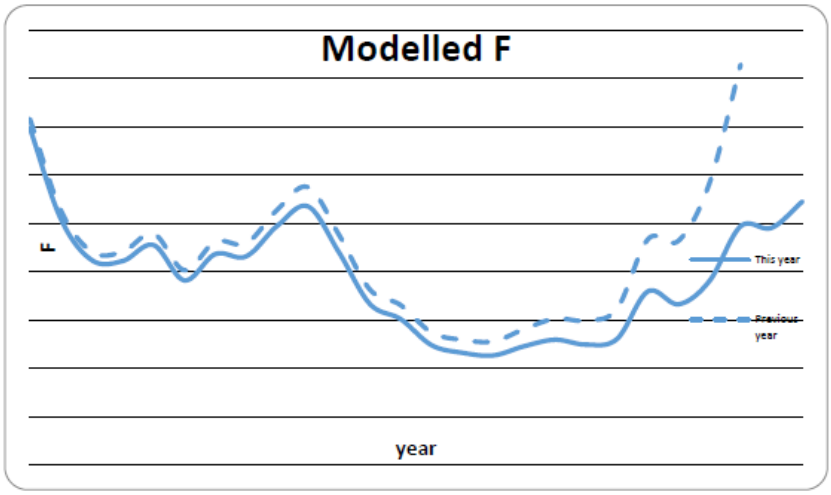


Figure 7.8. *Sebastes norvegicus* in subareas 1 & 2. Unweighted average fishing mortality of ages 1219 as estimated by Gadget in 2016 (solid line) and at the 2014 AFWG.

Figure 26 Modelled fishing mortality pressure on S norvegicus

The ICES (2016) assessment concludes that the SSB is likely continuing to fall, leading to an upwards trend in F which may further deplete an already poorly performing stock. Furthermore, in the absence of a significant population of fish aged 10—18, the fishery has become increasingly concentrated on the 18 years + group, reducing the reproductive capacity of the stock. They explored the resilience of the stock further using various modelling approaches, and concluded that "at stability, the population could sustain an annual catch of around 1,500 tonnes" and "a constant catch above about 6,500 tonnes will lead to a progressive reduction of the stock, and a collapse within 10—15 years if recruitment remains low". It seems likely therefore that current exploitation rates are still too high, a view mirrored in other assessments[3]. A benchmark assessment for this species will take place in 2018 at which it is hoped that some of the current uncertainty in the assessment (especially related to recruitment) will be reduced.

[3] k. Nedreaas K.,Smirnov, O.,Russkikh, A. Golden redfish (Sebastes norvegicus) http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/628-golden-redfish-sebastes-norvegicus

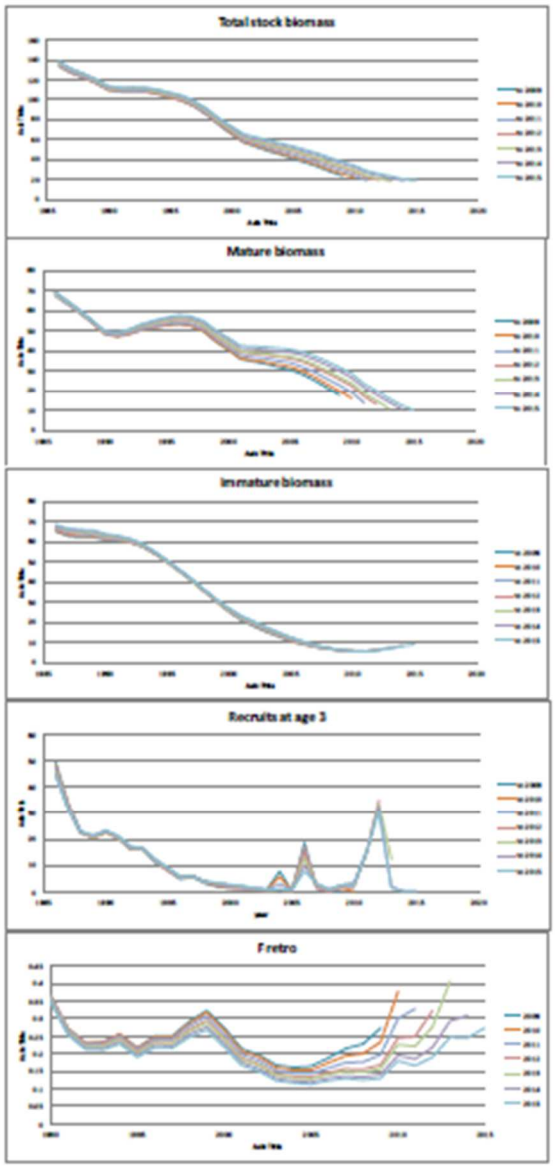


Figure 7.11. 7 year retrospective plots for the S. norvegicus Gadget model.

Figure 27 Modelled (ICES gadget) stock trends. Source: ICES 2016(a) AFWG Report.

Note: captions in descending order: total stock biomass; Mature biomass; Immature biomass; recruits age 3; F retro – all under a range of parameter assumptions

Management

Unlike S mentella, which is managed by the Russian-Norwegian Fishery Council, S norvegicus is not regarded as a joint stock so is primarily managed through national legislation – and given its distribution, primarily Norwegian regulation. Since 2003 all directed trawl fishery for redfish (both S. norvegicus and S. mentella) outside the permanently closed areas was forbidden in the Norwegian Economic Zone north of 62°N and in the Svalbard area. The ban does not, however, apply to vessels less than 15 meters fishing with handline during 1 June - 31 August.

Since 2004, a minimum legal catch size of 32 cm has been set for all fisheries, with the allowance to have up to 10% undersized (i.e. less than 32 cm) specimens of S. norvegicus (in numbers) per haul.

When fishing with conventional gears for other species, it is permitted to have up to 10% by weight of redfish bycatch (2017). This is reduced from 20% in 2016. Vessels less than 21 meters can still have up to 30% by weight of redfish in the period 1 August to 31 December. Bycatch of redfish is calculated in live weight per week. Since 2016 trawling outside 12 nm is allowed to have up to 20% by weight of redfish in each catch and upon landing.

The Norwegian government declares no-take areas for redfish on a regular basis, and there may be as many as 20 closed areas at any one time. These are mainly targeted at aggregations of juveniles.

Management advice

ICES provides advice on this species on a three year cycle, with the most recent advice in 2016 (AFWG report 2016), following a stock annex presentation in 2014. ICES anticipates that there will be a new assessment and advice after the next benchmark, planned for 2018.

On the basis of a gadget model (assuming current and stable recruitment rates) ICES **(2016a) estimate that a sustainable catch from the fishery should be less than 1,500 tonnes.** In 2014 landings decreased from a previous steady 5,000t to 4,436 t, followed by a further decrease 3,633 t in 2015 possibly resulting from stronger regulation. There is substantial uncertainty associated with the model because of possible confusion between young *S. norvegicus* and *S. mentella* in survey data, and lack of correspondence between historic data on year class abundance.

ICES AFWG considers that "the current catch level is several times higher than can be sustained by the stock, given the ongoing downwards trend in mature biomass. AFWG therefore recommends that current area closures and low bycatch limits should be maintained. No directed fishery should be conducted on this stock at the moment, and the percent legal bycatch should be set as low as possible for other fisheries to continue. The current bycatch regulations are in general too liberal to further constrain the catch as would be required for the stock to recover".

More specifically, ICES advises that: "no directed fishery should be conducted on this stock until a clear increase in the number of juveniles has been detected in surveys, and an improved situation of the mature stock is confirmed by the assessment. Furthermore, it is imperative that actions be taken to prevent F increasing further, and reduce F to at least the levels seen in 2005". Specific advice for fisheries targeting cod, haddock and saithe fisheries is as follows: *"bycatches of coastal cod and* Sebastes norvegicus *in Subareas I and II should be kept as low as possible"*.

More stringent management has been suggested (Bogstad et al 2015), particularly with regards reducing bycatch of young fish in the shrimp fisheries as well as pelagic trawl fisheries for herring and blue whiting in the Norwegian Sea.

No limit reference points have been suggested or adopted for this species, although a management plan is finally under development in Norway.

ICES (2016a) expresses concern over the decrease in the sampling intensity of commercial catches. Further, they note that, with the recent expansion of the cod distribution, the joint winter trawl and acoustic surveys do not presently cover the whole stock distribution area. As in previous advice, ICES emphasizes that fisheries targeting North East Arctic (NEA) cod have as a bycatch a considerable part of the total golden redfish (*Sebastes norvegicus*) catch, and the bycatch of this species is still far above any sustainable catch level.

Contribution to fishing pressure by the UoC.

Assuming the fleet catches 53 tonnes of *S norvegicus* (10% of 2017 total redfish catch) this would comprise 0.5% of the total catch of the UoC, and 1.5% of the estimated total catch of *S norvegicus* in Subareas 1 and 2. It should be noted that the bulk of redfish is still caught by gill-netters and long-liners.

Wolffish or catfish

Three wolfish species are caught by the UoC: Northern wolfish, *Anarhicas denticulatus*, spotted wolffish *(Anarhichas minor*), and Atlantic wolffish (*A. lupus*). Quantities vary from year to year as indicated in table *

	2015		2016		2017	
Species	Tonnes	% of catch	Tonnes	% of catch	Tonnes	% of catch
Anarhicas denticulatus	252	0.51%	350	0.69%	271	0.52%
Anarchichas minor	187	0.38%	175	0.35%	255	0.49%
Anarchichas lupus	139	0.28%	41	0.08%	129	0.25%
All	578	1.18%	566	1.04%	655	1.35%

Table 4 Catch of wolfish by UoC

The UoC has no specific license restrictions on the catch of these species.

Biology and distribution

Atlantic wolfish*, Anarhichas lupus* is widely distributed from the North American East coast (especially the Grand banks) to the inner Barents Sea. It tends to inhabit shallower water than the other species, being found in depths 18-600m but more typically 18-110m, usually on rocky bottoms, but sometimes over sand or mud. Spotted wolfish *A. minor* is found at depth range 25 - 600 m, more usually 100 - 400 m over soft bottoms, often with boulders. The northern wolffish *L. denticulatus* is a benthopelagic/epibenthic species found at between 60 to 1700m, but mainly 100-900m. It spawns at great depths (Fishbase).

This broad picture is supported by more local data from the 2012 Ecosystem Survey of the Barents Sea suggesting that Atlantic and Spotted wolffish are most abundant in shallower waters (50-150m) while Northern wolffish is found between 200 and 400m.

All three wolffish species are vulnerable to over-exploitation. They are slow growing, long-lived fish that spawn late in life (5-8 yrs). Research by PINRO suggests 50% maturity at length 1m for *L. denticulatus*), 50cm for *A lupus* and 50-80cm for *A minor*. Fishbase classes all three species as of low resilience. *A lupus* is also classed as high to very high vulnerability, while the other two species are considered to be highly vulnerable. In addition to the slow growing and late maturity characteristics, these species have a reproductive strategy that is vulnerable to trawling activity. The male guards large clusters of eggs, deposited on the bottom, until they hatch.

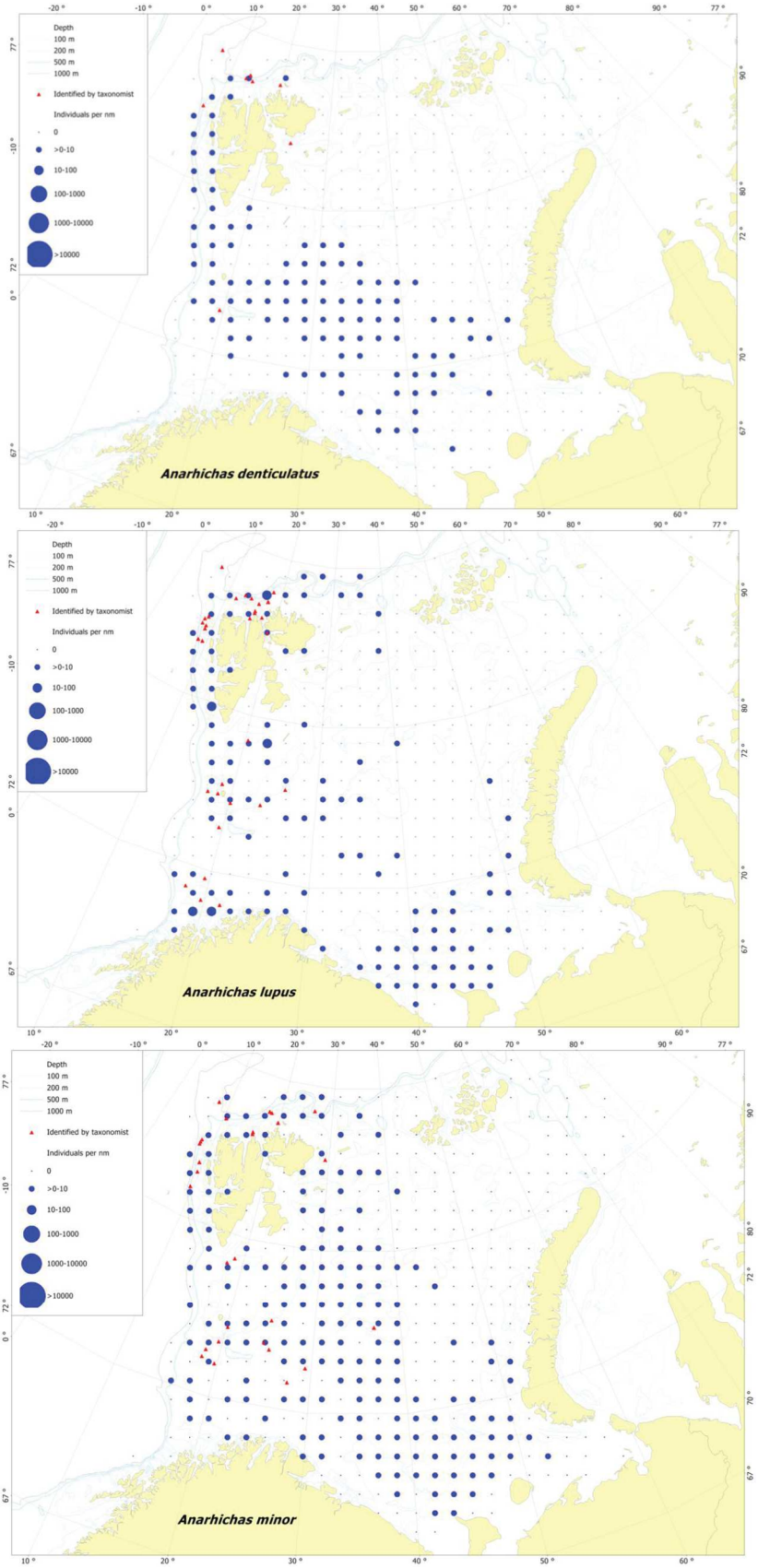


Figure 28 a,b,c: Distribution of three wolfish species in the Barents Sea (Wienerroither 2011)

Exploitation patterns

Wolfflish is caught primarily (and targeted by) the longline fleet and is also caught as bycatch in the trawl fishery. Between 1983 and 2003 wolfish were the main species for the Russian longline fleet, after which cod came to dominate. However, wolffish still comprise a significant proportion of the catch of long-liners, and licenses normally allow 49% bycatch of these species. Typical proportions are less however, with for example 15-20% catch of wolfish in the Svalbaard long-line fishery (Skipper, Oceanprom long-liner). In 2016, 16 long-liners took approximately 59% of the total wolffish catch, in the following proportions: 75% northern wolfish, 22% spotted wolfish; 3% Atlantic wolfish (Acoura 2017). The balance was caught primarily as bycatch in the trawl fishery split approximately: 42% northern wolfish, 45% spotted wolfish; and, 13% Atlantic wolfish.

Taking the Barents Sea fleet as a whole, Northern and spotted wolffish comprise more than 90% of the total wolfish catch. Atlantic wolfish are caught primarily in the coastal zone[4].

The trend in landings of these species in Norway and Russia is presented below. Following a period of decline in the early 2000s the Russian catch has remained relatively stable since 2009 at 13-14,000t. Landings in Norway have been lower and more erratic, amounting to between 4 and 10,000t. Total catch is therefore around 20,000t.

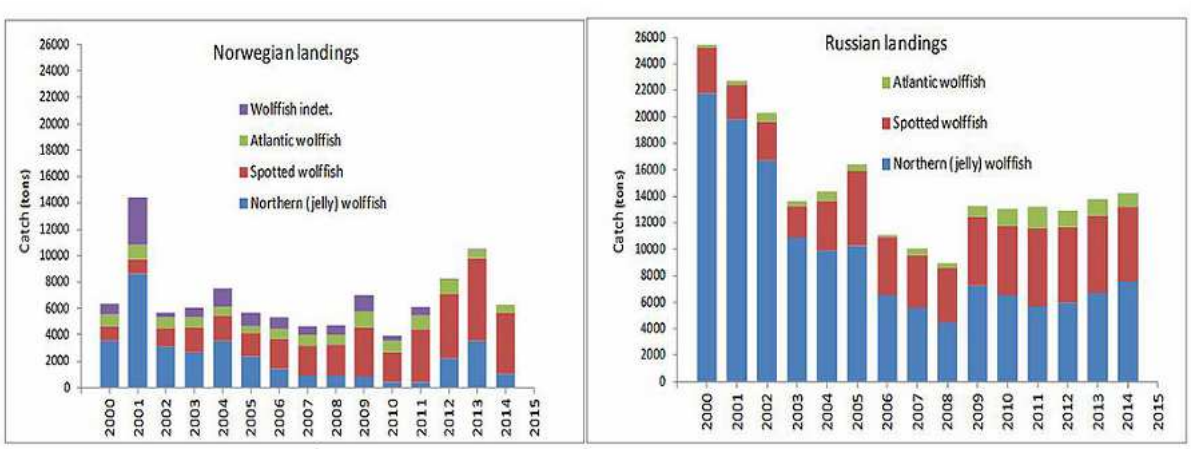


Figure 4.4.4. Annual landings of wolfish/ catfish by the Norwegian (left) and Russian fleet (right) during 2000-2014 (Grekov 2014, IMR 2014).

Figure 29 Landings of wolfish by species and fleet
Source: http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/626-wolffish-anarhichas-spp

Status

There is no ICES assessment for these species, and the relationship between recruitment and stock size index is poor. Generally, the abundance and biomass of all three species is relatively low, but they are all widely distributed throughout the Barents Sea.

[4] k. Nedreaas, K.,Smirnov O., Russkikh, A.A. 2015. Wolffish (Anarhichas spp.). http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/626-wolffish-anarhichas-spp
B. Bogstad, B., Dolgov, A.V., Gjøsæter H. Hallfredsso n, E.H.,Johannesen, E., Kovalev, Y.A. Mehl , S., Prozorkevitch, D. V. Russkikh, A.A., Smirnov O.V. 2015 Wolffish (Anarhichas sp.) http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/81-fish-species/604-wolffish-anarhichas-sp

According to Bogstad et al (2015) the stock size of Atlantic wolffish and spotted wolffish, as measured by area-swep-clear estimates, has been relatively stable since 2004.

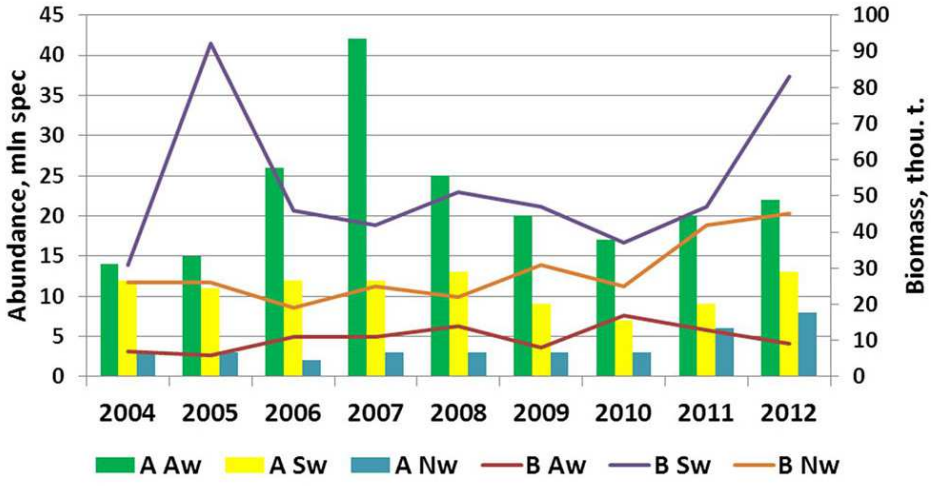


Figure 30 Stock abundance (A) and stock biomass (B) of Atlantic wolffish (Aw), Spotted wolffish (Sw) and Northern wolffish (Nw) during the ecosystem survey 2004-2012, calculated using bottom trawl estimates (swept area). Source Bogstad et al 2015**.**

More up to date information from a report on wolffish stock commissioned by FiUN to meet an MSC condition has recently been made available at re-assessment (Acoura 2018) and similar data published by IMR in their wolfish fact sheets. These confirm previous indications suggesting that since 2007 stock indices for all three species have shown a positive trend. This is further supported by anecdotal evidence from skippers of long-line vessels operating in the Barents Sea that wolfish remain plentiful and are increasing in abundance – especially the northern (*L. denticulatus*). PINRO stock assessment scientists interviewed as part of the stakeholder consultation stated that all indices for wolfish suggest that stocks are stable. Furthermore, there is a discard ban, species are easily distinguished, and all species are commercially valuable - so log book and landings data are all reliable.

There is no evidence of a decline either in catch or mean size in the long-line fishery (in which these species are a significant component of the catch) and no concerns have been raised by stakeholders.

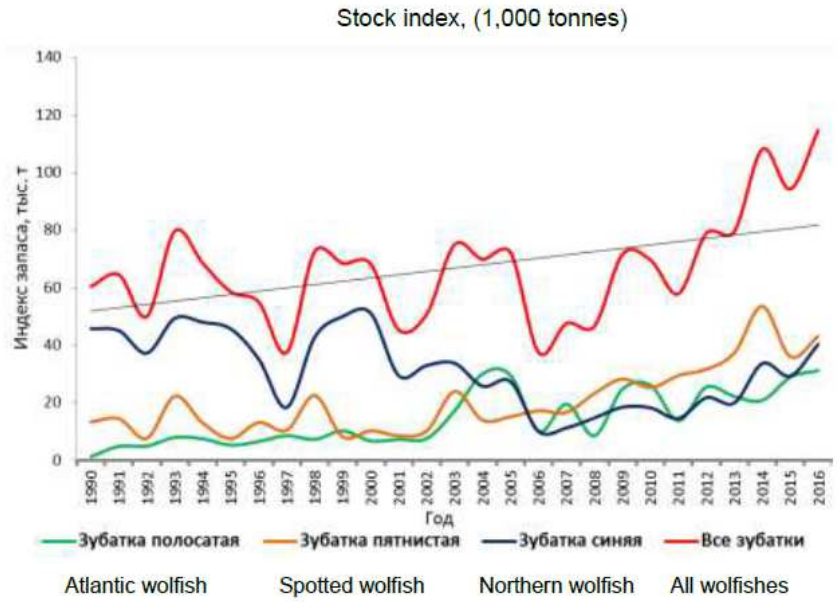
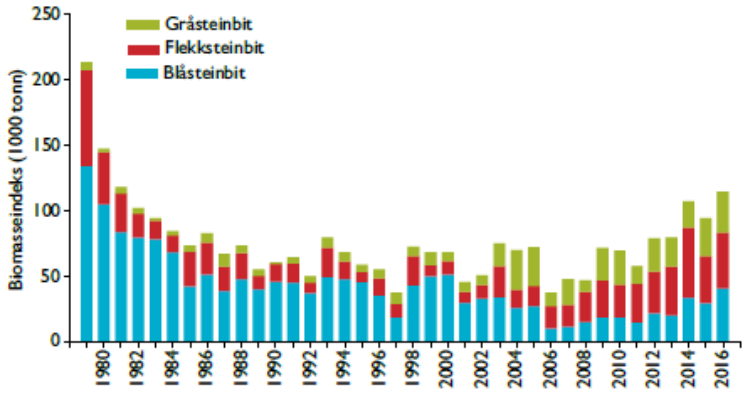


Figure 5. Biomass indices of Atlantic, spotted, northern of wolfish of the Barents Sea and adjacent waters at the beginning of the year according to trawl survey data for 1990-2016. (source: PINRO 2017)

Figure 31 Biomass indices for 3 wolfish species



Figur 1. Bestandsutviklinga til dei tre steinbitartane i Barentshavet i perioden 1979–2016 ifølgje russiske botntråltokt (Grekov 2017).

Year-to-year dynamics of wolffishes biomass from the Barents Sea and adjacent waters by species in 1979–2016 during the Russian demersal trawl survey.

Kontaktperson: Kjell Nedreaas | kjell.nedreaas@imr.no

Figure 32 Biomass indices for 3 wolfish species

Note: Gråsteinbit – *Anarhichas lupus* – atlantic wolfish; Flekksteinbit – *Anarhichas minor* – Spotted wolf-fish; Blåsteinbit – *Anarhichas (Anarhicas) denticulatus* – northern wolfish

Management

In terms of overall management strategy, the three species are managed jointly

- through "recommended quotas" set by PINRO in Svalbard waters and international waters of the 'Loophole', or,
- via regulatory measures that set quotas for Russian vessels in the Russian and Norwegian EEZ:

Area	Quota (tonnes)
Svalbard waters and international waters of the 'Loophole'	6,720 tonnes
Russian EEZ	6,050 tonnes
Norwegian EEZ	5,000 tonnes

Table 5 Wolfish quota

At regional level management is limited. Russian fishing regulations for the Northern Basin stipulate by-catch limits of 49% of total catch in 1 haul, and maximum 45% of landed catch. However, the recommended total of 17,770 is broadly comparable with a total catch around 20,000t in recent years.

Contribution to fishing pressure

The catch of all species of wolfish by the UoC amounts to around 3.5% of the total recommended catch and 0.5% of the total estimated biomass

Greenland halibut (*Reinhardtius hippoglossoides*) in subareas 1 and 2 (North East Arctic).

The fleet catches roughly 300 tonnes/year of this species (879 tonnes in total for the three years 2015-17). This amounts to 0.6% of the total catch of the fleet.

Biology and distribution

Greenland halibut are found in depths from 1 to over 2000m but more commonly between 500 and 1000 m throughout Subareas I & II and is widely distributed in the Barents Sea.

Catches are highest along the continental slope where the main spawning grounds are located, but it is also relatively abundant in the deep channels between shallow fishing banks (ICES AFWG, 2014). The northern and north-eastern part of the Sea functions as a nursery area[5].

[5] Bogstad, B., Dolgov, A.V., Gjøsæter, H., Hallfredsson, E.H. Johannesen, E., kovalev, Y.A., Mehl, S., ProzorkevitchD.V., Russkikh, A.A., and Smirnov O. V. 2015. Greenland halibut (*Reinhardtius hippoglossoides*). http://www.barentsportal.com/barentsportal/index.php/en/more/adopting-and-adapting-an-ecosystem-approach-to-management/108-supporting-legislation/645-

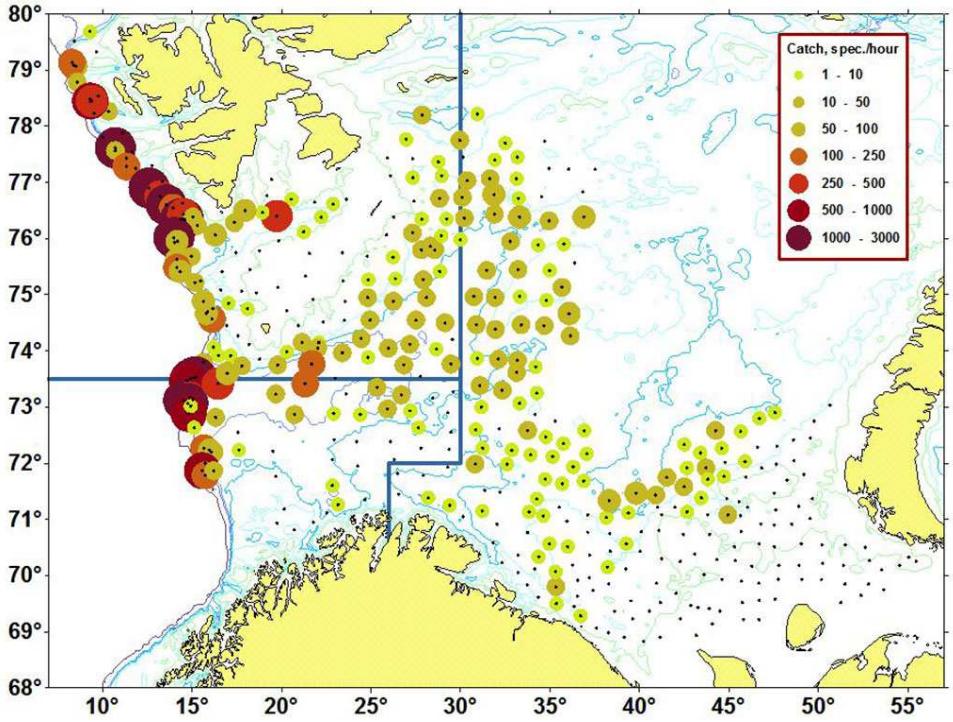


Figure 33 Greenland halibut distribution November-December 2012 based on the Russian survey, spec./trawling hour. Source Bogstad et al 2015

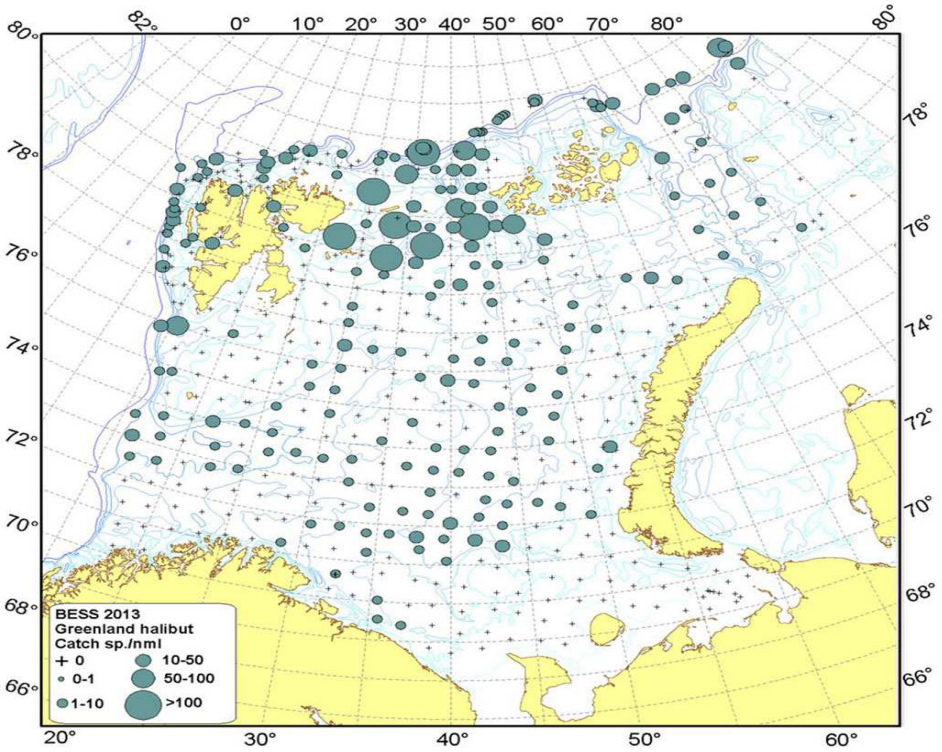


Figure 34 Greenland halibut distribution in August-October 2013 based on results from the Joint Norwegian/Russian Survey of the Barents Sea Ecosystem, spec./nml Source Bogstad et al 2015

Exploitation patterns

Between 20,000 and 24,000 tonnes of Greenland halibut have been caught in sub areas I and II in recent years. Most is caught by trawl, but significant quantities also by long line and gillnet. This species

is targeted by some vessels. Landings are roughly evenly split between Russia and Norway, with a small amount also taken by the Faeroe Islands.

Total landings (Norwegian, Russian as well as third countries) for 2013 was 22,167t and a similar amount is estimated for 2014 (ICES 2015 AFWG Report). This is 48% more than the ICES advised maximum catch for 2013 and 2014 (15,000 t) and 17% more than the JNRFC TAC of 19,000t. Enforcing the TAC is difficult because Greenland halibut is an allowable bycatch, up to 7%, in non-target fisheries.

Status

Data is relatively poor for this species (only landings and survey trends of biomass are available). A modelling and benchmarking process is however underway which should provide the basis for indicative reference points in the future (ICES 2015).

The fishable biomass (length ≥ 45 cm) increased from 1992 to 2013 and has been relatively stable since. The harvest rate has been low since 1992 but has increased since 2009. Recruitment is erratic/periodic and has been low since 2011 (ICES 2017). Benchmark modelling by ICES suggests stable biomass, and a risk analysis (using a Bayesian surplus production model) suggested that, for a catch of 0 to 30,000 tonnes pa (2013–2020), the probability of the stock size being under the threshold levels (B_{MSY}, B_{lim}) was less than 1%.

At the recent (last 2-year average) fishing intensity level, the stock is forecast to remain above Bpa over this five-year period, and this forms the basis of ICES advice

ICES used an age–length-structured Gadget model for its 2017 assessment (ICES, 2015a), but there is disagreement between Russian and Norwegian scientists regarding the age reading methodology. There are also discrepancies between surveys, and the surveys do not cover the known distribution of the stock. There is therefore significant uncertainty regarding modelled biomass, F, and recruitment.

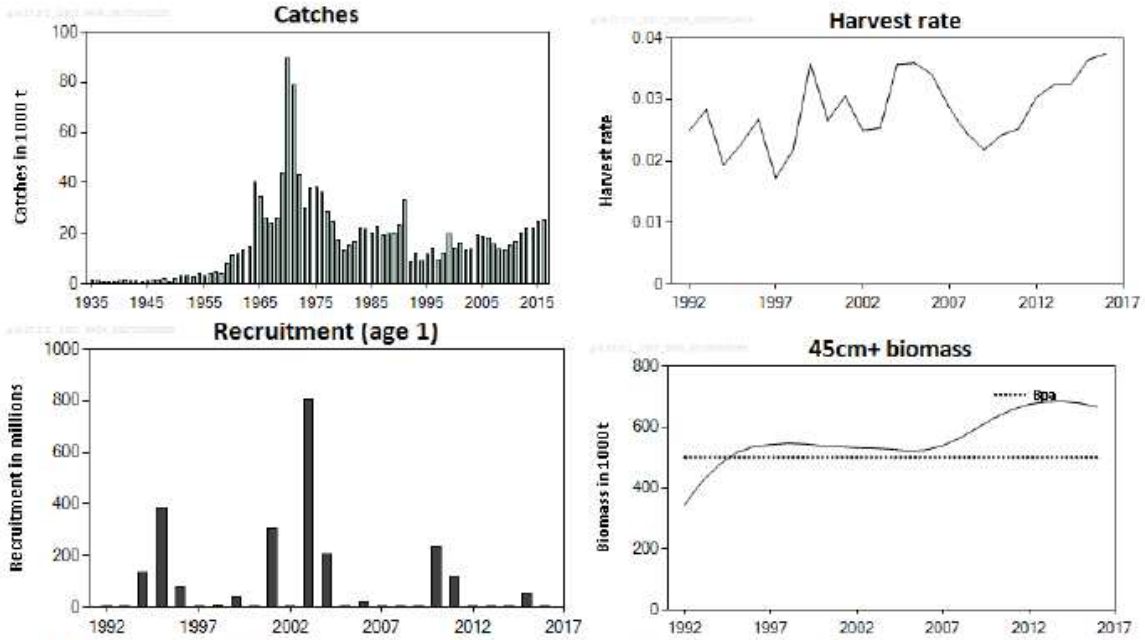


Figure 1 Greenland halibut in subareas 1 and 2. Summary of the stock assessment. Catches (thousand tonnes), harvest rate (defined as catch in a year divided by biomass at the start of the year), recruitment at age 1 (millions), and fishable (length ≥ 45 cm) biomass (thousand tonnes).

Figure 35 ICES summary of stock status for Greenland halibut subareas 1 and 2.

Management and advice

There are no biological reference points (MSY reference points), and no explicit management objectives or harvest control rules for the stock in sub-areas I and II.

In 2009 JNRFC decided to cancel the ban against targeted Greenland halibut fishery and establish a TAC of 15,000 t for 2010-2012. JNRFC agreed TAC has since increased steadily to 24,000t for 2017

ICES advises that if a precautionary approach is applied, catches in 2018 and 2019 should be no more than 23 000 tonnes (actual total catch in 2016 was 24,927)

Specific management measures

TAC

Minimum size 45 cm. Bycatch of undersized Greenland halibut shall not exceed 15% by number in each haul.

Mandatory to use sorting grids since 2012.

Allowable bycatch of Greenland halibut up to 7% in non-target fisheries

Contribution to fishing pressure by the UoC.

The fleet catches roughly 300 tonnes/year of this species (879 tonnes in total for the three years 2015-17). This amounts to 0.6% of the total catch of the fleet, and 1.3% of the total recommended catch for sub-areas I and II.

A**merican plaice or Long rough dab** *(Hippoglossoides platessoides)*

This species is widely distributed from the Grand Banks and UK waters to the inner part of the Barents Sea, found on soft bottoms in depths depth range 10 - 3000 m but typically 90 - 250 m. According to fishbase it is of low resilience and high to very high vulnerability.

This fish is however common throughout the Barents Sea, where it eats benthos (*Ophiura*, polychaetes etc.) and different fish species (Jakobsen and Ozhigin 2011, Dolgov et al. 2011). Older fish are more actively voracious, feeding on polar cod, cod, capelin and juvenile redfish). Long rough dab are in turn an important source of food for blue skate and spinytail ray. The species is much less abundant in the Norwegian Sea.

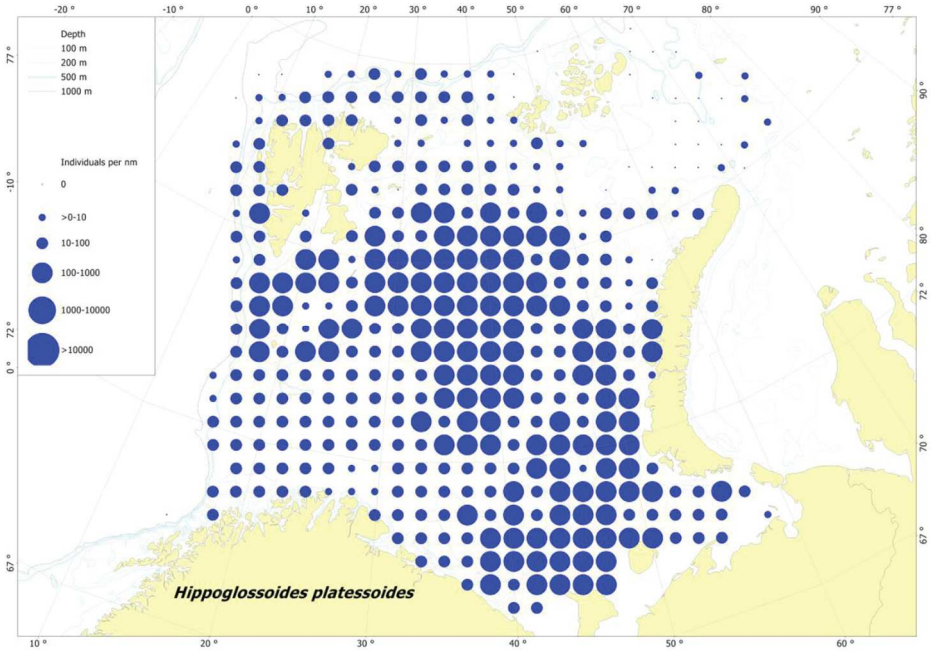


Figure 36 Distribution of *H platessoides* in the Barents Sea

There is no ICES assessment for this species, but it is regarded as common and the impact of the client fleet is likely to be insignificant.

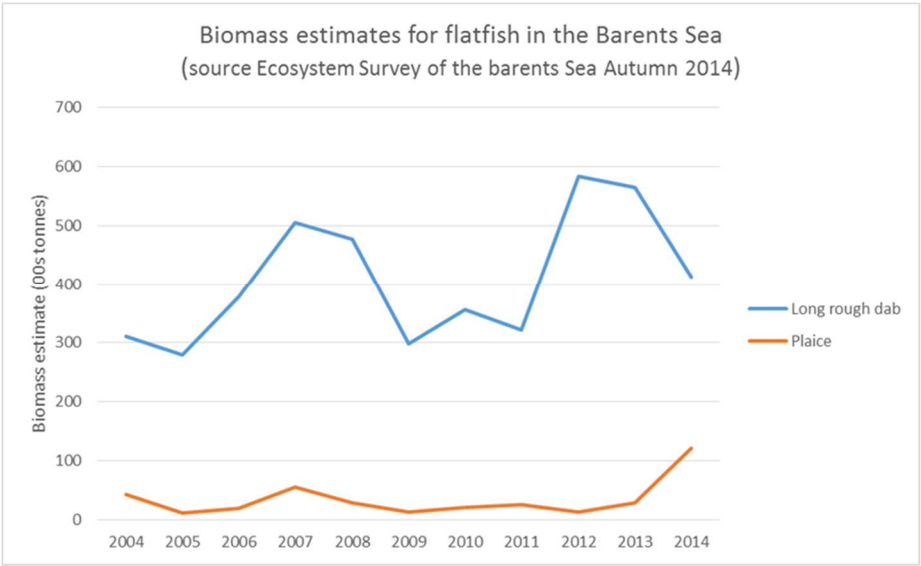


Figure 37 Biomass estimates for flatfish in the Barents Sea

European plaice, *Pleuronectes platessa*

There is no ICES assessment of plaice caught in Sub-areas I or II.

Plaice is on the edge of its distribution in the Barents and North Norwegian Sea. However, it is relatively abundant in the far south of the Barents Sea (IMR/PINRO 2015) and further south in the Norwegian Sea where stock status is very high. It is possible that the Barents Sea stock will further increase if temperatures continue to rise.

Plaice is managed under national regulation.

Discarding of commercial fish species

Although discarding of listed (commercial) species is banned, high concentrations of target species may result in overfilling of nets, despite the routine use of catch sensors. As a result, some slippage (spilling of excess fish prior to final recovery) and high-grading may be taking place, although this appears to be in decline. Some fishing vessels (Russian and other states) have been accused and found guilty of illegal discarding in the Barents Sea and Norwegian Sea in the past. In practice this has become less of a problem in recent years because of 2 factors:

- The slow reduction in cod aggregations following the peak 7 years ago, and
- The greatly improved sensor technology that allows vessels to monitor quantity of fish in the net and rate of filling.

Occasional commercial and non-commercial species

The following additional species are occasionally caught by Russian bottom trawlers as recorded by scientific observers from PINRO, from data from the Norwegian reference fleet (IMR 2011), and other MSC certified fisheries.

Tusk (*Brosme brosme*)	Lumpsucker (*Cyclopterus lumpus*)
Capelin (*Mallotus villosus*)	Rabbit fish (*Chimaera monstrosa*)
Herring (*Clupea harengus*)	Anglerfish (*Lophius* spp.)
Polar cod (*Boreogadus saida*)	Blue whiting (*micromesistius poutassou*)
Ling (*Molva molva*) and Blue Ling (*Molva dypterygia*)	Greater argentine (*argentina silus*),
Norway pout (*Trisopterus esmarkii*)	Common sole (*solea solea*).
Starry ray/thorny skate (*Amblyraja radiata*) IUCN Vulnerable	Northern skate *Rajella hyperborean*
Round skate (*Rajella fyllae*)	Blue skate (*Dipturus batis*) IUCN critically endangered

Table 6 Occasional species caught in Barents Sea Trawls

The more commonly caught or vulnerable of the above are briefly described below; while endangered species are dealt with under ETP

Ling (Molva molva) is taken in significant numbers by the Norwegian reference fleet (offshore demersal). The latest ICES assessment (ICES 2017), based on CPUE in the long-line fishery where it is mainly caught, presents an increasing biomass index and fishing mortality below F MSY.

Blue ling is occasionally taken as bycatch by trawlers in the Barents Sea. It is recorded occasionally by the Norwegian reference fleet (offshore demersal), although it has not been recorded by the UoC. Blue ling has a distribution from the Azores to Spitsbergen, and the Barents Sea is an important centre of population. It has low resilience and very high vulnerability. It is found at 350-500m on muddy bottoms.

This species suffered stock collapse in the 90s and has not recovered. A steady decline in landings suggests serious depletion in Subarea II and this species is listed as endangered on the Norwegian red list. No standardized abundance estimates are available for blue ling in the North Atlantic.

ICES (2017) advises that when the precautionary approach is applied, there should be zero catches in each of the years 2018 and 2019. This advice is unlikely to change until the scientific information is sufficient to assess the status of the stock. Closed areas to protect spawning should be maintained.

Tusk *Brosme brosme*

Tusk is occasionally taken as bycatch by trawlers in the Barents Sea, although hardly recorded for the UoC. The major fisheries for Tusk in Subareas I and II are the Norwegian longline and gillnet fisheries, but there are also bycatches by other gears, e.g. trawls and handlines.

Catch levels since 2004 do not appear to have had a detrimental effect on the stock given that CPUE continues to steadily increase, and stock biomass index is also rising.

ICES (2017) advises that when the precautionary approach is applied, catches should be no more than 10 451 tonnes in each of the years 2018 and 2019.

Elasmobranchs

The distribution and status of elasmobranchs in the Barents Sea was recently reviewed by ICES (ICES WGEF REPORT 2015).

Skate species inhabiting offshore areas included thorny skate *Amblyraja radiata*, Arctic skate *Amblyraja hyperborea*, round skate *Rajella fyllae*, spinytail skate *Bathyraja spinicauda*, common skate *Dipturus batis* complex, sailray *Rajella lintea*, long-nose skate *Dipturus oxyrinchus* and shagreen ray *Leucoraja fullo-nica*. All skate species occurring in offshore areas also occur in more coastal areas, with the exception of *A. hyperborea*, *D. oxyrinchus* and *R. lintea.*

There is no directed fishery for skates (although there was a brief experimental Russian fishery in the 1980s), but bottom-trawlers targeting cod and haddock, and longliners targeting cod, wolffish and Greenland halibut have a skate bycatch, which is generally discarded (ICES 2015). The **Starry ray,** *Amblyraja radiata* is by far the most abundant, comprising 96% by number and about 92% by biomass of skates caught in surveys or as bycatch, followed by *A. hyperborea* and *R. fyllae* (3% and 2% by number, respectively). *A. radiata* is also the pre-dominant skate in catches of the Norwegian Reference Fleet operating in ICES Sub-area I, comprising more than 95% of elasmobranch catch by both numbers and weight. According to Dolgov et al., 2005b, larger skates are caught in longline fisheries compared with trawl fisheries.

In trawl survey undertaken by Dolgov et al (2005) starry ray was caught at a rate of around 10kg / hour of trawl, but the author concludes that "the total catch of skates in the Barents Sea is relatively small compared to the stock size, which is as large as 116,000 tons for starry ray". Furthermore, although most elasmobranch species are regarded as vulnerable, starry ray matures relatively quickly and demographic modelling suggests it is less susceptible to fishing mortality than other larger-bodied skate species

There is some information and analysis of the distribution of these species from the Joint Russian Norwegian ecosystem surveys.

Sharks known to occur in the Barents Sea and occasionally caught as bycatch in the trawl fishery include spurdog, velvet belly, porbeagle, and Greenland shark. The chimaeroid (*Chimaera monstrosa*) also occurs. According to skippers these species are rarely encountered by the UoC , and as for skates and rays, are discarded live whenever possible. However, data on encounters is very limited other than through the Norwegian reference fleet. These are considered further under ETP.

There are no specific **management measures** relating to elasmobranchs and no regular advice from ICES PINRO or other bodies. However, since 2010 under Norwegian jurisdiction, all dead or dying skates and other fish in the catches should be landed, although live specimens can be discarded. Our understanding from skippers is that most are released live, and this is reinforced by data from the Norwegian reference fleet suggesting that catches of A. radiata are far higher than landings.

Recent work has indicated that skates and rays have relatively high post capture survival (55%) although this will depend critically on the weight of fish in the cod end (Ellis et al 2012). Overall impact will depend both on survival (lower with more fish in the cod-end) and trawl time/swept area (generally higher when fish accumulate less rapidly in the cod-end. In other words, it is likely that during the period of very high cod and haddock catches 5-10 years ago catch of elasmobranchs would have been relatively low but survival poor, whereas as stocks of target species become less abundant or aggregated, catch of elasmobranchs may increase but live discard survival rates may be higher.

Other vulnerable fish species

Several other fish that might be significant in a discarded bycatch of Barents Sea trawl fisheries, and which occur in reasonable quantities in the Norwegian reference fleet include the rough rattail or rough headed grenadier (Macrourus berglax) and the greater argentine (Argentina silus) both of which have centres of distribution in the Barents Sea, and have life cycle characteristics that make them highly vulnerable. Data is limited on the total bycatch of these species by all fisheries in the Barents Sea, and they have not been recorded in log-books by the client fleet.

General management measures for retained species

Low levels of retained and bycatch species in the client fishery are due to a number of factors:

- Mesh size in cod end is now usually 138 mm (above the minimum of 130mm harmonised Norwegian/Russian regulation);
- A separation/sorting system is used compliant with the decisions of the Joint Russian-Norwegian Fishery Commission for Barents and Norwegian Sea Cod and haddock. This comprises a sort-V with a selective grid 1.2 x 1.0 m, and 55 mm spacing between bars;
- Discard bans in Norwegian, Svalbard and Russian sectors;
- Move on rule / real time closures in Norwegian waters - to protect juveniles, or in event of high by catch;
- Permanently closed areas to protect spawning / nursery grounds;
- High concentrations of cod and haddock on the fishing grounds; and the ready availability of target stock quotas (reflecting good stock status), which, combined with increased trade in quotas reduces the incentive to 'high grade' catches.
- Experienced and knowledgeable skippers and crew;

Classification of retained (non-target) and bycatch species

There is a strict discard ban in place, so most non-target species qualify as retained and are scored under P2.1. Nonetheless it is legal (and recommended) to return non-retained and living (not dying)

elasmobranch species to the sea, so these are classed as bycatch and scored under P2.2, unless they are on CITES Annex 1, in which case they are classed as ETP.

Some species may qualify as both retained species (P2.1) or ETP (P2.3). Under V1.3 all CITES Annex 1 species shall be classed as ETP (see 3.4.4). Retained fish which are not CITES Annex 1 species, but which are on other non-binding lists (e.g. IUCN redlist) should be scored as retained or bycatch species.

For both retained and bycatch species there is a distinction between main and minor species. The former would typically comprise more than 5% of total catch and the latter less than 5%. Nonetheless, if a species is vulnerable, and the UoC may have a significant effect on it, it may be classed as main irrespective of such percentages.

<table>
<tr><th>Species</th><th>Selected scoring category</th><th colspan="2">Rationale</th></tr>
<tr><td>Northern wolfish (Anarhicas denticulatus)</td><td>Retained, minor</td><td>0.5-0.7% of catch (2015-17)</td><td rowspan="3">1-1.35% of catch of UoC;
Catch of UoC 3.5% of total recommended catch and 0.5% of total estimated biomass (3 species)
All three stocks stable or rebuilding</td></tr>
<tr><td>Spotted wolfish (Anarchichas minor)</td><td>Retained. minor</td><td>0.35-0.49% of catch (2015-17)</td></tr>
<tr><td>Atlantic wolfish (Anarchichas lupus)</td><td>Retained, minor</td><td>0.08-0.28% of catch (2015-17)</td></tr>
<tr><td>Beaked redfish, Sebastes mentella</td><td>Retained, minor</td><td colspan="2">• <1% of UoC catch;
• UOC catch 1.5% of recommended maximum total catch for the stock
• SSB at reasonably high levels and fishing mortality low</td></tr>
<tr><td>Golden redfish, Sebastes norvegicus (x marinus)</td><td>Retained, minor</td><td colspan="2">• Estimated 0.1% of catch of UoC
• UoC catch roughly 4% of total recommended catch (SA 1&2) and 1.5% of total actual catch SA1&2)
• Stock status poor and declining. Although on the Norwegian redlist as threatened, it is not CITES Appendix 1 listed so assessed at P2.1 rather than as ETP under V1.3</td></tr>
<tr><td>Greenland halibut (Reinhardtius hippoglossoides)</td><td>Retained, minor</td><td colspan="2">Comprises 0.6% of the total catch of the fleet (average 2015-17), and 1.3% of the total recommended catch
Fishable biomass stable since 2013. ICES assesses risk of stock size < Blim at less than 1%</td></tr>
<tr><td>American plaice (Hippoglossoides platessoides)</td><td>Retained, minor</td><td colspan="2">Comprises 0.3% of the catch (average 2015-17).
Regarded as common and widely distributed</td></tr>
<tr><td>European plaice (Pleuronectes platessa)</td><td>Retained, minor</td><td colspan="2">Less than 0.1% of the UoC catch.
Main population further south where stock status healthy</td></tr>
</table>

Other	Retained, minor (other than ETP species)	All other species listed above, other than elasmobranchs) are caught in very small quantities (<0.1%) and are retained according to discard ban.
Elasmobranchs and miscellaneous non-commercial fish	Bycatch, minor	Most elasmobranchs are returned live to the water where possible. It is likely that a small number of other non-commercial fish species are returned to the sea

Table 7 Classification of retained and discarded bycatch

3.4.3 ETP species

ETP (endangered, threatened or protected) species are defined as follows in the MSC (v 1.3 guidance):

- Species that are recognised by national ETP legislation;
- Species listed in the binding international agreements:
- Species listed in Appendix 1 of the Convention on International Trade in Endangered Species (CITES)

Under V2 of the standard the definition is extended to include amphibians, reptiles, birds and mammals listed in the IUCN red list as vulnerable, endangered, or critically endangered. While this assessment uses V1.3 it is important to highlight issues that may be relevant for V 2

In terms of national legislation, the Russian Red Book of species in the Murmansk region describes threatened species and supporting regulations (No. 221 and 421 (2014)5). The Norwegian Red List, prepared by the Norwegian Biodiversity Information Centre in accordance with criteria from the International Union for Conservation of Nature (IUCN), includes species at risk of going extinct in Norway, with 5 status levels from regionally extinct to near threatened, and a "data deficient" category. Both the Norwegian Marine Resources Act and the Norwegian Marine Diversity Act require management action to promote the rebuilding of a species when it is red-listed. Norwegian Regulation J-250-20137 addresses the protection of basking sharks, spurdogs, porbeagles and silky sharks, requiring their release if still alive when landed aboard. However, no data is collected nationally on the number or species captured and released.

Russia and Norway are signatories to a number of international conventions on species protection and management, notably the Convention on Biological Diversity and the Convention on International Trade in Endangered Species (CITES). Norway is also subject to agreements under OSPAR Annex V "on the protection and conservation of the ecosystems and Biological Diversity in the maritime area" and the Norwegian Government has established 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, and endangered species for which Norway has special responsibility.

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Mammals

Norway (but not Russia) is a member of the North Atlantic Marine Mammal Commission (NAMMCO) which provides for cooperation on conservation and management of whales, dolphins, seals and walruses in the region. The following can be found in the Norwegian and Barents Seas (Table 3.4.4.1)

Note: *Amber implies either very high vulnerability and/or significant likelihood of encounter*

Common name	***Latin name***	**Occurrence**	**IUCN and national red list (NRL) status**	**Cites Annex 1 protection**
Bowhead whale	*Balaena mysticetus*	rare	IUCN Critically endangered	Y
Fin whale	*Balaenoptera physalus*	frequent?	IUCN endangered	Y
Sei whale	*Balaenoptera borealis*	occasional	IUCN endangered	Y
Blue whale	*Balaenoptera musculus*	occasional	IUCN endangered	Y
Sperm whale	*Physeter macrocephalus*	Occasional (deep water at shelf edge)	Not listed as endangered by IUCN except in Mediterranean; not on national redlist	Y
Narwhal	*Monodon monoceros*	possible	NRL Endangered	N
Hooded seal	*Cystophora cristata*	Possible	NRL Endangered	N

Table 8 Status of ETP marine mammals that may be encountered in the Barents and Norwegian Seas.

Harp seals are sometimes taken in Barents Sea trawl fisheries, though encounters with other species are thought to be unusual. Despite their abundance in the Barents Sea, dolphins are rarely caught in trawls (Barents Portal[6]). According to ICES (2009) larger offshore demersal trawl vessels "are regarded as having a relatively low risk for by catches of marine mammals". None were reported for the client fishery or raised as an issue by stakeholders during the site visit. According to the North Atlantic Marine Mammal Commission website, by-catch concerns in NAMMCO countries are related primarily to harbour porpoises, grey and harbour seals in gillnet fisheries. Trawls are not mentioned as a threat.

Common name	***Latin name***	**Potential for encounter**	**IUCN/national red list status**
Common or blue skate	*Dipturus batis*	significant	IUCN and Norwegian red list Critically endangered
European eel	*Anguilla anguilla*	low	IUCN critically endangered; Norwegian red list critically endangered
Spiny dogfish or spurdog	*Squalus acanthus*	Low	Norwegian red list Critically endangered
Basking shark	*Cetorhinus maximus*	low	IUCN Vulnerable. Norwegian red list: Endangered
Blue ling	*Molva dypterygia*	Retained bycatch	Norwegian red list - E ndangered
Golden redfish	*Sebastes norvegicus*	Retained bycatch	Norwegian red list - Endangered
Greenland shark	*Somniosus microcephalus*	Known occasional encounters	IUCN Near threatened Norwegian red-list Data deficient
Porbeagle	*Lamna nasus*	low	IUCN Critically endangered

[6] http://barentsportal.com/barentsportal_v2.5/index.php/en/updated-articles-2013/current-status-2013/human-activities-and-impacts-2013/853-updated-2013-fisheries-and-other-harvesting-important-indirect-effects-of-fisheries-on-the-ecosystem

Table 9 Endangered fish species that may be encountered in the Barents and Norwegian Seas. None are listed on CITES Appendix 1
Note: *Amber implies either very high vulnerability and/or significant likelihood of encounter; yellow implies either less vulnerability and/or less likelihood of encounter*

There are no fish known to be encountered by the fleet or similar vessels in the UoC that are on CITES Appendix 1, but several are on Norwegian and IUCN red-lists. Routine catch records, along with additional information from MSC log books and the Norwegian reference fleet records (IMR 2011) suggest that some of these species are occasionally encountered.

Reference fleet data suggests that the critically endangered (IUCN) **blue skate** (*Dipturus batis*) may be caught very occasionally, but the UoC operates well to the north of the main areas of natural distribution.

European eel is not recorded from the offshore demersal reference fleet though it does occasionally occur in the catch of the coastal reference fleet. This species is on the edge of its natural distribution in the Barents Sea.

The **spurdog** (*Squalus acanthius*) is recorded as taken very occasionally by the reference fleet. It has widespread distribution in temperate waters and is at the northern limit of its range in the Barents Sea. This was a very abundant species but has very low resilience and high to very high vulnerability. The catch in Norwegian waters has halved in the last 5 years. It is found mostly found at 50-200m usually at the bottom but also mid water and surface.

Basking shark are mainly pelagic and unlikely to be encountered by trawls.

Norway has imposed a temporary ban on commercial fishing of porbeagle, spurdog and basking shark, though landed bycatch may enter trade.

Of the endangered or vulnerable species, **Blue ling and the two redfish species** have been dealt with under retained bycatch. It is notable that some Barents Sea MSC assessments have scored Golden redfish as an ETP species. However, according to GCB3.11.2 of the MSC Certification Requirements Guidance retained species on non-binding lists (such as IUCN red list) should be assessed under retained or bycatch PIs. While it is recognized that their presence on the Norwegian redlist could imply ETP status, neither species are referred to in Government ETP regulation, but are recognized and regulated under fisheries legislation.

Greenland shark are caught occasionally by trawlers in the Barents Sea, and are returned to the sea alive wherever possible. Status of this species is very poorly understood but no specific concerns have been raised by stakeholders or scientists regarding trawling impacts on this species.

Porbeagle (*Lamna nasus*) (IUCN critically endangered) stock in the NE Atlantic is well below B_{MSY} and is fished at or above F_{MSY} (ICES). Porbeagle is not recorded in the Norwegian reference fleet (trawl) bycatch data, although it does occur in the coastal reference fleet. It tends to be taken mainly by gillnetters and longliners, and the main concentration of population is further south.

Seabirds

Fisheries may impact seabird populations directly through bycatch of seabirds in fishing equipment; or indirectly, through competition for the same food sources.

The Barents Sea is globally important for its seabird populations. The summer population comprises around 20-25 million seabirds (more than 40 species) that harvest approximately 1.2 million tonnes of

biomass annually. Major concentrations of breeding seabirds (more than 80%) are located on the Norwegian mainland, Novaya Zemlya and Svalbard. Seabirds play a significant role in transferring nutrients from sea to land and from North to South.

Unfortunately, many species are currently in decline, especially in the south of the Barents Sea, for reasons which are unclear. Decline is especially serious in the case of common guillemot and black-legged kittiwake in the southern parts of the Barents Sea, and Brünnich's guillemot and kittiwake in the north. The long line and trawl fisheries are not implicated in this decline, though historic coastal gill-netting may have been a problem.

Common name	***Latin name***	**Status in Norwegian and IUCN redlists**
Black-legged kittiwake	*Rissa tridactyla*	Endangered (IUCN vulnerable)
Atlantic puffin	*Fratercula arctica*	Vulnerable (IUCN vulnerable)
Steller's eider	*Polysticta stelleri*	Vulnerable (IUCN vulnerable)
Razorbill (Svalbard)	*Alca torda*	Endangered (IUCN near threatened)
Ivory gull (Svalbard)	*Pagophila eburnea*	Vulnerable (IUCN near threatened)
Common guillemot	*Uria aalge*	Critically endangered (IUCN least concern)
Sabine's gull (Svalbard)	*Xema sabini*	Endangered (IUCN least concern)
Black guillemot	*Cepphus grylle*	Vulnerable (IUCN least concern)
Common tern	*Sterna hirundo*	Vulnerable (IUCN least concern)
Brünnich's guillemot	*Uria iomvia*	Vulnerable (IUCN least concern)

Table 10 Bird Species on Norwegian and Russian Red lists that may be encountered by OT vessels

Several types of interaction with red-listed seabirds may take place:

- Aggregations of seabirds exploiting fish waste
- Capture of diving seabirds during hauling of trawls
- Indirect impacts through reduction of food resources.

With regard to the last of these, since these fisheries target larger predators, the effects if any are arguably beneficial to these species.

Of greatest concern are the deep diving and critically endangered (in Norway) common guillemot (dives to >200m), black guillemot (dives to 130m), thick billed guillemot, puffin (typically dives to <30m, but occasionally to 60m), and razorbill (dives to 120m). All these species could become entrapped in trawls, especially during recovery, and there have been historic instances of heavy catches (Strann et al 1991). However, such encounters are now considered to be relatively rare especially for the deep- water trawling (Grekov and Pavlenko 2011; ICES AFWG, 2012) undertaken by the UoC. Furthermore, Common guillemot is very widely distributed and classed as least concern by IUCN;

Gulls, kittiwakes, fulmar, petrel and tern could interact with trawlers during recovery at the water surface but are more likely to benefit from spilled or waste fish than be adversely affected. Fishermen have reported limited negative interaction.

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"[7]

3.4.4 Benthic habitats

The main habitat affected by trawling is benthic. Knowledge and understanding of the distribution of benthic habitats is substantial, based on a series of surveys since the beginning of the 19th century and continuing with the on-going annual PINRO-IMR collaboration on the Joint Norwegian-Russian Environmental Status Report on the Barents Sea Ecosystem (Anisimova 2010). This is reinforced through work in support of Mareano Project (Norwegian Waters) and Barents Portal. A comprehensive overview of the Barents Sea Ecosystem is provided by Jakobsen and Ozhigin (2011). The WWF (2011) Atlas is also a useful source.

3.4.4.1 Biodiversity and community types

Species diversity is highest along the Norwegian Coast. The Barents Sea itself is less diverse, but still substantially more than the Kara, Leptov and White Seas (Jakobsen and Ozhigin 2011).

According to Jorgensen et al 2014 there are four main megafaunal regions within the Barents Sea which were significantly related to depth, temperature, salinity, and number of ice-days:

- southwestern - dominated by filter-feeders (sponges) in the inflow area of warm Atlantic water and a detritivorous fauna (echinoderms) in the deeper trenches;
- southeast and west – dominated by predators (sea stars, anemones and snow crabs) together with filtrating species (sea cucumber and bivalves) within a mosaic of banks and slopes;
- northwestern and North Eastern: dominated by plankton-feeding brittlestars, but with increasing snow crab population in NE.

The main sub-communities that may be encountered by trawl vessels include the following, derived primarily from Jakobsen and Ozhigin 2011, Denisenko and Zgurovsky 2013, and various publications related to the joint PINRO/IMR ecosystem survey.

Sponge communities: Sponges (Porifera) are often associated with bryozoans and sea anemones. They make up the largest part of the communities in weight along the continental slope in depths of 50 to 300m from the Tromsø Plateau north along the west coast of Svalbard, north of Svalbard and east to Franz Joseph Land. Within the Barents Sea itself they are found in high concentrations to the north of

[7] http://www.regjeringen.no/en/dep/md/documents-and-publications/government-propositions-and-reports-/reports-to-the-storting-white-papers-2/2010-2011/meld-st-10-20102011/7.html?id=682132

the Finnmark coast, in the Bear Island Channel, and more widely on the slopes of trenches and banks in the southern Barents Sea (Jakobsen and Ozhigin 2011). They can be broadly divided into soft bottom sponge communities comprising a variety of large sponge species (*Geodia spp., Aplysilla sulfurea, Stryphnus ponderosus and Steletta sp*.), and hard bottom sponge communities**,** including medium sized sponges such as *Phakellia spp., Axinella infundibulum, and Antho dichotoma*. This biotope is generally home to more species, but lower density than soft bottom sponge community.

Hardbottom and reef communities: The richest communities of benthic animals (including sponges, bryozoans, *Balanus* spp, brachiopods, mussels, soft and hard corals) are associated with hard substrates and strong currents or turbulence, especially along the Norwegian coast and the coast of Svalbard. These animals create structural habitat diversity and are often species-rich and associated with high biomass.

» Reefs of the hard coral Lophelia pertusa are found along the continental slope in Norwegian waters.

» Massive settlements of barnacles, bryozoans, hydroids, and sea urchins (Strongylocentrotus) are found in the shallow rocky waters of the Novaya Zemlya bank.

» Aggregations of different large, non-mobile, long-living habitat-forming species such as large deep sea sponges (Geodia spp, Stelletta spp, Tethya citrina, Thenea muricata) mussel beds (Modiolus modiolus) and some reef species such as Zooanthidae and the soft coral Drifa glomerata, are found along the southern coast of Spitzbergen/Svalbaard, Bear Island and North

Bivalve beds: generally, more common in the east (especially coasts of Novaya Zemlya) and bivalves and gastropods also dominate offshore parts of south-western Barents Sea, and parts of the west coast of Svalbard**.**

Feather star communities: the sea lily (*Heliometra glacialis*) – a species of crinoid - is common in water depths of 105-292 m on the slopes of the Spitsbergen Bank, the Central Bank and the Great Bank.

Basket star and soft coral communities: Further north and west and at the eastern slope of the Eastern Basin at depths between 200 and 300m, communities are dominated by the basket star *Gorgonocephalus spp.* These creatures thrive where there are high concentrations of zooplankton close to the sediment surface. Settlements of soft corals and crinoids are also found alongside basket stars on soft substrates in the Northern Barents Sea on the slopes of deep-water trenches and uplands

Sea cucumber/starfish communities: At depths below 300 m on muddy grounds in the Bear Island Trough, Hopen Deep and deep Eastern Basin, the benthic communities are dominated by sea cucumbers (*Molpadia spp)* and the starfish *Ctenodiscus crispatus.* The starfish *Pontaster tenuispinus*, the shrimp *Sabinea septemcarinata*, the brittle star *Ophiacantha bidentata* and soft corals of the Nephteidae family are also commonly found in these communities.

Crab, shrimp and sea anemone communities: Predators and scavengers (small mobile crustaceans as well as larger gastropods such as *Colus sabini*) concentrate in areas with high availability of organic debris (such as fishing grounds) and may also be associated with sea anemones such as *Hormathia digitata*. These communities form a belt that extends from the Murman coastal area through all eastern fishing banks up to the Moller Table near the southern island of the Novaya Zemlya archipelago. Red king crab (*Paralithodes camtschaticus*) and snow crab (*Chionoecetes opilio*) dominate the south-eastern part of the sea.

A variety of other groups including Annelids (mainly polychaetes), nemaltelmintes, bryozoans, foraminiferans, and cnidarians also contribute a substantial biomass and numbers of species.

Some of these communities can be seen on the graphic below from Denisenko and Zgurovsky 2013.

A recent publication (Jorgensen et al 2016[8]) suggests that some Barents Sea regions/ecotypes are particularly susceptible to trawling, including *Geodia* sponges in the southwestern Barents Sea, basket stars (*Gorgonocephalus*) in the northern Barents Sea, sea pen (*Umbellula encrinus*) on the shelf facing the Arctic Ocean, and sea cucumber (*Cucumaria frondosa*) in shallow southern areas. They recommend management action in the southwestern and the northwestern Barents Sea and on the Arctic shelf facing the Arctic Ocean.

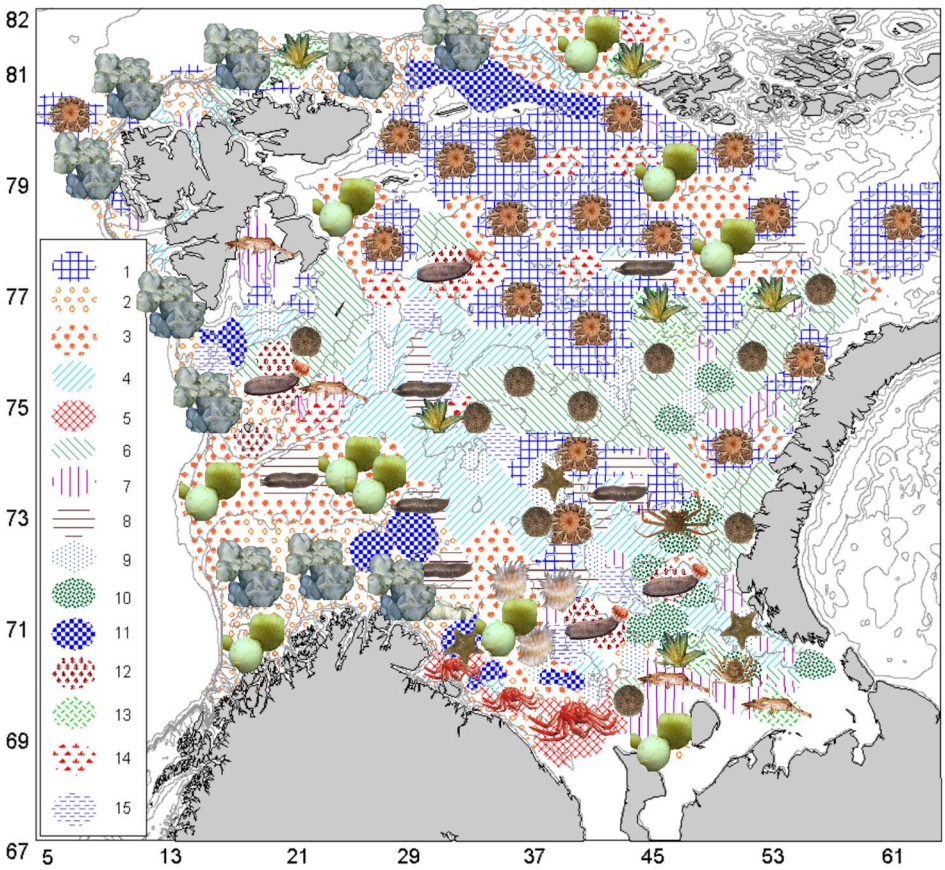


Figure 38 Areas with various dominant representatives of megazoobenthos in the Barents Sea in 2006-2011 (by: Lyubin et al., 2010; Anisimova et al., 2011).

Legend: 1 - *Gorgonocephalus spp., 2 - Geodia spp., 3 - Spongia g. Spp., 4 - Ctenodiscus crispatus, 5 - Paralithodes camtschaticus, 6 - Strongylocentrotus spp., 7 - Sabinea septemcarinata, 8 -Molpadia spp., 9 - Urasterias linckii, 10 - Chionoecetes opilio, 11 - Hippasteria phrygiana, 12 - Cucumaria frondosa, 13 - Sclerocrangon spp., 14 - Crinoidea g. spp., 15 -Icasteriaspanopla*

Mapping of major benthic habitats in the Barents Sea has been undertaken and is on-going under several national and international programmes[9] and areas of high biodiversity value/vulnerability have been identified. Particular attention has been paid to deepwater corals such as *Lophelia* which occur especially on the NW continental slope of Norway.

[8] Jørgensen, L. et al 2016. Vulnerability of megabenthic species to trawling in the Barents Sea. ICES Journal of Marine Science, Volume 73, Issue suppl_1, 1 January 2016, Pages i84–i97, https://doi.org/10.1093/icesjms/fsv107

[9] e.g. Larsen et al 2003; the "Mareano programme" (http://www.mareano.no/english/index.html); the Joint Russian/Norwegian Ecosystem Assessment (Barents Portal); IMR/PINRO 2014; WWF, 2011.

3.4.5 Vulnerable marine habitats

Following from guidance produced by FAO there has been increasing activity on the part of governments and regional fisheries management organizations to define and manage "vulnerable marine ecosystems" (VMEs).

FAO[10] offers the following criteria for identifying Vulnerable Marine Ecosystems:

1. **Uniqueness or rarity** - an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems. These include:

- habitats that contain endemic species
- habitats of rare, threatened or endangered species that occur only in discrete areas
- nurseries or discrete feeding, breeding, or spawning areas

2. **Functional significance** of the habitat - discrete areas or habitats that are necessary for the survival, function, spawning/reproduction or recovery of fish stocks, particular life history stages (e.g. nursery grounds or rearing areas), or of rare, threatened or endangered marine species.)

3. **Fragility** - an ecosystem that is highly susceptible to degradation by anthropogenic activities.

4. **Life-history traits** of component species that make recovery difficult - ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics:

- slow growth rates
- late age of maturity
- low or unpredictable recruitment
- long-lived

5. **Structural complexity** - an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

In the Annex to its guidance FAO lists several example VMEs which may need protection or management. These include (of relevance to the Barents Sea)

- coldwater corals and hydroids, e.g. reef builders and coral
- stony corals (Scleractinia), alcyonaceans and gorgonians (Octocorallia), black corals (Antipatharia) and hydrocorals (Stylasteridae);
- some types of sponge dominated communities;
- communities composed of dense emergent fauna where large sessile protozoans (xenophyophores) and invertebrates (e.g. hydroids and bryozoans) form an important structural component of habitat.

FAO also offers guidance as the meaning of "significant adverse effects" on VMEs: They are those that compromise ecosystem integrity (i.e. ecosystem structure or function) in a manner that:

- impairs the ability of affected populations to replace themselves;
- degrades the long-term natural productivity of habitats; or

[10] FAO 2009. International Guidelines for the management of deep sea fisheries in the high seas. ISBN 978-92-5-006258-7

- causes, on more than a temporary basis, significant loss of species richness, habitat or community types.

NEAFC has obligations to contribute to the key objectives of the UN General Assembly Resolutions on the protection of vulnerable marine ecosystems and to ensure the long-term sustainability of deep sea fish stocks and non-target species. They have therefore responded by seeking guidance from ICES11 on implementing the FAO guidance at regional level, and subsequently issued a recommendation on the Protection of Vulnerable Marine Ecosystems in the NEAFC Regulatory Area (which encompasses most of the Barents and all the Norwegian Sea) (NEAFC 2014).

NEAFC uses the same definition of VMEs and "significant adverse impacts" as those offered in the FAO guidance (reproduced above). These recommendations are specifically designed to "prevent significant adverse impacts on VMEs". The specific management measures recommended are presented below in the section on management.

In its advice to NEAFC, ICES12 lists seven VME habitat types for the North East Atlantic and the taxa and species that are most likely to be found in these habitats. To be classed as VMEs the habitats should contain significant aggregations of the representative taxa or species. The VMES are:

1. Cold water coral reef (Lophelia pertusa, Solenosmilia variabilis)
2. Coral garden (Hard Bottom; Soft Bottom)
3. Deep-sea sponge aggregations (ostur sponge aggregations; hard bottom sponge communities, glass sponge communities)
4. Seapen fields
5. Tube-dwelling anemone patches (CERIANTHIDAE - Pachycerianthus borealis)
6. Mud- and sand-emergent fauna (BOURGETCRINIDAE, ANTEDONTIDAE, HYOCRINIDAE, XENOPHYOPHORA, SYRINGAMMINIDAE
7. Bryzoan patches (EUCRATEIDAE)

ICES (2008) also developed a list of 25 sponge species which are habitat-forming and can be considered indicators of sponge VMEs in the North Atlantic. These are species that form the sponge grounds, and host a variety of associated smaller sponge species that contribute to the biodiversity of the habitat.

VMEs in the Barents and Norwegian Sea and vulnerability to fleet activity

Drawing on the above we summarize the distribution and vulnerability to trawling of 8 VME community types found in the Barents Sea. It should be noted that detailed mapping is only available for the SW part of the Barents Sea, and even here most of the mapping is based on extrapolation based on topography and sediments type.

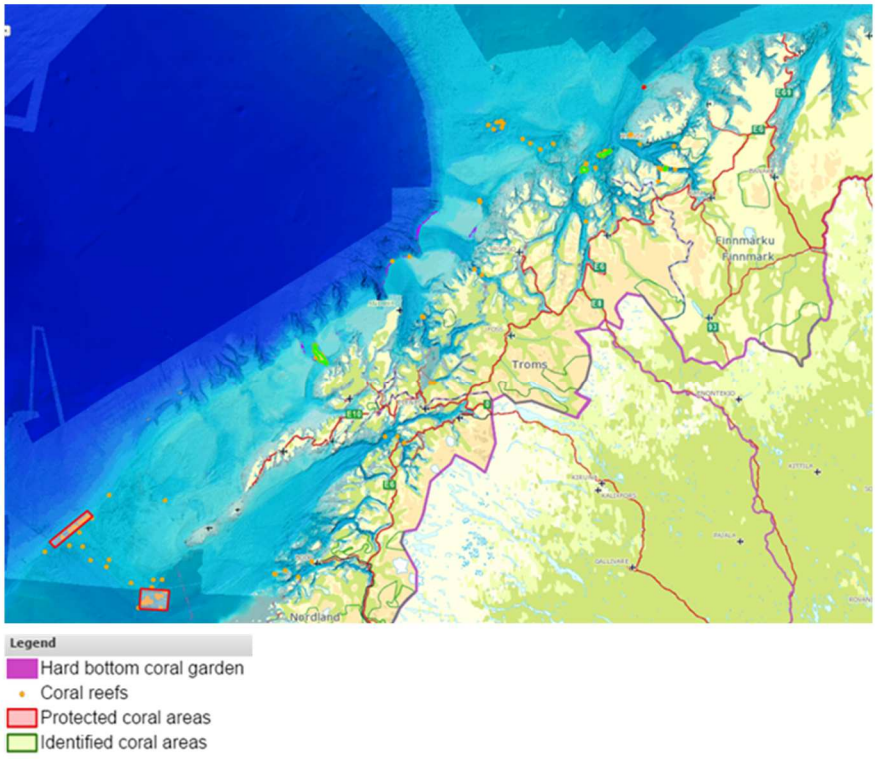
1. **Cold water coral reef** (*Lophelia pertusa, Solenosmilia variabilis*): occur at mid-depths (ie depths coincident with fishing activity) in the south-western part of the Barents Sea off the coast of Norway.

[11] 9.3.2.3 NEAFC request on identification of vulnerable marine ecosystems, including definitions and assessment of fishing activities that may cause significant adverse impacts on such ecosystems. ICES Advice 2008, Book 9
http://www.ices.dk/news-and-events/news-archive/news/Pages/Newly-released-ICES-advice-on-Vulnerable-Marine-Ecosystems-%28VMEs%29-includes-information-on-hydrothermal-vents.aspx

[12] ICES Advice 2013, Book 1. 1.5.5.3 Special Request Advice June 2013. Assessment of the list of VME indicators and elements

There are four marine protected areas to the SW of the Lofoten Islands designated specifically to protect these features. There are no known colonies North of the Varanger Penninsular or within the Russian EEZ. Although they are afforded some protection through 4 designated marine protected areas, the reefs to the North and North East of Lofoten are not protected. For example, there is a significant area of coral reef to the NW of the Flatvaer Nature Reserve (Nordkvaloyac Island) outside the 12m limit (70 44N; 18.35E). In the absence of effective avoidance mechanisms or new protected area designations, there is therefore potential for damage to these habitats.

2. **Hardbottom coral garden:** These coral aggregations (mainly seafans) occur on hard substrates exposed to strong currents at the upper edge of the continental slope to the West of Tromsø and the Lofotens. Most aggregations occur northwest of Rise out to the edge of the 12 mile limit, but with some smaller patches beyond. There are additional areas of this habitat in clearly defined ribbons along the upper edge of the continental slope to the North of Andova (69.58; 16.38) and also outside the 12mile limit (62.02; 15.34). These coral gardens occur as the continental slope falls steeply away so it is unlikely that the fleet vessels would trawl a significant proportion of these



areas.

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Figure 39: Distribution of coral reef and hard bottom coral garden in SW Barents and Norwegian Seas (data from Mareano, http://mareano.no/en/maps/mareano_en.html)

3. **Softbottom coral gardens:** "Soft coral" species belonging to the Alcyonacea are relatively common on silty and mixed bottom substrates throughout the Barents Sea, including *Gersemia fruticosa, G. rubiformis, Drifa glomerata and Duva florida*. While most of these species need hard bottom or rock on which to attach, *Gersemia* is able to anchor itself in relatively soft sediments and establish significant colonies. These species are relatively common and widely dispersed, but dense aggregations appear to be unusual. However, an extensive area of softbottom coral garden has

been mapped on the upper part of the continental slope to the northwest of Finmark (due north of the Lofoten Islands) (roughly 70°00' to 70°30'N; 14°45 to 16°17E).

4. **Seapen and burrowing megafauna.** This is a widespread fine mud habitat typical of low energy depressions and may include seapens, though these are usually sparsely distributed in the Barents Sea (Denisenko and Zgurovsky 2013). This habitat is not a VME according to the criteria discussed above, because it generally lacks "structural complexity"; and in its advice to NEAFC, ICES (2013) did not class it as a VME. However, it is classed as a "vulnerable biotype" under the "Mareano" mapping programme, and is classed by OSPAR as a declining and threatened habitat in the North and Celtic Seas. In some other MSC assessments it has been classified as a "sensitive marine habitat". Neither of the two comprehensive recent reviews - by Denisenko and Zgurovsky (2013), and by Jakobsen and Ozhigin (2011) raise particular concerns about this habitat, nor does the most recent ecosystem overview by ICES (2016). The Norway NEA assessment notes that 'most burrowing fauna / epibenthic fauna are not subject to direct effects by rock-hopper trawls. Studies conducted in relation to pressures on UK Marine SACs concluded that trawling was not a significant cause for concern with respect to sea pen populations (Atkinson, 1989; 210 Howson & Davies, 1991). We take the view that, other than where this habitat is dominated by *Umbellula* sea pen fields as described above, this is not a critical habitat element for the purposes of this assessment.
5. **Seapen fields:** Aggregations of the seapen *Umbellula* are relatively common throughout both Barents and Norwegian Seas, occurring in the central and lower parts of the continental slope at depths in excess of 800m[13]). *Umbellula incrinis* is found in dense aggregations on soft muddy substrates in the north-eastern part of the Barents Sea near the St. Anna Trough and toward the bottom of the continental slope to the W of the Lofotens. The long stalks (up to 1m) mean that these organisms are vulnerable to trawling. However, these seapen communities tend to occur in the deeper marine valleys and deepwater canyons on the mid-lower continental slope at depths in excess of 800m . Overlap between this community and fishing activity is therefore likely to be limited.

[13] http://mareano.no/en/topics/biotopes/vulnerable_biotopes

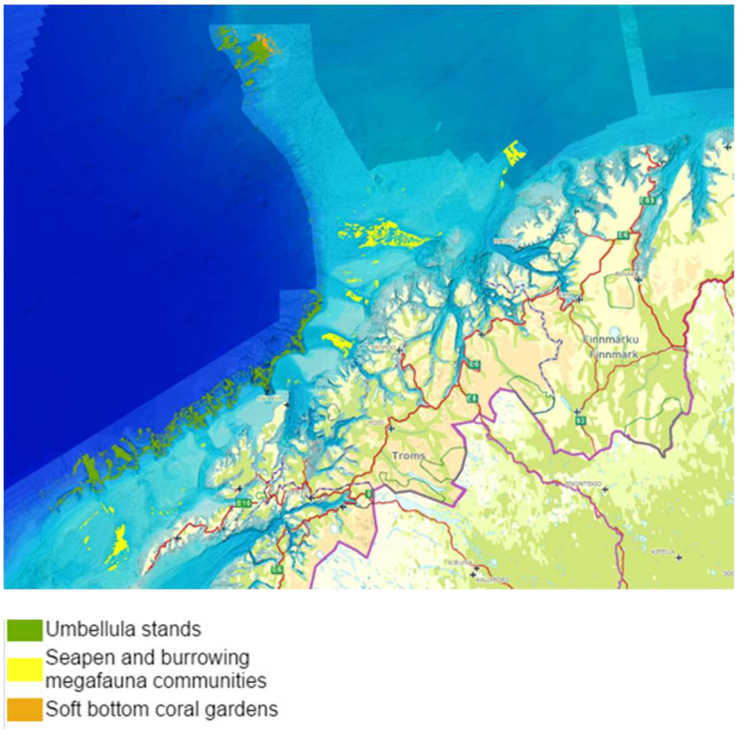

Figure 40 Distribution of seapen and softbottom coral garden in SW Barents and Norwegian Seas (data from Mareano, **http://mareano.no/en/maps/mareano_en.html**)

6. **Hardbottom sponges** can be found over substantial areas of the continental slope and plateau, stretching from the coral habitat into shallower water. Ostur (Geoid) sponges form mass settlements in areas with active sea bottom hydrodynamics, notably on deepwater banks and slopes. The richest communities are found along the edge of the Barents Sea shelf and at the upper parts of the continental slope. Larger settlements of *Geodia* sponges are found in the most south-western parts of the shelf and the Tromsø Bank (Tromsø flaket) where the Norwegian current encounters the Barents Sea shelf. A rich fauna of hydroids and bryozoans is usually found in association with these sponges. They are common mainly to the West of the Lofotens, and further north in the Barents Sea where conditions are sufficiently dynamic. There is likely to be overlap between this habitat and that used by the trawl fleet. Indeed, it is probable that this habitat is typical of the depths and conditions where trawling for cod, haddock and saithe would normally occur, and that historically significant areas of this habitat have been impacted. Equally it may be argued that the fleet will avoid areas where the habitat is still largely intact and will by preference fish in "cleared areas" to avoid excessive and heavy catches of benthos.
7. **Softbottom sponge communities** dominate the plateau and minor depressions further north, interspersed with hard bottom sponge in more dynamic/rocky areas. The depth, substrate and hydrodynamic conditions preferred by these species corresponds to that typically fished by trawlers, so there is potential for sigmificant overlap. Mareano data is limited for more northern waters, but historic data suggests that these communities (including in particular *Geodia, Thenea, Tetilla, Phakellia, Rhadiella, and Polymastia*) were abundant in the early part of the 20th century to the north of Norway, NE of Bear Island, S and SE of Svalbaard, and in coastal waters North of Kirkiness and Murmansk (Denisenko and Zgurovsky 2013) and it is likely that intensive trawling has substantially reduced the biomass.

8. **Glass sponge** dominated habitat is found in deeper water toward the bottom of the continental slope and coincidence between fishing and this habitat is unlikely, especially since trawlers are not permitted to fish in water deeper than 1,000m.

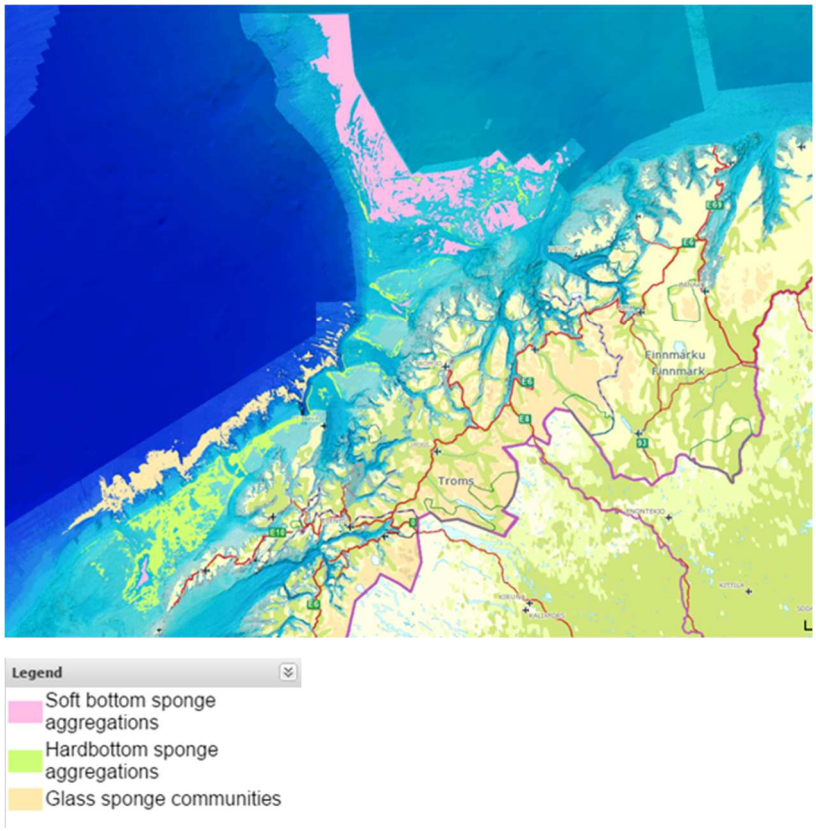

Figure 41 Distribution of sponge communities in SW Barents and Norwegian Seas (data from Mareano, http://mareano.no/en/maps/mareano_en.html)

3.4.6 Other vulnerable habitats

The habitats of the continental slope to the W of Svalbaard are likely to be rich and biodiverse with similar communities to those described above on the continental slope to the N and W of Norway. Communities on the slopes of the plateau are likely to be a mosaic of soft bottom and hard bottom sponge communities, mixed with clam beds (Asparte), sipunculid (Golfingia) and polychaete worm communities, with seapen communities in channels or other areas with high levels of hydrodynamic activity.

A study by Jorgensen et al (2016)– but based on 2011 data – suggests that some regions of the Barents Sea particularly susceptible to trawling due to the dominance of the "high-risk" species (those that are likely to be taken out by trawls), including *Geodia* sponges in the southwestern Barents Sea, basket stars (*Gorgonocephalus*) in the northern Barents Sea, sea pen (*Umbellula encrinus*) on the shelf facing the Arctic Ocean, and sea cucumber (*Cucumaria frondosa*) in shallow southern areas. The potentially vulnerable soft corals (*Gersemia fruticosa, Gersemia rubiformis, D. glomerata, and Duva florida*) are widely distributed throughout the entire Barents Sea, but with the highest biomass in the North Eastern Barents Sea outside trawled areas.

Coincidence of trawling activity with vulnerable marine habitat

The client fleet normally fishes on silty slopes, marine valley and bank, sometimes on rocky slopes, although the latter are usually avoided as they can damage or even lose fishing gear. Fishing may take place at depths between 100m and 800m, though by far the majority of activity takes place at depths between 200m and 450m.

There is therefore potential for interaction between trawling activity and some VMEs, especially softbottom sponge communities, as described above. Several studies have explored the direct impacts of trawling on benthic habitat in the Barents Sea.

3.4.6.1 Impact of trawling on benthic habitat in the Barents and Norwegian Seas

There is therefore potential for interaction between trawling activity and some VMEs, especially softbottom sponge communities, as described above. Several studies have explored the direct impacts of trawling on benthic habitat in the Barents Sea

The feeding habits and preferences of cod, offer a clue as to the type of habitat impacted by trawls targeting this species. They are found mostly on rocky, pebbly, sandy or gravelly bottoms, and are only seldom found on muddy bottoms. This explains the distribution of the fishing fleet – typically fairly dynamic areas along the mid and upper parts of the continental slope, and around the edges of the major banks within the Barents Sea. More generally, Mareano and other data suggests that species richness peaks in the mid continental slopes, especially in channel features, and in coastal areas. There is likely substantial overlap between benthic species richness and fleet trawling activity.

Trawling has taken place the Barents Sea since the late 19th century and there is some historic evidence of damage. Trawling is selective of the larger benthos species, and therefore has a differential impact on overall biodiversity. The most frequently encountered groups of bycatch are sponges (in south-western parts of the sea) and sea cucumbers (western, south-western, southern and south-eastern parts of the sea) (Denisenko and Zgurovsky 2013). However, echinoderms, cnidarians, corals, soft corals, and large clams are also commonly found in trawls.

The total biomass of the zoobenthos is highly variable – ranging from a few grams up to 500g/m^2. A baseline of sorts for the nature and quantity of the benthos in the Barents Sea is available from the Plavmornin surveys that were carried out between 1924 and 1935. These found very high benthic biomass to the south of Spitzbergen and to the north of Norway – areas that are now important fishing areas. There appears to have been a substantial loss of benthic biomass over time due to a combination of factors including fishing (Jakobsen and Ozhigin 2011). The areas with most significant decrease in benthic biomass overlapped with the main fishing areas, and there was a strong correlation between fishing intensity and the decline in zoobenthos biomass. An impact from fishing is not surprising – fishermen will explain that areas have been "cleaned" for trawling.

Denisenko (2007) analysed the biomass distribution of 13 taxa in different periods. In the areas of intensive demersal trawl fishery, a decrease in biomass and reduction of distribution area were found in 11 of these 13 taxa. These included substantial reduction in biomass of the sponges *Geodia* spp. and *Thenea muricata* - important components of the ICES defined VME "Ostur sponge aggregations". Large settlements of sponges that dominated the epifauna in the Western and Southern parts of the Barents Sea in the 1920-1930s appear to have been greatly reduced. However, after fishing effort decreased in late 1960, the state of many disturbed taxa returned to normal (PINRO 2012). A single-factor analysis of variance was used to estimate the impact of fishing intensity on macrozoobenthos bycatch. This suggested that 38% of the total variability in the biomass of bycatch was due to the impact of fishing,

and 62% to other factors (biological productivity, depth, temperature, salinity, etc.). These impacts have been further analysed and discussed by Denisenko and Zgurovsky (2013)

More recently work was undertaken under the joint PINRO-IMR research initiative that appears to confirm these findings (Lyubin et al 2010 (Russian), reported in Jakobsen and Ozhigin 2011). They demonstrated significant differences in species composition in different fishing areas in the Barents Sea. They also showed large differences in the total benthic biomass in these areas. Biomass was much lower in the more intensively fished Southern area, almost 10 x higher in the productive but less intensively fished NW and double that again in the least intensively fished NE. However, there are different conclusions and interpretations. For example, a survey undertaken from 1991 to 1994 suggested that biomass of benthos did not significantly differ from the biomass in 1924-1935, and exceeded the biomass recorded in 1968-1970 (Kiyko & Pogrebov 1997a). They concluded that the bottom communities in the Barents Sea were in a largely undamaged and natural state. Only in Belushya Guba of the Southern Island of the Novaya Zemlya archipelago, and in the mouth of the Kola Bay, major changes in the composition and structure of the bottom communities were recorded that were assigned to anthropogenic factors (Kiyko & Pogrebov 1997a; Kiyko 1997; Kulakov et al. 2005 cited in Jakobsen and Ozhigin 2011).

More recently, studies conducted as part of the "Mareano" mapping programme and reported by ICES AFWG have shown that density and diversity of megafauna was significantly lower in areas with high fishing intensity; and even low trawling frequency appeared to have a negative effect. Of 134 taxa 100 showed a negative trend with increased fishing intensity. Nine of these revealed a significant ($p < 0.05$) response including five sponge species. A few taxa such as large scavenging gastropods responded positively to increase fishing intensity. Buhl Mortensen et al 2016 showed that for 79 of the 97 most common taxa, density was negatively correlated with historuc fishing intensity. Negatively affected species included sponges *Craniella zetlandica* and *Phakellia / Axinella*, *Flabellum macandrewi* (Scleractinia), *Ditrupa arietina* (Polychaeta), *Funiculina quadrangularis* (Pennatulacea), and *Spatangus purpureus* (Echinoidea). Asteroids, lamp shells, and small sponges showed a positive trend. In the Tromsøflaket area of the SW Barents Sea, Kedra et al (2017) showed that trawled areas had lower species numbers, and there were significant differences in epifaunal abundance and biomass between trawled and untrawled areas. Mean individual poriferan (sponge) biomass was higher in untrawled areas, and, although poriferans were observed in areas subjected to intensive trawling, they were at least five times less frequent than in untrawled areas.

Vulnerable Marine habitats (VME) are by definition vulnerable to trawling and this has been confirmed specifically for the Barents Sea. Buhl Mortensen (2017) demonstrated significant trawl damage to offshore *Lophelia* reefs, although protected sites are now showing signs of regrowth.

The wider effects of these changes on other species is hard to gauge, but it is notable that redfish (*Sebastes* spp) which are often found amongst boulders and sponges showed a strong negative relation to fishing intensity, while (not surprisingly) the opposite was observed for cod.

It can be concluded that trawling has had significant impacts on benthic fauna in the Barents and Norwegian Seas, including impacts on total biomass, communities and species – though these impacts are difficult to separate from natural spatial and temporal variations. There is no clear evidence that such impacts have had wider repercussions on the structure and functioning of benthic habitats or on the provision of ecosystem services.

Furthermore, modern trawling is a very different activity from the hit and miss fishing of the past. It is likely that skippers will avoid areas with significant hard coral or massive sponges, and these areas are increasingly well mapped – both by scientists and skippers themselves. It is therefore increasingly

unlikely that fishing vessels will – either by design or accident – "break" new ground. Fishermen are effectively maintaining an altered habitat within fishing areas, and the marginal impact of their activities on more "natural" habitat is likely to be limited.

3.4.6.2 Coincidence of trawling activity with vulnerable marine habitat

The client fleet normally fishes on silty slopes, marine valley and bank, sometimes on rocky slopes, although the latter are usually avoided as they can damage or even lose fishing gear. Fishing may take place at depths between 100m and 800m, though by far the majority of activity takes place at depths between 200m and 450m.

VME tracks are available for the UoA but there are some confidentiality issues, and these are not presented here. However, WWF Russia has been working with PINRO and the Russian MSC certified trawl companies to compile aggregate data on trawl fishery interaction with benthic habitat. This data is presented in the following maps. Although historic it nonetheless provided valuable insight into the likely distribution of impacts and the habitats affected, and broadly supports the analysis provided above related to vulnerability of VME to trawling. Hardbottom sponge aggregations, and especially *Geodia* communities appear to be most at risk/most impacted. It is highly likely that the areas now most intensively trawled are areas previously dominated by Geodia sponges but now largely cleared by historic trawling activity. There are significant constraints and disincentives (both practical and regulatory) to fishing outside these areas.

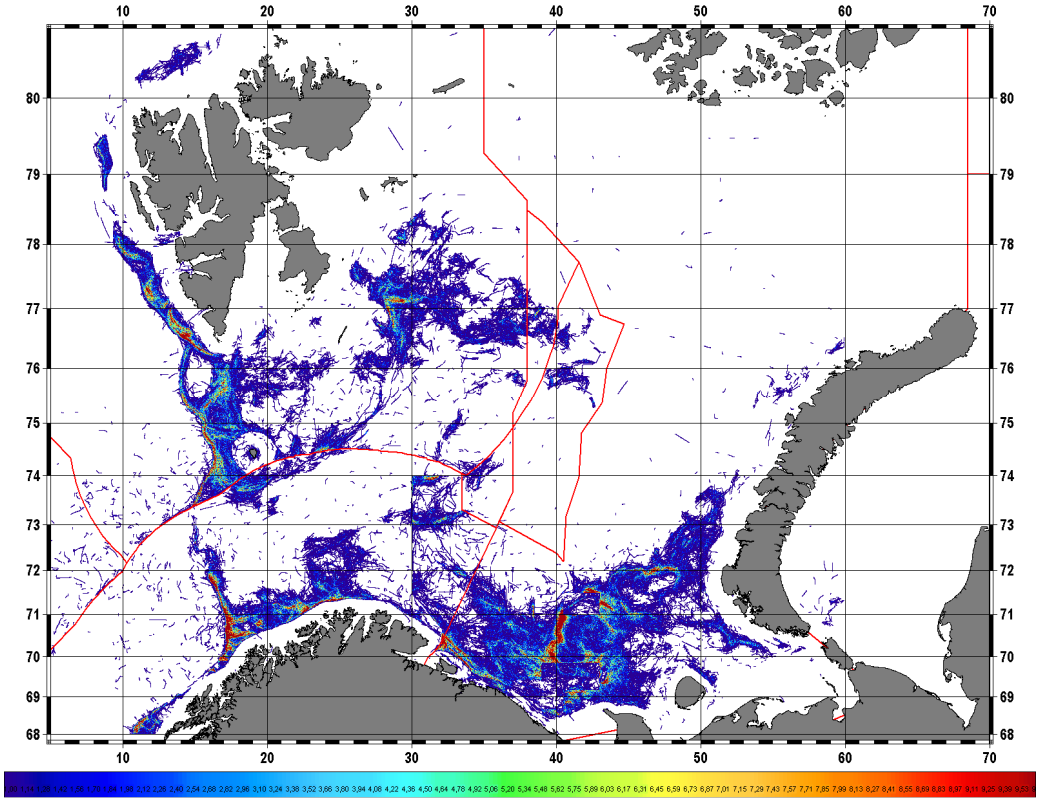

Figure 42 Distribution of trawling of the Russian trawl fleet in the fishing of cod in the Barents Sea during the period of 2007-2009 GG Sea.

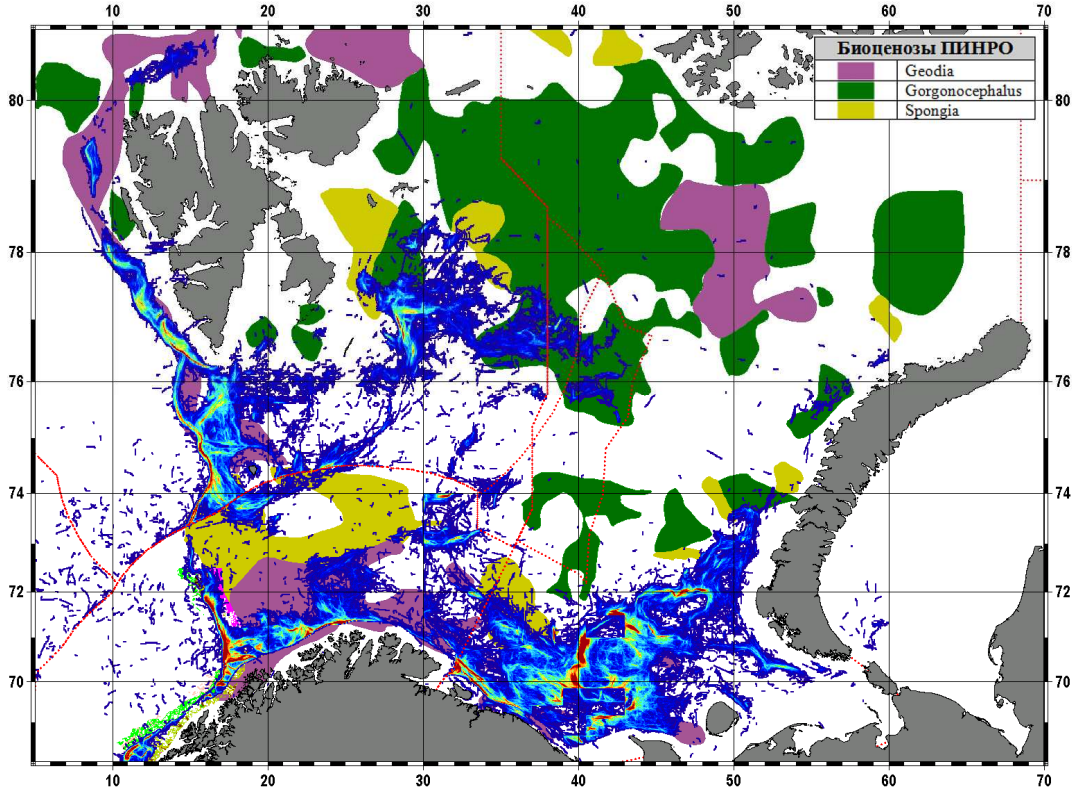

Figure 43 Overlay map of trawl tracks on major sponge community types (PINRO data).

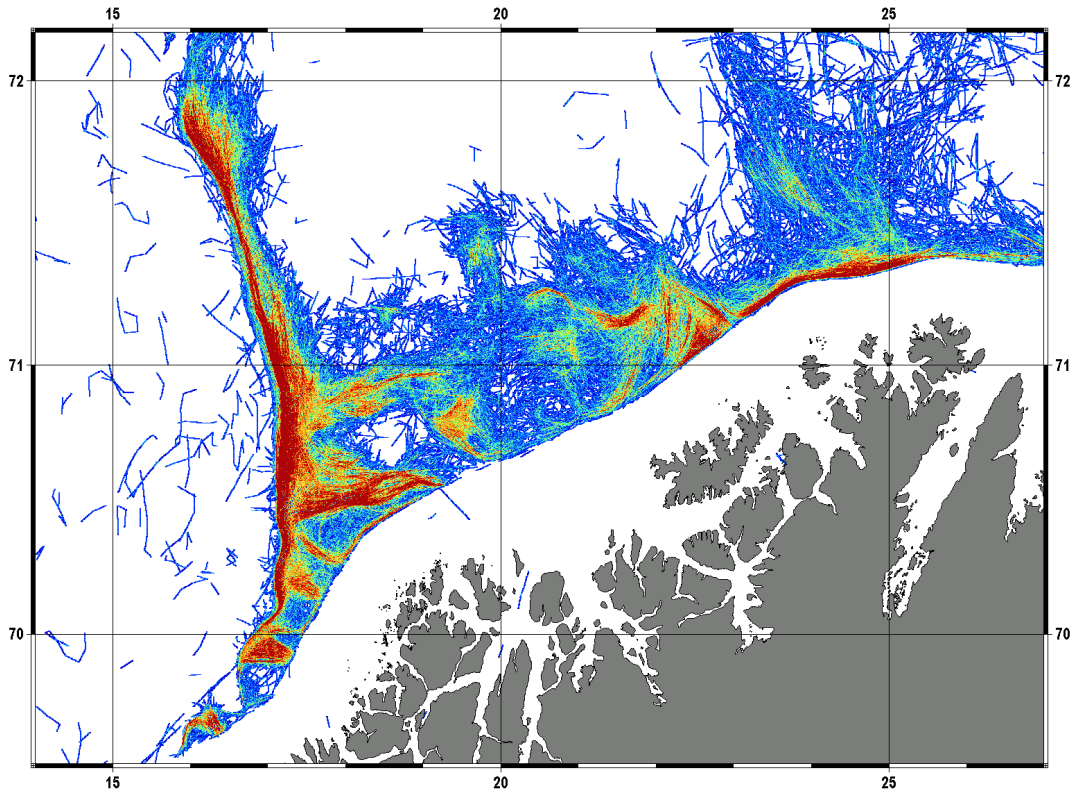

Figure 44 Distribution of trawl tracks in the south-western part of the Barents Sea in 2007-2009.

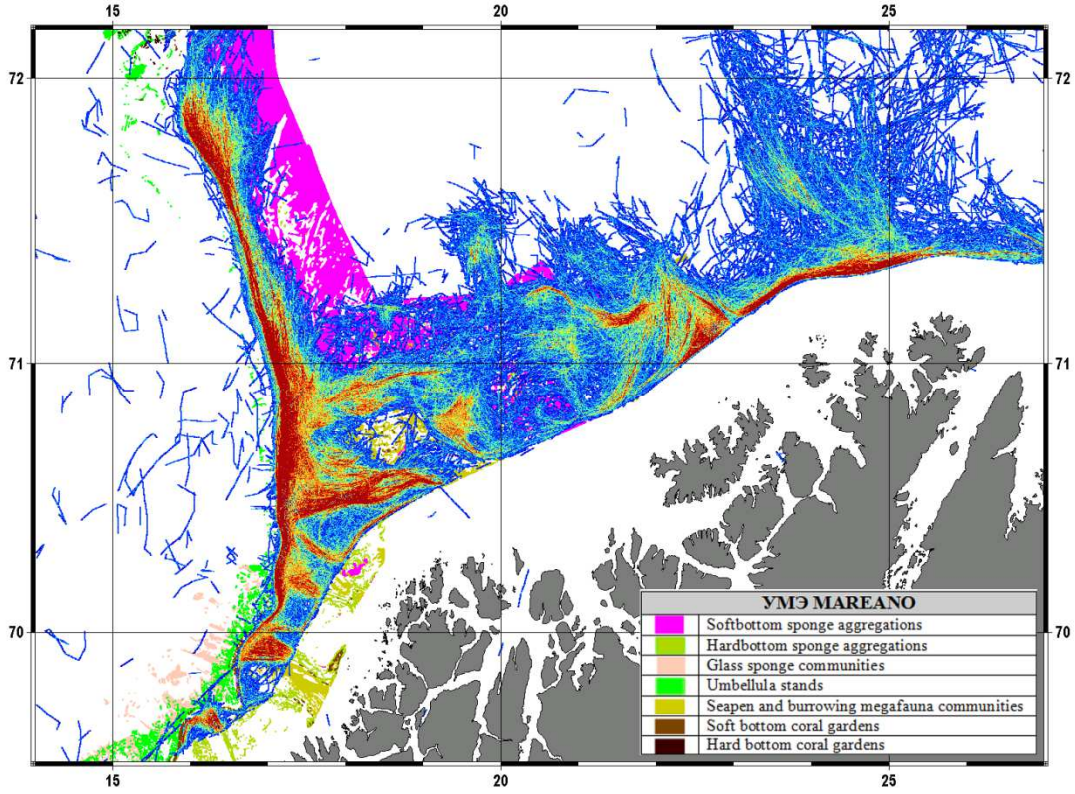

Figure 45 Overlay Map of trawl tracks on sensitive benthos (mareano data) in the south-western part of the Barents Sea in 2007-2009.

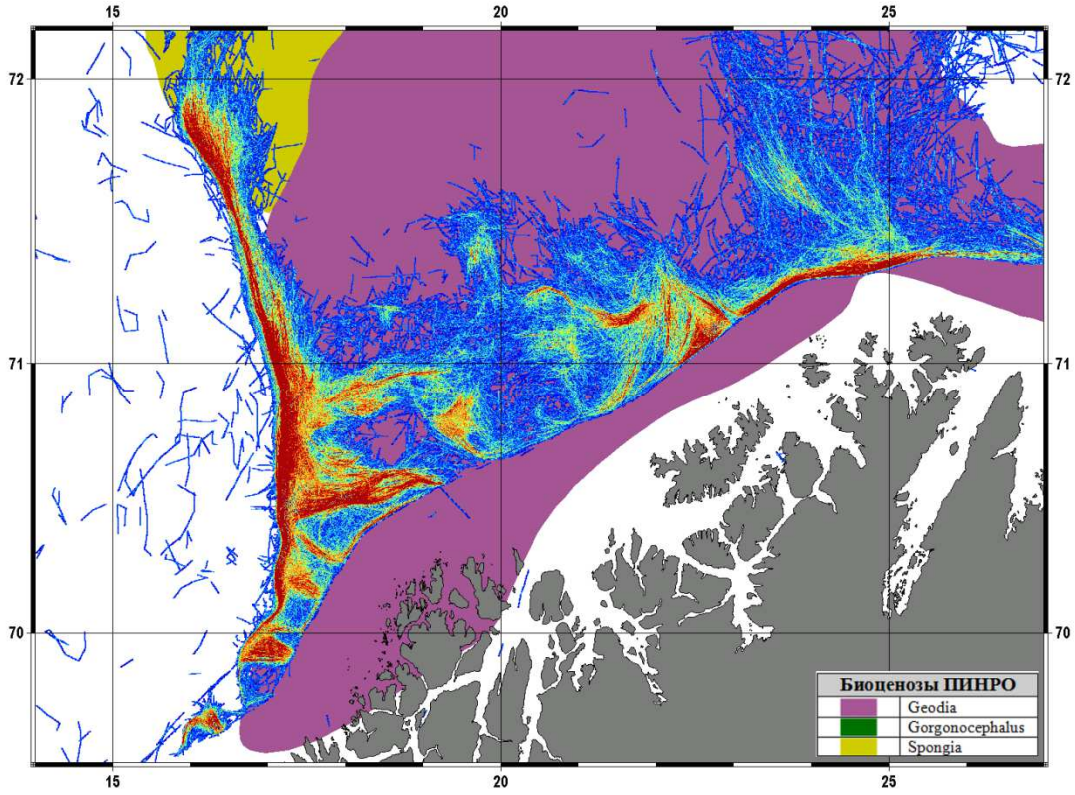

Figure 46 Overlay map of trawl tracks on major sponge community types (data from PINRO) in the south-western part of the Barents Sea in 2007-2009

3.4.6.3 Recovery, harm and baselines

The potential for recovery of benthic habitat after trawl impacts will depend on several factors:

- Species composition of the habitats and their reproductive/regenerative capacity;
- Source of seed or propagules from within or outwith the impacted area;
- Interactions with other species that may have taken over specific ecological niches or spaces (in other words possible "regime shift")
- Physical changes to habitat that may make it less suitable (e.g. sedimentation or conversely loss of sediment)

Most of the benthos of the Barents Sea has a relatively short life cycle (average around 4 years – Denisenko and Zgurovsky 2013) and therefore reproduces itself fairly rapidly. There is also a very substantial area of habitat mosaic whose components may serve as sources of propagule for impacted areas. It may therefore be assumed that most benthic communities, and especially those on relatively dynamic sediment bottoms, will recover most of their characteristics relatively quickly. VME and other habitats associated with hard bottoms will take much longer.

Denisenko and Zgurovsky (2013) consider recovery in some detail. They point out that benthic communities in the Barents Sea are rich (>2,800 species; average 60 species/0.1m2), that some of the coral structures are thousands of years old, and some sponges live for hundreds of years. Full recovery (in terms of complete restoration of age structures and species composition) is likely to take decades. Nonetheless there are examples of very rapid recovery of sponge communities. While these may not be the same as the original habitat in terms of age, size structure and species composition, it is arguable that they are nonetheless functioning, diverse and healthy habitats delivering a wide and comparable range of ecosystem services.

During the round table "Sustainable use of biological resources of the seas of Russia: Problems and Prospects" organized by the World Wildlife Fund (WWF) of Russia with support of the Karat Association (27-28 May 2013 in Murmansk) it was suggested that duration of community recovery is determined by the average life expectancy of the most long-lived species in the community. On this basis a community cannot be considered fully recovered prior to the time the longest-living member completes its entire life cycle. A map (see below) was developed based on this assumption which suggests that recovery in most parts of the Barents Sea would take place within 5 years, but recovery would be up to 10 years or more in the areas where VMEs tend to occur (such as sponge aggregations on the edge of the continental slope).

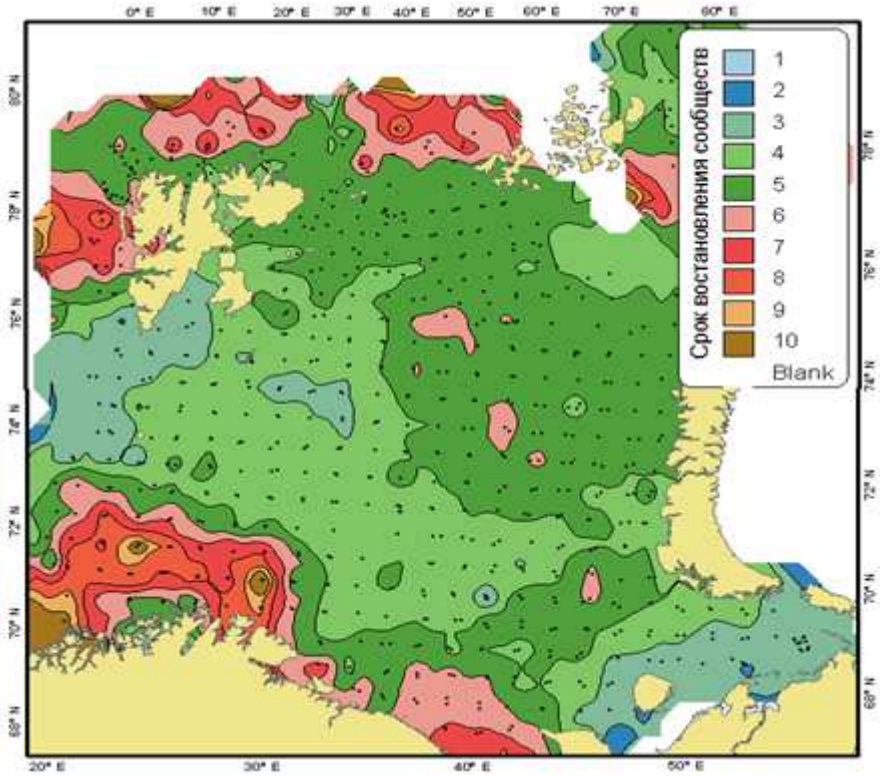

Figure 47 Map of the minimum recovery time (years) in the Barents Sea after megabentosa terminal effects (by Lubin, 2013)

However, this type of analysis begs the question: recovery to what? It is hard to define a "natural" state – many studies have shown the dynamism of the Barents Sea ecosystem and its relatively rapid response to changes in climate and oceanography. If the objective is to restore a productive habitat that supports ecosystem services (such as nutrient recycling, fisheries production) then it is arguable that there is no need for recovery since the benthic (sub)-ecosystem continues to function in these terms even after change caused by trawling. If the objective is species richness, most studies suggest that this peaks some years after disturbance but before "climax" communities are established.

For the purposes of MSC certification the key question relates to the meaning of "serious or irreversible damage". MSC guidance suggests that serious (or irreversible) harm refers to *change that fundamentally alters the capacity of the component to maintain its function (e.g. reducing ecosystem services; loss of resilience; regime shift; gross changes in composition of dependent species) or to recover from the impact (within timescales of natural ecological processes - normally one or two decades*).

Over significant areas of the Barents Sea, trawling activity for more than a century has led to modified benthic habitat comprised mainly of species that are less sensitive to trawling (because of size, shape or habit). There is no evidence to suggest that these changes have compromised ecosystem services – in terms of nutrient cycling, productivity, resilience, or fisheries production itself. There is some evidence for some overall loss of biodiversity attributable to trawling (though this is compounded by many factors), and it is likely that in the past there was significant destruction of what are now termed VMEs. It is possible that in some situations full recovery of the most vulnerable of these may never occur. However, given modern fishing technology and evolving benthic habitat maps it should be possible to avoid further damage to these habitats.

3.4.7 Ecosystem Management

Management measures designed to address specific ecosystem elements are described in the sections above. More general commitments and measures are as follows.

International and national commitments

Norway and Russia have 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.

3.4.8 Bycatch

There is a discard ban throughout the area, although elasmobranchs should be returned to the sea alive where possible. The ban has been described and assessed by Gullestad et al (2015).

Temporary or real time **closure of areas** coupled with a move on rule is currently implemented under Norwegian law where excessive bycatch is caught – both fish and benthic species.

3.4.9 Protection of benthic species and habitat

Protected areas

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. Furthermore the Norwegian government is committed to cooperate with Russia on "the establishment of an integrated Norwegian-Russian monitoring programme for the Barents Sea, particularly with the aim of assisting in the development of a Russian management plan for the Russian part of the Barents Sea"[14]

[14] http://www.regjeringen.no/en/dep/md/documents-and-publications/government-propositions-and-reports-/reports-to-the-storting-white-papers-2/2010-2011/meld-st-10-20102011/7.html?id=682132.
First update of the Integrated Management Plan for the Marine Environment of the Barents Sea–Lofoten Area. http://www.regjeringen.no/en/dep/md/documents-and-publications/government-propositions-and-reports-/reports-to-the-storting-white-papers-2/2010-2011/meld-st-10-20102011/4.html?id=682071

In the Russian zone there are some closed areas designed to protect commercially important juvenile fish and crab species, and one area designed to protect and serve as a baseline or reference zone for representative habitats and species.

Regulation and protocols

ICES advice. In its advice to NEAFC and NAFO, ICES lists seven VME habitat types for the North East Atlantic and the taxa and species that are most likely to be found in these habitats, and this serves as a basis for further identification and protection of VMES throughout the region.

Under the Biodiversity **Assessment of the Barents Sea** (Larson et al 2003) experts nominated areas of high conservation value for plankton, benthos, fish, seabirds and marine mammals. In the Norwegian sector this work was taken forward under the **Barents Sea Integrated Management Plan**, using criteria including productivity, number of species, endangered or vulnerable habitats, and important/ETP species. As a consequence, several areas were selected as closed areas designed mainly to protect coldwater corals and fish nursery areas. VMS tracks show that Russian Federation vessels avoided these areas. In the Russian sector, there are several special areas of importance to fisheries – such as exclusion zones to protect crab stocks – and one area designated to protect typical habitats of the Barents Sea. Again, VMS records show that these areas were avoided by the OT fleet.

The NEAFC recommendation on *the protection of vulnerable marine ecosystems in the NEAFC Regulatory Area* (which encompasses most of the Barents and all the Norwegian Sea) (NEAFC 2014) is specifically designed to "prevent significant adverse impacts on VMEs". Article 4 of the recommendation identifies "existing bottom fishing areas" in NEAFC regulated international waters. Article 5 defines a series of area closures for the protection of deep sea VMEs. These are mainly seamounts, mounds and banks in international waters of the NE Atlantic. Articles 6 and 7 require that any "exploratory fishing" outside existing fishing areas as defined in article 4 will require thorough assessment and rigorous protocols to ensure that appropriate information is collected and VMEs are not damaged. Article 8 sets down protocols for responding to any encounter with VMEs (defined as >30kg of live coral and/or >400kg of live sponge) – specifically to report the encounter and move at least 2nm from the relevant trawl track. Information should be collated and preferably mapped.

Norwegian regulations. Although this recommendation is not obligatory within national jurisdictions, Norway has largely implemented it within its own regulations (prior to the NEAFC recommendation). The Norwegian Ministry of Fisheries and Coastal Affairs regulates fishing with bottom gear in the fisheries protection zone around Svalbard. A new regulation, entered into force in 2011. This establishes a distinction between existing fishing areas (where the water depth is less than 1000 m) and new fishing areas (where the water depth is more than 1000 m) although the latter may be classed as existing fishing area if sufficient information is available. In existing fishing areas, a "move on" rule requires a vessel that catches more than 30 kg of live corals or 400 kg of live sponges in a single haul to cease fishing activities and relocate to a position at least two nautical miles from the position of the vulnerable benthic habitat that has been identified. The vessel must report the encounter to the Directorate of Fisheries, including the location and the type of habitat. Vessels must hold a special permit from the Directorate of Fisheries to fish in new fishing areas (>1000 m depth) application for which requires a detailed protocol for the exploratory fishery, including a harvesting plan describing fishing gear, target species, bycatch, dates and areas; a mitigation plan for avoiding damage to sensitive marine ecosystems; a plan for log-keeping and reporting; and a plan for collection of data on vulnerable benthic habitats. A scientific observer may also be required.

Russian regulations. The situation in Russia is less clear: Russia has been party to the process of developing VME advice and the NEAFC recommendation, but application of the rules and protocols has

not been formalized in Russian regulations. Nonetheless the fleet abides by these protocols and has worked with other MSC certified fisheries to develop an industry led management response. Initiative by MSC certified fisheries.

Industry initiative

All Russian companies (group of companies) that have their fisheries in MSC program have agreed to establish a Coordination Council for Development of Sustainable Fishery in the North East Atlantic, in order to harmonize the actions to improve the fisheries performed by the parties of this Coordination Council.

Initiative undertaken by the fleet under this agreement includes:

- Agreement to apply the *encounter and move on rules* for all their fishing activity;
- Agreement not to fish outside of the existing trawl fishery footprint (independently monitored and assessed by "Oceanmind".)
- All vessels are equipped with the MaxSea Navigation Software, allowing the crew to detect and record all habitats interactions including interactions with sponges and corals and incidents of hitting the sea bottom, damages of trawl gear, trawling routes and etc.
- Collaboration with PINRO and WWF Russia to improve analysis and mapping of this data so that areas can be identified that should be avoided by the whole fleet
- Collaboration with PINRO and WWF on development of less damaging fishing gear/nets

As a result of this initiative, WWF Russia has accumulated a great deal of data on the fishing activities of the MSC certified fleets and the distribution of this activity relative to VMEs and benthic habitats more generally. It has concluded that so long as fishing remains within the footprint, marginal damage to VMES is likely to be minimal.

3.5 Principle Three: Management System Background

3.5.1 Jurisdiction

The fishery takes place in the Norwegian Economic Zone and the Fishery Protection Zone around Svalbard, which is also under Norwegian jurisdiction. The certificate also covers UoA fisheries in the Russian Economic Zone. Cod and haddock are joint stocks, managed by the Joint Norwegian–Russian Fisheries Commission (JNRFC). Saithe is and exclusive Norwegian stock, for which Russia receives a share in mutual quota exchange.

3.5.2 Legal basis and management set-up

Barents Sea cod and haddock are shared stocks between Norway and Russia, while saithe is an exclusive Norwegian stock. Norway and the Soviet Union agreed in 1975 to set up a Joint Norwegian–Soviet (later: –Russian) Fisheries Commission (JNRFC) and to treat cod and haddock as joint stocks to be split 50/50 between them. (Capelin, Greenland halibut and red fish have later been added to the list, with varying distribution keys, all in Norway's favour.) The Commission sets TAC for the joint stocks and coordinates research, regulatory and enforcement cooperation between the parties. Within the context of the Commission, the parties also exchange quota shares of their respective exclusive stocks.

Norway and Russia set their own fishing rules in their respective economic zones, and for Norway in the Protection Zone around Svalbard as well. Since the mid-1990s, the two countries have worked actively to harmonize regulations in their respective zones, and around the turn of the millennium they jointly introduced significant new regulatory measures, such as obligatory use of VMS and sorting grids in trawls. Both countries have well-established systems for fisheries management, evolved over more than a century and now codified in the Norwegian 2008 Marine Resources Act and the 2004 Russian Federal Fisheries Act, respectively, and supplementary legislation. The most important practical fishing rules are found in the Norwegian Regulation on the Execution of Marine Fisheries, which is updated annually, and the Russian Rules for Fishing in the Northern Fishery Basin [Murmansk and Arkhangelsk Oblasts, the Republic of Karelia and Nenets Autonomous Region] of the Russian Federation, which were adopted in 2014 and last revised in 2017. These regulatory documents in both countries set rules, now largely harmonized between them, on closed areas, fishing gear (e.g. mesh size), by-catch and minimal allowable size of different species, among other things.

The executive body at governmental level in Norway is the Ministry of Trade, Industry and Fisheries, while the practical regulation of fisheries is delegated to the Directorate of Fisheries. Enforcement at sea is taken care of by the Coast Guard, which is part of the Royal Norwegian Navy, but performs tasks on behalf of several ministries, including the Ministry of Trade, Industry and Fisheries. Scientific research is performed by the Institute of Marine Research. Fisheries management authorities coordinate their regulatory work with that of other bodies of governance, for instance the Ministry of Climate and Environment and the Norwegian Environmental Agency, which are responsible for the implementation of the integrated management plans for different marine areas under Norwegian jurisdiction.

Within the Russian Government, fisheries policy falls under the purview of the Ministry of Agriculture (Minselkhoz). The implementing body for fisheries management under the Ministry is the Federal Fisheries Agency (FFA – in Russian: Rosrybolovstvo), which is the successor of the former State Committee for Fisheries (abolished in 2004), and in turn the Soviet Ministry of Fisheries. The Federal Border Service (since 2003 part of the Federal Security Service, the FSB) is responsible for enforcement at sea. The Barents and White Sea Territorial Administration of the Federal Fisheries Agency (BBTA – in

Russian: BBTU) was established in 2007 as the implementing body of the Federal Fisheries Agency in the Northern basin, located in Murmansk. Within the Russian Government, the Ministry of Agriculture interacts with other federal ministries, e.g. with the Ministry of Natural Resources and Environment (Minprirody) through its implementing Agency for Monitoring of Natural Resources (Rosprirodnadzor), which carries out environmental impact assessments of fisheries regulations. The Northern basin in practice includes Russian fisheries in the northern Atlantic, but if formally defined as covering fishing activities conducted from the follow four federal subjects (regions) of the Russian Federation: Murmansk and Arkhangelsk Oblasts, the Republic of Karelia and Nenets Autonomous Region. In practice, fisheries in the Northern basin are managed in and largely operated from Murmansk, although companies located in the other three regions also have quota shares (as have a few companies in the Western fishery basin, operated from St Petersburg).

3.5.3 Objectives

The precautionary approach has been in practical use by the JNRFC since the late 1990s, when ICES' precautionary reference points were adopted for the Barents Sea stocks. The harvest control rule established by the JNRFC in 2002 is explicitly founded on the precautionary approach. Likewise, the 2010 agreement between Norway and Russia on marine delimitation and cooperation in the Barents Sea explicitly states that fisheries management in the area shall be based on the precautionary approach.

The 2008 Marine Resources Act requires that Norwegian fisheries management be guided by the precautionary approach, in line with international treaties and guidelines, and by an ecosystem approach that takes into account habitats and biodiversity. The same objectives are found in the most relevant policy documents, such as the integrated management plan for the Barents and Norwegian Seas

Russian fisheries law defines protection and rational use of aquatic biological resources as the main goal of the country's fisheries management. 'Protection and rational use' was an established concept in Soviet legislation on the protection of the environment and exploitation of natural resources, and has remained so in the Russian Federation. 'Rational use' bears resemblance to the internationally recognized ideal of sustainability, insofar as the emphasis is on long-term and sustained use of the resource, supported by science for socio-economic purposes. The Federal Fisheries Act states that the protection of aquatic biological resources shall be given priority to their rational use. The precautionary approach is not mentioned explicitly, but the requirement to protect aquatic biological resources and take the best scientific knowledge into account equals the requirements of the precautionary approach, as laid out in the FAO Code of Conduct. Furthermore, the provisions of international agreements entered into by the Russian Federation stand above those of national law, according to the 1993 Russian Constitution. The Russian Federation has signed and ratified a number of international agreements which adopt the precautionary approach, including the 1995 UN Straddling Stocks Agreement, and works actively in international organizations or arrangements which explicitly adhere to the precautionary approach to fisheries management, such as ICES and NEAFC.

3.5.4 Stakeholders and consultation processes

Norway has a long tradition of including non-governmental organizations in fisheries management, with continuous consultation and close cooperation between governmental agencies and user-group organizations, in particular the Norwegian Fishermen's Association, but also the more specialized organizations such as the fishermen's sales organizations. As these organizations have regional branches, whose representatives are actively involved in policy-making, ensuring that local knowledge is also taken

into consideration in the management process. So-called Regulatory Meetings are organized twice a year are open to all; user-group organizations and NGOs attend on a regular basis. In addition, there is day-to-day contact by telephone and email between authorities, user groups and other interested parties. Distribution of the national quota between different gear and fishing fleets has in practice been delegated to the Norwegian Association of Fishermen, which includes all fishermen from the smallest coastal vessels to ocean-going trawlers. Technical regulation measures are to a large extent decided upon in direct consultations 'over the table' between authorities and user groups at the Regulatory Meetings. The Sami Parliament is formally consulted in the management of fisheries that are of historical importance to the Sami population.

Similarly, there is a strong Russian (and previously Soviet) tradition of stakeholder consultation in fisheries management. A formal arena for interaction between the Russian fishing industry and the government are the advisory bodies, the so-called fishery councils, found at federal, basin and regional levels. At the federal level, the Public Fisheries Council was established in 2008 on the basis of the requirement in the Federal Public Chamber Act to have a public council for most federal bodies of governance. Basin-level and regional fishery councils have existed since Soviet times, and the 2004 Federal Fisheries Act makes them mandatory for all basins and regions located on their territory. Rules of procedures for 'basin scientific and fishery councils' in the Russian Federation were adopted in 2008. They state that the councils shall advice on a wide range of fishery-related issues, including conduct of fisheries in the relevant region; control and surveillance; conservation; recovery and harvesting of aquatic biological resources; distribution of quotas and other issues of importance to ensure sustainable management of fisheries. The fishery councils consist of representatives of the fishing industry, federal executive authorities, executive bodies of the Russian federal subjects (the regions), research institutions and non-governmental organizations (NGOs), including the indigenous people of the North, Siberia and the Far East. Hence, in the Northern basin (see SI 3.1.1 a) above) both federal authorities (the FFA through its representation in Murmansk, the BBTA) and regional authorities (the Ministry of Fisheries and Agriculture under the Governor) meet regularly with representatives of the fishing industry (individual companies and associations such as the Fishing Industry Union of the North (FIUN) and the Association of coastal fisheries in Murmansk Oblast), and other stakeholders that have taken an interest in fisheries management in the region, notably WWF-Murmansk.

The current regulations of the Northern Basin Scientific and Fishery Council were given in 2002 and corresponding regulations for the Murmansk Territorial Fishery Council in 2005, stating, inter alia, that the council shall contribute to a harmonized fishery policy in the region, liaise between the fishing industry, fishery authorities, scientific institutions and NGOs. At a more general level, all new federal regulations in Russia have to go through public hearings; i.e. all draft proposals for new regulations have to be published at the website https://regulation.gov.ru, administered by the Ministry of Economic Development, where the public are given 15–30 days to provide their comments. Further, the FFA has a dedicated 'Open Agency' initiative which is comprehensively detailed on their website. In addition to the use of the Public Chamber and consultation bodies at lower level, this includes the use of internet conferences with citizens, reference groups to discuss policy initiatives, and a general objective to increase public access to information.

User groups from both countries also participate in the respective national delegations to the JNRFC and regular fishery consultations with third countries. Management authorities actively seek advice from user groups in preparation for the international consultations and negotiations.

3.5.5 Enforcement and compliance

All landings in Norway are registered by the Norwegian Fishermen's Sales Organization and checked towards catch information sent electronically to the Norwegian Directorate of Fisheries after each haul, as well as before entering the Norwegian Economic Zone (NEZ). The Norwegian Food Safety Authority checks all landings by foreign vessels in Norwegian ports, while the Directorate of Fisheries conducts physical inspections of at least 15 % of these landings. The Norwegian Coast Guard performs spot checks at sea (in the NEZ and the Protection Zone around Svalbard), including inspections at check points that foreign vessels have to pass when entering or leaving the NEZ and in connection with transshipments in Norwegian waters, which have to be reported in advance. Coast Guard inspectors board fishing vessels and control the catch from last haul (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculate the volume of the fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment.

In Russia, the FFA (in the northern basin: the BBTA as the Agency's regional branch) keeps track of how much fish each vessel and company (quotas are given to companies, not vessels in Russia) has fished at any moment, based on daily reports from each fishing vessels and accumulated reports each 15th day from all fishing companies, as well as VMS data. The Inspection Service of the Russian Border Guard, which is part of the Federal Security Service (FSB), conducts inspections at sea and in port. Fish caught in the REZ must be taken to Murmansk for customs clearance, but some of it is subsequently transshipped for export. The Border Guard conducts random inspections at sea, including from helicopters, during fishing, following the same procedures as the Norwegian Coast Guard, with inspection of documentation, fish from last haul, gear and catch in holds. It also conducts physical inspections of all transshipments at sea (weather conditions allowing) and at the control points that all foreign vessels – and Russian vessels having fished outside the REZ – have to go through when entering and leaving the REZ. When Russian vessels land in other European ports, they are subject to the NEAFC port state control scheme, which implies that the port state has to check with the flag state that the landed catch is counted towards a quota, inspect a share of the catch physically, and inform the flag state of the landed volumes. Both Norwegian and Russian inspectors have the authority to close an area with too much juvenile or bycatch (real-time closure).

Enforcement bodies on both sides – the Coast Guard and the Directorate of Fisheries in Norway and the BBTA and the Border Guard in Russia – cooperate closely in the enforcement of fisheries regulations in the Barents Sea, including running exchange of inspection data and more analytical material related to compliance, as well as regular exchange of inspectors both at sea and in port. Inspection procedures have also been harmonized between the two countries (see above).

Sanctions to deal with non-compliance in Russian and Norwegian waters exist in both countries' systems for fisheries management, as well as in their wider legal systems. Both make wide use of administrative fines and refer serious cases to the judicial system. The Russian Federal Fisheries Act requires the withdrawal of quota rights if a fishing company has committed two serious violations of the fisheries regulations within one calendar year, among other things. The Code of the Russian Federation on Administrative Infractions specifies the level of fines that can be issued administratively by enforcement bodies, e.g. up to RUR 5,000 for 'citizens', 50,000 for executive officers' and 200,000 for companies. The Criminal Code requires that illegal fishing such as causing 'large damage', conducted in spawning areas or migration ways leading to such areas, or in marine protected areas be penalized by either fines up to RUR 300,000 or an amount corresponding to 1-2 years' income for the violator, compulsory work of no

less than 480 hours, corrective work for at least two years or arrest for at least 6 months. The Norwegian Marine Resources Act opens up for 6 years' imprisonment for serious violations of fisheries regulations, but this applies only to Norwegian citizens. However, the fines issued for infringements of the fisheries legislation are significantly higher in Norway than in Russia. Alternatively, catch, gear, vessels or other properties can be confiscated. In the judgment of the seriousness of the infringement, the economic gain of the violation, among other things, is to be taken into consideration.

the Norwegian Coast Guard in 2015 carried out approx. 1500 inspections in both 2015 and 2016. In 2015, 293 inspections (20 %) resulted in a warning and 44 inspections (3 %) in a fine or prosecution. In 2016, 74 inspections (4.7 %) resulted in a fine or prosecution. The Russian Border Guard in 2016 performed 3629 inspections; this includes both at-sea and port inspections, and the REZ as well as NEAFC waters and the Protection Zone around Svalbard (where Norway allows Russian enforcement authorities to inspect Russian vessels). 208 infringements (in 5.7 % of inspections) were revealed. This can be considered a relatively high level of compliance in a large-scale fishery such as the Barents Sea demersal fisheries, especially taking into account that none of these infringements were of a serious nature. The infringements were mainly related to procedure, such as delay in sending in documentation, or failure to report in the catch log fish that the crew had kept on board for personal consumption (typically in the amount of 200-300 kg). Both Norwegian and Russian enforcement authorities operate on a risk-based framework and give priority to discard of fish, e.g. through the use of helicopters for impromptu inspection. Two instances of discard were detected and sanctioned in 2016 and none in 2017. Both the Norwegian Coast Guard and the Russian Border Guard work proactively with the fishing industry to avoid discard and regularly organize seminars and meetings with the industry on this topic. Studies show that the close relations between inspectors and fishers in the Barents Sea, with inspectors taking more of a consultative than policing role vis-à-vis the fishing fleet, has contributed to a high level of compliance.

3.5.6 Review of the management system

The working of the JNRFC has been subject to several comprehensive evaluations over the last decade or so. After its session in 2004, it commissioned an anniversary edition from an independent researcher to be published at its 30 years anniversary in 2006. Furthermore, the Russian Auditor General invited his Norwegian counterpart to conduct a parallel audit of the Barents Sea fisheries in 2005. After this work was finished in 2007, the two parties continued to monitor developments and published a follow-up report in 2011. The fishery-specific management system is also subject to various forms of review by ICES. For instance, ICES has reviewed the harvest control rules for cod and haddock. There is a comprehensive system of routine monitoring of information relevant for management decision making and stock assessment purposes, although not of the management system as such.

Within Russia, there are various mechanisms in place to evaluate key parts of the fishery-specific management system, but at varied levels of ambition and coverage. At the fishery councils meetings, found at federal, basin and regional levels, management authorities receive feedback on management practices from the industry and other interested stakeholders, including NGOs. The FFA and the Ministry of Agriculture report annually to the Government and the Presidential Administration about their work, with emphasis on achievements in the fishing industry. Other federal agencies also review parts of the fisheries management system. For instance, the Auditor General evaluates how allocated funds are spent, and the Anti-Monopoly Service how competition and investment rules are observed. Within FFA, there is regular review of the performance of the Agency's regional offices. In the establishment of TACs, the scientific advice from PINRO is peer reviewed by the federal fisheries research institute, VNIRO, and then

forwarded to FFA and the federal natural resources monitoring agency Rosprirodnadzor for comments. It is also presented to the general public for discussion at public hearings, announced in the local press.

In Norway, management authorities receive feedback on management practices from the industry and other interested stakeholders, including NGOs, at the Regulatory Meetings that take place twice a year (see PI 3.1.2 above). The enforcement component of the management system is subject to continuous evaluation at meetings between the various bodies involved in enforcement activities, where priorities are hammered out on the basis of risk-based monitoring of past experience. The international side to the Norwegian fisheries management system is reviewed by the Parliament upon submission by the Government (through the Ministry of Trade, Industry and Fisheries) of annual reports on the agreements concluded with other states for the coming year, and the previous year's fishing in accordance with such agreements. The Office of the Auditor General conducts annual reviews of the financial performance of the fishery management system.

4 EVALUATION PROCEDURE

4.1 Harmonised Fishery Assessments

CABs assessing overlapping fisheries shall ensure consistency of products and outcomes so as not to undermine the integrity of MSC fishery assessments.

There are several other fisheries targeting NEA cod, haddock and saithe that are already MSC Fishery certified or undergoing the certification process (Table below).

Information from the assessment reports on the fisheries which directly or partially overlap with the unit of assessment (presented in Table 8) has been used to validate the evidence presented here. In order to ensure consistency of outcomes in assessments of overlapping fisheries, the following activities were undertaken:

- Coordinated certification process
- Use of common assessment trees
- Sharing of fishery information
- Harmonisation of conclusions, scoring and conditions

Fishery	Species	Gear types	Locations	Version of assessment tree	MSC status
AGARBA Spain Barents Sea cod	Cod (Atlantic) (*Gadus morhua*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified
Compagnie des Pêches Saint Malo and Euronor cod and haddock	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified
FIUN Barents & Norwegian Seas cod and haddock	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*)	Hooks and Lines - Longlines Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified
Arkhangelsk Trawl fleet Norwegian & Barents Seas cod, haddock & saithe	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified
Barents Sea cod, haddock and saithe	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls - otter trawls	North East Atlantic (FAO Area 27)	1.3	Certified
UK Fisheries Ltd/DFFU/Doggerbank North East Arctic cod, haddock and saithe	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls - otter trawls	North East Atlantic (FAO Area 27)	1.3	Certified with component(s) in assessment

Fishery	Species	Gear types	Locations	Version of assessment tree	MSC status
Russian Federation Barents Sea cod and haddock	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified with component(s) in assessment
Norway North East Arctic cod	Cod (Atlantic) (*Gadus morhua*)	Gillnets and Entangling Nets - Gillnets Hooks And ...	North East Atlantic (FAO Area 27)	1.3	Certified
Faroe Islands and Iceland North East Arctic cod, haddock and saithe	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified with component(s) in assessment
Greenland cod, haddock and saithe trawl fishery	Cod (Atlantic) (*Gadus morhua*), Haddock (*Melanogrammus aeglefinus*), Saithe (*Pollachius virens*)	Trawls - Bottom trawls	North East Atlantic (FAO Area 27)	1.3	Certified

Table 11 MSC certified fisheries for cod, haddock and saithe in the Barents Sea. Source: Download from MSC.ORG 12/3/2018

Given the considerable number of MSC assessments that have been carried out on similar fisheries in the Barents Sea, it is not feasible to compare individual scores between the client fishery and every other UoC. but to identify those PIs where the current fishery scored outside the main range of all UoCs and where there is a material difference to the outcome between fisheries. This is particularly important where other fisheries have scored below 80 and a condition

There is no material difference in scores in regards to P1 assessment of cod, haddock and saithe and in regards to P3 assessment of saithe. For P2, the score range of other fisheries is compared to the current fishery:

	Score Range (current assessment)
2.1.1	70-85 (80)
2.1.2	75-95 (95)
2.1.3	70-90 (80)
2.2.1	80-100 (80)
2.2.2	80-100 (90)
2.2.3	80-100(80)
2.3.1	75-90 (85)
2.3.2	75-85(80)
2.3.3	75-80 (80)
2.4.1	60-80 (80)
2.4.2	60-85 (85)
2.4.3	75-95 (90)
2.5.1	80-100 (90)
2.5.2	80-100 (80)

2.5.3	85-100 (90)

Table 12 Harmonisation Principle 2. The present scoring is shown in brackets.

The scores for the present assessment are broadly in agreement with the more recent assessments, which tend to be slightly higher than earlier assessments. This is because the provisions, protocols and initiatives for environmental management have evolved over time and are now more consistently applied across the Barents Sea trawl fishery. The assessment team noted the harmonisation efforts on 2.4 (Habitats) that took place in March 2017.

The assessment team found no basis for change in the scoring of P2.

4.2 Previous assessments

4.2.1 Summary of the original assessment

The original assessment included Barents Sea cod and haddock. The intent of the Russian Federation Barents Sea cod and haddock fishery to become MSC certified was announced on 21 March 2013, and the fishery received its certification on 6 May 2014. Scope of certification is up to the point of landing and chain of custody for the client vessels commences following the sale of cod and haddock products and identifiable by-products, as specified in the PCR (section 5), at the point of landing (auction, cold/freezer store or processing plant) either directly from the client vessels or via transhipment. Land-based processing plants as w ell as cold/freezer stores that perform anything more than movement of product must have separate CoC certification.

The default assessment tree, set out in the MSC Certification Requirements, version 1.2, was used for the initial assessment. The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any of the individual MSC Criteria. In the initial certification, the scores of the three principles were:

Principle	Russian Federation Barents sea cod	Russian Federation Barents sea haddock
Principle 1 – Target Species	98.1	91.9
Principle 2 – Ecosystem	87.0	87.0
Principle 3 – Management System	89.9	89.9

Table 13 Principle scores – Original assessment

The fishery did not achieve a score of below 80 against any scoring indicators, and no conditions were thus set for the fishery following the initial assessment. The assessment team set three recommendations for the fishery.

4.2.2 First annual surveillance – 2015

The first surveillance audit was performed as a remote audit with a review of new information. The surveillance audit was conducted according to MSC CR v1.3. The default assessment tree as set out in the MSC CR v1.2 was used for this surveillance. The surveillance was announced on the MSC website 24 March 2015 followed by a supporting notice to stakeholders issued by the MSC on the same date. Direct email notification was also sent to the stakeholders previously identified for this fishery, inviting interested parties to contact the audit team.

The document review activities for the fishery were carried out by members of the original assessment team, DNV GL team leader and CoC expert Anna Kiseleva and independent MSC Fisheries expert John Nichols during week 19 (4-5 May), 2015.

The assessment team gathered input from the various stakeholders, including the Federal Agency for Fisheries of the Russian Federation Barentsevo -Belomorskoe Territorial Departement, Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO) and the client fishery.

4.2.3 Second annual surveillance – 2016

The second surveillance audit was performed as an off-site audit with a review of new information. The surveillance audit methodology, as defined in the MSC Certification Requirements (CR) (version 2.1) and in the subsequent MSC Guidance for the Fisheries Certification Requirements (version 2.0) were followed in this audit. The default assessment tree as set out in the MSC CR v1.3 was used for this surveillance. The surveillance was announced on the MSC website 7 June 2016 followed by a supporting notice to stakeholders issued by the MSC on the same date. Direct email notification was also sent to the stakeholders previously identified for this fishery, inviting interested parties to contact the audit team.

The document review activities for the fishery were carried out by members of the original assessment team, DNV GL team leader and CoC expert Anna Kiseleva and Independent MSC Fisheries expert John Nichols during 8 -15 July 2016.

The assessment team gathered input from the various stakeholders, including the Federal Agency for Fisheries of the Russian Federation Barentsevo -Belomorskoe Territorial Departement, Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO) and the client fishery.

4.2.4 Third annual surveillance – 2017

The third surveillance audit was performed as an off-site audit with a review of new information. The surveillance audit methodology, as defined in the MSC Certification Requirements (CR) (version 2.1) and in the subsequent MSC Guidance for the Fisheries Certification Requirements (version 2.0) were followed in this audit. The default assessment tree as set out in the MSC CR v1.3 was used for this surveillance. The surveillance was announced on the MSC website on 14th June 2017 followed by a supporting notice to stakeholders issued by MSC on the same date. Direct email notification was also sent to the stakeholders previously identified for this fishery, inviting interested parties to contact the audit team.

The document review activities for the fishery were carried out by member of the original assessment team Independent MSC Fisheries expert John Nichols and DNV GL team leader and CoC expert Sandhya Chaudhury during 17 -21 July 2017.

4.2.5 Fourth annual surveillance – 2018

The fourth surveillance audit was performed as an on-site audit and coordinated with the re -assessment activities for the same fishery.

The surveillance audit methodology, as defined in the MSC Certification Requirements (CR) (version 2.1) and in the subsequent MSC Guidance for the Fisheries Certification Requirements (version 2.0) were followed in this audit. The default assessment tree as set out in the MSC CR v1.3 was used for this surveillance. The surveillance was announced on the MSC website 18. December 2017 followed by a supporting notice to stakeholders issued by the MSC on the same date. Direct email notification was also sent to the stakeholders previously identified for this fishery, inviting interested parties to contact the audit team.

The surveillance activities for the fishery were carried out by members of the original assessment team, DNV GL team leader and CoC expert Anna Kiseleva and Independent MSC Fisheries expert John Nichols during 22-26 January 2018 in Murmansk, Russia. The assessment team gathered input from the various stakeholders, including the Federal Agency for Fisheries of the Russian Federation Barentsevo - Belomorskoe Territorial Departement, Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO), W W F and the client fishery.

4.2.6 Summary of Previous Assessment Conditions

Conditions: The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 80 against any MSC Criteria. Neither a condition nor a client action plan were therefore required prior to certification being granted.

4.3 Assessment Methodologies

The assessment was carried out according to the Fisheries Certification requirements, version 2.0. The 'MSC Full Assessment Reporting Template v 2.0 has been used to produce this report. The default assessment tree from Certification Requirements v 1.3 was used without adjustments

The risk based approach (RBF) was not applied.

4.4 Evaluation Processes and Techniques

4.4.1 Site Visits

Relevant stakeholders were identified and stakeholder meetings were scheduled and carried out as planned in Murmansk (Russia) From 2018-01-22 to 2018-01-25. Persons consulted and key issues discussed during these site-visits are outlined below. Information gathered was used as a basis for this report and is presented throughout several chapters and in the scoring tables.

Monday 22.01.2018 Murmansk

Time/ Venue	Name of organisations and key topics discussed	Participants

09:30 – 13:00 Shmidta 43 183038 Murmansk Russia	**JSC "Strelets", JSC "Taurus", JSC "Eridan":** Basic info about 3 companies, Review of fishing operations, Review of impact on ecosystem, Compliance with rules and regulations, Chain of Custody start.	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **JSC "Strelets", JSC "Taurus", JSC "Eridan":** Igor Grekov and representatives from the companies.
14.00-17.00	**Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO):** • PINRO (function, role and responsibility) • Role in stock assessments • Sampling programmes and level of sampling, surveys • Integration of Russian national data collection programmes and stock assessments with ICES assessments. • Stock status, stock structure and recruitment of cod, haddock and saithe • Review of Limit and Target reference points established for the stocks • Harvest strategy and harvest control rules • Short-term and long-term management objectives for Russian fisheries, incl. cod, haddock and saithe • Monitoring programmes for non-target species • Level of discards (composition of species, quantities) • Level of by-catch (composition of species, quantities) • Monitoring programmes for ETP species. Can extent of interactions with ETP species be quantified • Strategy for minimising/ eliminating ETP/ by-catch • Impact of cod, haddock and saithe fisheries on marine habitats. • *Strategy/ plans for protection of sensitive habitats.* • Research on low ecological impact fishing gear • *Impact of cod, haddock and saithe fisheries on ecosystem.* • Ecological role of the cod, haddock and saithe stock • Ecosystem surveys in the Barents Sea • Strategy in scientific research. Research programmes for cod, haddock, saithe and other important species.	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **PINRO:** Victoria Egochins, Ergeny Shamray, Nina Partileesa, Yury Kovalev, Andrey Dolgov, Konstantint Sokolov, Pavlenko Alexander

Tuesday 23.01.2018 Murmansk 09:00-11:00 Kominterna 7, 183038 Murmansk	**BBTU/Federal Agency for Fishery:** • BBTU/ Federal Agency for Fishery *(function, role and responsibility)* • Russian Federation Fishery strategy • Harvest strategy, Short-term and long-term management objectives, Precautionary approach in management of marine resources • Consultation and decision-making process for the cod, haddock and saithe stocks. Stakeholder involvement in decision-making. • Review of regulations for cod, haddock and saithe in ICES division I and II (International waters of NEAFC, Norwegian EFZ, Russian EFZ, Svalbard FPZ) • Control, surveillance and monitoring routines/regulations applied to Russian cod, haddock and saithe fisheries in ICES I and II (NEAFC, Norwegian EFZ, Russian EFZ, Svalbard FPZ) • Logbooks: recording of non-commercial species • Fishermen's compliance with laws and regulations. Significant discrepancies found at landing control for cod, haddock and saithe and fisheries in 2017-2018. • Quota and level of catches (2017-2018) • Observed fishing patterns (gear used, fishing area, fleet composition, fishing season). • Level of discards in cod, haddock and saithe fisheries. • VMS data for Russian cod, haddock and saithe trawl fleet in 2017-2018	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **BBTU:** Participants to be agreed
11:30-12:30	**Ministry of Agriculture and Fisheries, Murmansk Region:** • function, role and responsibility of the Ministry • Role of cod, haddock and saithe fisheries in Murmansk Region • System for resolution of legal disputes • Legal rights of people (minority groups) depending on cod, haddock and saithe fishing for food and livelihhod • Consultation and decision-making process • Incentivies for sustainable fishing	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **Ministry of Agriculture and Fisheries, Murmansk Region** Anolzeg Alekseev, Arten Badabaev
13:30-14:30	**FSB/Boarder service:** • FSB/ Boarder service *(function, role and responsibility)* • Review of regulations for Barents Sea cod and haddock fisheries in Russian EFZ • Control, surveillance and monitoring routines applied to Russian cod and haddock fisheries • Fishermen's compliance with regulations. Significant non-compliances found during inspections in 2017-2018. Extension of historic fishing patterns into new fishing areas. • Observed fishing patterns (gear used, fishing area, fleet composition, fishing season). • Level of discards in cod and haddock fisheries. • VMS data for Russian cod, haddock and saithe fleets in 2017-2018	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **FSB/Boarder service:** Participants to be agreed

15:00-17:00 Karl Libknehta 15A-23	**WWF Russia:** • WWF Russia (function, role and responsibility) • Role of cod, haddock and saithe fisheries in Murmansk Region • Review of stakeholder groups • Legal rights of people (minority groups) depending on cod, haddock and saithe fishing for food and livelihhod • Consultation process in cod, haddock and saithe fisheries • Incentivies for sustainable fishing • Information on ETP species and sensitive marine habitats. Status and content of national ETP "red lists" • Coordination and mapping of benthic and other ecological information to facilitate avoidance of sensitive habitat and ETP. Associated legally binding and voluntary protocols • Estimated impact of cod, haddock and saithe fisheries on ETP species and sensitive marine habitats • Level of discards (composition of species, quantities) • Level of by-catch (composition of species, quantities) • Fishermen's compliance with rules and regulations. • Other issues of concern.	**DNV GL** John Nichols John Hambrey Geir Hønneland Anna Kiseleva **WWF Russia** Aleksey Golenkevich (WWF), Igor Galin (Captain)

4.4.2 Consultations

Information on the assessment process was made publicly available through www.msc.org at given stages of the assessment according to the given requirements. In addition to that, all relevant stakeholders identified at the beginning of the assessment were reached through direct e-mails and given a possibility to monitor the assessment process and provide a feedback to the assessment team.

As no stakeholder comments were submitted during the stakeholder consultancy period prior to the site visit in Murmansk, information gathered during the site visits formed the main basis of the stakeholder consultancy for this assessment.

4.4.3 Evaluation Techniques

The full assessment was publicly announced on September 27th 2017 through www.msc.org

At the beginning of the assessment, the assessment team compiled a stakeholder list based on guidance from the client. The list has been used at every stage of the consultation process undertaken for Russian Barents Sea cod, haddock and saithe fishery. Site visits were performed in 22 -26 January 2018.in Murmansk, Russia and conducted by members of the assessment team as specified above. Stakeholder consultations were performed in the form of direct meetings. Information on meeting's participants and issues discussed could be found in table above. The performance indicators and the pertaining scoring systems were evaluated jointly by the assessment team and all scoring was based on unanimous conclusions by the entire team during the scoring meeting which took place in Murmansk during the last days of the site visit.

The RBF was not used for this assessment.

Component	Scoring elements	Main/not main	Data-deficient or not
P2 Retained species	Northern wolffish	Not main	Data deficient
	Spotted wolffish	Not main	Data deficient
	Atlantic woflfish	Not main	Data deficient

	Beaked redfish	Not main	Data deficient
	Golden redfish	Not main	Data deficient
	Greenland halibut	Not main	Data deficient
	American plaice	Not main	Data deficient
	European plaice	Not main	Data deficient
	Elasmobranchs and other	Not main	Data deficient
P2 Habitats	Cold water coral reef		
	Hardbottom coral garden		
	Softbottom coral garden		
	Seapen fields		
	Ostur sponge aggregations		

Table 14 Scoring elements

5 TRACEABILITY

5.1 Eligibility Date

In case of successful re-certification outcome, products from the fishery under re-assessment will be eligible to be sold as MSC certified or bear the MSC ecolabel from the date of the recertification. All the traceability and segregation systems in the fishery are already implemented.

5.2 Traceability within the Fishery

Traceability up to the point of first sale has been scrutinised as part of this assessment and the positive results reflect that there is a sufficient system of tracking and tracing in place (incl. control, monitoring and recording systems) to ensure that all cod, haddock and saithe products originating from the fishery under re-assessment could be identified prior or at the point of landing. Due to the strict system of control, monitoring and enforcement, there is no opportunity for the client vessel to substitute certified cod, haddock and saithe products with noncertified prior to or at the point of landing. All client catches taken in the UoA are properly reported, labelled and recorded. Thus, no specific risk factors related to traceability have been identified by the assessment team.

Client vessels have permissions to fish in the Svalbard FPZ, in international waters of NEAFC, in Norwegian EZZ and in Russian EEZ and require a license to fish in all areas issued by the Russian authorities. But vessels primarily operate in Norwegian EEZ and Svalbard FPZ. In NEAFC waters catches of cod, haddock and saithe are very low (NEAFC grounds are mostly fished for shrimp) therefore client vessels chose not operate there.

In all areas, client vessels have a Vessel Monitoring System (VMS) on board and must complete log books. Log-books and sales notes are regularly inspected and cross-checked both by Norwegian and Russian authorities. In addition to that, vessels targeting cod, haddock and saithe in the Barents Sea are subject to a routine boarding and inspection, spotter planes, reporting to checkpoints when crossing international boundaries and reporting prior to landing.

From 2007, NEAFC port state control requires authorisation to land from the vessel flag state to the port state before foreign fishing vessels will be authorised to land their products in the designated ports.

A catch certification scheme by the European Union (EC no 1224/2009) was implemented in 2010 to ensure full traceability of all marine fishery products traded with the European Community. Fishery products can now only be imported into the European Community when accompanied by a catch certificate, issued by the competent authorities of the flag State certifying that the catches concerned have been made in accordance with applicable laws, regulations and international conservation and management measures. This applies to both directly landed and transhipped products.

5.2.1 Transshipment at sea

The nature of the client operation involves long fishing trips, which can last up to several months. In order to save on fuel costs, vessels may discharge catches directly at sea and upload them on board of the transhipment vessels. Transhipment activities were considered as a high risk-factor in the past, when the level of IUU was high. Today the IUU level is considered to be negligible and transhipment operations are regulated in all areas of the Barents Sea and enforced accordingly. Transhipment activities are governed by the laws of the country in which waters the discharge at sea is taking place. In Norwegian EEZ, the Norwegian regulations apply. Discharge in the Russian EEZ is governed by the laws of Russian

Federation (E.g. Law on state border, law on the exclusive economic zone of the Russian Federation, the Fisheries Act, Government regulation 468). In convention areas of NEAFC, the transhipment activities are now regulated by the NEAFC - Scheme of control and enforcement (www.neafc.org).

In addition to that, in order to avoid any risk connected to the transhipment, the client operates with the trusted suppliers/ transhipment companies. It should be also noted that all client's cod, haddock and saithe catches which are being transhipped are packed and labelled accordingly in order to ensure that client catches can be easily identified and separated from other fish.

5.2.2 Processing on board

All client vessels are processing, freezing, packing and labelling at sea. This is permitted within the scope of this certificate and has been considered as part of this assessment.

Client processing activities at sea are conducted in a manner to ensure maximum utilization of the marine resources and minimum waste. Thus, by products from cod, haddock and saithe are often landed for further utilization and processing. Main by-products include: liver (incl. canned cod liver), milt and roe, heads and tails, cheeks and tongues, stomachs.

All species taken on board are inspected for quality, sorted by specie type and size and stored in separate containers before they are sent to the processing. Heads and tails are also sorted per specie type as heads will for example undergo further processing with cheeks and tongues being removed. There are no by-catch species taken in the fishery that could be mistaken for cod, haddock and saithe before or after processing. Saithe fillets for example has different (greyish) colour compare to cod and haddock fillets. In regards to segregation between cod and haddock, all crew members working with processing are experienced personnel and the chances of a human mistake during sorting activities prior to or during processing are negligible. During processing species are segregated and processed by type. All stages of processing undergo quality checks with more rigorous inspection and weighing taking place before freezing and packing. All customer vessels are equipped with Marel K60 automatic weighing and sorting system and with electronic weights Marel M2200. Fish processing is conducted in accordance with approved Technological Instructions developed in cooperation between the client fishery and PINRO.

All products and by-products are packed in a way that their packaging could not be opened without damaging the packaging. Big-size species (over 2 kg) which are often presented as HG are packed in sealed paper polypropylene bags. Smaller size species (under 2 kg) which are often filleted are packed in sealed carton boxes. All products are clearly labelled with the following information: Species, Product category, Fishing area, Gear type, Date of production, Vessel name and Company name and address.

Unloading and onward transport is typically on pallets, wrapped in transparent film and labelled as described above.

5.2.3 Points of landing

Main points of landing for the client fleet are: Norway (Tromsø, Hammerfest, Hønninsvåg, Ålesund); Russia (Murmansk, Saint-Petersburg, Kaliningrad) and Holland (Velsen, Ijmuiden, Eemshaven)

All landings are subject to inspection from the authorities of the respective countries. The scope of inspections also covers laboratory testing of the species.

5.2.4 Traceability risk factors

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery	None: No non-certified gear is used onboard the UoA on the same trips as the certified gear. Client vessels are bottom trawler vessel and do not operate with other gears other than trawl. Gear type is subject to control and inspection in all areas where vessels are operating and there is no possibility for vessels to operate with another type of gear without being detected. According to fisheries inspection authorities of Russian Federation, there are no cases of non-compliance related to the gear type used, registered for Russian trawl fleet in the last 5 years.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	None: The client has a licence to operate throughout the entire area of distribution of NEA cod, haddock and saithe and therefore do not fish outside the UoA or in different geographical areas (on the same trips or different trips).
Potential for vessels outside of the UoC or client group fishing the same stock	Negligible: There are several fleets and nations (main nations are Norway and Russia) targeting cod, haddock and saithe in the Barents Sea, which are not part of the UoA. Fishing activity and catches of these fleets are controlled and monitored with the same degree of rigor as for the client vessels. Therefore, there is no risk related to traceability involved in other fleets targeting the same stocks. Those vessels could not sell their catches on behalf of the client group and client group could not tranship their catches to another fishing vessel without this activity being detected on VMS by Russian or Norwegian authorities. Therefore, products from outside the UoA will not be able to enter CoC.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	None: There is no risk of mixing certified and non-certified cod, haddock and saithe during storage, transport, or handling activities. Products from outside the UoA are not handled by client. There are clear visual differences between cod, haddock, saithe and other retained species taken by client. All species are separated and sorted directly on-board. Quantities of cod, haddock and saithe are recorded and reported to the authorities on a daily basis. All products are packed in a way that their packaging could not be opened without damaging the packaging. See "processing at sea" chapter above for more info. All products are clearly labelled with the following information: Species, Product category, Fishing area, Gear type, Date of production, Vessel name and Company name and address.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	None: There is no risk of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody) as client group does not handle non-MSC catch during processing at sea. There are also no other retained species which could be mistaken for cod, haddock and saithe in the client's operations. All products processed on-board are clearly labelled with the following information: Species, Product category, Fishing area, Gear type, Date of production, Vessel name and Company name and address.
Risks of mixing between certified and non-certified catch during transhipment	None: Transhipment to the transport cargo at sea is allowed in the Barents Sea. Transhipment activities of all vessels targeting cod, haddock and saithe is closely monitored by Russian and Norwegian authorities with no room for fraud or mislabelling non-certified catches as certified. See transhipment chapter above for more info.

Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	None identified.

Table 15 Traceability risk factors within the fishery

5.3 Eligibility to Enter Further Chains of Custody

Frozen at sea cod and haddock products and identifiable by-products originating from Russian Federation Barents Sea cod, haddock and saithe fishery will be eligible to enter Chain of Custody and carry the MSC logo in the case of successful certification.

Frozen at sea cod, haddock and saithe products eligible to enter chain of custody are, but not limited to: cod h/g frozen at sea, haddock h/g frozen at sea, saithe h/g frozen at sea, cod fillets frozen, haddock fillets frozen and saithe fillets frozen

Frozen at sea identifiable by-products eligible to enter chain of custody are: liver, milt and roe, heads, tails, cheeks and tongues and stomachs.

Canned at sea by-products: canned cod liver

Fish meal is not covered by this certification. In order to include fish meal into certification, the separate CoC certification of processing operations on board shall be required.

Chain of custody for the client vessels will commence following the sale of cod, haddock and saithe products and identifiable by-products, as specified above, at the point of landing (auction, cold/freezer store or processing plant) either directly from the client vessels or via transhipment.

Land-based processing plants as well as cold/freezer stores and auction houses that perform anything more than movement of product must have separate CoC certification.

Conclusion and determination	Cod, haddock and saithe products will be eligible to enter further certified chains of custody and be sold as MSC certified or carry the MSC ecolabel
List of parties, or category of parties, eligible to use the fishery certificate and sell product as MSC certified	The only eligible party to use the certificate is the client group and vessels owned by client: • JSC Strelets with vessel Strelets (M-0269) • JSC Eridan with vessel Korund (M-0245) • JSC Taurus with vessel Taurus (MK-0411) There are no other eligible vessels in this fishery.
Point of intended change of ownership of product	At the transfer of the ownership from the client group to the buying company. Change of ownership takes place at the point of landing.
List of eligible landing points (if relevant)	• Norway (Tromsø, Hammerfest, Hønninsvåg, Ålesund); • Russia (Murmansk, Saint-Petersburg, Kaliningrad); • Holland (Velsen, Ijmuiden, Eemshaven)
Point from which subsequent Chain of Custody is required	At the point of landing at shore. Land-based processing plants as well as cold/freezer stores and auction houses that perform anything more than movement of product must have separate CoC certification.

Table 16 Eligibility to enter further chains of custody

5.4 Eligibility of Inseparable or Practically Inseparable (IPI) stock(s) to Enter Further Chains of Custody:

There are no IPI stocks to the stocks included in UoC.

6 EVALUATION RESULTS

6.1 Principle Level Scores

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	96,9
Principle 2 – Ecosystem	87,0
Principle 3 – Management System	89,8

Table 17 Final Principle Scores Cod and Haddock

Final Principle Scores	
Principle	**Score**
Principle 1 – Target Species	91,9
Principle 2 – Ecosystem	84,3
Principle 3 – Management System	89,8

Table 18 Final Principle Scores Saithe

6.2 Summary of scores

PI No.	Performance Indicator (PI)	Cod and haddock Score	Saithe Score
1.1.1	Stock status	100	90
1.1.2	Reference points	100	90
1.1.3	Stock rebuilding		
1.2.1	Harvest strategy	100	100
1.2.2	Harvest control rules & tools	100	95
1.2.3	Information & monitoring	100	90
1.2.4	Assessment of stock status	100	100
2.1.1	Outcome	80	80
2.1.2	Management	95	95
2.1.3	Information	80	80
2.2.1	Outcome	80	80
2.2.2	Management	90	90
2.2.3	Information	80	80
2.3.1	Outcome	85	85
2.3.2	Management	80	80
2.3.3	Information	80	80
2.4.1	Outcome	80	80
2.4.2	Management	85	85
2.4.3	Information	90	90
2.5.1	Outcome	90	90
2.5.2	Management	80	80
2.5.3	Information	90	90
3.1.1	Legal & customary framework	100	100
3.1.2	Consultation, roles & responsibilities	100	100
3.1.3	Long term objectives	80	80
3.1.4	Incentives for sustainable fishing	90	90
3.2.1	Fishery specific objectives	90	90
3.2.2	Decision making processes	85	85
3.2.3	Compliance & enforcement	100	100
3.2.4	Research plan	80	80
3.2.5	Management performance evaluation	80	80

6.3 Summary of Conditions

There are no conditions set for these fisheries

6.4 Determination, Formal Conclusion and Agreement

Final determination:

The Russian Federation Barents Sea cod, haddock and saithe fishery achieved a score of 80 or more for each of the three MSC Principles and did not score under 60 for any of the set MSC criteria.

No conditions have been set for the fishery

Based on the evaluation of the fishery presented in this report, the assessment team recommends the certification of the Russian Federation Barents Sea cod, haddock and saithe fishery

The Technical Reviewer at DNV GL adheres to the recommendation of the assessment team and approves the certification of the Russian Federation Barents Sea cod, haddock and saithe fishery for the client group consisting of fishing companies: JSC "Strelets", JSC "Taurus", JSC "Eridan"

6.5 Changes in the fishery prior to and since Pre-Assessment

Not relevant as this is a re-assessment.

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APPENDIX 1 SCORING AND RATIONALES

Appendix 1.1 Performance Indicator Scores and Rationale

6.5.1 Evaluation table principle 1 NEA cod and haddock

Evaluation Table for PI 1.1.1 – NEA cod and haddock

PI 1.1.1		**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	The biomass limit reference points have been defined by ICES for both stocks and are used as PRI reference points for this assessment. Cod: The biomass limit reference point (Blim) is defined on the basis of the change point in the regression of SSB vs Recruitment (age 3yrs) and is set at 220,000t. The assessment provides high and low 95% probability estimates of SSB. The estimate of SSB in 2016 was 1,769,635t with the lower 95% confidence level at 1,387,617t. SSB is estimated to increase to 1,835,962t in 2017. Clearly there is a high degree of certainty that the lowest estimate of SSB (95% probability) is above a point of recruitment impairment (PRI). ICES considers the stock to be at full reproductive capacity. SG 100 is met. Haddock: The biomass limit reference point (Blim) is defined on the basis of Bloss, the lowest observed SSB in the time series (1985: 49,702t) and is set at 50,000t. The assessment provides high and low 95% probability estimates of SSB. The estimate of SSB in 2016 was 675,068t with the lower 95% confidence level at 501,105t. Clearly there is a high degree of certainty that the lowest estimate of SSB (95% probability) is above a point of recruitment impairment (PRI). ICES considers the stock to be at full reproductive capacity.SG 100 is met.		
b	**Guidepost**		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	Y

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing
	Justification	Both SSB and F target reference points are defined in the Cod and Haddock Management plans. The management plans are evaluated as being precautionary by ICES (ICES 2016) Neither stock has a Bmsy reference point defined but both have Fmsy reference points. MSC guidance states that this can be used to determine whether the stock status is consistent with Bmsy. Cod: MSC guidance states that where Bmsy is not defined then Bmsy can assume to be achieved through consistent maintenance of fishing mortality at or below Fmsy (F0.4). Fishing mortality for this stock has been consistently well below Fmsy since 2008 which is greater than one generation time. Furthermore, the assessment provides a 95% probability estimate of F (high) which shows that there is a high degree of certainty that F has fluctuated around or been below Fmsy since 2008. SG 100 is fully met. Haddock: MSC guidance states that where Bmsy is not defined then Bmsy can assume to be achieved through consistent maintenance of fishing mortality at or below Fmsy (F0.35). Fishing mortality for this stock has been consistently well below Fmsy since 2007, which is greater than one generation time. Furthermore, the assessment provides a 95% probability estimate of F (high) which shows that there is a high degree of certainty that F has fluctuated around or been below Fmsy since 2009. SG 100 is fully met.
References		ICES (2003); ICES (2005); ICES, (2011) ICES (2017b); ICES (2017d)

Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Target reference point	Management Plan target: : Bpa: MSY Btrigger	**Cod:**460,000 t	**Cod:** (2016) 1,769,635t (2,256,988t / 1,387,517t 95% CI) 1,835,962t (2017: predicted
	Fmsy/mgt/pa	F0.40	F0.33
	Management plan target: Bpa: MSY Btrigger	**Haddock**: 80,000 t	**Haddock**:(2016) 675,068 t (909,423t / 501,105t 95% CI). 537,865t (2017: predicted)
	Fmsy/mgt Fpa	F0.35 F0.47	F0.20
Limit reference point	B_{lim}	**Cod:** 220,000 t	**Cod**: (2016) 1,769,635t (2,256,988t / 1,387,517t 95% CI)

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
	Flim B_{lim} Flim	F0.74 **Haddock**: 50,000 t F0.77	1,835,962t (2017: predicted F0.33 **Haddock**:(2016) 675,068 t (909,423t / 501,105t 95% CI). 537,865t (2017: predicted) F 0.20
OVERALL PERFORMANCE INDICATOR SCORE:			**NEA Cod: 100** **NEA Haddock: 100**
CONDITION NUMBER (if relevant):			**N/A**

Evaluation Table for PI 1.1.2 - NEA cod and haddock

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	Cod: A range of eight biological reference points for biomass and fishing mortality are presented for this stock ICES (2017). They are based on standard ICES methodology for the evaluation of reference points. The evaluation method used to validate the reference points is listed against each reference point in the ICES annual advice on the status of the stock. SG 60 is met. All the reference points have been satisfactorily estimated and are appropriate for the stock. SG 80 is met Haddock: A range of eight biological reference points for biomass and fishing mortality are presented for this stock ICES (2016). They are based on standard ICES methodology for the evaluation of reference points. The evaluation method used to validate the reference points is listed against each reference point in the ICES annual advice on the status of the stock. SG 60 is met. All the reference points have been satisfactorily estimated and are appropriate for the stock. SG 80 is met		
B	**Guidepost**		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y

PI 1.1.2		Limit and target reference points are appropriate for the stock		
	Justification	Cod: The biomass limit reference point, Blim is based on a "change point in the regression of SSB vs recruitment (age 3yrs)" This is a standard and acceptable methodology used by ICES to identify the SSB level at and below which there is an appreciable risk of impairing reproductive capacity. The method is used by ICES when the stock-recruitment relationship is weak. The change-point regression methodology has been reviewed by ICES (ICES, 2003) and is effective means to analytically derive Blim. SG 80 is met. The precautionary biomass level (Bpa) reference point for this stock is 460,000t and is based on the lowest SSB estimate with a 90% probability of remaining above Blim. This reference point is also the SSB management plan reference point and is designed to build precaution into the Management plan. SG 100 is met Haddock: The biomass limit reference point is based on Bloss (50,000t) the lowest estimate of SSB at which there has not been any signs of impaired recruitment (ICES, 2011). This is an acceptable means of evaluating the biomass limit reference point and is standard practice within ICES in the absence of a reliable stock and recruitment relationship. SG 80 is met. There is a precautionary level (Bpa) reference point for this stock which is also an action point in the management plan. Bpa is based on Blim via an acceptable formula which builds the necessary precaution into the management of the stock ensuring that it never falls to the Blim level. SG 100 is met.		
C	**Guidepost**		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	Y
	Justification	Cod: The management plan target reference point is based on long-term computer simulations of stock development. The simulations are based on an assessment that takes account of cannibalism and growth in relation to capelin abundance. The ecological role of the species is well investigated through a series projects on the Barents Sea ecosystem, see Sakshaug et al (2009). The stock is maintained above B_{MSY} and is expected to remain in this situation under the revised management plan. SG 80 and SG 100 are met Haddock: The management plan target reference point is based on long-term computer simulations of stock development. The ecological role of the species is well investigated through a series projects on the Barents Sea ecosystem, see Sakshaug et al (2009). The stock is maintained above B_{MSY} and is expected to remain in this situation under the management plan. i.e SG 80 and SG 100 are met.		
D	**Guidepost**		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not relevant	

PI 1.1.2		Limit and target reference points are appropriate for the stock	
	Justification	The species are gadoids with trophic levels of 4 and above.	
References		ICES (2003); ICES (2005); ICES, (2011); ICES (2016b,c); ICES (2017b,c,d); Sakshaug et al (2009).	
OVERALL PERFORMANCE INDICATOR SCORE:			Cod: 100 Haddock: 100
CONDITION NUMBER (if relevant):			N/A

Evaluation Table for PI 1.1.3 Not scored. The stocks (Cod, haddock and saithe) are not depleted.

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	Not scored		
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	Not scored		
c	**Guidepost**	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	(Y/N)	(Y/N)	

PI 1.1.3		**Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe**
	Justification	Not scored
References		
OVERALL PERFORMANCE INDICATOR SCORE:		
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 1.2.1 - NEA cod and haddock

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving anagement objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The first JNRFC management plan was formulated in 2002 and the resultant harvest control rules applied for the first time in setting the quotas for 2004. The plan was reviewed and amended by the JNRFC in 2009. In 2015 Norway and Russia made a request to ICES for the evaluation of alternative harvest control rules for North East Arctic cod, haddock and capelin (ICES, 2016b). For cod ICES investigated and evaluated a series of ten harvest control rules including the existing one. ICES concluded that they were all in accordance with the ICES standard that the annual probability of SSB being below the biomass limit level should be no more that 5%. For haddock, it was decided to retain the existing harvest control rules for the next five years. SG60 is met. The cod and haddock plans both define target fishing mortality and biomass target and limit reference points. The plans have been evaluated by ICES and found to be precautionary, ICES (2016). Both plans are based on a stepped reduction in exploitation rate if SSB falls below specified reference levels. SG80 is met. The management plans are supported by a set of technical measures including minimum mesh size in the cod-end (130 mm) minimum landing size, a maximum by-catch of undersized fish linked to a move-on rule. The number of vessels allowed to operate in the fishery is limited through a license scheme. SG100 is met. **Cod:** A new Management Plan for cod was agreed by the Joint Russian–Norwegian Fisheries Commission in October 2016. This formed the basis for the agreed TAC for 2017 although ICES continued to provide advice on the basis of the original plan. The ICES advice for the fishery in 2018 was provided on the basis of the new Management plan. SG60 is met The 2009 plan has clearly been achieving its objectives since then as evidenced by the current levels of SSB and F. SG80 is met Both the 2009 and the revised 2016 plans are designed to meet objectives laid down in Principle 1 as they make explicit reference to ICES reference points and are responsive to the state of the stock and are designed to achieve stock management objectives reflected in the target and limit reference points. SG100 is met. **Haddock**: The plan is designed to meet objectives laid down in PI 1 as it makes explicit reference to ICES reference points. SG60 is met. It is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points. SG 80 is met. The JNRFC HCR includes provision for the reduction of exploitation rate should the stock fall below Blim. SG100 is met.		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The Harvest strategy has been fully tested through ICES MPE evaluations, most recently ICES (2016). This evaluation considered a range specific HCRs for both cod and haddock. The current status of both the cod and haddock stock presents evidence that the strategy is achieving its objectives including being clearly able to maintain stocks at target levels (SG 80 for both stocks) Cod: As noted in scoring issue (a) above the harvest strategy was re-evaluated by ICES in 2016 and a new set of harvest control rules put in place for the management of the fishery from 2017. The new strategy is designed to ensure that there is a low probability that the SSB will be below the biomass limit level. The current status of the stock in full reproductive capacity and being harvested sustainably confirms the success of the 2009 harvest strategy in clearly maintaining the stock at target levels SG 100 is met The strategy has resulted in a steady increase in the SSB since the management plan started in 2004 and SSB reached a time series peak of 2.7 million t in 2013. Fishing mortality was reduced from a high of F0.7 in 2004 and 2005 and has now fallen to F0.33 in 2016 well below the management plan target (F0.4). Haddock: The Harvest strategy has been fully tested through ICES MPE evaluations, most recently ICES (2016). Experience with harvest strategy is extensive and the stock status is safely within sustainable limits. See ICES (2016) answer to Norway on MPE. Hence SG100 is met.		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	There is a comprehensive IMR-PINRO stock monitoring and assessment programme in place that includes environmental, biological and acoustic surveys, plus rigorous fishery monitoring, control and surveillance which lead to an annual evaluation of the success of the harvest strategy. The fishery based monitoring programme is strongly supported by appropriate fishery independent surveys which provide valuable tuning indices in support of the annual stock assessment. ICES publishes an annual evaluation of current stock status in relation to fishing mortality at Fmsy, the precautionary approach Fpa and Flim and F management plan levels. For the stock biomass the evaluation is provided in relation to MSY B trigger, the precautionary approach Bpa and Blim levels and the SSB management plan level. This evaluation clearly demonstrates whether or not the harvest strategy is working SG 60 is fully met for both species. **Cod**: SG 60 is met. **Haddock**: SG 60 is met.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
	Justification	The management plans and HCRs have been reviewed and changed three times over the last decade and are reviewed at each meeting of the JNRFC (annual). The most recent Management Plan Evaluation for cod and haddock took place in 2016. This evaluation considered a number of formulations of the harvest control rules for both cod and haddock. As a result, a new Harvest strategy (Management Plan) is now in place for cod while the evaluation concluded that the 2009 strategy for haddock should remain in place for a further five years. SG100 is met for both species.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Cod and Haddock are not sharks		
References		ICES (2015 a,b,c); ICES (2016 a,b,c,d); ICES (2017 a,b,c,d)		
OVERALL PERFORMANCE INDICATOR SCORE:				**Cod: 100** **Haddock: 100**
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.2.2 - NEA cod and haddock

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	The current strategy for both species is to set an annual TAC, which forms the harvest rule, in accordance with the harvest strategy. The harvest strategy provides the 'route map' for managing the stocks in accordance with the agreed JRNFC management plans. The structured plans are inextricably linked to the SSB reference levels and provide an advised exploitation level. This fishing mortality level then forms the basis for the ICES advice on the annual TAC. The annual TAC is therefore firmly based on the predicted catch corresponding to the ICES advice. These TAC rules are generally understood and are clearly consistent with the Harvest Strategy in reducing exploitation in line with declining SSB and as limit reference points are approached. SG 60 is met for both species. The TAC rules are also very well defined, easily understood and firmly linked to the Harvest Strategy. The structure of the strategies for both species is clearly designed to ensure that the exploitation rate, on which the annual TAC is based, is reduced as SSB reduces towards limit reference points. SG 80 is met for both species		
B	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	Y

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Justification	The main uncertainties affecting the harvest control rule are the reliability of the annual stock assessment in estimating current SSB and fishing mortality. The major problem, prior to 2001, was estimating the extent of illegal, unregulated and underreported (IUU) landings for both species. IUU landings have been addressed and are now formalized within the 2009 FAO Port State Measures Agreements and increased surveillance. ICES now consider the level of IUU landings to be negligible and discard levels are assumed to be low but are unknown. The HCR's are based on long-term simulations taking the variations of growth and recruitment into account including periods of low recruitment. In these simulations, a range of uncertainties are included, see ICES (2016). These evaluations meet SG 80 for both species. **Cod**: These main uncertainties, noted above, have been taken into account when selecting the current harvest rules and in particular the "three- year rule" in setting the annual TAC. The harvest control rule also takes variation of capelin abundance into account and the general productivity of the cod stock. Predation mortality also forms an important element in the stock assessment process. The assessment also takes cannibalism into account in the calculation of natural mortality. The assessment also benefits from four fishery independent tuning indices which form an integral and important part of the process. They help to address areas of uncertainty and work to modulate the effects of an assessment based solely on data from the fishery. Thus, the assessment includes a range of ecological considerations. SG 100 is met. **Haddock**: As noted above the main potential source of uncertainty in setting the harvest control rule is the annual stock assessment. The 2017 assessment suffered from one incomplete survey coverage and the complete absence of one survey in 2016. However, this assessment is supported by two other fishery independent tuning indices. Tuning indices form an important part of the stock assessment process on which the TAC is based. They provide the fishery independent 'windows' in the SAM assessment and work to modulate an assessment based solely on data from the fishery. The haddock harvest control rule includes less consideration of the ecosystem impact on the haddock dynamics than for the cod. Natural mortalities from cod consumption of ages 1–6 are included and for the period from 1984 to 2016 and actual data from predation by cod have been used. The robustness of this assessment provides sufficient evidence that a wide range of appropriate uncertainty is addressed in determining the harvest control rules. SG 100 is met		
C	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	Y

PI 1.2.2		There are well defined and effective harvest control rules in place
	Justification	The range of tools in use which includes the annual TAC and technical measures are required to deliver sustainable exploitation of the stock. Sustainable exploitation is measured against maximum sustainable targets for both biomass and fishing mortality **Cod:** The 2017 assesment of the stock shows that the stock is well above the MSY biomass trigger level and well below the MSY fishing mortality level. The ICES advice for the fishery in 2018 concludes that the stock is in full reproductive capacity and is being harvested sustainably. **Haddock**: The 2017 assesment of the stock shows that the stock is well above the MSY biomass trigger level and well below the MSY fishing mortality level. The ICES advice for the fishery in 2018 concludes that the stock is in full reproductive capacity and is being harvested sustainably. The JRNFC management generally complies with the annual advice on the harvest control rule and the technical measures. The current status is evidence that these tools are effective and achieve the required exploitation levels for both cod and haddock. SG 100 is met for both species.
References		ICES (2015 a,b,c); ICES (2016 a,b,c,d); ICES (2017 a,b,c,d)
OVERALL PERFORMANCE INDICATOR SCORE:		**Cod: 100** **Haddock: 100**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 1.2.3 - NEA cod and haddock

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	There is a comprehensive range of data available for NEA cod and NEA haddock. Life history information is extensive and built up over many decades of research. This research provides valuable information on the stock structure and the temporal and spatial distribution of all life stages for both species. Long-term trends in recruitment, growth and natural mortality are available in stock assessments. Fishery removals are monitored both at sea through scientific observer (Russian fishery) and reference fleet (Norwegian fishery) programs. While information on discarding is limited, based on the analyses of the at-sea observations, it is not considered a major issue in the cod-haddock fishery. The Norwegian institute operates a 'Reference fleet' [selected Norwegian vessels] which provides fisheries data in more detail than the data generally collected from the fishery. A range of surveys and commercial catch rate information provide annual indices of abundance. There is a wide array of environmental and other data available from the Barents Sea ecosystem survey, some of which is used to inform the harvest strategy. **Cod and Haddock**: The stocks are the subject of annual fishery independent abundance surveys including acoustic surveys and an annual ecosystem survey covering the distribution area of both stocks. The collection of Fisheries statistics is in place which covers all fleet components including the non-Norwegian/Russian components (EU, Faroese, Icelandic). This system provides the stock assessment team with a very reliable estimate of all fishery dependent and fishery independent mortality for both species. SG 100 is met.		
B	**Guidepost**	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Justification	**Cod and Haddock:** The fishery is subject to detailed monitoring. All operators fishing for Cod and Haddock in the Barents Sea provide accurate fisheries statistics based on logbooks and on landing statistics. All vessels fishing offshore are subject to mandatory VMS surveillance. There is long term experience with the sampling programme, although some sampling stopped in 2009. There is good understanding of uncertainties. There are annual fisheries independent abundance surveys which provide tuning indices for both cod and haddock stock size, used in the stock assessment process. Survey estimates are provided with confidence limits. The assessment has gone through ICES benchmarks and the robustness of the assessments are tested and found to be good The SAM assessment model, now used for both species, provides 95% confidence interval estimates for all the outputs from the assessment. The recent management plan evaluation ICES (2016) still found the HCRs to be precautionary and include the adjustments to the survey time series have affected the estimates of uncertainty (both precision and bias) in these data and how robust the management strategy is to these. Implementation error (e.g. overshooting the TAC or IUU fishing) is not considered an issue. SG80 is fully met for both species. However, in relation to the more rigorous requirements at SG 100 there are a number of issues which result in a failure for both species to fully meet the SG 100 scoring issue. These uncertainties are well documented in the annual AFWG report and the subsequent advice from the ICES advisory committee (ACOM) For example, estimates of discards, of both species, are imprecise and the AFWG has highlighted the need for more studies of this issue. Recent issues with sampling to characterize the age/size composition of the catch are a concern. Sampling of commercial catches is believed to be less precise because of the termination of a Norwegian port sampling programme in mid-2009. Russian sampling of commercial catches has decreased in recent years. Poor sampling of commercial catches is impairing the quality of the assessment and the advice. Discarding, particularly in the haddock fishery is known to have taken place but discards cannot be quantified (assumed to be below 5% in recent years). Whilst these uncertainties are not serious enough to affect confidence in the robustness of the current assessment the fishery does not meet the high standard (high degree of certainty) SG 100 is not met for either species.		
C	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	**Cod and Haddock**: Norwegian, EU, Faroese, Icelandic, Russian fisheries statistics systems are good and accurate. Landings from all vessels operating in the North East Arctic are well monitored. There is a rigorously enforced total discard ban on all commercial species throughout the North East Arctic. All fish caught must be retained, recorded and landed. In addition, all vessels fishing in the Russian zone must carry a Russian observer; supporting information in the Norwegian zone is collected through the reference fleet. Thus, there is good information on all other fishery removals from the stock SG 80 is fully met for both species.		
References		Bogstad, B. and Mehl, S. 1997; ICES, (2009); ICES, (2010); ICES, (2012); ICES (2014); ICES (2015a); ICES (2016a); ICES (2017a); Mehl, S. and Yaragina, N.A.		

PI 1.2.3	Relevant information is collected to support the harvest strategy	
	1992; Russell, F.S. (1976). Wheeler, A. (1969).	
OVERALL PERFORMANCE INDICATOR SCORE:		**Cod: 100** **Haddock: 100**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 1.2.4 - NEA cod and haddock

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y
	Justification	**Cod**: At the ICES Inter-Benchmark meeting in April 2017 the stock assessment model was changed from XSA to the State-space Assessment Model (SAM) (ICES, 2017n). The meeting also recommended a change in the Recruitment Model and the inclusion of a wider age range in the assessment. This resulted in a change in the perception of spawning stock biomass compared to the results of the 2016 assessment (ICES, 2016a). SAM is a statistically based and in general more appropriate model which is now widely used for other stocks within the ICES area including the North East Arctic cod (ICES, 2015) One important argument for choosing SAM was better retrospective performance and independence of SAM model of assumption on form of relationship between stock abundance and survey indexes A natural mortality (M) of 0.2 plus cannibalism was used in the assessment. Cannibalism is assumed to only affect natural mortality of ages 3-6. The method used for calculation of the prey consumption by cod described by is used to calculate the consumption of cod by cod (Table 3.12) for use in cod stock assessment. The SAM model uses four fishery independent tuning indices in support of the assessment. **Haddock**: The benchmark Workshop on Arctic stocks, in 2015 (ICES, 2015) concluded that for North East Arctic haddock the State Space assessment model, SAM, should replace XSA as the main assessment model. For this stock, XSA has been shown to be very sensitive to the choice of settings, especially use or non use of population shrinkage. SAM is a statistically based and in general more appropriate model which is now widely used for other stocks within the ICES area including the North East Arctic cod (ICES, 2015) The SAM model uses four fishery independent tuning indices in support of the assessment The NEA haddock implementation of SAM includes growth and maturity data. Density-dependent changes in the survey indices' selectivity at age are extensively explored in the model. SG100 is met is fully met for both species.		
B	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	Y		

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	**Cod and Haddock:** SSB, fishing mortality and annual recruitment are estimated in the annual assessments. Each parameter is assessed with 95% confidence intervals on the estimates. Biological reference points have been estimated based on medium and long-term considerations. The annual stock status is evaluated relative to biological reference points. SG60 is met for both species.		
C	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y
	Justification	Areas of uncertainty in the stock assessment process have been appropriately identified and addressed in PI 1.2.3 (b) for both species. SG 60 is met This confirms that uncertainty is carefully taken into account in the assessment. SG 80 is met The State space assessment model (SAM), now used for the assessment of both species, estimates all relevant stock assessment parameters and provides the 95% confidence interval estimates for each one. This strongly supports the requirement for the stock status, in terms of SSB Fishing mortality and Recruitment, to be evaluated, relative to reference points in a probabilistic way. SG 100 is met		
D	Guidepost			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y
	Justification	Both cod and haddock assessments have been through the ICES benchmark process in 2015. The ICES Benchmark process is thorough and involves the exploration of all data sources as well as assessing alternative modelling approaches. The methodology is thoroughly tested before recommendations are made to the Assessment working group to consider the need or otherwise for change. SG 100 is met for both species		
e	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status	
	Justification	The assessments are subject to peer review within JNRFC, AFWG and the ICES advisory committee, ACOM. The assessment of the stocks is subject to rigorous annual review at a number of levels. The JRNFC meetings review the assessment independently of ICES, even though many of the same scientists are also members of the AFWG. Within ICES, the stock assessments are subject to internal peer review by the ICES advisory committee ACOM before advice is provided to member states and the JNRFC. ICES also commission occasional periodic reviews of specific stock assessments and its overall assessment methodology. Assessments, assessment methods, management procedures and advice are also subject to frequent scrutiny by a range of third parties from the fishing industry itself to a variety of environmental NGOs. The assessments are also subject to more extensive review through the benchmark process. These in-depth reviews occur less frequently but include external experts invited to evaluate the assessment data and assumptions in a workshop environment. SG 100 is met for both species.	
References		Bogstad and Mehl (1997); ICES (2015c); ICES (2016 a,b,c): ICES (2017 a,b,c); Nielsen, A.C and C.W. Berg, 2014.	
OVERALL PERFORMANCE INDICATOR SCORE:			**Cod: 100** **Haddock: 100**
CONDITION NUMBER (if relevant):			

6.5.2 Evaluation table principle 1 NEA saithe

6.5.2.1 Evaluation Table for PI 1.1.1 - NEA saithe

PI 1.1.1		The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Y	Y	Y
	Justification	The biomass limit reference point has been defined by ICES and is used as PRI reference point for this assessment. The biomass limit reference point (Blim) is defined on the basis of the change point in the regression of SSB vs Recruitment (age 3yrs) and is set at 136,000t. The assessment provides high and low 95% probability estimates of SSB. The estimate of SSB in 2016 was 473,544t with the lower 95% confidence level at 351,758t. Clearly there is a high degree of certainty that the lowest estimate of SSB (95% probability) is above a point of recruitment impairment (PRI). ICES considers the stock to be at full reproductive capacity. SG 100 is met.		
B	**Guidepost**		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		Y	N
	Justification	Neither Bmsy or Fmsy are defined by ICES for this stock. There is however an SSB management plan and precautionary approach level set at 220,000t. MSC guidance (CR v1.3, SA 2.2.4) states that where Bmsy is not defined then Bmsy can assume to be achieved through consistent maintenance of fishing mortality at or below Fmsy. Although there is an F precautionary approach level at F 0.35 and a management plan F level at 0.32. these F levels cannot be considered to be proxy MSY level but are defined as the action point levels in the management plan. For this stock, in the absence of either Bmsy or Fmsy reference points, an SG 80 score can be achieved where the stock is substantially higher than Bpa (for example 2 times) irrespective of the F level (Froese et al 2014). The SSB in 2016 (473,544t) which is over two times Bpa (SG 80). SSB in 2017 is predicted to reduce marginally to 465,149t. Fishing mortality has been below the Fpa level since 2012 and below the F management plan level since 2013. This provides further support for a score of SG 80 (CR v1.3, SA 2.2.4) However, the 95% lower confidence level estimate of SSB in 2016 was 351,758t which is less than 2 times Bpa (220,000t). SG 100 is therefore not achieved.		

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
References	ICES, 2005; ICES, 2011a; ICES, 2011b; ICES, 2017e (Advice sheet); ICES, 2017a (AFWG): Froese et al, 2014		
Stock Status relative to Reference Points			
	Type of reference point	**Value of reference point**	**Current stock status relative to reference point**
Target reference point	Management plan: Bpa. F Management plan (F_{MP}) F (precautionary approach)	SSB_{mgt} 220kt: Bpa: 220kt: F_{MP} 0.32 F_{PA} 0.35	SSB (2016) 473,544t (+637,494t/-351,758t 95% CI) F (2016) 0.228 (+0.325/-0.159 95%CI)
Limit reference point	Blim Flim (ages 4-7yrs)	Blim 136kt Flim 0.58	SSB (2016) 473,644t (+637,494t/-351,758t 95% CI) F (2016) 0.228 (+0.325/-0.159 95%CI) F(2016) 0.228
OVERALL PERFORMANCE INDICATOR SCORE:			**90**
CONDITION NUMBER (if relevant):			

6.5.2.2 Evaluation Table for PI 1.1.2 - NEA saithe

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Y	Y	
	Justification	ICES has developed and adopted a set of three fishing mortality and three spawning stock biomass reference points. They are limit, precautionary approach and management level reference points. Maximum sustainable yield reference points for fishing mortality and SSB have not been estimated. The reference points are based on standard ICES methodology for the evaluation of reference points. SG 60 is met The reference points are presented and explained in a Table in the ICES annual stock assessment advice. The technical basis for each reference point is listed and referenced in the advice sheet. This confirms that they are firmly based on stock parameters and are therefore entirely appropriate for the stock. SG 80 is met.		
B	**Guidepost**		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Y	Y
	Justification	The biomass limit reference point, Blim is based on a "change point in the regression of SSB vs recruitment (age 3yrs)" This is a standard and acceptable methodology used by ICES to identify the SSB level at and below which there is an appreciable risk of impairing reproductive capacity. The method is used by ICES when the stock-recruitment relationship is weak. The change-point regression methodology has been reviewed by ICES and is an effective means to analytically derive Blim. SG 80 is met There is a precautionary level (Bpa) reference point for this stock which is also an action point in the management plan. Bpa is based on Blim via an acceptable formula: Blim × exp(1.645 × σ),where σ = 0.3. This formula is clearly linked to Blim and builds the necessary precaution into the management of the stock ensuring that appropriate action is taken to prevent the SSB falling to the Blim level. SG 100 is met.		

PI 1.1.2		Limit and target reference points are appropriate for the stock		
c	Guidepost		The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with B_{MSY} or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Y	N
	Justification	The Bmsy and MSY B trigger levels are not defined for this stock. To clarify that situation the MSC provided advice, to all CABs, in March 2017, on *Scoring stock status against Bmsy for ICES stocks*. The advice confirms that a target level consistent with Bmsy can be estimated based on the precautionary biomass level, Bpa. The resultant proxy level for Bmsy is a least two times the biomass precautionary approach level (220,000t). This biomass precautionary level is also defined as the SSB management plan level and provides a trigger level for action to reduce fishing pressure in the management of the stock. It is noted that the management plan has steadily built up the stock and it has been above the proxy Bmsy level since 2004. The SSB was estimated at 473,544t in 2016 and is predicted to be at a similar level in 2017 (465,149t). SG 80 is met. There is no evidence in relation to the setting of a Bmsy proxy level, as described above, that precautionary issues such as the ecological role of the stock have been taken into consideration. Indeed, it is simply set by a formula linked to Blim as described in scoring issue b above. SG 100 is not met.		
d	Guidepost		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		Not Relevant	
	Justification	Saithe is not a LTL species.		
References		ICES, 2005; ICES, 2011a; ICES, 2011b; ICES, 2017e (Advice sheet); ICES, 2017a (AFWG): Froese et al, 2014.		
OVERALL PERFORMANCE INDICATOR SCORE:				90
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 1.1.3 Not scored. The stock (NEA saithe) is not depleted.

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	(Y/N)		(Y/N)
	Justification	NA		
b	**Guidepost**	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	(Y/N)	(Y/N)	(Y/N)
	Justification	NA		
c	**Guidepost**	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	

PI 1.1.3		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
	Met?	(Y/N)	(Y/N)	
	Justification	NA		
References		[List any references here]		
OVERALL PERFORMANCE INDICATOR SCORE:				
CONDITION NUMBER (if relevant):				

6.5.2.3 Evaluation Table for PI 1.2.1 - NEA saithe

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	Management of Saithe in Sub-areas I and II is by TAC and technical measures. The Norwegian Ministry of Trade, Industry and Fisheries set the TAC according to the advice from ICES which is firmly based on the management plan and the assessment of stock status. The Harvest Strategy /Management plan provides the 'route map' to ensure the sustainable exploitation of the stock. The harvest strategy is inextricably linked to status of the stock in terms of the SSB, fishing pressure and recruitment and their reference points. SG 60 is met The Harvest strategy / Management plan for setting the annual TAC was evaluated by ICES in 2007. ICES then concluded that it was consistent with the Precautionary approach for all simulated data settings and took uncertainty in the historic data set, including actual catch levels, into account. The resultant HCR, below, was implemented in 2007. • Estimate the average TAC level for the coming 3 years based on **F**mp. TAC for the next year will be set to this level as a starting value for the 3-year period. • The year after, the TAC calculation for the next 3 years is repeated based on the updated information about the stock development. However, the TAC should not be changed by more than 15% compared with the previous year's TAC. • If the spawning stock biomass (SSB) in the beginning of the year for which the quota is set (first year of prediction), is below **B**pa, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from **F**mp at SSB=**B**pa to 0 at SSB equal to zero. At SSB levels below **B**pa in any of the operational years (current year and 3 years of prediction) there should be no limitations on the year-to-year variations in TAC. This harvest strategy is very clearly responsive to the status of the stock and each of the three elements work together towards achieving management objectives reflected in the target and limit reference points. SG 80 is met. Furthermore, this harvest strategy is clearly designed to achieve stock management objectives reflected in the target and limit reference points. It is firmly based on the annual stock assessment and the independent advice from ICES on exploitation levels in line with the management plan and precautionary reference points. SG 100 is met		
b	Guidepost	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	This type of Harvest Strategy is common within the ICES management area. It is based on a tiered structure for action on fishing pressure linked to the annual stock assessment. This type of structured plan has a good record of success based on experience with other stocks as well as this one.(SG60 is met). There is strong evidence that the Harvest Strategy is working. Since 2008 the annual TAC has been set in accordance with the HCR and catches have either been in line with the TAC or below it since then. This provides strong evidence that the strategy is working. SG 80 is met. The HCR was initially evaluated by ICES in 2007 ánd found to be in accordance with the precautionary approach. ICES carried out a further evaluation of the HCR in 2011 taking into account the changes made to the assessment after the 2010 benchmark assessment. The evaluation concluded that the HCR continues to be in agreement with the precautionary approach. One change has been made to the management plan fishing mortality in the HCR. In 2007 the HCR fishing mortality was set in line with Fpa at 0.35. In June 2013, following the ICES advice for 2014, the management plan fishing mortality was reduced to F 0.32. The SSB is has been above the management plan target level since 1996 and is currently more than twice that level. The fishing mortality has been below the management plan target level since 2013 having been above it for a short period between 2009 and 2012. ICES considers the stock to be harvested sustainably and in full reproductive capacity. This provides ample evidence in support of the SG 100 requirements. SG 100 is met		
c	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	Collection of the international catch and effort data from the fishery in support of the annual stock assessment is carried out at an acceptable level. These data are well supported by scientific sampling of the catch, for length, age and maturity, both on shore and by on board observers. The annual stock assessment is supported by a fishery independent acoustic survey. Thus, the annual stock assessment provides the necessary information on which to evaluate stock status in relation to the reference points and determine whether the harvest strategy is working. SG 60 is met.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
	Justification	The management plan and related Harvest strategy was reviewed by ICES in 2007 and again in 2011. On both occasions the HCR was found to be compliant with the ICES precautionary approach. After the 2011 review the management plan fishing mortality was reduced from the precautionary level of F0.35 to F0.32 to add an additional level of precaution to the strategy. The ICES reviews follow requests for evaluation of the strategy by the JRNFC. Although these requests are ad hoc, and no formal review process exists, the team is of the opinion that current procedures fully meet the requirements at SG 100		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Saithe is not a shark		
References		ICES, 2007; ICES, 2005; ICES, 2010; ICES, 2011a; ICES, 2011b; ICES, 2014b; ICES, 2016e; ICES, 2017e (Advice sheet); ICES, 2017a.		
OVERALL PERFORMANCE INDICATOR SCORE:				**100**
CONDITION NUMBER (if relevant):				

6.5.2.4 Evaluation Table for PI 1.2.2 - NEA saithe

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	Whilst the Management Plan / Harvest strategy (PI 1.2.1) provides a route map to sustainable exploitation of the stock it has to be backed by effective harvest control rules and tools. For this fishery, a raft of relevant rules and tools exist in support of the harvest strategy. The main, and overriding rule, is the annual TAC based firmly on the harvest strategy and targeted at sustainable exploitation of the stock both in terms of SSB and fishing mortality. The level of the annual TAC is determined by the harvest strategy which is designed to reduce fishing pressure (and thus the TAC) if the SSB falls below management trigger levels. In support of the harvest strategy there are a number of technical measures which include mesh regulations, minimum landing size and area closures. All the rules are well defined, well established and fully understood by all within the industry. SGs 60 and 80 are fully met.		
B	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	N

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Justification	The main uncertainties affecting the selection and design of the harvest control rules are the reliability of the annual stock assessment in estimating current SSB and fishing mortality. These are the major prerequisites which underpin the setting of the annual TAC in accordance with the harvest strategy. In order for that TAC to be effective: ▪ The stock assessment must be reliable. ▪ The technical measures must be enforceable and effective. The management plan / harvest strategy is listed and described in the text of the report and at PI 1.2.1a. It is clear that this design does take into account uncertainty by having a precautionary three- year rule. This ensures a precautionary approach to annual changes, either increases or decreases, in the TAC. When the strategy, which underpins the harvest control rules, was evaluated by ICES in 2017 and 2011 it was concluded that the strategy was consistent with the Precautionary approach for all simulated data settings and took uncertainty in the historic data set, including actual catch levels, into account. SG 80 is met In the context of a wide range of uncertainties in the assessment to which the harvest strategy has to respond the assessment working group have identified some major areas of concern which have a potential impact on the harvest strategy: ▪ Reduced levels of biological sampling after the termination of the original Norwegian port-sampling program in 2009. *Could affect the reliability of the assessment* ▪ The lack of reliable recruitment estimates is a major problem. Prediction of catches will still, to a large extent, be dependent on assumptions of average recruitment in the intermediate year and the forecast period. ▪ Since the saithe HCR is a three-year-rule, the estimation of average Fmp catch in the HCR will affect stock numbers up to age five, and thereby affect the total prognosis of the fishable stock and the quotas derived from it. ▪ Although discarding is illegal there are reported incidents of slipping in the purse seine fishery, mainly related to minimum landing size. However, there are no quantitative estimates of the level of discarding available. As a result of these uncertainties the team conclude that the more rigorous requirements at SG 100 are not fully met		
C	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	Y

PI 1.2.2		There are well defined and effective harvest control rules in place
	Justification	The tools used to implement the HCR include TAC control and sea-going surveillance, monitoring and control of technical measures. Evidence of the effectiveness of the annual TAC is provided by the official landings statistics supported by confidential estimates from members of the ICES assessment working group. These all show total compliance with the annual TAC over the past fifteen years. Compliance with the technical measures is also believed to be high supported by enforcement data and on board observers. SG 60 is met The available evidence to demonstrate that tools in use (TAC And technical measures) are effective in achieving the exploitation levels required under the harvest control rules is the stock status. The exploitation rate expressed as an annual fishing mortality. The maximum sustainable yield fishing mortality has not been defined for this stock. A judgement on the effectiveness of the tools in use in achieving the required exploitation levels has to be based on the management plan trigger fishing mortality set at F 0.32. Fishing mortality in 2016 was F 0.28 (0.32/0.15 95% CI) Fishing mortality was below the management plan level from 1997 to 2008 and has recently been below it since 2013. SG 80 is met. When taken together with the evidence at SG 80, linked to the fishing mortality the status of the stock in terms of SSB, provides clear evidence that the tools in use are effective in achieving the exploitation levels required under the harvest control rules. SSB in 2016 was estimated at 473,544t which is more than double the management plan / precautionary approach level. Further evidence is that the SSB has been above that reference level (220,000t) since 1996. SG 100 is met.
References		ICES, 2007; ICES, 2005; ICES, 2010; ICES, 2011a; ICES, 2011b; ICES, 2014b; ICES, 2016e; ICES, 2017e (Advice sheet); ICES, 2017a.
OVERALL PERFORMANCE INDICATOR SCORE:		**95**
CONDITION NUMBER (if relevant):		

6.5.2.5 Evaluation Table for PI 1.2.3 - NEA saithe

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Y	Y	Y
	Justification	There is a comprehensive range of data available for NEA saithe. Life history information is extensive allowing elucidation of the stock structure and the temporal and spatial distribution of all life stages. Long-term trends in recruitment, growth and natural mortality are available in stock assessments. Fishery removals are monitored both at sea through scientific observer (Russian fishery) and reference fleet (Norwegian fishery) programs. While information on discarding is limited, based on the analyses of the at-sea observations, it is not considered a major issue in the saithe fishery although some discarding is reported to occur in the purse seine fishery related to minimum size regilations. The Norwegian institute operates a 'Reference fleet' [selected Norwegian vessels] which provides fisheries data in more detail than those generally collected at the point of landing. An annual acoustic survey and commercial catch rate information provide annual indices of abundance in support of the assessment although currently only the acoustic survey data are used as tuning indices. There is a wide array of environmental and other data available from the Barents Sea ecosystem survey, although these data are not currently used in the saithe assessment. This comprehensive range of available data both current and historic fully meets the requirements at SG 100		
B	**Guidepost**	Stock abundance and fishery removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	Y	Y	N

PI 1.2.3		Relevant information is collected to support the harvest strategy		
	Justification	The fishery is subject to detailed monitoring. All operators fishing for saithe in the Barents Sea provide accurate fisheries statistics based on logbooks and on landing statistics. All vessels fishing offshore are subject to mandatory VMS surveillance. There is long time experience with the sampling program. There is good understanding of uncertainties. The state space assessment model (SAM) uses only two fishery independent tuning indices. These are the acoustic survey split into two time periods. 1994 -2001 and 2002 – 2016. The assessment has gone through ICES benchmarks and evaluations and the robustness of the assessment is tested and found to be good. SG80 is met. Sampling of commercial catches is believed to be less precise because of the termination of a Norwegian port sampling programme in mid-2009. Russian sampling of commercial catches has decreased in recent years. Early estimates of recruitment, based on ages 0-2yrs are not possible because of the nearshore and inaccessible distribution of those young fish. Estimates of recruitment, based on the abundance of 2-4years old fish in the acoustic survey, are highly dependent on the timing and extent of their offshore migration. As a result, recruitment prediction has to be based on a time series average obtained retrospectively from the assessment model. Because of these uncertainties, which can affect the precision of the stock assessment and future predictions, the more rigorous requirements at SG 100 are not met		
C	Guidepost		There is good information on all other fishery removals from the stock.	
	Met?		Y	
	Justification	Norwegian, EU, Faroese, Icelandic, Russian fisheries statistics systems are fully compliant with international standards. Landings from all vessels operating in the North East Arctic are well monitored. There is a rigorously enforced total discard ban on all commercial species throughout the North East Arctic. All fish caught must be retained, recorded and landed. In addition, all vessels fishing in the Russian zone must carry a Russian observer; supporting information in the Norwegian zone is collected through the reference fleet and some observers. Thus, there is good information on all other fishery removals from the stock. SG 80 is fully met.		
References		ICES, 2016a, Stock annexe; ICES 2017a, +Stock annexe; Russell 1976; Wheeler, 1969.		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				

6.5.2.6 Evaluation Table for PI 1.2.4 - NEA saithe

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
A	**Guidepost**		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Y	Y
	Justification	At the inter-Benchmark Protocol meeting in March April 2014 (ICES, 2014 ACOM: 53) a comprehensive review of the stock assessment model was carried out. As a result, it was recommended that the Assessment Woking Group should change from the XSA model to the State Space Assessment model SAM. The change was made in 2016 for the assessment of stock status in 2015. This model is now widely used throughout the ICES area as a replacement both for XSA and for the integrated catch assessment model used for some pelagic species. For the North East Arctic saithe the shift from XSA to SAM resulted in only minor changes in estimated fishing mortality, spawning-stock biomass, and recruitment. This fully meets the requirements of the Harvest Control Rule. SG 100 is met		
B	**Guidepost**	The assessment estimates stock status relative to reference points.		
	Met?	Y		
	Justification	SSB and fishing mortality are estimated and through the HCR are stated relative to biological reference points. SG60 is met This model satisfactorily addresses all the relevant data and provides estimates of all the stock parameters with 95% confidence intervals. These are published in the ICES annual advice sheet by the ICES Advisory Committee on Management (ACOM) as a time series list dating back to 1960. SG 60 is met		
C	**Guidepost**	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Y	Y	Y

PI 1.2.4		There is an adequate assessment of the stock status		
	Justification	The AFWG in 2017 identified and described the major sources of uncertainty in the data used in the stock assessment and subsequent forecasts. The biological sampling from the fishery may have become critically low after the termination of the original Norwegian port-sampling program in 2009, but this issue has now been addressed and improved from 2016. Its major impact has been on the precision of the catch at age matrix. Discarding in the fishery is no longer considered to be a cause of any uncertainty in the catch data. The time series of catch per unit of effort (CPUE) from the fishery is not used in the SAM model. Some uncertainty is generated in the assessment by the reliance on a single survey tuning index, the acoustic survey split into two time periods. The lack of reliable recruitment estimates is a major problem in terms of the prediction of future stock trends. Predictions of stock trajectory have to be made based on a time series mean recruitment. All these areas of uncertainty are known and satisfactorily addressed and taken into account by the assessment working group and reviewed annually. SG 80 is fully met. Achievement of SG 80 ensures that the first part of scoring issue c at SG 100 is also achieved. It is also clear that the new SAM model does evaluate stock status in relation to reference points in a probabilistic way. Over and above the requirements at scoring issue b above, the SAM model provides 95% confidence interval estimates on all the stock parameters directly related to the biological reference points SSB, F and Recruitment SG 100 is fully met		
D	**Guidepost**			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Y
	Justification	At the inter-Benchmark Protocol meeting in March April 2014. The stock assessment model then in use, the Extended Survivors Analysis (XSA) model was thoroughly tested in order to ascertain its continued suitability. Unresolved issues were identified and as is normal at an ICES Benchmark meeting alternative hypotheses and modelled approaches were rigorously explored. As a result of the rigorous exploration a recommendation was made to change to a more suitable model for this stock, the State Space Assessment Model (SAM). This model was found to be much more robust and depend to a lesser degree on subjective choice of model settings (such as shrinkage). In addition, SAM as a stochastic model is not treating catches as known without error. This whole process fully meets the requirements at SG 100.		
e	**Guidepost**		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Y	Y

PI 1.2.4		There is an adequate assessment of the stock status
	Justification	The assessment is subject to internal peer review through the AFWG process, which produces a consensus report. The Working Group process includes an in -depth evaluation and review of the conclusions of the assessment group by the ICES advisory committee on management (ACOM) before they publish the resultant management advice. The JRNFC meetings also review the assessment, independently of ICES, even though many of the same scientists are also members of the AFWG. ICES also commission occasional periodic reviews of specific stock assessments and its overall assessment methodology. Assessments, assessment methods, management procedures and advice are also subject to frequent scrutiny by a range of third parties from the fishing industry itself to a variety of environmental NGOs. All aspects of the report itself is externally reviewed (by correspondence) and reviewers' comments are published as an annex to the report. This process provides an independent assessment of all the working group's results. The assessment is also subject to more extensive review through the periodic benchmark process. These in-depth reviews occur less frequently (normally quinquennial) but include external experts invited to critique the assessment data and assumptions in a workshop environment. SG 100 is met
References		ICES, 2011a; ICES, 2011b; ICES, 2014b; ICES, 2015b; ICES, 2016e; ICES, 2017a; ICES, 2017e; Neilsen and Berg, 2014.
OVERALL PERFORMANCE INDICATOR SCORE:		**100**
CONDITION NUMBER (if relevant):		

6.5.3 Evaluation table Principle 2

The evaluation results are identical for cod, haddock and saithe included in the assessment

Evaluation Table for PI 2.1.1

PI 2.1.1		**The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main retained species are likely to be within biologically based limits (if not, go to scoring issue c below).	Main retained species are highly likely to be within biologically based limits (if not, go to scoring issue c below).	There is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points.
	Met?	Y	Y	N

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Justification	All commercial species of fish must be retained, recorded and landed; hence, all commercial demersal species qualify as retained species. Table 2.6 in the background provides a full classification of retained and non- retained bycatch as main or minor. The only species comprising more than 5% (the standard criteria for main retained) of the catch are cod and haddock which are target species and dealt with under P1. Saithe(also dealt with under P1) comprises 2.1%. All other species comprise less than 1% and are therefore classed as minor. The relatively offshore nature of the Russian vessels means that Norwegian coastal cod would not be encountered. The two Redfish species together comprise less than 1%, and the more vulnerable *Sebastes norvegicus* comprises around 10% of total redfish – i.e. less than 0.1% of total catch. Despite its vulnerability therefore – and taking account of the fact that the main pressure on this species derives from long-line and gillnet fisheries – this is also classed as minor. *A score of 80 for this PI is therefore achieved by default. However, as the following analysis shows, it cannot be said (as required at 100) that there is a high degree of certainty that retained species are within biologically based limits and fluctuating around their target reference points*: Total stock biomass for **beaked redfish**, ***Sebastes mentella*** is now fluctuating around one million tonnes with some decline in SSB in recent years due to weak year-classes (1996-2003) entering the mature stock. SSB estimate for 2016 is 857,406t. In the medium term, projections indicate increase in SSB to 1.4 Mt by 2022. However, there is no agreed management plan nor reference points for this species, and recruitment estimates are highly uncertain (ICES 2017a); so although the stock appears to be relatively healthy significant uncertainty remains. Score 80. **The golden redfish** (***S norvegicus***) stock is in a poor state and according to ICES the current fishing mortality is estimated to 0.27 which is well above a sustainable level for a redfish species (ICES AFWG 2016). Score 80. **Three wolfish species** are caught by the UoC: Northern wolfish, *Anarhicas denticulatus* (0.5% to 0.7% of catch), spotted wolffish (*Anarhichas minor*) (0.4-0.5% of catch) and Atlantic wolffish (*A. lupus*) (0.1% to 0.30% of catch. Quantities vary from year to year. There is no ICES assessment for these species, and the relationship between recruitment and stock size index is poor. Generally, the abundance and biomass of all three species is relatively low, but they are all widely distributed throughout the Barents Sea. According to Bogstad et al (2015) the stock size of Atlantic wolffish and spotted wolffish has been relatively stable since 2004, and this assessment is repeated in IMR wolfish fact sheets This is further supported by anecdotal evidence from skippers of long-line vessels operating in the Barents Sea that wolfish remain plentiful and are increasing in abundance – especially the northern (*L. denticulatus*). PINRO stock assessment scientists interviewed as part of the stakeholder consultation stated that all indices for wolfish suggest that stocks are stable. It is therefore likely that these species are within biological limits, but this cannot be said with a high degree of certainty. Score 80 **Greenland halibut** (*Reinhardtius hippoglossoides*). The fleet catches roughly 300 tonnes/year of this species (879 tonnes in total for the three years 2015-17). This amounts to 0.6% of the total catch of the fleet. Data is relatively poor for this species (only landings and survey trends of biomass are available). A modelling and benchmarking process is however underway which should provide the basis for indicative reference points in the future (ICES 2015). This currently suggests a stable biomass; but recruitment is erratic/periodic and has been low since 2011 (ICES 2017). It is therefore highly likely that this species is within biological limits, but this cannot be said with a high degree of certainty. Score 80 **Long rough dab** *(Hippoglossoides platessoides)* is widely distributed and common in the Barents Sea. There is no ICES assessment but given its distribution and status it is highly likely to be within safe biological limits. Score 80. **Plaice** (*Pleuronectes platessa*) is on the edge of its distribution in the Barents and North Norwegian Sea. However, it is relatively abundant in the far south of the Barents Sea (IMR/PINRO 2015) and further south in the Norwegian Sea where stock status is very high. It is possible that the Barents Sea stock will further increase if temperatures continue to rise (score 100)

PI 2.1.1		The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species		
b	Guidepost			Target reference points are defined for retained species.
	Met?			N
	Justification	Target reference points have not been defined for any of the retained species within sub-areas I and II. SG100 is not met.		
c	Guidepost	If main retained species are outside the limits there are measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species.	If main retained species are 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.	
	Met?	NA	NA	
	Justification			
d	Guidepost	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the retained species to be outside biologically based limits or hindering recovery.		
	Met?	NA		
	Justification	There are no main retained species. Information on other retained species is sufficient to make the assessment presented under SIa		
References		» Bogstad B., Dolgov A. V. Gjøsæter, Hv., Hallfredsson E. H. Johannesen E., Kovalev Y.A., Mehl S., Prozorkevitch D. V.,Russkikh, A.A., Smirnov, O. V. 2015a. Redfish (*Sebastes mentella and Sebastes norvegicus*). http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/81-fish-species/646-redfish-sebastes-mentella-and-sebastes-norvegicus> » Bogstad B., Dolgov A. V. Gjøsæter, H., Hallfredsson E. H. Johannesen E., Kovalev Y.A., Mehl S., Prozorkevitch D. V.,Russkikh, A.A., Smirnov, O. V. 2015b. Wolffish (*Anarhichas sp*.). http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/81-fish-species/604-wolffish-anarhichas-sp » ICES 2016a. AFWG REPORT 2016: Golden redfish (Sebastes norvegicus) in Subareas 1 and 2. P 433-478 » ICES 2017a. ICES Advice on fishing opportunities, catch, and effort Arctic Ocean,		

PI 2.1.1	The fishery does not pose a risk of serious or irreversible harm to the retained species and does not hinder recovery of depleted retained species
	Barents Sea, Faroes, Greenland Sea, Icelandic Waters, and Norwegian Sea Ecoregions. Beaked redfish (Sebastes mentella) in subareas 1 and 2 (North East Arctic) DOI: 10.17895/ices.pub.3212 reb.27.1-2
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.1.2

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing retained species.
	Met?	Y	Y	Y

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species
	Justification	There are no main retained species so 80 is scored by default. There are a series of cohesive measures governing catches of retained species in the Norwegian and Russian zones. These fall under the overarching strategy for safeguarding the exploited fish stocks of the NE Arctic, enshrined in the Joint Russian–Norwegian Fisheries Convention and the Norwegian management plans for the Barents Sea and Norwegian Sea. This is supported by the following specific measures for the minimization and management of retained species. **Monitoring** • PINRO and IMR monitoring of bycatch species through observer programmes and logbook records • Norwegian Reference fleet data • Russian and Norwegian (IMR/PINRO) ecosystem surveys with abundance mapping covering most retained species • ICES Arctic Fisheries Working Group assessments **Management response** • Review by scientific (IMR/PINRO) and management authorities on need for and/or changes to measures **Measures** • Discard bans in Norwegian, Svalbard and Russian sectors; • Move on rule should catch begin to exceed quota, contain fish less than minimum size (redfish, Greenland halibut) or more than allowable bycatch limit (redfish, Greenland halibut) • Ban on targeted fishing for vulnerable species such as redfish other than in specific seasonal licensed fisheries. • Obligation to change fishing ground if fishing operations are likely to result in contravention of the discard ban • Real-time closures in areas where vulnerable species such as redfish or juvenile fish of any species exceed threshold levels in individual catches. • Haul limits for redfish and halibut in both Russian and Norwegian EEZs. • Permanently closed areas to protect spawning / nursery grounds; • Closed areas in both Norwegian and Russian sectors, including real time closures to protect redfish; • Mesh size in cod end is now usually 138 mm (above the minimum of 130mm harmonised Norwegian/Russian regulation); • A separation/sorting system is used compliant with the decisions of the Joint Russian-Norwegian Fishery Commission for Barents and Norwegian Sea Cod and haddock. This comprises a sort-V with a selective grid 1.2 x 1.0 m, and 55 mm spacing between bars. Anything smaller than 18cm should escape • Requirement to return live elasmobranchs to the sea where possible otherwise to land whole • Species identification manuals on board all vessels covering ETP and other vulnerable species, and protocol to record such species in log books While there are some differences between the measures applied to different species, they are effectively part of a broader management system and an elemental approach to scoring is therefore neither appropriate nor necessary. These measures apply to all retained species These measures are reinforced by the commercial incentive to maximize catch of target species. Together, these measures are considered to represent an effective strategy for managing retained species.SG100 is met.

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species). (applicable for main species only)	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. (applicable for main species only)	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved. (applicable for all species)
	Met?	Y	Y	N
	Justification	Given the very low proportion of bycatch the strategy overall seems to be working in practice for the client fleet. Information on bycatch collected by the fleet (log book data, observer data), coupled with analysis by scientific authorities (IMR, PINRO), and ongoing survey of the abundance of bycatch species under the Joint Norwegian Russian Ecosystem survey together provide an objective basis for confidence that the strategy is working. The discard ban adds substantially to confidence about the nature of the bycatch. Positive trends in abundance indices have resulted in an easing of earlier restrictions affecting fishing for Greenland halibut and there are similar positive trends in the abundance indices for other species such as ling, tusk and beaked redfish. Although the status of Golden redfish continues to deteriorate, both the amount and the proportion (of total catch) of golden redfish caught as bycatch in the trawl fisheries of the Barents Sea continues to decline. SG80 is met. Testing is limited for all species and is unlikely to support high confidence that the strategy will work given: • the lack of biological reference points and uncertainties about the level of fishing mortality for minor retained species; • the lack of discrimination between species of redfish in terms of both management measures and management response; • The small but significant (relative to stock size) bycatch of *S norvegicus* by the trawl fleet as a whole SG100 is not met.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	Y
	Justification	The combination of discard ban; daily reporting of all fishing activity and catches; log book entries; scientific observers; logbook and gear inspections; and landings statistics together provide clear evidence that the strategy is being implemented. There have been no infringements of any elements of the strategy reported by fishery observers and inspectors SG100 is met.		

PI 2.1.2		There is a strategy in place for managing retained species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species		
d	Guidepost			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	The very low level of retained species in the catch (<1%), and the positive trends in abundance indices for Greenland halibut (resulting in an easing of restrictions) ling, tusk and beaked redfish suggests the strategy is achieving its overall objective. SG100 is met		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification	Sharks are not caught in significant numbers in the fishery. If caught, these will be subject to requirements for releasing live or landing animals whole.		
References		Gullestad et al 2015 The "Discard Ban Package": Experiences in efforts to improve the exploitation patterns in Norwegian fisheries. Marine Policy 54 · April 2015 DOI: 10.1016/j.marpol.2014.09.025}		
OVERALL PERFORMANCE INDICATOR SCORE:				95
CONDITION NUMBER (if relevant):				

Evaluation Table for PI 2.1.3

PI 2.1.3		Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main retained species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery.	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	There are no main retained species so SG80 is met by default. Good quantitative data is available on all retained species, at the point of capture and landing (because of the discards ban), and this is reinforced and verified through the observer and inspections programme. Synthesis of data, analysis and checks are made by PINRO and Norwegian Authorities on an on-going basis. Reported species composition is broadly consistent between vessels and years. The quality of these data and the monitoring, surveillance and compliance have been assessed by FAO and found to be high (FAO FIRMS). However, there remain some uncertainties over the identification of redfish species, and the consequences for the status of redfish, wolffish and other minor retained species. SG100 is not met.		
b	**Guidepost**	Information is adequate to qualitatively assess outcome status with respect to biologically based limits.	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The information on bycatch described above, taken together with data generated from the PINRO/IMR surveys under the Barents Sea Ecosystem Survey is sufficient to estimate outcome status with respect to biologically based limits (SG80 met), but not with a high degree of certainty (SG100 not met).		
c	**Guidepost**	Information is adequate to support measures to manage main retained species.	Information is adequate to support a partial strategy to manage main retained species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	There are no main retained species, so SG 80 is met by default. Because of the uncertainties associated with redfish identification it is not possible to say that the information is sufficient to determine whether the strategy is achieving its objective with a high degree of certainty. SG 100 not met.		

PI 2.1.3		**Information on the nature and extent of retained species is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage retained species**		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk level (e.g. due to changes in the outcome indicator score or the operation of the fishery or the effectiveness of the strategy)	Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.
	Met?		Y	N
	Justification	Monitoring, reporting and analysis of bycatch of the Russian fleet and others engaged in the fishery is generally of a high standard. These protocols and regulations are enforced by on-board observers in the Russian sector and through ad hoc and scheduled inspections by the Norwegian Coastguard. The monitoring of the principal species is sufficient to assess ongoing mortalities to main retained species SG80 is met. There are some limitations related to monitoring, reporting and analysis of length and weight distribution of wolfish, uncertainties regarding redfish species identification, and limited identification of different skate and ray species. SG100 is not met.		
References		FAO FIRMS. http://firms.fao.org/firms/resource/10327/en Gullestad et al 2015 The "Discard Ban Package": Experiences in efforts to improve the exploitation patterns in Norwegian fisheries. Marine Policy 54 · April 2015 DOI: 10.1016/j.marpol.2014.09.025} ICES 2016 ghal; ICES 2016 gred, ICES2016HCR, ICES 2016ling, ICES2016saithe, ICES2016tusk, ICES Advice 2016, Book 9 http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/her-noss.pdf		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.2.1

PI 2.2.1		The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Main bycatch species are likely to be within biologically based limits (if not, go to scoring issue b below).	Main bycatch species are highly likely to be within biologically based limits (if not, go to scoring issue b below).	There is a high degree of certainty that bycatch species are within biologically based limits.
	Met?	Y	Y	N
	Justification	There are no main bycatch species so SG80 is met by default. Drawing on data from the Norwegian Reference Fleet, and some specific studies (Dolgov et al 2002, 2005; Grekov and Pavlenko 2011) it may be concluded that the following may be caught and discarded in small quantities: Thorny skate (Amblyraja radiata) (listed by IUCN as vulnerable), Northern Skate (R Hyperborean), Round skate (Rajella fyllae) (IUCN least concern). Small quantities of the critically endangered (IUCN) blue skate (Dipturus batis) may also be caught, but the UoA operates well to the north of the main areas of natural distribution. Other fish species that might be significant in a discarded bycatch include the Lumpsucker (Cyclopterus lumpus), Common sole (solea solea), Rabbit fish (Chimaera monstrosa), and possibly also rough rattail/rough headed grenadier (Macrourus berglax) and the greater argentine (Argentina silus) both of which have centres of distribution in the Barents Sea, and have life cycle characteristics that make them highly vulnerable. Reference fleet data, and discussions with company staff and skippers, suggest that catch and discards of these and other species are not significant, and no specific concerns were raised in this regard by other stakeholders. This might be expected given good selectivity of the gear, the high density and concentration of cod and haddock (implying short trawl times relative to catch), and the knowledge, experience and technology available to modern fishing vessels. However, the available information is inadequate to state with a high degree of certainty that by-catch species are within biologically-based limits. SG 100 is not met		
b	**Guidepost**	If main bycatch species are outside biologically based limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding.	If main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	
	Met?	NA	NA	
	Justification	Not applicable: there are no main bycatch.		

PI 2.2.1		**The fishery does not pose a risk of serious or irreversible harm to the bycatch species or species groups and does not hinder recovery of depleted bycatch species or species groups**		
c	**Guidepost**	If the status is poorly known there are measures or practices in place that are expected to result in the fishery not causing the bycatch species to be outside biologically based limits or hindering recovery.		
	Met?	Y		
	Justification	The measures and practices described under 2.2.2 are expected to result in the fishery not causing the bycatch the bycatch species to be outside biologically based limits or hindering recovery, and the very low catch rates recorded coupled with the information on distribution and habit given above all suggest operations would not hinder recovery		
References		DNV 2016 Report for the Russian Federation Barents sea cod and haddock fishery: Surveillance 2, ICES2016HCR, Gullestad et al 2015; Meeting client, Catch data Dolgov et al 2002. By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea. NAFO Scientific Council Meeting September 2002. Dolgov, A. V., A. A. Grekov, I. P. Shestopal, and K. M. Sokolov. (2005). By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea. J. Northw. Atl. Fish. Sci., 35: 357-366 Drevetnyak K. V., Dolgov, A.V., Sokolov, K.M., Gusev, E.V. and Grekov A.A. Skates in the Barents Sea: stock status and catch by fishing fleet. 2005 ICES Annual Science Conference. Elasmobranch Fisheries Science (Session N) CM 2005/ N:11 Enever R., Catchpole T. L., Ellis J. R and Grant A (2009). The survival of skates (Rajidae) caught by demersal trawlers fishing in UK waters. Fisheries Research. Volume 97, Issues 1-2, April 2009, Pages 72-76 Grekov, A.A. Pavlenko A.A 2011 A comparison of longline and trawl fishing practices and suggestions for encouraging the sustainable management of fisheries in the Barents Sea, — Moscow-Murmansk, World Wide Fund for Nature (WWF), 50p.…… Gullestad et al 2015 The "Discard Ban Package": Experiences in efforts to improve the exploitation patterns in Norwegian fisheries. Marine Policy 54 · April 2015 DOI: 10.1016/j.marpol.2014.09.025}		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.2.2

PI 2.2.2		There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a partial strategy in place, if necessary, that is expected to maintain the main bycatch species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding.	There is a strategy in place for managing and minimizing bycatch.
	Met?	Y	Y	Y
	Justification	There are no main bycatch species so SG80 is met by default. The strategy described under PI 2.1.2 includes measures to minimise all unwanted bycatch. These measures fall under the overarching strategy for safeguarding the exploited fish stocks of the NE Arctic, enshrined in the Joint Russian–Norwegian Fisheries Convention and the Norwegian management plans for the Barents Sea and Norwegian Sea. This generic strategy for the conservation and sustainable exploitation of fish stocks is supported by ongoing research by IMR and PINRO into the distribution and abundance of fishes in the NE Arctic. These measures are expected to manage and minimise levels of bycatch and so SG100 is met,		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/species).	There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or species involved.
	Met?	Y	Y	N
	Justification	The information entered in the standard log, the work of the observers, and the analysis by IMR, PINRO and other scientists (e.g. Gullestad 2015) - taken together provide a sound basis for confidence that the strategy is working. SG80 is met. However, the diversity of the species involved and the limited understanding of their interaction with the trawl fleet means that testing is extremely difficult. SG100 is not met.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N

PI 2.2.2		**There is a strategy in place for managing bycatch that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to bycatch populations**		
	Justification	Data from vessel logs, landings, gear and catch inspections, provides some evidence of successful implementation (SG 80 met) although this is not clear for all measures (especially the lesser known ones) and all measures (such as detailed bycatch recording). SG100 is not met.		
d	**Guidepost**			There is some evidence that the strategy is achieving its overall objective.
	Met?			Y
	Justification	The very low bycatch and strong evidence of compliance both suggest the strategy is achieving its objective. Furthermore, there is no evidence that bycatch taken by the fleet is having negative impact on any species. SG100 is met.		
References		Gullestad et al 2015 The "Discard Ban Package": Experiences in efforts to improve the exploitation patterns in Norwegian fisheries. Marine Policy 54 · April 2015 DOI: 10.1016/j.marpol.2014.09.025}		
OVERALL PERFORMANCE INDICATOR SCORE:				**90**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main bycatch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main bycatch species taken by the fishery.	Accurate and verifiable information is available on the catch of all bycatch species and the consequences for the status of affected populations.
	Met?	Y	Y	N
	Justification	There are no main bycatch species SG80 is met by default. Reasonably accurate and verifiable information is collected in the fishing logbooks, and through occasional inspections for most bycatch species as well as reference fleet data; and catch rates are unlikely to significantly affect the populations of these species. However there remain some uncertainties – about both the accuracy of reporting and the consequences for all species– for example with respect to elasmobranch species. SG100 is not met		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	The quality of the information collected in the on- board logbooks and catch data, as well as through the observer programme is relatively good, but still falls short of allowing for quantitative assessment of impact on all bycatch species, many of which do not have biologically based limits. SG80 is met but not SG100.		
c	**Guidepost**	Information is adequate to support measures to manage bycatch.	Information is adequate to support a partial strategy to manage main bycatch species.	Information is adequate to support a strategy to manage bycatch species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N
	Justification	Information is adequate to support a strategy to manage bycatch species, but it is inadequate to evaluate with a high degree of certainty whether the strategy is achieving its objective. This is, as noted above, because the range of relatively unusual species involved means that measuring the impact of the strategy on these species is extremely difficult. SG80 is met but not SG100.		

PI 2.2.3		**Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch**		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.
	Met?		Y	N
	Justification	There are no main bycatch species so SG80 is met by default. Monitoring of bycatch is inadequate (in terms of both species identification and quantification of catch) to assess on-going mortality of all bycatch species. SG100 is not met		
References		Condie, H., Grant.A., and Catchpole, T. 2014. Incentivising selective fishing under a policy to ban discards: lessons from European and global fisheries. Marine Policy Vol 45 287-292 Gullestad et al 2015 The "Discard Ban Package": Experiences in efforts to improve the exploitation patterns in Norwegian fisheries. Marine Policy 54 · April 2015 DOI: 10.1016/j.marpol.2014.09.025}		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.3.1

PI 2.3.1		The fishery meets national and international requirements for the protection of ETP species The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species.	The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species.	There is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species.
	Met?	Y	Y	N
	Justification	ETP species are those recognised by national legislation and/or binding international agreements to which the jurisdictions controlling the fishery under assessment are party, including Appendix I of CITES. Denmark, Greenland, Russia and Norway are all signatory to the Convention on Biological Diversity and the Convention on International Trade in Endangered Species (CITES). Norway and Russia have developed "red-lists" of threatened species which are recognized in Government policy and legislation. Under Russian Fishery Rules for the Northern Fish Economic basin (2009), the catch of red listed "water bio resources" is forbidden except under license or as part of research. Russia, Norway and Denmark are also signatory to NAMMCO (the North Atlantic Marine Mammal Commission) which along with IWC advocate measures to reduce bycatch of marine mammals, and accurate recording to inform understanding and abundance estimates. ICES provide and coordinate knowledge and advice relating to ETP management through the Study Group on Protected Species (SGBYC) and the working group on marine mammal ecology (WGMME). In addition, the fleet operates in an area subject to the Integrated Management Plan for the Marine Environment of the Barents Sea–Lofoten Area, and a range of monitoring initiatives under the Joint Russian Norwegian environmental assessment and status report for the Barents Sea. Identification guides for ETP species are present on all client vessels. We are aware of no evidence to suggest that the requirements under these agreements and initiatives are not being met, and no specific concern in this regard was raised by any stakeholder (scientists, NGOS). SG60 and SG80 are met. No significant encounters with ETP species have been reported, other than with golden redfish, and the fleet is complying with Norwegian and Russian regulations regarding these species. Evidence presented below supports the view that the effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species. However, the lack of comprehensive on-board recording of ETP encounters; and the lack of time and identification skills on board client vessels mean that this cannot be said with a high degree of certainty, so SG100 is not met.		
b	**Guidepost**	Known direct effects are unlikely to create unacceptable impacts to ETP species.	Direct effects are highly unlikely to create unacceptable impacts to ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the fishery on ETP species.
	Met?	Y	Y	N

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
		The evidence presented in background section suggests that negative encounters with bird and mammal ETP species are likely to be rare and insignificant. Examination of the Russian and Norwegian red lists suggest that the following species listed as endangered or critically endangered may be encountered during trawl activities: • Golden redfish (Sebastes norvegicus) • Greenland shark (Somniosus microcephalus) • Common or blue skate (Dipturus batis) • Spurdog (Squalus acanthias) • Blue ling (Molva dypterygia) The status and management of Golden redfish (*S. norvegicus*) has been discussed in some detail in section 2.4.2.1, and as since it is retained bycatch has been scored under Principle 2.1. The status of this species is poor but the fleet catches a very small quantity and is following all rules and protocols imposed by the Norwegian Authorities. The Greenland shark, *Somniosus microcephalus* (Norwegian red-list, near threatened) is occasionally encountered by the fleet, but the double grid system is designed to exclude large fish and mammals. If these animals are caught they are required to be released alive. Although the log books and other research suggest that skates and rays are occasionally found in the bycatch, it is not known whether this might include significant quantities of common/blue skate (*Dipturus batis*), since species are not separately identified. It may be possible to identify this from photographic records and is recommended that more such analysis is conducted. However, the Greenland trawl fishery operates well to the north of the main areas of natural distribution, and does not therefore pose a significant risk to this species. Spurdog is a very widely distributed and in many cases abundant species but is nonetheless vulnerable because of life history characteristics. However, it is more of a temperate species and at the edge of its range in the Barents Sea. The risk to this species from the fishery is therefore assessed as small, and there are no specific legal requirements Blue ling (*Molva dypterygia*) – another species with low resilience and high vulnerability - is caught by trawlers in the Barents Sea, although it has not been recorded in the catch of the client fleet in recent years. However, its more common cousin *Molva molva* is caught and it is possible there is some species misidentification. Unfortunately, this species is not included in the Barents Sea ecosystem survey so its current status is difficult to assess. ICES recommends that measures be taken to minimize bycatch of this species. Several marine mammals are included on the Norwegian and Russian red lists, and are listed in CITES Annex 1, but direct encounters with cetaceans and seals are recorded as rare, and are avoided, given the potential negative impact on fishing operations. Encounters with cetaceans are normally associated with set nets and pelagic gears rather than deep trawls. Similarly, encounters with seals and similar species are unlikely in an offshore fishery of this kind. A review of the impact of Norwegian offshore demersal trawl fisheries on marine mammals was undertaken by ICES Study Group for Bycatch of Protected Species (SGBYC 2009) and concluded that larger offshore demersal trawl vessels "are regarded as having a relatively low risk for bycatches of marine mammals". Interactions with ETP seabirds, especially deep diving auks, are also possible, especially during hauling. However, the main interaction is between these birds and gill and drift netters in coastal fisheries, and there are no reports of significant interactions with deeper water trawl nets.

PI 2.3.1		**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**		
	Justification	It is concluded that direct effects are highly unlikely to create unacceptable impacts to ETP species. SG60 and SG80 are met. However, the lack of fisher's knowledge relating to most of these species and the limitations of species identification means that we fall short of a high degree of confidence that there are no significant detrimental direct effects on ETP species, and SG100 is not met.		
c	**Guidepost**		Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		Y	N
	Justification	The principal indirect effect will be removal of the gadoids as (cod/haddock/saithe) as prey species from the food web and/or the removal of the gadoids as competitors with ETP species for pelagic prey (notably herring and capelin). Adult cod are known to be prey to some cetaceans and seals and seabirds quite possibly take them as inshore juveniles, so there is the potential for the fishery to be in competition with these predators. These could suffer negative effects if the NEA cod stock were in serious decline or depleted. For the past decade, however, the NEA cod stock has been increasing in abundance. Removal of gadoids may therefore be more of a positive than negative indirect effect. Studies have taken place on trophic relationships in the Barents Sea, and fish consumption by minke whale and harp seal presented in the report above. Indirect effects have been considered, and no unacceptable adverse impacts are identified. Other indirect effects may include "ghost" fishing and pollution, as well as e.g. disturbance/interference of feeding or breeding behaviour of ETP species. Loss of gear and the danger associated with ghost fishing is kept to the minimum through gear design and knowledge of seabed characteristics. In any case this tends to be a problem in respect of gillnet and drift net fisheries rather than trawl nets. As noted in the Barents Sea Ecosystem Assessment "The factors responsible for the declining trends (in seabird populations) in the western parts of the region probably involve food shortage, predation from an increasing population of white-tailed eagles and lagged effects from previous by-catch in fisheries". The latter almost certainly refers to historic catches in gill and drift nets in inshore fisheries. Pollution is highly unlikely to be significant from fishing vessels. All vessels are fully MARPOL compliant, with fully compliant waste and oil handing protocols. PCBs etc. from other sources are of far greater concern in this regard. Discard of fish waste may be seen to be broadly beneficial to several seabird species. This evidence suggests that the fishery is unlikely to create unacceptable impacts on ETP and SG 80 is met. However, indirect effects from damage to benthic habitat and the general uncertainties associated with food web impacts mean that it cannot be said with a high degree of confidence that there are no significant detrimental indirect effects and SG100 is not met.		
References		Barents Portal 2017. Marine mammals of the Barents Sea. http://www.barentsportal.com/barentsportal/index.php/en/general-description/109-biotic-components/708-marine-mammals-of-the-barents-sea CITES/UNEP Appendices I, II and III. valid from 5 February 2015 Dolgov, A.V. et al (2002), By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea, NAFO Scientific Council Meeting September 2002. Dolgov, A.V., A.A. Grekov, I.P. Shestopal and K.M. Sokolov (2005), By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea. J. Northw. Atl. Fish. Sci., 35: 357-		

PI 2.3.1	**The fishery meets national and international requirements for the protection of ETP species** **The fishery does not pose a risk of serious or irreversible harm to ETP species and does not hinder recovery of ETP species**
	366 ICES 2009. ICES Study Group for Bycatch of Protected Species (SGBYC) ICES Advisory Committee 2015. Report of the Study Group on Bycatch of Protected Species (SGBYC). ICES CM 2015/ACOM:26. Copenhagen, Denmark. ICES 2017f ICES Advice on fishing opportunities, catch, and effort Arctic Ocean, Barents Sea, Faroes, Greenland Sea, Icelandic Waters, and Norwegian Sea Ecoregions. Blue ling (Molva dypterygia) in subareas 1, 2, 8, 9, and 12, and in divisions 3.a and 4.a (other areas). DOI: 10.17895/ices.pub.3056 Nedreaas K, Smirnov, O, and Russkikh , A. 2015a. Beaked redfish (Sebastes mentella). http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/627-beaked-redfish-sebastes-mentella Nedreaas K.,Smirnov, O.,Russkikh, A. 2015b. Golden redfish (Sebastes norvegicus) http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/628-golden-redfish-sebastes-norvegicus Nedreaas, K.,Smirnov O., Russkikh, A.A. 2015c. Wolffish (Anarhichas spp.). http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/626-wolffish-anarhichas-spp WWF- Norway, 2008. Management and Technical Measures in the Norwegian Cod and Groundfish Fisheries. October 2008. WWF Bycatch Initiative. North Atlantic Cod. www.panda.org/bycatch
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.3.2

PI 2.3.2		The fishery has in place precautionary management strategies designed to: • Meet national and international requirements; • Ensure the fishery does not pose a risk of serious harm to ETP species; • Ensure the fishery does not hinder recovery of ETP species; and • Minimise mortality of ETP species.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place that minimise mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	Y	Y	N

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**
		NAMMCO (the North Atlantic Marine Mammal Commission) and IWC advocate measures to reduce bycatch of marine mammals, and accurate recording to inform understanding and abundance estimates. There are several significant research programmes to monitor marine mammal abundance and distribution in the Barents Sea (Barents Sea Portal) ICES provides and coordinates knowledge and advice relating to ETP management through the Study Group on Protected Species (SGBYC) and the working group on marine mammal ecology (WGMME). Much of this advice however relates to reducing the catch of marine mammals and seabirds, neither of which is considered to be a significant issue for the Greenland BSCH trawl fleet. There are few national and international requirements relating to the catch of other ETP species, although there has been substantial discussion and research especially in relation to bycatch (Grekov and Pavlenko 2011), and catch of elasmobranch species, some of which are threatened. ICES has a working group on elasmobranch fisheries (WGEF) that generates status reports and management recommendations. The European Commission has an Action plan for the Conservation and Management of Sharks that conforms to the FAO International Plan of Action for Sharks (IPOA-shark), but the obligations of Greenland and Norway under this plan are unclear. An overarching review of ecosystem interactions (studied as part of the annual Barents Sea ecosystem surveys) takes place through the Barents Sea Management Plan (BSMP), which also identifies appropriate mitigation measures as necessary. For example, the BSMP recognises the importance of the life history and population trends of bird species within the ecosystem of the Barents Sea, and noted that "In the light of new knowledge, the [Norwegian] Government will assess the need for restrictions on gear to reduce bycatch of vulnerable seabirds in certain areas and during certain periods' (principally, inshore breeding populations of diving birds, which are vulnerable to gill nets.) Where Norway or Russia identifies a need for strategies to be introduced, appropriate action is taken, including monitoring of potential interactions with ETP species. The Norwegian Marine Resources Act and associated regulations provide a strategy for managing fishery interactions with ETP species, including the closure of areas as deemed necessary. There is also provision in the act to require all vessels to record and retain all non-fish bycatch if necessary. At present, it has not introduced this measure or placed special conditions or restrictions on the NE Arctic trawl fisheries In more practical terms, and in line with NEAFC recommendations, Norway has in place a temporary ban on commercial fishing of *Squalus acanthias*, *Cetorhinus maximus* (basking shark) and *Lamna nasus* (porbeagle), and is in process of developing a national plan of action for sharks. However, landing of bycatch is obligatory and these may enter into trade.

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
	Justification	Norway is subject to agreement under OSPAR Annex V "*on the protection and conservation of the ecosystems and Biological Diversity in the maritime area*" and the Norwegian government has established objectives for species management in the Barents Sea – Lofoten area. These relate to population viability, genetic diversity, safe biological limits (for harvested species), management of key species in the ecosystem, and endangered species for which Norway has special responsibility. Under Russian Fishery Rules for the Northern Fish Economic basin (2009), the catch of red listed "water bio resources" is forbidden except under license or as part of research. At present practical measures to protect threatened species are limited, but reflect the (likely) limited number of damaging encounters. Measures currently in place include measures for the reduction of bycatch (138mm mesh size; double grid system; discard ban; guidance and education on the identification of ETP species; and a requirement to release sharks and rays live to the sea. These may be regarded as a strategy appropriate to scale of interaction and meeting national/international requirements. SG 80 is met. However, it cannot be said that this comprises a comprehensive strategy designed to achieve above national and international requirements for the protection of ETP species, SG 100 is not met.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the strategy will work, based on information directly about the fishery and/or the species involved.	The strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	Y	Y	N
	Justification	Coastal states' agencies (IMR, NINA, PINRO) monitor the status of fish, seabird and marine mammal populations and pay close regard to the potential for adverse interactions of these populations with fisheries. It is part of the role of these agencies to ensure that the national an internationally agreed (JNRFC) strategies are met and that there are no unacceptable effects on the populations. Where specific problems are identified (in other fisheries), they are modelled and subject to quantitative analysis (e.g. inshore gillnet fisheries and harbour porpoise). SG80 is met. This provides an objective basis for confidence that the strategy will work, based on information directly about the fishery (which is monitored by Russian compliance observers and through the Norwegian coastguard) and the species involved which are monitored. SG80 is met. However, actual data on encounters with ETP species is limited. While this may reflect the infrequency of such encounters, it is nonetheless inadequate to support a high degree of confidence and quantitative analysis. SG100 is not met.		

PI 2.3.2		**The fishery has in place precautionary management strategies designed to:** • **Meet national and international requirements;** • **Ensure the fishery does not pose a risk of serious harm to ETP species;** • **Ensure the fishery does not hinder recovery of ETP species; and** • **Minimise mortality of ETP species.**		
c	**Guidepost**		There is evidence that the strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	Implementation of the strategy, through relevant measures, is ensured by on-board compliance observers in the Russian zone and Coastguard inspections in the Norwegian zone. In addition, national agencies (IMR, NINA, PINRO) monitor ETP populations and advise on targeted conservation measures as and when deemed necessary. The status of ETP species in the NE Arctic are kept under review by international bodies (ICES, OSPAR and NAMMCO) and their respective specialist working groups. None of these bodies has apparently identified specific cause for concern relating to the Russian FEST trawl fisheries in the Barents Sea. There is, therefore, evidence that the strategy is being implemented successfully and so SG80 is met. No systematic evidence of successful implementation has been presented, and there remain significant doubts about the accuracy and utility of data collected in the absence of scientific observers. The information collected has not been analysed to provide an overall review of encounters with ETP, protocols put in place, and likely consequences for the organism involved. SG100 is not met.		
d	**Guidepost**			There is evidence that the strategy is achieving its objective.
	Met?			N
	Justification	No systematic evidence has been presented showing that the strategy, in relation to the client vessels, is achieving overall objectives. SG100 is not met.		
References		Joint PINRO/IMR Ecosystem Survey of the Barents Sea http://www.imr.no/tokt/okosystemtokt_i_barentshavet/en Grekov, A.A. Pavlenko A.A 2011 A comparison of longline and trawl fishing practices and suggestions for encouraging the sustainable management of fisheries in the Barents Sea, — Moscow-Murmansk, World Wide Fund for Nature (WWF), 50p……. WWF- Norway, 2008. Management and Technical Measures in the Norwegian Cod and Groundfish Fisheries. October 2008. WWF Bycatch Initiative. North Atlantic Cod. www.panda.org/bycatch		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.3.3

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Sufficient information is available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.	Information is sufficient to quantitatively estimate outcome status of ETP species with a high degree of certainty.
	Met?	Y	Y	N

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Justification	The PINRO / IMR Reports on the State of the Barents Sea ecosystem offer an overview of the ETP species which occur in the Barents Sea including their spatial and temporal distribution and ecology. Since 2002 the distribution of marine mammals in the Barents Sea has been recorded by research vessels, aircraft, fishing vessels and coastguard vessels under the Joint PINRO / IMR ecosystem survey. The surveys are driven in part by ICES advice relating to quotas for commercial harvesting of marine mammals, or species identified as particularly vulnerable. Marine mammal and seabird stock monitoring and abundance estimates are made by IMR and NINA and records of all biota are made during annual IMR–PINRO trawl surveys undertaken under the auspices of JNRFC. The IMR undertakes annual surveys of minke whales and other large baleen whales generating abundance estimates every 6 years. An analysis of marine mammal interactions within a variety of Faeroese fisheries (including foreign fishing vessels) including demersal trawl fisheries for cod haddock and saithe in the Northern Norwegian Sea over a number of years concluded that marine mammal bycatch was largely limited to gillnet fisheries, especially shallow water set nets, with some bycatch in driftnets, dropnets, purse seining and pelagic/midwater trawling of pelagic shoaling fish, and little or no marine mammal catch observed for the demersal trawls (Mikkelsen 2016). With the introduction of the electronic logbook it is now obligatory to record the presence or absence of marine mammals and seabirds in the catch. No interactions with seabirds have been reported. VMS data now allows for precise analysis of spatial distribution of fishing effort allowing for potential interactions with sea mammals and to a lesser degree seabirds to be assessed or predicted. The discard ban and species recording requirements generate high quality data on the catch of a wide range of species, suggesting that encounters with ETP species are rare. The Norwegian reference fleet provides information on catch of all species, though this is unlikely to correspond exactly to catch composition of the trawl fleet in the Barents Sea. Interactions with national red list fish may occur more frequently, but the most likely species - spurdog, common skate, basking shark and porbeagle are not routinely recorded in the catch, or in sufficient numbers to feature on returns; when caught, they will be taken as rare individuals. Norway submits analysis of gear interaction with key ETP species to the ICES SGBYC. The client fleet itself collects some information in its fishing log-books, although analysis of this data has been limited. Several MSC certified trawl fisheries have been maintaining records of ETP encounters and some basic analysis is available that suggests such encounters are rare (e.g. Acoura 2018) SG80 is met. However, data on fishery interactions with some ETP species is limited – in large part because of their rarity, but also because of limited identification skills and analytical resources. While understandable, this limitation means outcome status cannot be estimated quantitatively with a high degree of certainty. To meet this requirement at 100 there would be a need for more representative reference fleet data and/or high quality species identification skills on a representative sample of fleet vessels, regular synthesis and analysis of photographic data, and more systematic analysis of data relating to the whole fleet. SG100 is not met

PI 2.3.3		**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**		
b	**Guidepost**	Information is adequate to broadly understand the impact of the fishery on ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species.	Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.
	Met?	Y	Y	N
	Justification	The information as described above is considered sufficient to determine that the fishery is extremely unlikely to be a threat to the protection and recovery of any ETP species, and so SG80. The information available does not, however, appear to be comprehensive and verifiable in determining the magnitude of all impacts, mortalities and injuries and so SG100 is not met.		
c	**Guidepost**	Information is adequate to support measures to manage the impacts on ETP species.	Information is sufficient to measure trends and support a full strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	Y	Y	N
	Justification	The information and monitoring described above is considered sufficient to measure any significant trends in both interactions of the fishery with ETP species, and trends in populations. SG80 is therefore met. The information does not appear sufficient, however, to evaluate with a high degree of certainty whether measures are achieving their objectives and so SG100 is not met.		
References		Acoura 2018. Acoura Marine Public Certification Report. FIUN Barents & Norwegian Seas Cod and Haddock Fishery Barents Portal 2017. Marine mammals of the Barents Sea. http://www.barentsportal.com/barentsportal/index.php/en/general-description/109-biotic-components/708-marine-mammals-of-the-barents-sea CITES/UNEP Appendices I, II and III. valid from 4th October 2017 https://cites.org/eng/app/appendices.php Dolgov, A.V. et al (2002), By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea, NAFO Scientific Council Meeting September 2002. Dolgov, A.V., A.A. Grekov, I.P. Shestopal and K.M. Sokolov (2005), By-catch of Skates in Trawl and Long-Line Fisheries in the Barents Sea. J. Northw. Atl. Fish. Sci., 35: 357-366 ICES Advisory Committee 2015. Report of the Study Group on Bycatch of Protected Species (SGBYC). ICES CM 2015/ACOM:26. Copenhagen, Denmark. ICES 2017f ICES Advice on fishing opportunities, catch, and effort Arctic Ocean, Barents Sea, Faroes, Greenland Sea, Icelandic Waters, and Norwegian Sea Ecoregions. Blue ling (Molva dypterygia) in subareas 1, 2, 8, 9, and 12, and in divisions 3.a and 4.a (other areas). DOI: 10.17895/ices.pub.3056		

PI 2.3.3	**Relevant information is collected to support the management of fishery impacts on ETP species, including:** • **Information for the development of the management strategy;** • **Information to assess the effectiveness of the management strategy; and** • **Information to determine the outcome status of ETP species.**
	Larsen, T. Nagoda, D. and Andersen, J.R. (Eds) 2003. A biodiversity assessment of the Barents Sea Ecoregion WWF NAMMCO Working Group on bycatch reports and studies. (e.g. Report of the By-catch Working Group 2-4 May 2017/NAMMCO SC/24/12) Nedreaas K.,Smirnov, O.,Russkikh, A. 2015b. Golden redfish (Sebastes norvegicus) http://www.barentsportal.com/barentsportal/index.php/en/human-activities/89-fisheries-and-other-harvesting/628-golden-redfish-sebastes-norvegicus
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	Y	N

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
		The nature and distribution of benthic habitats and their interaction with the client fleet has been described in detail in the background section on ecosystems. It may be concluded from this analysis that: The FEST trawl fleet normally fishes in areas that are productive and relatively dynamic on the continental slope and on the slopes of banks and trenches within the Barents Sea. These areas are often also characterised by rich benthic habitat and in some cases VMEs. Some of these areas have been trawled for more than a century, and benthic communities have changed/adapted in response to the pressure of trawling. It is highly likely that some VMEs have been destroyed in the past. However, there is no evidence of any significant loss of function in terms of productivity, nutrient cycling or fisheries productivity, and the evidence suggests that most of these habitats would return to a "pre-trawl" state within something between 4 and 20 years. However, some very old biogenic reefs could take longer to recover and indeed may never fully rebuild given the dynamic and changing nature of these systems. In practice the level of impact caused by modern fishing gear is likely to be less than that caused historically (rock-hopper gear with large diameter rubber disks; better targeting of shoals; net sensors to optimize tow period; use of hydrodynamic trawl doors). There may therefore be some partial recovery within previously damaged existing fishing areas. Although most of the area trawled by the fleet is likely to be previously modified (or cleared) habitat, the coincidence of fishing activities with areas favourable for the development of rich benthic communities and VMEs is such that encounters with these communities are likely, especially on the edges of previously trawled areas or those that are only trawled periodically. Data on the activity of the fleet, the habitats fished, and the distribution of VMEs suggests possible interaction with the following, in roughly descending order of likelihood: hard bottom sponge communities; soft bottom sponge communities; coral reef and hard bottom coral garden; soft bottom coral gardens and seapen fields. These encounters are more likely within the Norwegian jurisdiction and Svalbard zones. The client fleet respects existing marine protected areas designed to protect deep sea coral within the Norwegian Jurisdiction, and a range of other closed areas designed to protect other interests, but which also incidentally provide some protection for marine habitats. The UoC records encounters with coral and sponge, and weighs sponge where this comprises a significant part of the catch. There have been no significant encounters in recent years. **Assessment by element** There is no consensus as to which habitat "elements" should be separately scored, and the rationale presented above applies broadly to all sensitive or important habitats that may be impacted by the fleet. Nonetheless there is increasing emphasis on the protection of VMEs as defined in the ICES advice to NEAFC and NAFO and these can be assessed separately as follows: **Cold water coral reef (***Lophelia pertusa, Solenosmilia variabilis***):** These occur in the south-western part of the Barents Sea off the coast of Norway. A significant part of this habitat occurs within the 12m limit and is not fished by the fleet. Outside this limit, four marine protected areas have been designated specifically to protect prime examples of coral reef habitat to the SW of the Lofoten Islands, and some smaller areas further north. VMS data shows that the fleet has respected the MPA boundaries. There are also reefs to the North and North East of Lofoten that are not protected, and occur within general areas fished by the fleet. There are no known significant colonies North of the Varanger Penninsular or within the Russian EEZ. While there is therefore potential for some damage to these habitats, the 12m limit, MPAs, encounter and reporting rules, and evolving mapping and avoidance initiatives should greatly reduce the risk of serious damage. 90

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Justification	**Hardbottom coral garden** have been mapped in the Norwegian EEZ (excluding Svalbaard) on Mareano and some related habitats by ICES. They occur at the upper part of steep continental slope to the West of Tromsø and the Lofotens in depths of 250-900m. To date the fleet has not fished in these areas. In any case, the fleet mainly trawl less steep areas of the shelf and shelf slope, and the fishery encounter and reporting protocols, reinforced by improved information being facilitated by WWF Russia should ensure that the risk of damage will decline through time. 90 **Softbottom coral gardens**: An extensive area of softbottom coral garden has been mapped on the continental slope to the northwest of Finmark in depths of 550-800m. VMS data suggest the Greenland fleet rarely fishes this far north and west. In any case, "soft coral" (*Alcyonacea*) species are relatively common throughout the Barents Sea (such that recolonization should be relatively rapid), and the encounter and reporting protocols, coupled with evolving mapping and avoidance agreements should ensure that serious and irreversible damage is unlikely. 90 **Seapen fields**: Seapens are relatively common, if sparsely distributed within the habitat sometimes classed as "seapen and burrowing megafauna" which occurs throughout the North Atlantic in muddy depressions/marine valleys/fjiordic systems. This does not classify as VME. *Umbellula incrinis* on the other hand is found in dense aggregations on soft muddy substrates in the north-eastern part of the Barents Sea near the St. Anna Trough, and on the lower parts of the continental slope to the NW of the Lofotens, below 600m. It does class as VME. While these organisms are vulnerable to trawling, the main natural distribution is at depths greater than those typically trawled by the Greenland fleet (200-450m) and fleet VMS data overlain on habitat maps reveals a clear separation between fleet activity and VME distribution. 100 **Ostur sponge aggregations:** Aggregations of sponges are characteristic of substantial areas of the Barents Sea shelf as determined in surveys early in the 20th century, and there is significant overlap between their natural distribution and the main areas of fleet activity, although the typical depth range (250-1300m) is much greater than that within which the fleet usually operates (200-450m). They have been largely cleared from the areas now fished by the fleet, but remain relatively common. Further serious damage is now highly unlikely given the closed areas within Norwegian and Russian zones; the move-on rules when significant amounts of sponges are caught; the ban on trawling in, or in close proximity to known areas of sponge aggregations mapped in MAREANO; and the ongoing contribution to mapping VMEs under the Russian industry led initiative to cooperate with IMR/PINRO/Mareano scientists and WWF to develop comprehensive maps of sensitive habitat within or adjacent to main fishing areas. Score 80 The remaining impacts of the UoA are qualitatively considered to be highly unlikely to cause serious or irreversible harm as defined above. These scores are broadly consistent with other recent assessments, although the varied selection of scoring elements and differing interpretation of VME means that some variation in scoring is inevitable. *It is important for the credibility of the MSC process that there should be greater harmonisation in the selection of elements for subsidiary scoring and a tighter definition of VME.*
References		» Anisimova, N.A., Jørgensen, L.L., Lyubin, P.A. and Manushin, I.E. 2010. Mapping and monitoring of benthos in the Barents Sea and Svalbard waters: Results from the joint Russian - Norwegian benthic programme 2006-2008. IMR-PINRO Joint Report Series 1-2010. ISSN 1502-8828. 114 pp » Atkinson, R.J.A., 1989. Baseline survey of the burrowing megafauna of Loch Sween PMNR and an investigation of the effects of trawling on the benthic megafauna. Report to the Nature Conservancy Council from the University Marine Biological Station, Millport » Denisenko S.G. (2007), Zoobenthos of the Barents Sea under Conditions of Changing Climate and Human Intervention, pp. 418-511 in: Dynamics of Marine Ecosystems and Contemporary Problems of Protection of Biological Potential of

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Russian Seas, Vladivostok: Dalnauka » Denisenko S.G & Zgurovsky K.A (Eds). 2013. Impact of trawl fishery on benthic ecosystems of the Barents Sea and opportunities to reduce negative consequences - Murmansk. WWF. 2013. 55 pp. » FAO 2009. International Guidelines for the management of deep sea fisheries in the high seas. ISBN 978-92-5-006258-7 » Howson, C.M. & Davies, L.M., 1991. Marine Nature Conservation Review, Surveys of Scottish sealochs. A towed video survey of Loch Fyne. Volume 1 - Report. Report to the Nature Conservancy Council from the University Marine Biological Station, Millport. » dvla change of address » dvla change of address » ICES 2008 Advice: Book 9. NEAFC request on identification of vulnerable marine ecosystems, including definitions and assessment of fishing activities that may cause significant adverse impacts on such ecosystems. http://www.ices.dk/news-and-events/news-archive/news/Pages/Newly-released-ICES-advice-on-Vulnerable-Marine-Ecosystems-%28VMEs%29-includes-information-on-hydrothermal-vents.aspx » ICES 2013. Advice, Book 1. 1.5.5.3 Special Request Advice June 2013. Assessment of the list of VME indicators and elements » ICES 2014a Report of the Arctic Fisheries Working Group (AFWG) ICES Advisory Committee ICES CM 2014/ACOM:05 » ICES 2017 g Report of the Benthos Ecology Working Group (BEWG). Scicom Steering Group On Ecosystem Processes And Dynamics ICES CM 2017/SSGEPD:03 REF. SCICOM. » Jakobsen, T. and Ozhigin, K (Eds) 2011. The Barents Sea: Half a century of Russian-Norwegian Cooperation. Polar Research Institute of Marine Fisheries and Oceanography; Institute of Marine Research. Tapir Academic Press. » Jørgensen, L. L., Planque, B., Thangstad, T. H., and Certain, G. 2016. Vulnerability of megabenthic species to trawling in the Barents Sea. ICES Journal of Marine Science, 73: i84–i97. » Kiyko, O.A. and Pogrebov, VB. 1997. Long-term benthic population changes (1920-1930s - present) in the Barents and Kara Seas. Marine Pollution Bulletin, 35(7-12): 322-332. » Lyubin P. et al 2015. Multiple impacts on the megafauna in the Barents Sea. http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/79-benthos/688-multiple-impacts-on-the-megafauna-in-the-barents-sea » Mareano Vulnerable biotypes. http://mareano.no/en/topics/biotopes/vulnerable_biotopes » "Mareano programme" (http://www.mareano.no/english/index.html); WWF, 2011. The Atlas of marine and coastal biological diversity of the Russian Arctic Moscow. Edited by V.A. Spiridonov, M.V. Gavrilo, E.D. Krasnova and N.G. Nikolaeva). Moscow: — 64 pp.ISBN 978-5-9902786-2-2. http://www.cbd.int/doc/meetings/mar/ebsaws-2014-01/other/ebsaws-2014-01-submission-russian-federation-10-en.pdf; » NEAFC 2014. Recommendation 19: Protection of VMEs in NEAFC Regulatory Areas as Amended by Recommendation 09:2015 » OSPAR List of Threatened and/or Declining Species & Habitats.

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats » PINRO-IMR 2012. Norwegian-Russian workshop HAV 5: Biological – Geological Seabed Mapping and Monitoring in the Barents Sea. Murmansk, PINRO, 7-10 November 2011. Editors:Lis Lindal Jørgensen (IMR), Natasja Anisimova (PINRO) and Anne Britt Storeng (DN) » UK Marine SACs project. http://www.ukmarinesac.org.uk/communities/seapens/sp5_1_1.htm
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	The protected areas; reporting and encounter protocols; contribution to mapping and monitoring fleet footprint and VMEs under the industry initiative; joint PINRO/IMR ecosystem assessment; and steady improvement in gear and targeting amount to a partial strategy. SG 60 and 80 is met. However, it is arguable that this lacks the strength of a full strategy, since existing protected areas in Norwegian waters only protect coral reefs (and only to the south of Lofoten), and there are no clear measures in place for the protection of other known areas of VME, including in particular sponge fields. Hopefully agreement will be reached on appropriate areas for the protection of these other habitats on the back of the steadily increasing information on the distribution and quality of these habitats. SG100 is not met		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N
	Justification	There is some objective basis for confidence that the partial strategy will work, based on steadily improving information and targeting, and the self-interest of fishermen in terms of protecting nets from damage and maintaining the quality of the catch SG80 is met. However, the data is not yet sufficiently corroborated, nor is it adequate to allow for testing or for a full assessment of the status and trends of key benthic habitats. SG100 is not met.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	• There is clear independent evidence that the fleet is avoiding protected areas. • There is some evidence (i.e. skippers statements and occasional inspections) that the encounter and reporting protocols are being implemented. • There is limited evidence that fishers are identifying and recording all VMEs SG80 is met but not SG100		

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			Y
	Justification	VMS data clearly shows that the fleet avoids protected areas. It also shows that there is very limited overlap between its activities and the distribution of VMEs and other vulnerable habitats. The reported lack of encounter with significant coral and sponge aggregations, while unsubstantiated by third parties, also suggests that the strategy is achieving its objective. SG 100 is met.		
References		Christiansen 2010, Dayton 1979, Jason 2008, OSPAR 2009, 2010, Meeting client, ICES 2013, NEAFC 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				**85**
CONDITION NUMBER (if relevant):				**-**

Evaluation Table for PI 2.4.3

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is basic understanding of the types and distribution of main habitats in the area of the fishery.	The nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery.	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types.
	Met?	Y	Y	Y
	Justification	The nature, distribution and vulnerability of benthic habitats of the Barents and Norwegian Seas, are well known and researched by international standards. This information is summarized in various marine atlases, the Mareano mapping programme (2011) the reports by Joint Russian Norwegian Ecosystem Assessment; the review by Jakobsen and Ozhigin; through scientific studies undertaken by PINRO, and publications by WWF. This work is increasingly supplemented with data coming directly from the fleet in the form of VME encounter reporting and photographic records of catch. More recently, NEAFC has recommended Member States to provide VMS data to ICES and NEAFC constituent bodies to meet the needs of both science and compliance. (Recommendation 10, 2013: made at the 31th Annual Meeting in November 2012). See section 3.4 for a detailed presentation) Excellent complimentary information is available through VMS on the distribution and fishing intensity of the fleet. SG 60, 80 and 100 are all met.		
b	**Guidepost**	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.	Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified and there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.	The physical impacts of the gear on the habitat types have been quantified fully.
	Met?	Y	Y	N

PI 2.4.3		Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types		
	Justification	Several studies have been undertaken specifically addressing the impacts of trawl gear on benthic habitats of the Barents Sea (Denisenko 2007; Denisenko and Zgurovsky 2013; PINRO-IMR 2012; Jakobsen and Ozhigin 2011; Lyubin et al 2015a,b) and are reviewed in detail in the background section on P2. The annual Joint Russian Norwegian ecosystem survey undertakes benthic sampling and generates benthic composition/distribution time series. Good data is available on spatial overlap from fleet VMS data and habitat mapping. Data are also available from the on-going observer programme. Systematic long term trend data are collected under the Integrated Management Plan for the Barents Sea-Lofoten Area and the Joint Russian-Norwegian Ecosystem assessment and monitoring of the Barents Sea. SG80 is met. Some quantification of impacts has been attempted, but effects are compounded by natural spatial variability, and changes in oceanographic and climatic conditions. Some key questions have not been answered – such as the proportion of sponge beds destroyed or altered, and the wider implications of these changes in terms of other species, productivity, or resilience are not well understood. There is significant potential for more thorough analysis of existing data, which should lead to a refinement of focus of future data collection. A recommendation has therefore been raised in support of this. Clearly, more monitoring of benthic catch and damage, and more analysis of existing data is required before we can quantify these impacts with any degree of precision. SG100 is not met		
c	Guidepost		Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Changes in habitat distributions over time are measured.
	Met?		Y	Y
	Justification	The ongoing data collection at fleet level (encounter records, VMS data) coupled with broader scale data collection under the Joint IMR/OINRO ecosystem survey programme and the Integrated Management Plan for the Barents Sea-Lofoten Area should allow for detection of any increased risk to benthic habitat. There have been periodic surveys of benthic habitat in the Barents Sea since the early 20th century and long terms trends and changes have been analyzed. SG100 is met.		
References		Denisenko S.G & Zgurovsky K.A (Eds). 2013. Impact of trawl fishery on benthic ecosystems of the Barents Sea and opportunities to reduce negative consequences - Murmansk. WWF. 2013. 55 pp. Denisenko S.G. (2007), Zoobenthos of the Barents Sea under Conditions of Changing Climate and Human Intervention, pp. 418-511 in: Dynamics of Marine Ecosystems and Contemporary Problems of Protection of Biological Potential of Russian Seas, Vladivostok: Dalnauka Jakobsen, T. and Ozhigin, K (Eds) 2011. The Barents Sea: Half a century of Russian-Norwegian Cooperation. Polar Research Institute of Marine Fisheries and Oceanography; Institute of Marine Research. Tapir Academic Press. Larsen, T. Nagoda, D. and Andersen, J.R. (Eds) 2003. A biodiversity assessment of the		

PI 2.4.3	Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types
	Barents Sea Ecoregion WWF; Lyubin, P, Jorgensen, L., Anisimova, N., Renaud, P). 2015a Multiple impacts on the megafauna in the Barents Sea. http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/79-benthos/688-multiple-impacts-on-the-megafauna-in-the-barents-sea Lyubin, P, Jorgensen, L., Anisimova, N., Renaud, P. 2015b. Spatial distribution of the benthos in the Barents Sea. http://www.barentsportal.com/barentsportal/index.php/en/biotic-components/79-benthos/612-spatial-distribution-of-benthos "Mareano programme" (http://www.mareano.no/english/index.html); WWF, 2011. PINRO-IMR 2012. Norwegian-Russian workshop HAV 5: Biological – Geological Seabed Mapping and Monitoring in the Barents Sea. Murmansk, PINRO, 7-10 November 2011. Editors:Lis Lindal Jørgensen (IMR), Natasja Anisimova (PINRO) and Anne Britt Storeng (DN) Spiridonov, V.A. Gavrilo, M.V. Krasnova E.D and N.G. Nikolaeva (Eds) 2011. Atlas of Marine and Coastal Biological Diversity of the Russian Arctic. Moscow: WWF Russia. ISBN 978 5 9902786 2 2……
OVERALL PERFORMANCE INDICATOR SCORE:	**95**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.5.1

PI 2.5.1		The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	Y	Y	P
	Justification	Two ICES working groups provide annual assessments of the state of the Barents Sea Ecosystem (Arctic Fisheries Working group; WG for Regional Ecosystem Description). A new working group on integrated assessment in the Barents Sea (WGIBAR) has now been established. This information is supplemented by on-going data collected under the Joint Norwegian-Russian Environmental Status Report for the Barents Sea (which issues annual Barents Sea ecosystem status report, trends, highlights expected future situation) and work undertaken as part of implementing the Integrated Management Plan for the Barents Sea-Lofoten area. All these assessments suggest that broadly speaking the Barents Sea Ecosystem is relatively healthy, although changing in response to variations in temperature and marine currents. There have been changes in the spatial distribution and composition of the plankton, and several species have moved firther north in response to warming and reduced ice cover.There is no evidence or suggestion in the most recent (ICES 2016) assessment that current fishing activities are significantly changing or disrupting ecosystem structure and function. There has been a decline in seabird populations (similar to that throughout the NE Atlantic), but the reasons for this are unclear (local food shortage; increased predation; historic bycatch in drift net and long-line fisheries) and are not attributed to current fishing activity. The high stocks of key species at different trophic levels (cod/ haddock and capelin) suggest that the fish related elements of the ecosystem are broadly speaking in good shape. Significant changes are however taking place probably related to climate change. These surveys and assessments are also supported by a several ecosystem modelling studies related specifically to the Barents Sea, which have explored for example the trophic relations between fish species, and links between capelin, cod, seabirds, marine mammals. These include ecopath type studies by Blanchard et al 2002; EcoCod (which seeks to estimate cod MSY taking into account a range of ecosystem factors), Gadget (multispecies interactions between cod, herring, capelin, minke whale, krill) in the Barents Sea; Biofrost (multispecies model for Barents Sea – addressing primarily cod / capelin dynamics); STOCOBAR (Stock of cod in the Barents Sea). Broader ecosystem models include NORWECOM.E2E, which includes plankton and fish, and is under development and semi-operational, and both PINRO and IMR have developed hydrodynamic models that complement these mainly biologically based models. SG80 is met. The historical impacts of the fishery on benthic habitats has been discussed in the background section, and the knock-on effects on the wider ecosystem are not well understood. There remain concerns relating to some fish species and species groups – in particular redfish, wolfish and elasmobranchs – and again the wider impacts are not well understood. Our overall understanding of ecosystem structure and functioning, and the impacts of fisheries therefore remains inadequate to score this as highly unlikely for all ecosystem elements. SG100 is partially met.		
References		Anon. 2011. Survey report from the joint Norwegian/Russian ecosystem survey in the		

PI 2.5.1	The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function
	Barents Sea August-October 2011. IMR/PINRO Joint Report Series, No. 3/2011. ISSN 1502-8828. 118 pp. Arneberg, P., Titov, O., Filin, A., and Stiansen, J. E. (Eds.) 2013. Joint Norwegian-Russian environmental status report on the Barents Sea Ecosystem – update for current situation for climate, phytoplankton, zooplankton, fish and fisheries in 2011. IMR/PINRO Joint Report Series, 2013(3), 56 pp. ISSN 1502-8828. Blanchard, J.L. Pinnegar J.K. and S. Mackinson (2002) Exploring Marine Mammal Fishery Interactions using Ecopath with Ecosim: Modeling the Barents Sea Ecosystem, CEFAS Science Series Technical Report No 17. Ecosystem Survey of the Barents Sea Autumn 2014. 6. Monitoring the demersal community; Seabird observations; Marine Mammal and Seabirds Monitoring; Fish Biodiversity; invertebrate biodiversity. etc IMR/PINRO 2014. Update of the "Joint Norwegian-Russian environmental status report on the Barents Sea Ecosystem". The current situation for climate, phytoplankton, zooplankton, fish, and fisheries during 2012-13 ICES 2016b. ICES Advice 2016, Book 9 1 Barents Sea Ecoregion – Ecosystem overview Jakobsen, T. and Ozhigin, K (Eds) 2011. The Barents Sea: Half a century of Russian-Norwegian Cooperation. Polar Research Institute of Marine Fisheries and Oceanography; Institute of Marine Research. Tapir Academic Press. Johannesen, E., Ingvaldsen, R. B., Bogstad, B., Dalpadado, P., Eriksen, E., Gjøsæter, H., Knutsen, T., Skern-Mauritzen, M., and Stiansen, J. E. 2012. Changes in Barents Sea ecosystem state, 1970–2009: climate fluctuations, human impact, and trophic interactions. – ICES Journal of Marine Science, 69: 880–889 Larsen, T. Nagoda, D. and Andersen, J.R. (Eds) 2003. A biodiversity assessment of the Barents Sea Ecoregion WWF Magnussen K. 2012. Marine Ecosystem Services in the Barents Sea and Lofoten Islands, a scoping assessment. In the Economics of Ecosystems and Biodiversity…… McBride, M. M., Filin, A., Titov, O., and Stiansen, J. E. (Eds.) 2014. IMR/PINRO update of the "Joint Norwegian-Russian environmental status report on the Barents Sea Ecosystem" giving the current situation for climate, phytoplankton, zooplankton, fish, and fisheries during 2012-13. IMR/PINRO Joint Report Series 2014(1), 64 pp. ISSN 1502-8828.
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**-**

Evaluation Table for PI 2.5.2

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary.	There is a partial strategy in place, if necessary.	There is a strategy that consists of a plan, in place.
	Met?	Y	Y	N
	Justification	An ecosystem based management plan is in place for the Barents Sea-Lofoten area. This plan includes assessment of threats to ecosystem structure and function and where appropriate identification of measures to address such threats. There are initiatives to extend this to the Russian Barents Sea. The Norwegian plan states that the Norwegian authorities will work to standardise and harmonise Norwegian and Russian environmental monitoring in the Barents Sea. This will include continuing to assist Russia in introducing OSPAR standards, which will facilitate Russia's entry into the OSPAR cooperation in the long term. There is a range of more specific measures and initiatives in place to address management of individual ecosystem elements. • Measures described in P1 to ensure that the fishery does not pose a risk to cod and haddock, which are important (arguably key) species in the Barents Sea Ecosystem. • A range of technical measures and protocols to minimize bycatch of other fish species (described in 2.1 and 2.2) that may play an important role in ecosystem structure and function • Closed areas to protect the young of a variety of other species. • Closed areas to protect the most valuable/vulnerable benthic habitats in the Norwegian zone and to a lesser extent in the Russian zone, and protocols and gear development initiatives to reduce benthic impacts. There is limited interaction with marine mammals and seabirds, and specific measures are not considered necessary. The mix of planning initiatives, Russian-Norwegian cooperation initiatives, ecosystem monitoring and assessments, seabed mapping, fishing effort distribution monitoring, ICES advice, and the range of individual measures designed to protect different elements of the ecosystem ….taken together may be regarded as comprising a partial strategy. SG80 is met. However, while there is an overarching plan for the Norwegian Barents Sea and Lofoten Area, there is nothing equivalent in the Russian zone. Furthermore, several of the initiatives relating to benthic impacts have only recently been implemented and cannot yet be considered to be part of a strategic plan. SG100 is not met.		

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
b	Guidepost	The measures take into account potential impacts of the fishery on key elements of the ecosystem.	The partial strategy takes into account available information and is expected to restrain impacts of the fishery on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	The strategy, which consists of a plan, contains measures to address all main impacts of the fishery on the ecosystem, and at least some of these measures are in place. The plan and measures are based on well-understood functional relationships between the fishery and the Components and elements of the ecosystem. This plan provides for development of a full strategy that restrains impacts on the ecosystem to ensure the fishery does not cause serious or irreversible harm.
	Met?	Y	Y	N
	Justification	The measures described above address all key elements of the ecosystem, and take into account the steadily improving information resources and the various mapping initiatives. These measures are already significantly restraining impacts on fish and benthic communities, while impacts on seabirds and mammals are considered to be relatively minor and possibly positive (through increased food availability). SG60 is met. A fundamental part of the partial strategy is the process of Russian and Norwegian scientist collaborating annually on joint IMR / PINRO ecosystem research cruises, which result in annual status reports which specifically focus on ecosystem trends, threats and projections, and that this then directly contributes to both the work of ICES in producing advice for both cod and haddock, and perhaps more importantly, the considerations of the Joint Norwegian Russian Fisheries Commission, when considering that advice and determining catch levels. SG80 is met However, as noted under issue a, the lack of an overarching ecosystem management plan within the Russian zone, and the limited understanding of the wider effects of changes in benthic communities and benthic community functioning means this cannot be scored at 100		
c	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The partial strategy is considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ecosystems).	The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved.
	Met?	Y	Y	N

PI 2.5.2		There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function		
	Justification	Individual measures have been described under other principles, and plausible arguments and evidence from on-going scientific research suggest they are likely to work. Some specific measures, such as sorting grids, and minimum mesh size and gear design more generally have been subject to significant testing. The abundance of cod and haddock and the highly selective nature of the existing fishing means that wider impacts on other fish species are very limited. There are no obvious weaknesses in the overall strategy for the Norwegian zone, in so far as it encompasses the key elements of research, objective setting, implementation measures, monitoring of implementation, outcome assessment and review/adaptation. In the Russian zone, ecosystem objective setting is weaker and less coherent, but implementation, monitoring and outcome assessment are strong. SG80 is met. However, prior experience of ecosystem management remains limited, and significant uncertainties remain, not least in relation to the value and functioning of benthic habitats and the changes to these values that may be associated with trawling. SG100 is not met.		
d	Guidepost		There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is evidence that the measures are being implemented successfully.
	Met?		Y	N
	Justification	Fishery enforcement is considered highly effective in terms of Norwegian coastguard surveillance of fishing, Russian on-board compliance observers, VMS etc. This monitoring addresses all fishery regulations. Observations of information on FEST vessel plotters, particularly voluntary closed areas and trawl tracks also provides evidence that voluntary measures adopted by the UoA are also implemented successfully. SG 80 is met However, recording of non-commercial bycatch remains very limited. SG100 is not met.		
References		Arneberg 2009, Arneberg et al 2013, Bogstad et al 2016, IMR 2009, Jørgensen et al 2016, JRNFC, 2009, McBride et al 2013, » Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands (management plan) http://www.regjeringen.no/en/dep/md/Selected-topics/hav--og-vannforvaltning/havforvaltning/integrated-management-of-the-barents-sea.html?id=87148 » http://arcticgovernance.custompublish.com/norway-and-integrated-oceans-management-the-case-of-the-barents-sea.4651095-142902.html » Government of Norway 2006. (Report No. 8 (2005-2006) to the Storting. Management in the Barents Sea – Lofoten area: species objectives » Government of Norway 2011a. First update of the Integrated Management Plan for the Marine Environment of the Barents Sea–Lofoten Area. http://www.regjeringen.no/en/dep/md/documents-and-publications/government-propositions-and-reports-/reports-to-the-storting-white-papers-2/2010-2011/meld-st-10-20102011/7.html?id=682132. » Hoel , A.H., von Quillfeldt, C.H., Olsen, E. 2009 Norway and Integrated Oceans Management – the Case of the Barents Sea. REPORT SERIES NO 129 Norsk Polar Institutt » Ottersen, G., Olsen C,.van der Meeren, G., Dommasnes., and Loeng H. 2011.		

PI 2.5.2	There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function	
	The Norwegian plan for integrated ecosystem-based management of the marine environment in the Norwegian Sea. Marine Policy35(2011)389–398 Quillfeldt,, C. Olsen, E., Dommasnes A., and Vongraven, D. 2009. Integrated ecosystem-based management of the Barents Sea-Lofoten Area. In Sakshaug, E., Johnsen, G. and Kovacs, K. (eds) Ecosystem Barents Sea. Tapir Academic Press, Trondheim. Norway, 587 p	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**-**

Evaluation Table for PI 2.5.3

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Information is adequate to identify the key elements of the ecosystem (e.g., trophic structure and function, community composition, productivity pattern and biodiversity).	Information is adequate to broadly understand the key elements of the ecosystem.	
	Met?	Y	Y	
	Justification	The Barents Sea food web and ecosystem are well researched, a range of models at different levels of complexity have been developed, and key relations analysed. A good deal of biodiversity (location, migrations etc.) has been mapped. Key indicators and parameters are monitored on a regular basis and trend data collected. Information is adequate to broadly understand the key elements of the ecosystem. SG80 is met.		
b	**Guidepost**	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, and have not been investigated in detail.	Main impacts of the fishery on these key ecosystem elements can be inferred from existing information and some have been investigated in detail.	Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated.
	Met?	Y	Y	Y
	Justification	As described earlier, the main interactions of the wider cod/haddock trawl fishery with the Barents Sea ecosystem can be characterized in terms of amount and composition of catch, monitoring of ETP interactions, monitoring of habitats and fishing grounds and ecosystem interactions such as cod-capelin interactions. These can be at least inferred from existing information and all have been investigated to a reasonable extent, with research ongoing. SG100 is met		
c	**Guidepost**		The main functions of the Components (i.e., target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.	The impacts of the fishery on target, Bycatch, Retained and ETP species are identified and the main functions of these Components in the ecosystem are understood.
	Met?		Y	N
	Justification	The main functions of target, bycatch retained and ETP species are known. However, the indirect impacts of the fishery on some retained and ETP species (in particular through effects on habitat) remains limited, and the functions of some species groups in the wider ecosystem are not well understood. SG80 is met but not SG100.		

PI 2.5.3		There is adequate knowledge of the impacts of the fishery on the ecosystem		
d	Guidepost		Sufficient information is available on the impacts of the fishery on these Components to allow some of the main consequences for the ecosystem to be inferred.	Sufficient information is available on the impacts of the fishery on the Components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		Y	N
	Justification	Survey, monitoring and modelling all support fishery impact assessment studies, and some of the consequences for the ecosystem have been inferred. Thus relations between cod, haddock, capelin and marine mammals are all well researched. Relationships between the fishery and seabird populations are complex and less well understood - although direct impacts of the fishery appear to be limited. The role of benthic habitats on the wider ecosystem, and the implications of trawl damage in relation to these wider functions are less well understood. SG80 is met. Although the level of research and understanding is impressive given the complexity of ecosystem, and may be regarded as close to best practice, there remain some significant gaps in understanding. SG100 is not met		
e	Guidepost		Sufficient data continue to be collected to detect any increase in risk level (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	Information is sufficient to support the development of strategies to manage ecosystem impacts.
	Met?		Y	Y
	Justification	There is a relatively comprehensive monitoring programme in place related to the Joint Norwegian-Russian Barents Sea Ecosystem assessment and the Norwegian Integrated Management Plan for the Barents Sea/Lofoten Area. A variety of other related initiatives monitor marine mammals and seabirds and mapping of habitats, and evaluation of impacts, is also ongoing. PINRO and IMR collect comprehensive data related to the major commercial fisheries. Collection of such information through monitoring programmes continues, and overall understanding of the Barents Sea ecosystem through research and collaboration continues to increase (meeting SG80). The information available is considered sufficient to support the development of strategies to manage ecosystem impacts, as demonstrated by the current Norwegian Integrated Management Plan; SG100 is met		
References		• Arneberg 2009, Arneberg et al 2013, Bogstad et al 2016, Howell and Filin 2013, IMR 2009, Jørgensen et al 2016, JRNFC, 2009, Larsen et al 2003, Lubin et al 2013, McBride et al 2013, • Arneberg, P., Titov, O., Filin, A., and Stiansen, J. E. (Eds.) 2013. Joint Norwegian-Russian environmental status report on the Barents Sea Ecosystem – update for current situation for climate, phytoplankton, zooplankton, fish and fisheries in 2011. IMR/PINRO Joint Report Series, 2013(3), 56 pp. ISSN 1502-8828. • Barents Portal. http://www.barentsportal.com/barentsportal/index.php/en/…… • Blanchard, J.L. Pinnegar J.K. and S. Mackinson (2002) Exploring Marine Mammal Fishery Interactions using Ecopath with Ecosim: Modeling the Barents Sea Ecosystem, CEFAS Science Series Technical Report No 17.		

PI 2.5.3	There is adequate knowledge of the impacts of the fishery on the ecosystem
	• Ecosystem Survey of the Barents Sea Autumn 2014. 6. Monitoring the demersal community; Seabird observations; Marine Mammal and Seabirds Monitoring; Fish Biodiversity; invertebrate …… • ICES 2015. Second Interim Report of the Working Group on the Integrated Assessments of the Barents Sea (WGIBAR) 1-4 June 2015 Kirkenes, Norway. ICES CM 2015/SSGIEA:04 REF. SCICOM & ACOM • IMR/PINRO 2014. Update of the "Joint Norwegian-Russian environmental status report on the Barents Sea Ecosystem". The current situation for climate, phytoplankton, zooplankton, fish, and fisheries during 2012-13 • Jakobsen, T. and Ozhigin, K (Eds) 2011. The Barents Sea: Half a century of Russian-Norwegian Cooperation. Polar Research Institute of Marine Fisheries and Oceanography; Institute of Marine Research. Tapir Academic Press. • Johannesen, E., Ingvaldsen, R. B., Bogstad, B., Dalpadado, P., Eriksen, E., Gjøsæter, H., Knutsen, T., Skern-Mauritzen, M., and Stiansen, J. E. 2012. Changes in Barents Sea ecosystem state, 1970–2009: climate fluctuations, human impact, and trophic interactions. – ICES Journal of Marine Science, 69: 880–889 114 version 3.0 (11/09/15) • Larsen, T. Nagoda, D. and Andersen, J.R. (Eds) 2003. A biodiversity assessment of the Barents Sea Ecoregion WWF • Magnussen K. 2012. Marine Ecosystem Services in the Barents Sea and Lofoten Islands, a scoping assessment. In the Economics of Ecosystems and Biodiversity • Wienerroither R., Johannesen E., Dolgov A., Byrkjedal I., Bjelland O, Drevetnyak K., Eriksen KB., Høines Å., Langhelle G., Langøy H., Prokhorova T., Prozorkevich D., Wenneck T., 2011. Atlas of the Barents Sea Fishes. IMR/PINRO Joint Report Series 1-2011, ISSN 1502- 8828
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	**-**

6.5.4 Evaluation Table Principle 3

Evaluation Table for PI 3.1.1

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Y	Y	Y
		The fishery takes place in the Norwegian Economic Zone and the Fishery Protection Zone around Svalbard, which is also under Norwegian jurisdiction. The certificate also covers UoA fisheries in the Russian Economic Zone. All catch is landed in Norway. Hence, for the present assessment the national management systems of both Norway and Russia are relevant in addition to the international level. Barents Sea cod and haddock are shared stocks between Norway and Russia, while saithe is an exclusive Norwegian stock. Norway and the Soviet Union agreed in 1975 to set up a Joint Norwegian–Soviet (later: –Russian) Fisheries Commission (JNRFC) and to treat cod and haddock as joint stocks to be split 50/50 between them. (Capelin, Greenland halibut and red fish have later been added to the list, with varying distribution keys, all in Norway's favour.) The Commission sets TAC for the joint stocks and coordinates research, regulatory and enforcement cooperation between the parties. Within the context of the Commission, the parties also exchange quota shares of their respective exclusive stocks. Norway and Russia set their own fishing rules in their respective economic zones, and for Norway in the Protection Zone around Svalbard as well. Since the mid-1990s, the two countries have worked actively to harmonize regulations in their respective zones, and around the turn of the millennium they jointly introduced significant new regulatory measures, such as obligatory use of VMS and sorting grids in trawls. Both countries have well-established systems for fisheries management, evolved over more than a century and now codified in the Norwegian 2008 Marine Resources Act and the 2004 Russian Federal Fisheries Act, respectively, and supplementary legislation. The most important practical fishing rules are found in the Norwegian Regulation on the Execution of Marine Fisheries, which is updated annually, and the Russian Rules for Fishing in the Northern Fishery Basin of the Russian Federation, which were adopted in 2014 and last revised in 2017. These regulatory documents in both countries set rules,		

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	Justification	now largely harmonized between them, on closed areas, fishing gear (e.g. mesh size), by-catch and minimal allowable size of different species, among other things. The Northern basin in practice includes Russian fisheries in the northern Atlantic, but if formally defined as covering fishing activities conducted from the follow four federal subjects (regions) of the Russian Federation: Murmansk and Arkhangelsk Oblasts, the Republic of Karelia and Nenets Autonomous Region. In practice, fisheries in the Northern basin are managed in and largely operated from Murmansk, although companies located in the other three regions also have quota shares (as have a few companies in the Western fishery basin, operated from St Petersburg). The executive body at governmental level in Norway is the Ministry of Trade, Industry and Fisheries, while the practical regulation of fisheries is delegated to the Directorate of Fisheries. Enforcement at sea is taken care of by the Coast Guard, which is part of the Royal Norwegian Navy, but performs tasks on behalf of several ministries, including the Ministry of Trade, Industry and Fisheries. Scientific research is performed by the Institute of Marine Research. Fisheries management authorities coordinate their regulatory work with that of other bodies of governance, for instance the Ministry of Climate and Environment and the Norwegian Environmental Agency, which are responsible for the implementation of the integrated management plans for different marine areas under Norwegian jurisdiction. Within the Russian Government, fisheries policy falls under the purview of the Ministry of Agriculture (Minselkhoz). The implementing body for fisheries management under the Ministry is the Federal Fisheries Agency (FFA – in Russian: Rosrybolovstvo), which is the successor of the former State Committee for Fisheries (abolished in 2004), and in turn the Soviet Ministry of Fisheries. The Federal Border Service (since 2003 part of the Federal Security Service, the FSB) is responsible for enforcement at sea (see PI 3.2.3 below). The Barents and White Sea Territorial Administration of the Federal Fisheries Agency (BBTA – in Russian: BBTU) was established in 2007 as the implementing body of the Federal Fisheries Agency in the Northern basin, located in Murmansk. Within the Russian Government, the Ministry of Agriculture interacts with other federal ministries, e.g. with the Ministry of Natural Resources and Environment (Minprirody) through its implementing Agency for Monitoring of Natural Resources (Rosprirodnadzor), which carries out environmental impact assessments of fisheries regulations. In Murmansk Oblast (country), the Ministry of Fisheries and Agriculture (at the Governor's office, the executive branch of government at regional level in Russia) is responsible for inland fisheries, recreational fisheries and the distribution of the indigenous peoples' quota (see SI 3.1.1 c) below). Through the various international agreements, national fisheries acts and supporting legislation, binding procedures for cooperation between the different countries and their respective governmental agencies are in place, able to provide management outcomes that are consistent with MSC Principles 1 and 2. SG 100 is met.

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
b	**Guidepost**	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the fishery.	The management system incorporates or subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	Y	Y	Y
	Justification	At national level in Norway and Russia, there are effective, transparent dispute resolution mechanisms in place, as fishers can take their case to court if they do not accept the rationale behind an infringement accusation by enforcement authorities or the fees levied against them. Verdicts at the lower court levels can be appealed to higher levels. In both countries, however, most disputes are solved within the national systems for fisheries management, not requiring judicial treatment. There are well-established systems of consultation with user groups (see PI 3.1.2 below), transparent for actors within the fishing industry. At the international level, the JNRFC has a fine-meshed system of consultations between Norway and Russia at different levels of its administrative structure. The Permanent Committee, established in 1993, is of particular importance in clearing out differences that arise between the parties at the level of the Commission itself. The Permanent Committee also has several working groups where delegates from the two countries are set to find compromise when agreement cannot be reached in the Commission or the Permanent Committee. This has proven to be a very effective mechanism for resolving disputes between the two countries, where both parties take a pragmatic approach and intend to find compromise even if that takes several years in some instances. The system is transparent in that protocols from sessions in the JNRFC, including its Permanent Committee and working groups, are publicly available. At a wider international level, a state can institute proceedings against another state through mechanisms such as the International Court of Justice (ICJ) and the International Tribunal for the Law of the Sea (ITLOS), or bring a dispute before the Permanent Court of Arbitration (PCA). At the regional level, the North-East Atlantic Fisheries Commission (NEAFC) in 2004 adopted a recommendation for compulsory dispute settlement. It has not been necessary in the fishery under assessment to resort to these mechanisms. The consistent ability to provide for compromise and dispute resolution among the parties involved testifies to the appropriateness of the available mechanisms for the fishery under assessment. SG 100 is met.		

PI 3.1.1		**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**		
d	**Guidepost**	The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	Y	Y	Y
	Justification	The Norwegian system for fisheries management includes various mechanisms that generally respect and observe the rights of the coastal population along the country's northern, western and southern coast. For the most important species, significantly and proportionately larger quota shares are allotted to coastal fisheries than to the ocean going fleet (see, for instance, the Regulation on Participation in Fisheries for an overview), with particular attention to the traditional fisheries of the coastal Sami population in the northernmost part of the country. The Sami Parliament, which is a consultative body for the indigenous Sami population on Norwegian territory, is consulted on all management measures, including the distribution of the national quota, related to species of particular historic importance to the Sami. The Government has formally committed to this through the 2005 Royal Decree on Consultations with the Sami Parliament. In Russia, the rights of fishery-dependent communities are explicitly stated in the Federal Fisheries Act. The Act states that 'the small indigenous peoples of the North, Siberia and the Far East' (ethnic groups with a 'traditional' lifestyle consisting of less than 50,000 people) shall be given access to fish resources in order to secure their livelihood. It gives 'fisheries to protect the traditional lifestyle of small indigenous peoples of the North Siberia and the Far East' extended rights compared to the other types of fisheries listed in the Act (e.g., 'industrial fisheries', 'coastal fisheries' and 'fisheries for scientific and enforcement purposes'). In the Northern basin, a fixed quota of cod and haddock (currently 300 and 75 tonnes, respectively) is given to the Saami, based on their traditional fishing rights in the region. Since there is a formal commitment to these rights in Norwegian and Russian legislation, SG 100 is met.		
References		Avtale mellom Norge og Sovjetunionen om gjensidige fiskeriforbindelser ('Agreement between Norway and the Soviet Union on Mutual Fisheries Relations'), signed in Moscow 15 October 1976. Available in Overenskomster med fremmede stater ('Agreements with Foreign States'), Ministry of Foreign Affairs, Norway, 1977, p. 974. Avtale mellom Norge og Sovjetunionen om samarbeid innen fiskerinæringen ('Agreement between Norway and the Soviet Union on Cooperation within the Fishing Industry'), signed in Moscow 11 April 1975. Available in Overenskomster med fremmede stater ('Agreements with Foreign States'), Ministry of Foreign Affairs, Norway, 1975, p. 546. ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ ('Federal Act on Fisheries and Protection of Aquatic Biological Resources' – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004		

PI 3.1.1	**The management system exists within an appropriate legal and/or customary framework which ensures that it:** • **Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; and** • **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** • **Incorporates an appropriate dispute resolution framework.**
	(last revised 2014). Hønneland, Geir, *Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea*, Cheltenham & Northampton, MA: Edward Elgar, 2012. Interviews with the regional department of the Federal Fisheries Agency in the Northern basin (BBTA) and the Ministry of Fisheries and Agriculture of Murmansk Oblast during the site visit, Murmansk, January 2018. J-122-2016: Deltakerforskriften ('Regulation on Participation in Fisheries'), Directorate of Fisheries, Norway, 2016. J-125-2016: Forskrift om utøvelse av fisket i sjøen ('Regulation on the Execution of Marine Fisheries'), Directorate of Fisheries, Norway, 2016. J-153-2017: Forskrift om regulering av fisket etter torsk, hyse og sei nord for 62°N i 2017 ('Regulation on the Fishery for Cod, Haddock and Saithe North of 62°N in 2017'), Directorate of Fisheries, Norway, 2017. Jørgensen, Anne-Kristin, 'Рыбное хозяйство и управление отраслью в России' ('The fishing industry and fisheries management in Russia'), in Anne-Kristin Jørgensen and Geir Hønneland, *Общее море, общие задачи: Сравнительный анализ рамочных условий рыбной отрасли России и Норвегии* ('Common sea, common challenges: a comparative analysis of the framework conditions for the fishing industries in Russia and Norway'), Lysaker: Fridtjof Nansen Institute, 2015. Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 ('Marine Resources Act'), Parliament of Norway (Stortinget), 2008. Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten ('Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten'), Ministry of Climate and Environment, Norway, 2011. NEAFC Dispute Resolution Mechanism, Annex K – Amendment of the Convention on Dispute Settlement, 2004. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the Confirmation of Fisheries Regulations for the Northern Fishery Basin'), N 414, Ministry of Agriculture, the Russian Federation, 2014 (last revised 2017). Prosedyrer for konsultasjoner med Sametinget, Kgl. res. 04/186 ('Royal Decree on Procedures for Consultations with the Sami Parliament'), Government of Norway, 2005. Protocols from the annual sessions of the JNRFC, available in Norwegian and Russian on the Commission's website (www.jointfish.org).
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.1.2

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	Y	Y	Y
	Justification	The functions, roles and responsibilities of the different countries involved in the management of the Barents Sea fisheries, as well as of the different organizations and individuals involved at the national level, are explicitly defined in international agreements and national laws and regulations, as well as in long-standing practice; see SI 3.1.1 a) for an overview of the main state bodies engaged in the management of the fishery, and SI 3.1.2 b) for an overview of non-governmental organizations involved. According to interviews at the site visit, the roles, functions and responsibilities are well understood by all involved entities in all areas of responsibility and interaction. SG 100 is met.		
b	**Guidepost**	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	Y	Y	Y
		Norway has a long tradition of including non-governmental organizations in fisheries management, with continuous consultation and close cooperation between governmental agencies and user-group organizations, in particular the Norwegian Fishermen's Association, but also the more specialized organizations such as the fishermen's sales organizations. As these organizations have regional branches, whose representatives are actively involved in policy-making, ensuring that local knowledge is also taken into consideration in the management process. So-called Regulatory Meetings are organized twice a year are open to all; user-group organizations and NGOs attend on a regular basis. In addition, there is day-to-day contact by telephone and email between authorities, user groups and other interested parties. Distribution of the national quota between different gear and fishing fleets has in practice been delegated to the Norwegian Association of Fishermen, which includes all fishermen from the smallest coastal vessels to		

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties
	Justification	ocean-going trawlers. Technical regulation measures are to a large extent decided upon in direct consultations 'over the table' between authorities and user groups at the Regulatory Meetings. As mentioned under SI 3.1.1 d) above, the Sami Parliament is formally consulted in the management of fisheries that are of historical importance to the Sami population. Similarly, there is a strong Russian (and previously Soviet) tradition of stakeholder consultation in fisheries management. A formal arena for interaction between the Russian fishing industry and the government are the advisory bodies, the so-called fishery councils, found at federal, basin and regional levels. At the federal level, the Public Fisheries Council was established in 2008 on the basis of the requirement in the Federal Public Chamber Act to have a public council for most federal bodies of governance. Basin-level and regional fishery councils have existed since Soviet times, and the 2004 Federal Fisheries Act makes them mandatory for all basins and regions located on their territory. Rules of procedures for 'basin scientific and fishery councils' in the Russian Federation were adopted in 2008. They state that the councils shall advice on a wide range of fishery-related issues, including conduct of fisheries in the relevant region; control and surveillance; conservation; recovery and harvesting of aquatic biological resources; distribution of quotas and other issues of importance to ensure sustainable management of fisheries. The fishery councils consist of representatives of the fishing industry, federal executive authorities, executive bodies of the Russian federal subjects (the regions), research institutions and non-governmental organizations (NGOs), including the indigenous people of the North, Siberia and the Far East. Hence, in the Northern basin (see SI 3.1.1 a) above) both federal authorities (the FFA through its representation in Murmansk, the BBTA) and regional authorities (the Ministry of Fisheries and Agriculture under the Governor) meet regularly with representatives of the fishing industry (individual companies and associations such as the Fishing Industry Union of the North (FIUN) and the Association of coastal fisheries in Murmansk Oblast), and other stakeholders that have taken an interest in fisheries management in the region, notably WWF-Murmansk. The current regulations of the Northern Basin Scientific and Fishery Council were given in 2002 and corresponding regulations for the Murmansk Territorial Fishery Council in 2005, stating, *inter alia*, that the council shall contribute to a harmonized fishery policy in the region, liaise between the fishing industry, fishery authorities, scientific institutions and NGOs. At a more general level, all new federal regulations in Russia have to go through public hearings; i.e. all draft proposals for new regulations have to be published at the website https://regulation.gov.ru, administered by the Ministry of Economic Development, where the public are given 15–30 days to provide their comments. (For public hearings in the fishery-specific management system, see PI 3.2.5 below.) Further, the FFA has a dedicated 'Open Agency' initiative which is comprehensively detailed on their website. In addition to the use of the Public Chamber and consultation bodies at lower level, this includes the use of internet conferences with citizens, reference groups to discuss policy initiatives, and a general objective to increase public access to information. User groups from both countries also participate in the respective national delegations to the JNRFC and regular fishery consultations with third countries. Management authorities actively seek advice from user groups in preparation for the international consultations and negotiations. Consultation processes are inclusive and transparent, and stakeholders interviewed at the site visit refer to the established interfaces between authorities and representatives of the fishing industry as 'consensus bodies'. According to both individual captains and representatives of user groups and NGOs, authorities explain how the information is used or not used. SG 100 is met.

PI 3.1.2		**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**		
c	**Guidepost**		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
	Met?		Y	Y
	Justification	As follows from SI 3.1.2 b) above, the consultation processes provide opportunity for all interested and affected parties to be involved at both national and international level. Meetings are publicly announced and authorities encourage all interested parties, including NGOs and the media, to attend. The various hearing opportunities available online also contribute to encouraging and facilitating public involvement. All stakeholders consulted during the assessment report that management authorities actively facilitate their involvement, for instance through formal invitations to take part in meetings, and more widely by seeking the advice of stakeholders on their own initiative, not just responding to queries. SG 100 is met.		
References		ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ (‘Federal Act on fisheries and protection of aquatic biological resources’ – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004 (last revised 2014). Interviews with the client, the regional department of the Federal Fisheries Agency in the Northern basin (ВВТА), the Ministry of Fisheries and Agriculture of Murmansk Oblast and WWF-Murmansk during the site visit, Murmansk, January 2018. Jørgensen, Anne-Kristin, ‘Рыбное хозяйство и управление отраслью в России’ (‘The fishing industry and fisheries management in Russia’), in Anne-Kristin Jørgensen and Geir Hønneland, *Общее море, общие задачи: Сравнительный анализ рамочных условий рыбной отрасли России и Норвегии* (‘Common sea, common challenges: a comparative analysis of the framework conditions for the fishing industries in Russia and Norway’), Lysaker: Fridtjof Nansen Institute, 2015. Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 (‘Marine Resources Act’), Parliament of Norway (Stortinget), 2008. ОБ ОБРАЗОВАНИИ ОБЩЕСТВЕННОГО СОВЕТА ПРИ ФЕДЕРАЛЬНОМ АГЕНТСТВЕ ПО РЫБОЛОВСТВУ (‘On the formation of a public chamber under the Federal Fisheries Agency’), N 301, Federal Fisheries Agency, Russian Federation, 2008. ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ О СЕВЕРНОМ НАУЧНО-ПРОМЫСЛОВОМ СОВЕТЕ И ПОЛОЖЕНИЯ О РАБОЧЕЙ ГРУППЕ СЕВЕРНОГО НАУЧНО-ПРОМЫСЛОВОГО СОВЕТА (‘On the confirmation of the Order of a Northern scientific and fishery council and the Order of a working group of the Northern scientific and fishery council’), Federal Fisheries Agency, Russian Federation, 2002. ОБ УТВЕРЖДЕНИИ ПОРЯДКА ДЕЯТЕЛЬНОСТИ БАССЕЙНОВЫХ НАУЧНО-ПРОМЫСЛОВЫХ СОВЕТОВ (‘On the confirmation of arrangements for basin scientific and fishery councils’), Federal Fisheries Agency, Russian Federation, 2008. ОБ УТВЕРЖДЕНИИ ПОЛОЖЕНИЯ О ПОРЯДКЕ ДЕЯТЕЛЬНОСТИ ТЕРРИТОРИАЛЬНОГО РЫБОХОЗЯЙСТВЕННОГО СОВЕТА МУРМАНСКОЙ ОБЛАСТИ И ЕГО СОСТАВА (‘On the confirmation of arrangements for the territorial fishery council of Murmansk Oblast and its composition’), N 239-ПП/8, the Government of Murmansk Oblast, Russian Federation, 2005 (last revised 2016). ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА (‘On the confirmation of fisheries regulations for the Northern fishery basin’), N 414, Ministry of Agriculture, Russian Federation, 2014 (last revised 2017). ПОЛОЖЕНИЕ об Общественном совете при Баренцево-Беломорском территориальном управлении Федерального агентства по рыболовству (‘Regulation		

PI 3.1.2	**The management system has effective consultation processes that are open to interested and affected parties.** **The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties**
	on the Fishery Council at the Barents and White Sea Territorial Administration of the Federal Fisheries Agency'), N 61, Federal Fisheries Agency, Russian Federation, 2014. Prosedyrer for konsultasjoner med Sametinget, Kgr. res. 04/186 ('Royal Decree on Procedures for Consultations with the Sami Parliament'), Government of Norway, 2005. Protocols from the annual sessions of the JNRFC, available in Norwegian and Russian on the Commission's website (www.jointfish.org). Referat fra reguleringsmøtet 2. og 3. november 2016 ('Minutes from the Regulatory Meeting 2 and 3 November 2016'), Directorate of Fisheries, Norway, 2016. Referat fra reguleringsmøtet 8. juni 2017 ('Minutes from the Regulatory Meeting 8 June 2017'), Directorate of Fisheries, Norway, 2017.
OVERALL PERFORMANCE INDICATOR SCORE:	**100**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.1.3

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Long-term objectives to guide decision-making, consistent with the MSC Principles and Criteria and the precautionary approach, are implicit within management policy	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within and required by management policy.
	Met?	Y	Y	N
	Justification	The precautionary approach has been in practical use by the JNRFC since the late 1990s, when ICES' precautionary reference points were adopted for the Barents Sea stocks. The harvest control rule established by the JNRFC in 2002 is explicitly founded on the precautionary approach. Likewise, the 2010 agreement between Norway and Russia on marine delimitation and cooperation in the Barents Sea explicitly states that fisheries management in the area shall be based on the precautionary approach. The 2008 Marine Resources Act requires that Norwegian fisheries management be guided by the precautionary approach, in line with international treaties and guidelines, and by an ecosystem approach that takes into account habitats and biodiversity. The same objectives are found in the most relevant policy documents, such as the integrated management plan for the Barents and Norwegian Seas Russian fisheries law defines protection and rational use of aquatic biological resources as the main goal of the country's fisheries management. 'Protection and rational use' was an established concept in Soviet legislation on the protection of the environment and exploitation of natural resources, and has remained so in the Russian Federation. 'Rational use' bears resemblance to the internationally recognized ideal of sustainability, insofar as the emphasis is on long-term and sustained use of the resource, supported by science for socio-economic purposes. The Federal Fisheries Act states that the protection of aquatic biological resources shall be given priority to their rational use. The precautionary approach is not mentioned explicitly, but the requirement to protect aquatic biological resources and take the best scientific knowledge into account equals the requirements of the precautionary approach, as laid out in the FAO Code of Conduct. Furthermore, the provisions of international agreements entered into by the Russian Federation stand above those of national law, according to the 1993 Russian Constitution. The Russian Federation has signed and ratified a number of international agreements which adopt the precautionary approach, including the 1995 UN Straddling Stocks Agreement, and works actively in international organizations or arrangements which explicitly adhere to the precautionary approach to fisheries management, such as ICES and NEAFC. Hence, clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach are explicit within management policy. SG 80 is met. However, such objectives are not required by management policy. SG 100 is not met.		
References		ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ ('Federal Act on fisheries and protection of aquatic biological resources' – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004 (last revised 2014). Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 ('Marine Resources Act'), Parliament of Norway (Stortinget), 2008. Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten ('Update of the [Integrated]		

PI 3.1.3	**The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Principles and Criteria, and incorporates the precautionary approach**	
	Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten'), Ministry of Climate and Environment, Norway, 2011. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the confirmation of fisheries regulations for the Northern fishery basin'), N 414, Ministry of Agriculture, Russian Federation, 2014 (last revised 2017). Protocols from the annual sessions of the JNRFC, available in Norwegian and Russian on the Commission's website (www.jointfish.org). Treaty between the Kingdom and Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean, 2010. Available in English translation at the website of the Norwegian Ministry of Foreign Affairs (https://www.regjeringen.no/globalassets/upload/ud/vedlegg/folkerett/avtale_engelsk.pdf).	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.1.4

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and seeks to ensure that perverse incentives do not arise.	The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2, and explicitly considers incentives in a regular review of management policy or procedures to ensure they do not contribute to unsustainable fishing practices.
	Met?	Y	Y	P

PI 3.1.4		The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	Justification	The Norwegian management system provides for negative incentives designed to prevent fishers from violating regulations (see PI 3.2.3 on the enforcement system for details), designed to meet the outcomes expressed by MSC Principles 1 and 2 (see PIs 3.1.3 and 3.2.1 on the objectives of the general and fishery-specific management systems, respectively). These incentives are subject to regular internal review of enforcement policies. A risk-based framework aimed at utilizing resources to optimize compliance at any given moment is applied, implying that priorities are regularly amended. The management system does not include any subsidies that contribute to unsustainable fishing or ecosystem degradation. Subsidies to the fishing fleet were terminated in 1990 following the agreement between the European Free Trade Area signatories, negotiated in preparation of the European Economic Area Agreement. Since incentives are explicitly reviewed on a regular basis, and no subsidies exist in the fishery, SG 100 is met for the Norwegian component of the management system. In Russia, fishing companies and fish-processing plants can apply for support from the FFA to cover annual interest on loans taken up to buy equipment. Recent years' targeted programmes for the fisheries sector have been directed towards three main issue areas: shipbuilding, port infrastructure and fish restocking plants. Prioritized areas under the state budget are large infrastructure projects, construction of research and inspection vessels and modernization of restocking plants. The projects aimed at renewal and modernization of the fishing fleet and the processing industry are all to be financed by 'non-budget sources', i.e. private investors and credit institutions. Both the Russian fisheries authorities and industry organizations have repeatedly called for more state support, including subsidies, for the fisheries sector, but the Government is generally not in favour of direct subsidies. Nevertheless, in 2009 the Government introduced a new form of subsidy aimed at fleet renewal and modernization of the processing industry. Starting in 2009, companies which have taken up loans to finance such projects could apply for a 2/3 refund of the annual interest on the loans. The subsidies are aimed at the replacement of old vessels with more cost-effective ones, not to increase catch capacity. The number of vessels in the northern fishery basin has steadily declined during the post-Soviet period, from more than 400 in the early 1990s to just above 200 today – the reduction has accelerated in recent years. In summary, although some subsidies have been identified, these are mostly in the form of bank loans. For this fleet, they are not thought to contribute to unsustainable fishing. As in Norway, the Russian management system provides economic and social incentives for sustainable fishing. These include penalties for non-compliance with fisheries regulations, and the system of quota allocation for five years ahead from 2004 – increased to ten years from 2009 – is more stable and more akin to a rights-based system. In particular the guarantee of quota share for a 10-year period increases both certainty and commercial flexibility for industry to plan operations in a profitable and economically efficient manner. This greatly reduces the risk of vessels over-capitalizing and being forced to fish illegally following unexpected quota shortages. As the 10-year period ends at the end of 2018, there is currently a debate going in the Russian fishing industry about the quota mechanism that will follow from 2019. The fishing industry is generally in favour of a continuation of the system and an increase in the quota share ownership to 25 years. The referred strategy documents show that the management system explicitly considers incentives in a review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices. However, the management team has not been provided with documentation that this is done on a regular basis. Therefore a partial score is warranted at SG 100.
References		Concept of the Development of the Fishing Industry, Federal Fisheries Agency, Russian Federation, 2008. Economic Development of the Sector: Investments and Subsidies, Federal Fisheries Agency, Russian Federation, 2009. Interviews with the client, the regional department of the Federal Fisheries Agency in the Northern basin (BBTA), the Ministry of Fisheries of Murmansk Oblast and WWF-Murmansk during the site visit, Murmansk, January 2018.

PI 3.1.4	The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing
	Jørgensen, Anne-Kristin, 'Recent Developments in the Russian Fisheries Sector', in Elana Wilson Rowe (ed.), *Russia and the North*, Ottawa: University Press of Ottawa Press, 2009. Jørgensen, Anne-Kristin, 'Рыбное хозяйство и управление отраслью в России' ('The fishing industry and fisheries management in Russia'), in Anne-Kristin Jørgensen and Geir Hønneland, *Общее море, общие задачи: Сравнительный анализ рамочных условий рыбной отрасли России и Норвегии* ('Common sea, common challenges: a comparative analysis of the framework conditions for the fishing industries in Russia and Norway'), Lysaker: Fridtjof Nansen Institute, 2015. Jørgensen, Anne-Kristin, *Modernizing Russia's Northern Economies* (Chapter 3, 'The Fisheries Sector'), Cheltenham & Northampton, MA: Edward Elgar, 2018.
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.1

PI 3.2.1		The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery's management system	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery's management system.
	Met?	Y	Y	P
	Justification	Short- and long-term objectives are explicit in the annual protocols and research programmes of the JNRFC. The Commission uses precautionary reference points established by ICES as the basis for establishment of TACs. In the basic principles of the Commission, defined in 2002, it is stated that the Commission will follow the provisions for a responsible fishery as expressed in the FAO Code of Conduct for Responsible Fisheries. As main management objectives are defined: i) to attain high sustainable catches from exploited stocks in the ecosystems of the Barents and Norwegian seas without decreasing their productivity; ii) to keep exploited stocks within safe biological limits while maintaining the biodiversity and productivity of marine ecosystems; and iii) to ensure sustainable development of the fisheries industry while exploiting the stocks within safe biological limits. The 2010 agreement between Norway and Russia on marine delimitation and cooperation in the Barents Sea explicitly states that fisheries management in the area shall be based on the precautionary approach. Among the 'management obligations' listed in the Commission's basic principles is the requirement to apply the precautionary approach and base the Commission's work on the best scientific data available. While P1 objectives are generally well defined and measurable, this is to a lesser extent the case with the P2 objectives, which warrants a partial score at SG 100 for the bilateral component of the management system. While cod and haddock are joint stocks managed by the JNRFC, saithe is an exclusive Norwegian stock. The 2008 Marine Resources Act requires that Norwegian fisheries management be guided by the precautionary approach and by an ecosystem approach that takes into account habitats and biodiversity. Short-term objectives explicitly addressed in Norwegian fishery legislation include avoiding that TACs are exceeded, that discard does not take place and that catch of non-target species is minimized, which is demonstrably consistent with achieving the outcomes expressed by MSC Principles 1 and 2. These short-term objectives are well defined and measurable, in the sense that performance against them can be measured through the enforcement bodies' recording and inspection routines (see PI 3.2.3). Well defined and measurable long-term objectives consistent with achieving the outcomes of MSC Principle 1 are explicit within the fishery's management system, reflected in the ambition to maintain fishery at a level consistent with defined biological reference levels. However, less well defined and measurable objectives exist for Principle 2. A partial score is therefore given also for the Norwegian component of the management system.		
References		Annual Joint Norwegian–Russian Research Programmes for the Barents Sea, attached to the protocols from the annual sessions in the JNRFC. Basic Principles and Criteria for Long-term, Sustainable Management of Living Marine Resources in the Barents and Norwegian Seas, issued by the JNRFC in 2002. ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ ('Federal Act on Fisheries and Protection of Aquatic Biological Resources' – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004 (last revised 2014).		

PI 3.2.1	The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2
	J-125-2016: Forskrift om utøvelse av fisket i sjøen ('Regulation on the Execution of Marine Fisheries'), Directorate of Fisheries, Norway, 2016. J-153-2017: Forskrift om regulering av fisket etter torsk, hyse og sei nord for 62°N i 2017 (Regulation on the Fishery for Cod, Haddock and Saithe North of 62°N in 2017), Directorate of Fisheries, Norway, 2017. Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 ('Marine Resources Act'), Parliament of Norway (Stortinget), 2008. Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten ('Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten'), Ministry of Climate and Environment, Norway, 2011. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the confirmation of fisheries regulations for the Northern fishery basin'), N 414, Ministry of Agriculture, Russian Federation, 2014 (last revised 2017). Protocols from the annual sessions in the JNRFC, available in Norwegian and Russian on the Commission's website (www.jointfish.org). Treaty between the Kingdom and Norway and the Russian Federation concerning Maritime Delimitation and Cooperation in the Barents Sea and the Arctic Ocean, 2010. Available in English translation at the website of the Norwegian Ministry of Foreign Affairs (https://www.regjeringen.no/globalassets/upload/ud/vedlegg/folkerett/avtale_engelsk.pdf).
OVERALL PERFORMANCE INDICATOR SCORE:	**90**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.2

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Y	Y	
	Justification	There are established decision-making processes in the JNRFC (including the setting of TAC and quota shares as well as quota swaps, cf. saithe from Norway to Russia) and its Permanent Committee and working groups that result in measures and strategies to achieve the fishery-specific objectives. Any potential problem is first raised in direct contact between Norwegian and Russian fishery authorities, then possibly referred to further discussion in the Joint Commission, which meets 1-2 a year, or in its Permanent Committee, which meets 3-4 times annually, or working groups. Decisions by the JNRFC are subsequently implemented in federal and regional fishery regulations in Russia as well as Norwegian national legislation. Established decision-making procedures at national level in the two countries ensure that strategies are produced and measures taken to achieve the fishery-specific objectives; this is described under PI 3.1.1 above and applies to the stocks under assessment as well as to other stocks under Norwegian and Russian jurisdiction. The role of non-governmental organizations in decision making is described under PI 3.1.2 on consultation mechanisms. SG 80 is met.		
b	**Guidepost**	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Y	Y	N

PI 3.2.2		**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**		
	Justification	The well-established decision-making procedures at national level in Norway and Russia respond to issues identified in research, monitoring, evaluation or by groups with an interest in the fishery through the arenas for regular consultations between governmental agencies and the public. This happens first and foremost at the Regulatory Meetings in Norway and in the fishery councils at basin level in Russia, further through ad hoc consultation with the industry and other stakeholders in both countries (see PI 3.1.2 above). In addition, there is close contact between authorities and scientific research institutions, primarily between the Directorate of Fisheries and the Institute of Marine Research in Norway and the FFA and PINRO in Russia. Both scientists and user-group representatives claim that the relevant governmental agencies are open to any kind of input at any time. They feel that the authorities' response is transparent and timely and that the ensuing policy options take adequate account of their advice. The JNRFC is governed by the harvest control rule, which in its formulation and assessment takes into account a range of ecosystem considerations of the mixed nature of the fishery. Furthermore, relevant ICES working group reports include consideration of by-catch, endangered species and effects of fishing gear on habitats, and these are taken into account in decision making. However, the assessment team has not been provided with documentation that research on P2 issues is sufficiently taken into consideration in order to combat the shortcomings of the management system on this Principle. There is documented evidence in the protocols from the JNRFC that P2 issues are not given the same degree of attention as P1 issues within the Commission. SG 100 is not met.		
c	**Guidepost**		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		Y	
	Justification	The JNRFC formally states that it uses the precautionary approach (see reference in PIs 3.1.3 and 3.2.1 to the 2002 basic principles of the Commission and the 2010 agreement between Norway and Russia on maritime delimitation and cooperation in the Barents Sea) and bases its management on best available scientific information. ICES have evaluated both the cod and haddock harvest control rules as precautionary. Decision-making processes at the national level in Russia are based on scientific recommendations from PINRO. The Federal Fisheries Act, which applies to the capture of all marine species, requires fisheries management to be based on the precautionary approach (see PI 3.1.3 above). Similarly, in Norway the 2008 Marine Resources Act requires that all Norwegian fisheries management be guided by the precautionary approach and is based on best available information. SG 80 is met.		
d	**Guidepost**	Some information on fishery performance and management action is generally available on request to stakeholders.	Information on fishery performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on fishery performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.		
	Met?	Y	Y	N
	Justification	The protocols from meetings in the JNRFC are published on the websites of national fisheries management authorities (as well as on the Commission's own website www.jointfish.org), in Norwegian and Russian, along with press releases further substantiating the decisions. Examples are why the TAC was set at a specific level and why new technical regulations have been introduced. This meets the requirement of making explanations for action available to the public, so SG 80 is met, but stops short of being formal reporting to all interested stakeholders. SG 100 is not met for the international level. In Norway, the Ministry of Trade, Industry and Fisheries submits annual reports to the Parliament on behalf of the entire system for fisheries management. Other involved agencies, such as the Institute of Marine Research and the Directorate of Fisheries, produce annual reports that are available to the public on request. In these reports, actions taken or not taken by the relevant authority are accounted for. Elaborate explanations are given in minutes from the Regulatory Meetings (see PI 3.1.2 above). Likewise, information is available on the fishery's performance and management action on the websites of the Russian Federal Fisheries Agency and its regional office in the Northern basin, BBTA. Again, examples would be the justification for setting the TAC at a specific level and introduction of new management measures. (As a recent example, see https://www.regjeringen.no/no/aktuelt/enighet-om-norsk-russisk-kvoteavtale-for-2018/id2575470/) SG 80 is met for the national component of the management system. However, no formal reporting to all interested stakeholders takes place. SG 100 is not met.		
e	**Guidepost**	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Y	Y	Y
	Justification	Disputes between Norway and Russia are solved in the JNRFC, or in its Permanent Committee or working groups (see PI 3.1.1 above). The Norwegian and Russian systems for fisheries management is not subject to continuing court challenges. When occasionally taken to court by fishing companies, the management authority complies with the judicial decision in a timely manner. SG 60 and 80 is met. Importantly, the management authority works proactively to avoid legal disputes. This is done partly through the tight cooperation with user groups at the regulatory level (see PI 3.1.2 above), ensuring as high legitimacy as possible for regulations and other management decisions. Regulatory and enforcement authorities offer advice to the fleet on how to avoid infringements, keeping them updated on changes in regulations in both Russian and Norwegian waters. They also have the authority to issue administrative penalties for minor infringements (serious enough to be met by a reaction above a written warning), thus referring only the more serious cases to prosecution by the police and possible transfer to the court system (see PI 3.2.3 below). SG100 is met		

PI 3.2.2	**The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery under assessment.**
References	Basic Principles and Criteria for Long-term, Sustainable Management of Living Marine Resources in the Barents and Norwegian Seas, issued by the JNRFC in 2002. Hønneland, Geir, *Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea*, Cheltenham & Northampton, MA: Edward Elgar, 2012. Interviews with the client, the regional department of the Federal Fisheries Agency in the Northern basin (BBTA), the Ministry of Fisheries of Murmansk Oblast and WWF-Murmansk during the site visit, Murmansk, January 2018. Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37, 2008 ('Marine Resources Act'), Parliament of Norway (Stortinget). Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten ('Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten'), Ministry of Climate and Environment, Norway, 2011. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the Confirmation of Fisheries Regulations for the Northern Fishery Basin'), N 414, Ministry of Agriculture, the Russian Federation, 2014 (last revised 2017). Protocols from the annual sessions of the JNRFC, available in Norwegian and Russian on the Commission's website (www.jointfish.no). Websites of the Norwegian Directorate of Fisheries (www.fiskeridir.no), Institute of Marine Research (www.imr.no) and Parliament (Stortinget) (www.stortinget.no), as well as the Russian Federal Fisheries Agency (www.fish.gov.ru) and its regional office in the Northern basin, BBTA (www.bbtu.ru).
OVERALL PERFORMANCE INDICATOR SCORE:	**85**
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.3

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery under assessment and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	Y	Y	Y
		The vessels undergoing assessment fish only in waters under Norwegian jurisdiction and land most of their catches in Norwegian ports (primarily in Hammerfest and Tromsø, but occasionally also in Honningsvåg and Båtsfjord). However, the certificate covers fishing also in Russian waters and landings in Russian ports. Hence, the enforcement systems of both countries must be assessed. In addition, a portion of catches is transshipped to transport vessels and brought to Velsen in the Netherlands. These landings fall under the NEAFC port state control regime. All landings in Norway are registered by the Norwegian Fishermen's Sales Organization and checked towards catch information sent electronically to the Norwegian Directorate of Fisheries after each haul, as well as before entering the Norwegian Economic Zone (NEZ). The Norwegian Food Safety Authority checks all landings by foreign vessels in Norwegian ports, while the Directorate of Fisheries conducts physical inspections of at least 15 % of these landings. The Norwegian Coast Guard performs spot checks at sea (in the NEZ and the Protection Zone around Svalbard), including inspections at check points that foreign vessels have to pass when entering or leaving the NEZ and in connection with transshipments in Norwegian waters, which have to be reported in advance. Coast Guard inspectors board fishing vessels and control the catch from last haul (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculate the volume of the fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. In Russia, the FFA (in the northern basin: the BBTA as the Agency's regional branch) keeps track of how much fish each vessel and company (quotas are given to companies, not vessels in Russia) has fished at any moment, based on daily reports from each fishing vessels and accumulated reports each 15th day from all fishing companies, as well as VMS data. The Inspection Service of the Russian Border Guard, which is part of the Federal Security Service (FSB), conducts inspections at sea and in port. Fish caught in the REZ must be taken to Murmansk for customs clearance, but some of it is subsequently transshipped for export. The Border Guard conducts random inspections at sea, including from helicopters, during fishing, following the same procedures as the Norwegian Coast Guard, with inspection of documentation, fish from last haul, gear and catch in holds. It also conducts physical inspections of all transshipments at sea (weather conditions allowing) and at the control points that all foreign vessels –		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
	Justification	and Russian vessels having fished outside the REZ – have to go through when entering and leaving the REZ. When Russian vessels land in other European ports, they are subject to the NEAFC port state control scheme, which implies that the port state has to check with the flag state that the landed catch is counted towards a quota, inspect a share of the catch physically, and inform the flag state of the landed volumes. Both Norwegian and Russian inspectors have the authority to close an area with too much juvenile or bycatch (real-time closure). Enforcement bodies on both sides – the Coast Guard and the Directorate of Fisheries in Norway and the BBTA and the Border Guard in Russia – cooperate closely in the enforcement of fisheries regulations in the Barents Sea, including running exchange of inspection data and more analytical material related to compliance, as well as regular exchange of inspectors both at sea and in port. Inspection procedures have also been harmonized between the two countries (see above). As follows, there are a number of possibilities for enforcement authorities to physically check whether the data provided by fishers through self-reporting are correct. In addition, VMS data enables control of whether area restrictions are observed, among other things. Hence, a comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures; see SI 3.2.3 c) below on compliance. SG 100 is met.		
b	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	Y	Y	Y
	Justification	Sanctions to deal with non-compliance in Russian and Norwegian waters exist in both countries' systems for fisheries management, as well as in their wider legal systems. Both make wide use of administrative fines and refer serious cases to the judicial system. The Russian Federal Fisheries Act requires the withdrawal of quota rights if a fishing company has committed two serious violations of the fisheries regulations within one calendar year, among other things. The Code of the Russian Federation on Administrative Infractions specifies the level of fines that can be issued administratively by enforcement bodies, e.g. up to RUR 5,000 for 'citizens', 50,000 for executive officers' and 200,000 for companies. The Criminal Code requires that illegal fishing such as causing 'large damage', conducted in spawning areas or migration ways leading to such areas, or in marine protected areas be penalized by either fines up to RUR 300,000 or an amount corresponding to 1-2 years' income for the violator, compulsory work of no less than 480 hours, corrective work for at least two years or arrest for at least 6 months. The Norwegian Marine Resources Act opens up for 6 years' imprisonment for serious violations of fisheries regulations, but this applies only to Norwegian citizens. However, the fines issued for infringements of the fisheries legislation are significantly higher in Norway than in Russia. Alternatively, catch, gear, vessels or other properties can be confiscated. In the judgment of the seriousness of the infringement, the economic gain of the violation, among other things, is to be taken into consideration. The comprehensive enforcement system (see PI 3.2.3 a)) combined with the high level of compliance (see SI 3.2.3 c)) makes it reasonable to assume that the system provides effective deterrence. Sanctions are reported by both the authorities and fishers to be consistently applied – there is no information that indicates otherwise. SG100 is met.		

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with		
c	Guidepost	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	Y	Y	Y
	Justification	The level of compliance among the vessels undergoing assessment, and the Barents Sea cod, haddock and saithe fishery in general, is high. During 2017, the client vessels were subjected to thorough inspections at sea (see procedures under 3.2.3 a) above) by the Norwegian Coast Guard every month while fishing in Norwegian waters and by the Directorate of Fisheries in approx. 15 % of landings in Norway. No serious infringements were identified, but three warnings were given for procedural errors, such as not keeping all required certificates for the captain on board. At the aggregate level, the Norwegian Coast Guard in 2015 carried out approx. 1500 inspections in both 2015 and 2016. In 2015, 293 inspections (20 %) resulted in a warning and 44 inspections (3 %) in a fine or prosecution. In 2016, 74 inspections (4.7 %) resulted in a fine or prosecution. The Russian Border Guard in 2016 performed 3629 inspections; this includes both at-sea and port inspections, and the REZ as well as NEAFC waters and the Protection Zone around Svalbard (where Norway allows Russian enforcement authorities to inspect Russian vessels). 208 infringements (in 5.7 % of inspections) were revealed. This can be considered a relatively high level of compliance in a large-scale fishery such as the Barents Sea demersal fisheries, especially taking into account that none of these infringements were of a serious nature. The infringements were mainly related to procedure, such as delay in sending in documentation, or failure to report in the catch log fish that the crew had kept on board for personal consumption (typically in the amount of 200-300 kg). Both Norwegian and Russian enforcement authorities operate on a risk-based framework and give priority to discard of fish, e.g. through the use of helicopters for impromptu inspection. Two instances of discard were detected and sanctioned in 2016 and none in 2017. Both the Norwegian Coast Guard and the Russian Border Guard work proactively with the fishing industry to avoid discard and regularly organize seminars and meetings with the industry on this topic. Studies show that the close relations between inspectors and fishers in the Barents Sea, with inspectors taking more of a consultative than policing role vis-à-vis the fishing fleet, has contributed to a high level of compliance. In sum, the triangulation of both quantitative and qualitative information from the two Norwegian and the two Russian enforcement bodies, as well as documentation from the client about inspections of their vessels, makes it reasonable to conclude that there is a high degree of certainty that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery. SG 100 is met.		
d	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		Y	

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
	Justification	As follows from SI 3.2.3 c) above, there is no evidence of systematic non-compliance in the fishery.
References		Email correspondence with the Norwegian Coast Guard and Directorate of Fisheries. ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ ('Federal Act on fisheries and protection of aquatic biological resources' – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004 (last revised 2014). Hønneland, Geir, *Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea*, Cheltenham & Northampton, MA: Edward Elgar, 2012. Interviews with representatives of the BBTA and the Border Guard Service (FSB) during the site visit, Murmansk, January 2018. Jørgensen, Anne-Kristin, 'Recent Developments in the Russian Fisheries Sector', in Elana Wilson Rowe (ed.), *Russia and the North*, Ottawa: University Press of Ottawa Press, 2009. Jørgensen, Anne-Kristin, 'Тенденции в российском рыболовстве' (''Developments in Russian fisheries'), *EKO*, No. 5, pp. 58–75, 2010. КОДЕКС РОССИЙСКОЙ ФЕДЕРАЦИИ ОБ АДМИНИСТРАТИВНЫХ ПРАВОНАРУШЕНИЯХ ('Code of the Russian Federation on Administrative Offences'), N 195-ФЗ, Federal Assembly of the Russian Federation, 2001 (last revised 2017). List of inspections and infringements by the UoC vessels, provided by the client. Lov om forvaltning av viltlevande marine ressursar (havressurslova) ('Act relating to the Management of Wild Living Marine Resources (Marine Resources Act)'), LOV-2008-06-06-37, Stortinget (Norwegian Parliament), 2008. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the confirmation of fisheries regulations for the Northern fishery basin'), N 414, Ministry of Agriculture, the Russian Federation, 2014 (last revised 2017). Report from the Parallel Review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals ('Document No. 3:2 (2007–2008) from the Norwegian Auditor General'), Office of the Auditor General of Norway, 2008. Riksrevisjonens oppfølging av parallellrevisjonen med Den russiske føderasjons riksrevisjon om forvaltningen av fiskeressursene i Barentshavet og Norskehavet, Dokument 3:8 (2010–2011) ('The Office of the Auditor General's Follow-up of the Parallel Audit with the Office of the Auditor General of the Russian Federation relating to the Management of Fish Resources in the Barents Sea and Norwegian Sea, Document 3:8 (2010–2011)'), Office of the Auditor General of Norway, 2011. Stokke, Olav Schram, 'Trade Measures and the Combat of IUU Fishing: Institutional Interplay and Effective Governance in the North East Atlantic', *Marine Policy* 33: 339–349, 2009. Websites of the Federal Fisheries Agency (www.fish.gov.ru) and its regional office in the Northern basin, BBTA (www.bbtu.ru).
OVERALL PERFORMANCE INDICATOR SCORE:		**100**

PI 3.2.3	Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with
CONDITION NUMBER (if relevant):	

Evaluation Table for PI 3.2.4

PI 3.2.4		The fishery has a research plan that addresses the information needs of management		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2.	A research plan provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	A comprehensive research plan provides the management system with a coherent and strategic approach to research across P1, P2 and P3, and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.
	Met?	Y	Y	N
	Justification	The JNRFC produces annual research plans and long-term research strategies, sufficient to achieve the objectives consistent with MSC Principles 1 and 2. This degree of strategic planning of research appears to go beyond the approach of ICES. Given ICES' pivotal role in these fisheries, it is also important to consider their approach to research planning. ICES strategically establishes study groups based on information requirements identified by national delegates, including through industrial representations. Members of various ICES Working Groups focused on such elements as climate change, plankton, multi-species fisheries (ecosystem), etc. All review research, identify research requirements and undertake appropriate work. There is good communication between Working Groups (via ACOM), and between researchers through their specialist interests. Research/investigation is undertaken in relation to specific requirements, which generally come from the recommendations of the Stock Assessment Working Group. Members of the ICES community keep abreast of developments within the scientific community of relevance to the fishery under consideration. Research contracts are left to other organizations, including universities, to supplement scientific understanding relevant to the fishery and related ecosystem. In Russia, PINRO plays a key role in the work of ICES, and is the formal representative of Russia on ICES working groups and, as such, contributes significant resources and expertise to relevant research. For example, a number of key ICES working / study group have particular bearing on the fishery under assessment. These include (but are not limited to) the Arctic Fisheries Working Group (AFWG) and the Working Group for Regional Ecosystem Description (WGRED). Research direction is steered by the money available. Typically it is easier to get national research funding for national projects. As a result many projects are undertaken by national scientific institutes using national fleets. The findings of these studies contribute to ICES findings. The JNRFC produces annual research plans and long-term research strategies, sufficient to achieve the objectives consistent with MSC P1 and P2, but not for P3. The same goes for ICES research plans. Hence, SG 80 is met, but not SG 100.		
b	**Guidepost**	Research results are available to interested parties.	Research results are disseminated to all interested parties in a timely fashion.	Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.
	Met?	Y	Y	N

PI 3.2.4		The fishery has a research plan that addresses the information needs of management
	Justification	Research results under the JNRFC umbrella, in Russia represented by PINRO, are widely and publicly available, in the form of journal articles and reports, many of them published on the websites of ICES and the national scientific research institutes, and distributed to relevant actors according to their thematic relevance. Further, the Institute of Marine Research annually publishes popularized information about the state of the Barents Sea fish stocks, and on-going research related to them, in popularized pamphlets. SG 80 is met. Annual and multi-annual research plans are also available on the JNRFC's website, as attachments to the protocols from the Commission's annual sessions, but are not disseminated to all interested parties. Hence, SG 100 is not met.
References		Interviews with representatives of PINRO during the site visit, Murmansk, January 2018. Protocols from the AFWG and the WGRED, available on ICES' website (www.ices.dk). Protocols from the annual sessions of the JNRFC, available in Norwegian on the Commission's website (www.jointfish.no).
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Evaluation Table for PI 3.2.5

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery has in place mechanisms to evaluate some parts of the management system.	The fishery has in place mechanisms to evaluate key parts of the management system	The fishery has in place mechanisms to evaluate all parts of the management system.
	Met?	Y	Y	N

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
	Justification	The working of the JNRFC has been subject to several comprehensive evaluations over the last decade or so. After its session in 2004, it commissioned an anniversary edition from an independent researcher to be published at its 30- years anniversary in 2006. Furthermore, the Russian Auditor General invited his Norwegian counterpart to conduct a parallel audit of the Barents Sea fisheries in 2005. After this work was finished in 2007, the two parties continued to monitor developments and published a follow-up report in 2011. The fishery-specific management system is also subject to various forms of review by ICES. For instance, ICES has reviewed the harvest control rules for cod and haddock. There is a comprehensive system of routine monitoring of information relevant for management decision making and stock assessment purposes, although not of the management system as such. Within Russia, there are various mechanisms in place to evaluate key parts of the fishery-specific management system, but at varied levels of ambition and coverage. At the fishery councils meetings, found at federal, basin and regional levels (see PI 3.1.2 above), management authorities receive feedback on management practices from the industry and other interested stakeholders, including NGOs. The FFA and the Ministry of Agriculture report annually to the Government and the Presidential Administration about their work, with emphasis on achievements in the fishing industry. Other federal agencies also review parts of the fisheries management system. For instance, the Auditor General evaluates how allocated funds are spent, and the Anti-Monopoly Service how competition and investment rules are observed. Within FFA, there is regular review of the performance of the Agency's regional offices. In the establishment of TACs, the scientific advice from PINRO is peer reviewed by the federal fisheries research institute, VNIRO, and then forwarded to FFA and the federal natural resources monitoring agency Rosprirodnadzor for comments. It is also presented to the general public for discussion at public hearings, announced in the local press. In Norway, management authorities receive feedback on management practices from the industry and other interested stakeholders, including NGOs, at the Regulatory Meetings that take place twice a year (see PI 3.1.2 above). The enforcement component of the management system is subject to continuous evaluation at meetings between the various bodies involved in enforcement activities, where priorities are hammered out on the basis of risk-based monitoring of past experience. The international side to the Norwegian fisheries management system is reviewed by the Parliament upon submission by the Government (through the Ministry of Trade, Industry and Fisheries) of annual reports on the agreements concluded with other states for the coming year, and the previous year's fishing in accordance with such agreements. The Office of the Auditor General conducts annual reviews of the financial performance of the fishery management system. Hence, the fishery has in place mechanisms to evaluate key parts of the management system, so SG 80 is met. It is a principal challenge to claim that 'all' parts of a fisheries management system are subject to review, but it seems reasonable to expect some sort of a formal and holistic evaluation of the system as such to be in place for SG 100 to be met, which does not seem to be the case for the national management system in Russia. Holistic reviews of the JNRFC have been conducted, but on an adhoc basis more than as a result of a review 'mechanism' – nearly a decade has passed since the last report emerged from the bilateral cooperation between the Norwegian and Russia Auditors General. Holistic reviews of the management system as such are generally lacking in Russia. SG 100 is not met.		
b	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	Y	Y	N

PI 3.2.5		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system
	Justification	Regular internal review of the fishery-specific management system is performed through the various forms of evaluation in the Russian and Norwegian management systems listed under SI 3.2.5 a) above. SG 60 is met – SG 80 is also met for the *national* component of the management system. This SI, as opposed to SI 3.2.5 a) above, does not ask about the *extent* of reviews (covering some/key/all parts of the management system), but rather about their *frequency* and whether they are internal or external to the management system. (If that were not the case, scoring 3.2.5 b) would have made no sense in cases where 3.2.5 a) does not reach a 100 score, i.e. if not 'all' parts of the management system are subject to review.) Hence, various forms of evaluation can be taken into consideration under this SI even if they do not comprise the entire management system (the 'holistic' review required to score a 100 at SI 3.2.5 a)). But some level of interrelationship between these PIs must be assumed, so that external reviews of only peripheral components of the management system should not automatically lead to a positive score on the external review indicator (whether 'occasional' for SG 80 or 'regular' for SG 100), in the opinion of the assessment team. As follows from SI 3.2.5 a) above, the JNRFC has been subject to several external reviews, including a specially commissioned anniversary edition in 2006 and a parallel audit by the two countries' Auditors General in 2005–2007, with a follow-up four years later. SG 80 is met for the international component of the management regime. Although it can be debated how often (and at what specific intervals) reviews must be carried out to meet the SG 100 requirement of 'regular' external reviews, we conclude that it is not met here. External evaluations seem to be conducted only when particular circumstances require this. To qualify as a regular external review, there would have to be a system in place under which reviews are commissioned notwithstanding external circumstances, which is not the case here. SG 100 is not met.
References		ФЕДЕРАЛЬНЫЙ ЗАКОН О РЫБОЛОВСТВЕ И СОХРАНЕНИИ ВОДНЫХ БИОЛОГИЧЕСКИХ РЕСУРСОВ ('Federal Act on fisheries and protection of aquatic biological resources' – Federal Fisheries Act), N 166-ФЗ, Federal Assembly of the Russian Federation, 2004 (last revised 2014). Hønneland, Geir, *Kvotekamp og kyststatssolidaritet: Norsk-russisk fiskeriforvaltning gjennom 30 år* ('Quota Battles and Coastal State Solidarity: Norwegian–Russian Fisheries Management through 30 Years'), Bergen: Fagbokforlaget, 2006. Also published in Russian by PINRO Press in 2007. Anniversary edition commissioned by the JNRFC. Interviews with representatives of the BBTA, the Border Service (FSB) and PINRO during the site visit, Murmansk, 2018. Jørgensen, Anne-Kristin, 'Recent Developments in the Russian Fisheries Sector', in Elana Wilson Rowe (ed.), *Russia and the North*, Ottawa: University Press of Ottawa Press, 2009. Jørgensen, Anne-Kristin, 'Тенденции в российском рыболовстве' ('Developments in Russian fisheries'), *EKO*, No. 5, pp. 58–75, 2010. Meld. St. 20 (2015–2016) Noregs fiskeriavtalar for 2016 og fisket etter avtalane i 2014 og 2015 ('White Paper on Norway's [International] Fisheries Agreements and Fishing in Accordance with the Agreements in 2014 and 2015'), Ministry of Industry, Trade and Fisheries, Norway, 2016. ОБ УТВЕРЖДЕНИИ ПРАВИЛ РЫБОЛОВСТВА ДЛЯ СЕВЕРНОГО РЫБОХОЗЯЙСТВЕННОГО БАССЕЙНА ('On the confirmation of fisheries regulations for the Northern fishery basin'), N 414, Ministry of Agriculture, the Russian Federation, 2014 (last revised 2017). Report from the Parallel Review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals (Document No. 3:2 (2007–2008) from the Norwegian Auditor

PI 3.2.5	**There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives** **There is effective and timely review of the fishery-specific management system**
	General), Office of the Auditor General of Norway, 2008. Riksrevisjonens oppfølging av parallellrevisjonen med Den russiske føderasjons riksrevisjon om forvaltningen av fiskeressursene i Barentshavet og Norskehavet, Dokument 3:8 (2010–2011) ('The Office of the Auditor General's Follow-up of the Parallel Audit with the Office of the Auditor General of the Russian Federation relating to the Management of Fish Resources in the Barents Sea and Norwegian Sea, Document 3:8 (2010–2011)'), Office of the Auditor General of Norway, 2011. Websites of the Federal Fisheries Agency (www.fish.gov.ru) and its regional office in the Northern basin, BBTA (www.bbtu.ru).
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	

Appendix 1.2 Risk Based Framework (RBF) Outputs

RBF has not been used

Appendix 1.3 Conditions

No conditions have been set.

APPENDIX 2. PEER REVIEW REPORTS

Template for Peer Review of MSC Fishery Assessments

Version 1, January 2011

The template shall be used by peer reviewers of MSC Fisheries' Assessments to ensure that the content of the review is relevant and actionable by certification bodies. The template ensures a consistent format to facilitate comparisons between different fishery assessments. It will also inform future developments of the MSC scheme requirements.

If you have any queries about using the template please contact the CAB.

NB The peer reviewer contact details below can be completed by the Conformity Assessment Body as the peer reviews will be unattributed in the final report.

Contact Information					
Contact Name	*First*		*Last*		
Title					
On behalf of (organisation, company, government agency, etc.) – *if applicable*					
Organisation	*Please enter the legal or registered name of your organisation or company.*				
Department					
Position	*Please indicate the position or function you exert within your organisation or company.*				
Description	*Please provide a short description of your organization.*				
Mailing Address, Country					
Tel		**Mob**		**Fax**	
Email				**Web**	

Assessment Details	
Fishery	Russian Federation Barents Sea cod, haddock and saithe fishery
Conformity Assessment Body	DNV GL - Business Assurance
Contact Person	
Contact Details	
Peer Review Due Date	

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	**Yes~~/No~~**	**Conformity Assessment Body Response**
Justification: Yes. This is a recertification with several harmonized fisheries, so appropriate that scoring should be harmonized with others. Particularly on P2. It would be nice to also see (in table 12) that there was also harmonization on P1 and P3. In a number of places, I question whether the SG100 is met, and in two places (2.4.2 & 3.2.5) I mention that a condition could be justified. However, even if all the changes suggested were accepted this would not change the overall outcome.		

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	**Yes/No**	**Conformity Assessment Body Response**
Justification: Not applicable. There are no conditions.		

If included:

Do you think the client action plan is sufficient to close the conditions raised?	**Yes/No**	**Conformity Assessment Body Response**
Justification: Not applicable. There are no conditions.		

General Comments on the Assessment Report (optional)

- Title implies that the saithe is also a re-assessment. No mention is made, in initial pages, of fact that saithe is being assessed for the first time. This should be clarified. Does saithe also need a target eligibility date as this has not been previously certified? **CAB comment:** This is now mentioned in the presentation of the unit of the assessment.
- Report does not reflect the recent change of team leader, notified on the MSC website. **CAB comment:** The effective team leader is still as described in the report. However, for administrative purposes during the finalization of the report and due to maternity leave the formal change of team leader was modified at the MSC website.
- The Executive summary is rather brief and unhelpful. This should detail the main strengths and weaknesses of the client operation. Even with no conditions, this could still provide a little more description of the relative strengths and weaknesses. It would also be helpful to describe brief characteristics of the fishery in the Executive summary.
- Section 4.3 states that “MSC Full Assessment Reporting Template v 1.3 (dated 15 January 2013)” has been used. If so, further description of the fishing gear or the area of operation would be helpful in Section 3.2. **CAB comment:** Section 3.2 has been updated.
- Report is also unclear about the industry’s own initiatives. Various references are made in the evaluation tables to “encounter protocols” and “move-on rules” and Codes of Conduct and observers etc., but there is no explanation of what these are, nor auditable evidence of their existence. Perhaps a short section detailing exactly what initiatives are undertaken by the fleet would help. **CAB comment:** This section has been updated.

- Formatting: the main report body text needs formatting to be standardised. Font size, paragraph spacing and justification all changes. **CAB comment:** Formatting has been changed.
- UoA mentions “Primarily Norwegian EEZ and Svalbard FPZ”. As this also includes the Russian EEZ this should be explicitly referred to in the UoA (The P3 chapter states that: “The certificate also covers UoA fisheries in the Russian Economic Zone”). **CAB comment:** The unit of assessment remains as defined in the report.
- Report section 3.1.2 states vessel list is available from msc.org . Is this correct? If so, provide a more detailed link. **CAB comment:** Vessel lists will be available that MSc.org at the section for this fishery
- Report section3.2: Typo after list of companies – refers to 2031 instead of 2013. **CAB comment:** This has been corrected
- Report Section 3.3.1.2: Reference to table 1 shows: Error! Reference source not found
- Evaluations tables: There are 2 sets of evaluation tables for P1, a single evaluation table for P2 and a single evaluation table for P3. For P1 an evaluation table per species (i.e. per UoA) may have been clearer (particularly should scores for any 1 species change in the future). At the start of Principle 2 Evaluation tables it states “evaluation results are identical for cod, haddock and saithe included in the assessment”. However, the summary tables in report section 6.2 show considerable differences in the P2 scores between Cod / Haddock and Saithe. This suggest that at some point in the assessment process there were thought to be differences between the operations of the fishery when targeting cod/haddock or when targeting saithe. Likewise, the summary table shows differences in P3 scores which are not in the Evaluation table. Given that the management of saithe is different to cod/haddock it may have been clearer to have a separate evaluation table for P3.**CAB comment:** scoring tables have been corrected.
- Main species: Technically, (i) cod is a main retained species in the haddock UoA; (ii) haddock is main retained species in the cod UoA and; (3) both cod and haddock are main retained species in the saithe UoA. However, as the status of each is good, it does not lead to an incorrect score when applying a default score of 80 in P2 because “there are no main species”.
- ETP: The report / evaluation would be improved with an explicit list of which species are considered ETP (noting the definition of ETP in CB3.11.1) and these should be included as elements in table 14. Listing on the IUCN Red List *does not qualify* a species as ETP, so those species which are only listed on IUCN are not ETP. But perhaps the Norwegian and Russian Redlist does give more explicit legal protection? If so, these could be ETP but this should be further clarified. Some species referred to in the report section 3.4.2 are not discussed in the ETP evaluation tables and it is not clear why. And some species which are ETP such as *Physeter macrocephalus* (CITES Appendix 1) are not mentioned at all. Species of shark or ray are not CITES Appendix 1, so these are only ETP if explicitly protected in Norwegian and Russian ETP legislation. IUCN status alone does not qualify the species as ETP (even in MSC CRv2 these would only be ETP if bird, mammal, reptile or amphibian). **CAB comment:** all assessments have taken a rather broad and precautionary view of ETP; and there is some ambiguity as to the protection offered to national redlist species. However we have sought to clarify/rationalize this as far as possible. Details on Physeter microcephalus have been added. Regarding shark or ray: Indeed. However many of these species are in the Norwegian and Russian redlists which are referred to in Norwegian and Russian legislation and afforded therefore some protection
- Once an ETP list is defined, scoring should be done on elements, or if not, it should be explicitly stated that all elements are being scored together, because the justification applies equally to all. CAB comment: It is impractical and unnecessary to score all possible etp species as separate elements and this has not been done in other fisheries except where there are a few ETP species clearly at risk from the UoA . However I have now scored as 4 etp elements: seabirds, marine mammals, fish, reptiles and amphibians
- If the assessment team concludes that golden redfish (*S norvegicus*) is ETP then this should be scored as an ETP and not under retained. If the assessment team concludes that it is not

ETP, it should not be mentioned as such. Other species are also referred to under more than 1 component (e.g. *Dipturus batis* is referred to under both retained and ETP).

- Note Table 10 title refers to OT vessels. **CAB comment:** Revised
- Habitats: References appear to be rather old. Several more recent papers appear to be relevant so could be usefully added: **Cab comment: Background text and analysis updated revised accordingly; references inserted.**
    - Buhl-Mortensen, L., Ellingsen, K. E., Buhl-Mortensen, P., Skaar, K. L., and Gonzalez-Mirelis, G. (2016). Trawling disturbance on megabenthos and sediment in the Barents Sea: chronic effects on density, diversity, and composition. – ICES Journal of Marine Science, 73: i98–i114 https://academic.oup.com/icesjms/article/73/suppl_1/i98/2573995
    - Pål Buhl-Mortensen (2017) Coral reefs in the Southern Barents Sea: habitat description and the effects of bottom fishing, Marine Biology Research, 13:10, 1027-1040, DOI: 10.1080/17451000.2017.1331040
    - Monika Kędra, Paul E. Renaud, Hector Andrade (2017). Epibenthic diversity and productivity on a heavily trawled Barents Sea bank (Tromsøflaket), Oceanologia, Volume 59, Issue 2, 2017, Pages 93-101, ISSN 0078-3234, https://doi.org/10.1016/j.oceano.2016.12.001
    - Jørgensen, L. L., Ljubin, P., Skjoldal, H. R., Ingvaldsen, R. B., Anisimova, N., and Manushin, I. 2015. Distribution of benthic megafauna in the Barents Sea: baseline for an ecosystem approach to management. ICES Journal of Marine Science, 72: 595–613
    - Reference is made to the annual IMR/PINRO annual ecosystem review, but the most recent reference provided for this is 2011. (A more recent one is discussed under ecosystem PIs).
- A key difficulty when assessing habitat impact is the lack of any spatial representation of where the fleet fishes. It would be helpful to present a fishing intensity map somewhere in the report. It is noted at the end of the P2 chapter that “WWF Russia has accumulated a great deal of data on the fishing activities of the MSC certified fleets and the distribution of this activity relative to VMEs and benthic habitats more generally”. Could this be presented? **CAB** comment: yes, this has been added
- P3: It’s not clear from the report how the Russian allocation of saithe quota is determined. Explanation of how the saithe fishery is managed with Norway, but how is the Russian quota determined?
- **References:** Several of the references are missing. **CAB comment:** reference list has been updated
- Reference 4 in the main reference list is just a list of shortened citations: “Anker-Nilssen et al 2000, Anker-Nilssen 1992, Barrett and Krasnov 1996, Fauchald, and Erikstad 2002, ICES 2009a, Kovalev and Bogstad 2011, Lubin et al 2013, Mauritzen & Klepikovsky 2013, Mikkelsen 2016, RNME, 2006, Meeting client, Arneberg et al 2009”. Reference 14 in another such example. There may be more.
- Other references cited in the evaluation tables are not provided in the reference list: (e.g: Gullestad et al 2015, Mikkelsen 2016, Mauritzen & Klepikovsky 2013). A thorough check of refences and a standardized approach to referencing would much improve the report.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
Cod & Haddock					
1.1.1	Y	Y	NA	Justifications for both SIs are good and clear. However, the 2018 advice for haddock (released June 2018) indicates that F is now above Fmsy. As this was after the site visit and scoring there is no obligation to change, but worth noting.	We are fully aware of that change and are considering an addendum to the report to indicate the change and our awareness of it.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.1.2	Y	N	NA	SIa: states that "SG 100 is met" but there is no SG100 for SIa. This should be changed to SG80. Otherwise good and clear. SIb (both cod & haddock): justification for SG100 refers to the precautionary reference point, however the focus of this scoring issue is whether the limit reference point has been set with consideration of precautionary issues. This is a different question to the one that has been answered. SIc: Scoring justification refers to Bmsy even though Bmsy is not defined. The target in the managament plan is MSY Btrigger, which uses Bpa as a technical basis. Justification should explain why this target is above MSY.	Sia.Thank you, that has been corrected. Sib. The method used by ICES to establish limit refernce points is carefully considered by the relevant working groups and the methodology does take into account precautionary issues which, as stated, are built into the management plans for both species. Sic For cod I have anmended the scoring comments to refelect this valid point as follows (.*Where BMSY is not specifically defined the CR v1.3 permits Fmsy to be used as a proxy (CB 2.3.2.3). F has been consistently well beloe Fmsy (0.4) since 2008.* The situation for haddock is exactly the same as that explained for cod above where the fishing mortality has been consistently well below FMSY (0.35) since 2008.
1.1.3	Y	Y	NA	Appropriate justification.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	N	N	NA	The MSC defines Harvest Strategy as "the combination of moniotring, stock assessment, harvest control rules and managament actions which may include an MP or an MP (implicit) and be tested by MSE". The justification provided here focuses almost entirely on the HCR element of the strategy. Where reference is made to the Managament Plan, this is in fact an HCR. Likewise where it is stated that the strategy has been reviewed, it is actually the HCR which has been reviewed. A wider discussion of the Management Strategy (as per the MSC definition) would help to justify scores.	We see and interpret clear differences between the harvest strategy which is defined by the relevant management plan and the hatvest control rules which are adressed under PI 1.2.2. PI 1.2.1 provides the 'route map' to the sustainable management of the stock, whilst PI 1.2.2 provides the 'mode of transport' the means by which sustainable management is achieved namely the rules and tools. We feel that our comments propoerly reflect these differences and that under this PI we have commented accordingly underr each of the scoring issues.
1.2.2	Y	Y	NA	SIa: This may benefit from a clearer explanation of how the HCR leads to a reduction in the exploitation rate as the limit reference point is approached.	See comments above regarding the definition of this PI. Regarding the request for a clerarer explanation of the reduction in exploitation rate as limit reference points are reached, This is very clear and implicit in the JNRFC management plans for both stocks and included in the report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.3	Y	N	NA	A good range of information and clear justification. Overall score incorrect: There are 2 SIs at SG100. 1 is met, 1 is not met, so the score is 90.	Score corrected to 90 for both cod and haddock
1.2.4	Y	Y	NA	No explicit reference is made to external peer review, but external experts participation in the benchmarking process may suffice.	The ICES benchmark process is very robust and does always include carefully selected external experts.
Saithe					
1.1.1	Y	Y	NA	Good justification and appropriate score.	
1.1.2	Y	Y	NA	Should the lack of MSY reference points for either F or SSB be more clearly discussed and perhaps reflected in scoring?	IThe ICES assessment working group do not offer an explanation for their absence. The management plan, with its three year rule, is very firmly linked to the biomass precaurtionary approach. This is clearly reflected in failure to meet SG 100 at scoring issue c.
1.1.3	NA	NA	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.1	Y	N	NA	The MSC defines Harvest Strategy as "the combination of monitoring, stock assessment, harvest control rules and managament actions which may include an MP or an MP (implicit) and be tested by MSE". The justification provided here focuses almost entirely on the HCR element of the strategy. Where reference is made to the Managament Plan, this is in fact an HCR. Likewise where it is stated that the strategy has been reviewed, it is actually the HCR which has been reviewed. A wider discussion of the Management Strategy (as per the MSC definition) would help to justify scores. SId: states that SG100 is not met, but elsewhere it suggests it is met and it is scored as if it is met.	As for cod and haddock we see and interpret clear differences between the harvest strategy which is defined by the relevant management plan and the hatvest control rules which are adressed under PI 1.2.2. PI 1.2.1 provides the 'route map' to the sustainable management of the stock, whilst PI 1.2.2 provides the 'mode of transport' the means by which sustainable management is achieved namely the rules and tools. We feel that our comments propoerly reflect these differences and that under this PI we have commented accordingly under each of the scoring issues. Regarding scoring issue d the final paragraph is correct and we considered that SG 100 was not met. I have edited this section accordingly and reduced the score to 95.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.2	Y	N	NA	SIa: This PI should focus on the HCR. Instead this seems to discuss the wider strategy. Ideally this would describe how TAC is reduced following the HCR as the limit reference point is approached. SIc: OK Overall score is incorrectly calculated. There are 2 SIs at SG100. 1 is met, 1 is not met, so the overall score is 90.	See comments above regarding the definition of this PI.at 1.2.1 Regarding the request for a clerarer explanation of the reduction in exploitation rate as limit reference points are reached, This is very clear anmd implicit in the JNRFC management plan for saithe with the three year rule which is included in the text of the report.and the scoring coments I have reduced the score to 90 based on your logic. My logic was that scoring issue a did not have an SG 100 so I took it as a default 100 which was wrong.
1.2.3	Y	Y	NA		
1.2.4	Y	Y	NA	States that "All aspects of the report itself is externally reviewed (by correspondence) and reviewers' comments are published as an annex to the report". It is not clear which report this is referring to.	I have inserted the word 'assessment' to describe which report is being referred to.
Principle 2					

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Y	N	NA	Formatting problem: some text justification (i.e. for plaice) dissapears into the footer. Technically, each of the 3 target species are "retained main" for each other. Whilst their status is all good (above Bmsy) and scoring well in P1, the current approach to scoring is sufficient and has no impact on scores, but each species would need to be addressed as a P2 element if stock status for any was to decline considerably. Reference is made to table 2.6. Numbering appears to have changed so this needs to be updated. Greenland halibut should say "highly likely' if a score of 80 is given. Long Rough Dab: this is referred to as "highly Likely" so the score for the element should be 80. SId: does not appear to only apply to main species. Therefore further justification may be required.	a) Target species are "main". Technically correct but as the reviewer says this does not affect scores, and all the three species have been assessed under P1. Rescoring would have to be done under P1 if status declined b) Table numbering and basic editing has been addressed c) Greenland halibut: "highly" inserted d) Long rough dab rescored at 80 e) Sid cannot be scored given the information presented in Sia. It has not been scored in other Barents sea trawl fisheries. Some text has been added to this effect.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Y	Y	NA	Scoring appears to be fair. Given that some measures only apply to some species, an elemental approach (i.e. scoring each element in turn) may be required. Or, need to explain why elemental scoring is not being used. i.e. state the management approach is the same for all elements. SIb: could give consideration to the quality of the information used in the stock assessment of those species which are retained. SId: this does not refer to all species which are scored in 2.1.1. Only 1 reference is provided (Gullestad et al 2015), which is missing from the reference list.	a) While there are some differences between the measures applied to different species, they are effectively part of a broader management system and an elemental approach is therefore neither appropriate nor necessary b) SLb Information quality is more an issue for 2.1.3. In any case, reference to those responsible for the status assessments (PINRO/IMR) coupled with the consideration of quality of information to be found in the more detailed discussion of status in the background section, should be adequate to support the scoring here. c) Have added Gullestad 2015 full reference to the reference list. More detailed discussion of and reference to sources is found in the background section

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.3	N	Y	NA	A reference should be provided for the statement: "The quality of these data and the monitoring, surveillance and compliance have been assessed by FAO and found to be high" (SIa).	Done
2.2.1	Y	N	NA	Reference is made to the OT trawl fishery. Is this correct?SIc: does not apply only to main bycatch species.	a) Corrected b) Application of this SI has been inconsisten in previous assessments> However for the sake of precaution a short rationale has been added and the guidepost is met
2.2.2	N	Y	NA	SIb: It would be helpful to have a bit more detail here. What is the level of observer coverage? Is this really sufficient to give confidence that objectivtive of limiting discarded bycatch is being achieved? SIc: reference is made to landings, but this PI is focussing on discarding bycatch, so landings are not suitable evidence.	a) Information on oberver coverage is provided and scored under P3. Although observer data is (as always) limited, taken together with the discard ban, log books, landing records, reference fleet data, and work by PINRO and IMR scientists we consider it more than adequate to justify the 80 score. An an additional reference to the work of Gullestad (2015)has also been included.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.2.3	N	N	NA	What information is there to confirm that the objective of reducing discarded bycatch is being achieved. Reference is made to observers, and inspectors and reference fleets, but it would be helpful to have a critical review of whether this is sufficient to quanitfy the level of discarding. No actual data is presented here. There is no full reference provided for Gullestad et al 2015 so this cannot be checked. Similarly no full reference is provided for ICES2016HCR, so again this can't be checked.	There is no doubt that there is both "qualitative and some quantitative information" on main bycatch (from skippers, logbooks, authorities etc) and most of this can be cross-checked. With regards to possible false data and non-reporting of illegal discarding - the main source here are the authorities and the scientists, with some broader assessments from scientists such as Condie et al 2014 and Gullestad et al 2015 (full references now given). This is necessarily sample data, but both authorities and scientists are confident that discarding is not now a major issue, and that it has been reduced greatly. This is partly also because the authorities have worked in parallel on measures that would reduce the incentive to discard, such as real time closures. In any case, since there are no main bycatch species SG80 is met by default, and the uncertainties noted are captured by not awarding 100.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.1	Y	N	NA	See comments in "General Comments" (above) about the defintion of ETP species and elemental scoring. SIa: Final paragraph uses language of SG80 (i.e. highly likely) then concludes that SG100 is met. Evidence presented supports scoring at the 80 level. SIb: Formatting problem: some text justification dissapears into the footer.	a) Some changes have been made in the background section to address the ambiguities about ETP definition. However ETP encompasses not only species listed on CITES Appendix 1 but also species protected under national legislation and other mandatory international agreements that are referred to in the text. There is some ambiguity as to whether all (Russian and Norwegian) red listed species are subject to national regulation, but the redlist species are referred to in some national legislation and therefore afforded some protection. For this reason they are included in the tables. b) Scoring of SIa has been corrected to 80 and text amended.
2.3.2	Y	Y	NA	SIa: Formatting problem: some text justification dissapears into the footer.	
2.3.3	N	Y	NA	References provided for ETP information are either fairly old, or absent from the reference list, so it is difficult to be clear about what the data shows.	Additional references added

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.1	Y	Y	NA	Title of evaluation table states "FEST Group". Justification refers to FEST. No explanation is provided for what FEST is. The formatting of the footer means that it is not possible to see the elemental scoring. Scoring in line with harmonised fisheries makes sense.	removed

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Y	N	NA	Title of evaluation table states "Faroes & Iceland". SIa: The statement that there is "no clear measures in place for the protection of other known areas of VME" reflects poorly on the fishery. The statement that "hopefully agreement will be reached on appropriate areas for the protection" might be reinforced with either a justifiable condition or at least a recommendation. To help justify the conclusion that there is a partial strategy it'd also be helpful to have some more explanation / evidence of the reporting and encounter protocols, contribution to mapping and monitoring fleet footprint and VMEs under the industry initiative and steady improvement in gear. SIb: note that SIa has concluded that it is a partial strategy, therefore SIb should also say 'partial'. SIc: evidence of implementation seems relatively weak for some aspects of the partial strategy, in particular those that are industry initiatives.	a) Corrected b) Sia. The quoted statement does not really reflect poorly on the fishery. It is normal for the most valuable areas of habitat to be protected, but there are no fisheries on earth where all known VME are protected. This reflects partly the relatively recent development of the concept of VME, but also the need to prioritize protected areas while taking account of existing interests. Through its fishery council the industry is working closely to collect more data on benthic habitat and encourage agreement on and establishment of more protected areas to ensure that the most valuable benthic habitat is conserved – but it cannot do this without initiative also from authorities supported by scientists. Detailed explanation of the management protocols and initiatives are provided in background section 3.4.5.3 c) Sib partial inserted as recommended d) Sic As noted above information on industry initiative is presented in background section 3.4.5.3

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.3	N	N	NA	SIa: Mareano covers a relatively small area of the overall area fished. How well understood are the habitats in the areas beyond Mareano? Several of the references provided above (under the general comments section) note that there is a lack of understanding of seabed habitats.The explanation about VMS and fishing intensity data is not relevant to this SI, which is just focussed on habitat info. A score of 100 for SIa seems rather generous. Incorrect score. 2 SG100s are met. 1 is not met. So score should be 95.	a) Sia Mareano is exceptional detail in terms of habitat mapping. However, mapping and analysis of benthic habitat across the whole Barents Sea is also exceptional by international standards and includes long term trend data. b) Data on fishing intensity is highly relevant to the issue of vulnerability and to guide priority areas for enhanced mapping. We maintain that the level of information is exceptional by international standards and that the distribution of habitats is known over their range, with particular attention to vulnerable habitat types

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.5.1	Y	N	NA	Justification appears adequate to support a score of SG80. However, final paragraph which provides additional justification for SG100 mostly highlights a lack of understanding so it is not clear why the partial score is justified. Typically partial scoring is allowed where different elements score differently, however ecosystem elements are not defined in this justification.	The lack of understanding is highlighted precisely to explain why SG100 is not met. However, the quality of analysis and understanding of the barents Sea ecosystem is - by any international standard – exceptional and deserves therefore more than the minimum "pass" of 80 Choice of "ecosystem elements" is fraught with subjectivity and we are of the view that a broad integrated assessment of the eco "system" is more appropriate and useful
2.5.2	Y	Y	NA	Title of evaluation table states "Faroes & Iceland". Scoring appropriate, as is the conclusion that there is a 'partial strategy'.	
2.5.3	Y	Y	NA	Title of evaluation table states "Faroes & Iceland".	
Principle 3					

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.1	Y	N	NA	Formatting problem: some text justification dissapears into the footer. Good explanation and lots of relavent information. SIa: It must be demonstrated for SG100 to be met that international procedures are *binding*. If JNRFC is binding, then this should be more clearly stated. If JNRFC does not apply in the case of Saithe, what it the binding procedure? SIb: Does the JNRFC have an actual explicity stated dispute resolution mechanism? What is described is the effectiveness of the process which helps to avoid dispute, but the focus of the SI is whether a mechanism exisits, should diputes arise. Brief mention is made of the NEAFC dispute resolution mechanism. Would this be the mechanism which would be triggered in event of a dispute?	SIa: JNRFC is established and its work regulated in binding agreements between Norway and the Soviet Union/Russia from 1975 and 1976, referenced in the text. For saithe, the referenced Norwegian legislation provides the binding procedures for management. Quota exchange, i.e. transfer of a saithe quota to Russia from Norway, is carried out within the JNRFC. SIb: The NEAFC dispute resolution mechanism and international courts of justice are listed as relevant mechanism at the wider international level. In principle, disputes in the JNRFC can be transferred to these mechanisms, but as mentioned in the rationale this has not been necessary so far, and as the peer reviewer hints at, NEAFC would not be the most relevant mechanism to trigger. We have nevertheless listed it as it remains an opportunity. In practice, disputes in the JNFRC are solved within the 'instituttional web' of the Commission itself. The Commission has a Permanent Committee (with several sub-committees) as well as a number of working groups, including on science and enforcement. When a dispute arises in the Commission itself (in plenary), the issue is transferred to one or several working groups for resolution. Although this is not formally named 'dispute-resolution mechanism', it functions and is perceived by the parties as one. After nearly half a century in operation, this mechanism is well-established and well-functioning, 'appropriate to the context of the fishery and

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.2	Y	N	NA	Formatting problem: some text justification dissapears into the footer. SIa: It would be clearer if it was not necessary to refer to elsewhere in the evaluation tables. SIb: In order to score SG100 it must be demonstrated that the managament system "explains how (consultation information) is used or not used". At present SIb describes an effective system but does not show how this latter point is met.	SIa: The management authorities involved in the management of the fishery are thoroughly described under SI 3.1.1a and the non-governmental organizations under SI 3.1.2b. The team maintains that the report is more readable when this lenghty text is not reproduced several times within a few pages, but instead internally referenced. SIb: The guidepost requires that management authorities explain (to those included in consultation mechanisms) how information is used or not used. The justification details the arenas where such information is provided in both Norway and Russia. This is corroborated in minutes referenced in the report. The only way to find out whether such explanation is is perceived as satisfactory, is to ask stakeholders. All stakeholders consulted during the site visit confirmed that that is the case. Further, the team notes that the reviewer agrees with the justification and score of this PI.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.3	N	N	NA	Explanation of how "rational use" equals the precautionary approach is good. The difference between a score of 80 and a score of 100 is very small (but has a big impact on scores) with the key difference that at SG100 there must be a management requirement *that objectives are set*, not simply that there are objectives which require certain actions. In other words it is a requirement for objectives, rather than the requirement of objectives that is being assessed. Justification is adequate for SG80. Because the objectives are well described SG80 is met. For SG100 it is critical to point to where within (higher) managament policy there is an explicit "requirement" that clear long term objectives (consistent with MSC / precautionary principle) are set. Clearly demonstrating this "requirement" means that SG100 is met. If not only SG80 is met.	The team notes that the reviewer agrees with how the team has argued that 'protection and rational use' in Russian legislation equals the precautionary approch. (In Norway and at the bilateral level, the precautionary principle is explicitly stated.) The reviewer raises an interestig question regarding the difference in requirements for SG80 and SG100. It is a very common practice in MSC assessment reports to assign a 100 score on this PI as long as the precautionary approach is explicity stated as an underlying objective for management of the fishery – we agree with the reviewer that this is problematic since it does not distinguish between an 80 and a 100 score. That said, there is a fine line between the two. If a basic legal text states that fisheries management shall be based on the precautionary approach, if follows logically that also objectives must reflect this approach. And the legal tradition varies between countries as to how extensive and specific legal texts are. In some countries, laws are dozens of pages long and aimed at covering all thinkable definitions and provisions, while in other countries laws are aimed to be as accessible as possible to the general public and hence as brief and easily understandable as possible. In the view of the assessment team, the scoring of this PI must be based on an *interpretation* of the relevant legal texts. It is the team's best judgment that the SG100 requirement is met in this case. Both Norwegian and Russian law, as well as the agreed strategies

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.1.4	Y	N	NA	Is the partial score because (i) Norway meets 100 (as implied at the start of the first paragraph) and Russia meets 80 or because (ii) there is a review but it is not regular. If the former this is permissible because of elemental scoring. However, if it because there was a review in 2009 it does not appear to meet the intent of SG100. To meet SG100 an explicit review of incentives within a review of management policy or procedures should be referred to.	The partial score is given because Norway meets SG100 and Russia only SG80. As noted by the reviewer, this is permissible because of elemental scoring.
3.2.1	Y	Y	NA	A score of 90 where P1 objectives are well defined and measurable and P2 are not well defined and measurable is reasonable.	
3.2.2	N	Y	NA	It'd be good to include detail about the decision of how to allocate saithe quota to Russia.	A note has been made of this in the justification. Russia is given a quota share for saith under the quota exchange regime of the JNRFC, i.e. Norway received a part of the Russian cod quota in exchange for quota shares of exclusive Norwegian stocks.
3.2.3	Y	Y	NA	Good clear explanation for the score given.	

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.4	N	Y	NA	A score of 80 is probably justified. However, it is a shame (and possibly reason to score below SG80) that the JNRFC research is not more widely publicised. This fact is overlooked in the justification of SIb.	The team notes that the reviewer agrees that the 80 score is justified. SG100 for SIa is not met because research plans do not cover P3. SG100 for SIb is not met because research plans are not widely and publicly available. 'JNRFC research', i.e. joint and/or coordinated research conducted by IMR in Norway and PINRO in Russia is indeed widely and publicly available as it is mostly published in peer reviewed journals. It is also disseminated as accounted for in the rationale.
3.2.5	Y	N	NA	It is interesting to read the discussion of the intent of the SIs. This team considers that SIa focuses on the "parts" of the system (with SG100 being a holistic review) and SIb is on the frequency and the degree of internal and external review. My own view is the SIa is on the component "parts" of the management system but that SIb focuses on the holisitc fishery specific managament system. The standard is not sufficiently clear on this point. However, regardless of which interpretation is taken, the lack of a fishery specific review for either cod/haddock or saithe, could well be grounds for a condition.	The reviewer points to an interesting discussion about the intents of the two SIs under this PI. He/she concludes that 'the lack of a fishery specific review for either cod/haddock or saithe, *could* [team's emphasis] well be grounds for a condition.' As follows from the justification, the management of both cod/haddock and saithe has been subject to thorough external reviews, but not on a regular basis. Therefore SG80 is met, but not SG100.

Any Other Comments

Comments	Conformity Assessment Body Response
None	

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1	RBF was not used.			
2.1.1				
2.2.1				
2.4.1				
2.5.1				

For reports assessing enhanced fisheries:

Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	**Yes/No**	**Conformity Assessment Body Response:**
Justification: *NA*		

Fishery	Year	UoA stock	UoA gear	PR (A/B/C)		PI	PR Comm-ent Code	Peer Reviewer Justification (as given at Public Comment Draft Report (PCDR) stage)	CAB response to Peer Reviewer's comments (as included in the Final Draft Report)	CAB Res-ponse Code
Fishery	Assess-ment Start Year	Insert extra rows for P1 PIs if separate scores given for different UoA stocks	Insert extra rows for P2 PIs if separate scores given for different UoA gear types	Peer Revie-wer (A/B/C)	3PE name	Perfor-mance Indica-tor (PI)	Is the CAB response to the PR's comments adequate?	PR's should describe any concerns with the CAB's responses to their initial comments, on either PI scoring (including the RBF) or conditions. Comments at this stage should summarise any initial comments made by the PR at the previous PRDR stage, and detail those responses of the CAB (as provided in the PCDR) which are regarded as either incomplete or inconsistent with the MSC requirements. The comments in this column should be summarised in the PR Comment Code Column H. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells where useful, using the Alt-return key combination. Detailed justifications are only required at this stage where answers given are one of the 'No' code options and the CAB responses are regarded as insufficient to address the PR's previous concerns. In other (Yes) cases, either confirm 'scoring agreed' here or identify any places where weak rationales could still be further strengthened (without any implications for the PI scores).	CAB response to the PR's PCDR stage comments (as included in the Final Draft Report). CABs should summarise their response to the Peer Reviewer comments in the CAB Response code column (to right), and provide justification for their response in this column.	See codes page for response options
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.1.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.1.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.1.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.2.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.2.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.2.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod and Haddock	Trawl	PR A		1.2.4	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.1.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.1.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.1.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.2.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.2.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.2.3	Yes			

Russian Federation Barents sea cod and haddock	2017	Saithe	Trawl	PR A		1.2.4	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.1.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.1.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.1.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.2.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.2.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.2.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.3.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.3.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.3.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.4.1	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.4.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.4.3	No (score increase expected)	There are 3 SIs. Each has an SG100. 2 are met, one is not met, so the score is 95.	agreed and edited.	Accepted (non-material score reduction)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.5.1	No (scoring implications unknown)	Whilst I have sympathy with the CAB resonse, it may not be in line with MSC scoring theory.	we can bring this down to 80 if partial scoring is not deemed acceptable. However, the "sympathy of the reviewer suggests there is a good rationale for partial score here.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.5.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		2.5.3	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.1.1		See response under 'general comments'	Text has been added/amended to reflect that the Norwegian-Russian regime is based on binding agreement and has a mechanism for resolution of disputes.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.1.2		See response under 'general comments'	As explained in the CAB response to the peer review report, the justification details the arenas where management explains how consultation information is used or not used, corroborated in minutes referenced in the report and stakeholder input during the site visit. No changes were made in the text.	Accepted (no score change)

Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.1.3	No (scoring implications unknown)	Whilst I agree that it is common for MSC reports to score this at 100 on the basis of explicitly stated objectives and the precautionary approach, this is no different to SG80. By contrast, there are several examples in other fisheries where the high level requirement to define objectives compliant with the precautionary principle is defined. If the 'requirement' cannot be pinpointed, then SG100 is not met.	The team has agreed to follow the recommendation of the peer reviewer. We think he/she has a point saying that there wouldn't be any difference between SG80 and SG100 if the statement of the precautionary approach in itself were enough in itself to achieve the 100 score. In principle, though, we maintain that if a basic legal text (i.e. formal law) states that fisheries management shall be based on the precautionary approach, it might be interpreted as following logically that also objectives must reflect this approach. Importantly, legal tradition varies greatly between countries as to how extensive and specific legal texts are. In some countries, it is considered an objective that laws are as detailed and specific as possible, while in other counties the ideal is to have brief legal texts in order to make them as easily accessible as possible for the general public, and leave interpretation and specification to the court system. In the view of the assessment team, the socring of this PI must be based on an interpretation of the relevant legal text, seen in the relevant political and cultural context, and not simply by the wording of the text. It is the team's judgement that in this case the emphasis of the precautionary approach in Russian fisheries legislation and regulation in general isn't sufficiently strong to warrant a 100 score.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.1.4		See response under 'general comments'	The partial score is given because Norway meets SG100 and Russia only SG80. No changes have been made in the text.	Not accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.2.1		No CAB response given (or needed)		
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.2.2	Yes			
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.2.3		No CAB response given (or needed)		
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.2.4		See response under 'general comments'	JNRFC research' is actually research provided by the Norwegian and Russian national marine research institutes - this has now been specified in the rationale.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Cod, haddock and saithe	Trawl	PR A		3.2.5	Yes			

Template for Peer Review of MSC Fishery Assessments

Version 1, January 2011

The template shall be used by peer reviewers of MSC Fisheries' Assessments to ensure that the content of the review is relevant and actionable by certification bodies. The template ensures a consistent format to facilitate comparisons between different fishery assessments. It will also inform future developments of the MSC scheme requirements.

If you have any queries about using the template please contact the Conformity Assessment Body.

NB The peer reviewer contact details below can be completed by the Conformity Assessment Body as the peer reviews will be unattributed in the final report.

Contact Information				
Contact Name	*First*		*Last*	
Title				
On behalf of (organisation, company, government agency, etc.) – *if applicable*				
Organisation	*Please enter the legal or registered name of your organisation or company.*			
Department				
Position	*Please indicate the position or function you exert within your organisation or company.*			
Description	*Please provide a short description of your organization.*			
Mailing Address, Country				
Tel		**Mob**	**Fax**	
Email			**Web**	

Assessment Details	
Fishery	Russian Federation Barents Sea cod, haddock and saithe fishery
Conformity Assessment Body	
Contact Person	
Contact Details	

Peer Review Due Date	

Overall Opinion

Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?	Yes	Conformity Assessment Body Response
Justification: **Yes, the conclusions are fully appropriate.**		

Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?	N/A	Conformity Assessment Body Response
Justification: **No conditions were set up in this assessment**		

If included:

Do you think the client action plan is sufficient to close the conditions raised?	N/A	Conformity Assessment Body Response
Justification: **No conditions were set up in this assessment**		

For reports using the Risk-Based Framework please follow the link.

For reports assessing enhanced fisheries please follow the link.

General Comments on the Assessment Report (optional)

General comments:
The report is well written and structured, and easy to understand. This re-assessment is one of several certifications of cod, haddock and saithe bottom trawl fisheries in the Barents Sea, belonging to the same UoA. It is based on rich and successful experience of codfish fisheries certifications in the Barents Sea performed since late 2000s, when most of issues related to certifications were already extensively considered. Although I agree that the fishery is very well managed, and the management is based on sound scientific information, I am not convinced that all PIs should be scored 80 or above, as it is in the draft report. The bottom trawling is widely recognized as a destructive fishing practice and substantial improvements are required to reduce its impact on habitats and ecosystems. In the MSC system, this can be most effectively done via implementation of certification conditions.

Specific comments:
There are some technical issues with the text (which is really difficult to avoid while preparing such a voluminous document):

1. Page numeration is incorrect. After page 74, I see a page number 1. It makes difficult to refer the text. Further on, if I would like to refer page after 74, I'll use indication (2), for instance, p. 5(2). **CAB comment:** Corrected

2. P. 2: “Anna Kiseleva - DNV GL Team-leader and Chain of Custody expert (responsible for assessment of Faroe Islands and Iceland UoAs)”. Why Faroe Islands and Iceland? **CAB comment:** reference deleted

3. P. 8: correct “Error! Reference source not found” **CAB comment:** Corrected

4. References to literature sources are provided not in all cases where it is needed. For instance: (i) no references on population structuring of haddock and saithe; (ii) the sentence “The Norwegian Institute of Marine Research (IMR) has developed an aggregated spatial database for ecosystem datasets in the Barents Sea, called “the Barents Sea Marine Atlas” (p.29) is not accompanied with the web reference. I did not succeed to find the site; (iii) p. 50: “Recent work has indicated that skates and rays have relatively high post capture survival (55 %) although this will depend critically on the weight of fish in the cod end”. No reference provided. p. 48-49. “Discarding commercial fish species”. No references at all. There are also other examples like that. This prevents understanding of material quite a lot. **CAB comment:** references are updated. However, A good deal of information is derived from informal interviews with marine scientists, regulators and skippers. This cannot be formally referenced

5. P. 82: why “Evaluation Table for PI 2.4.2 – Faroe Islands and Iceland”

6. Reference “Jakobsen and Ozhigin 2011” cited in some cases as “Jakobsen and OzhigEn 2011”. **CAB comment:** Corrected

7. It is unclear if company “Feniks” is included in the Client group. Title page mentions only companies JSC “Strelets”, JSC “Taurus”, JSC “Eridan”, but p. 5 mentions these companies and “Feniks”. Also, p 32-33 mention “FEST group” (without explanation what it is), which likely includes “Feniks”. **CAB comment:** Corrected under “Overview of the fishery”

8. p. 24, second line from the bottom: to remove one “below”

9. p. 32: «High fishing pressure appears to have reduced abundance and reproduction in recent years». Abundance and reproduction of what? Red King crab, or both red king crab and snow crab? **CAB comment:**

10. p. 33, Table 2. It is unclear why not valid (according to Fishbase.com) name *Lycichthys denticulatus* (instead of valid name *Anarhichas denticulatus*) is used. In some cases (Fig. 28) the name *Anarhichas* is used for this species. **CAB comment:** There are inconsistencies in the use of these terms between Russian, Norwegian and other authors. They are therefore in effect interchangeable. While fishbase is accepted by westerns scientists this is not always the case with Russian

11. Table 2. the title indicates yellow and amber colors showing some concern status, but I see only one color (amber?). CAB comment: edited. Previously wolfish were included as yellow but their status has improved

12. P. 34: “The company estimates that around 90% of the redfish catch comprises *S mentella* and 10% S norvegicus”. Repetition from the previous para. CAB comment: Edited

13. In some cases captions are used before the figure (for instance, Fig. 21), in others – after (for instance, Fig. 22). In other cases captions and numbering of figures are provided both before and after the figure (Fig. 26). Please be consistent. CAB comment: Edited

14. Fig. 27. Text in the figure are unreadable. CAB comment: Edited

15. There are two titles “Figure 28” (p. 41 and 43).

16. P. 82(2): “Evaluation Table for PI 2.4.2 – Faroe Islands and Iceland” – why so? The same questions for p. 90 (2), 93(2), 112(2), CAB comment: Edited

In the further text I left blank the PIs where I agree with the justification and scoring.

Performance Indicator Review

Please complete the table below for each Performance Indicator which are listed in the Conformity Assessment Body's Public Certification Draft Report.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
Example:1.1.2	*No*	*No*	*NA*	*The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.*	
1.1.1	Yes	Yes	NA		
1.1.2	Yes	Yes	NA		
1.1.3	Yes	Yes	NA		
1.2.1	Yes	Yes	NA		
1.2.2	Yes	Yes	NA		
1.2.3	Yes	Yes	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
1.2.4	Yes	Yes	NA		
	Yes	Yes	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.1	Yes	No	NA	The golden redfish *Sebastes norvegicus* is considered as a retained species. The justification for that is it is not listed in CITES and because the Norwegian Red list 'has no official status in Norwegian or Russian legislation" (p.52, but this important statement has no reference). At the same time, official site of the Norvegian Environment Agency (http://www.environment.no/topics/biodiversity/species-in-norway/threatened-species/) states that "the Norwegian Red List is the official overview of threatened species in Norway". Therefore I understand that golden redfish should be considered as ETP species in the framework of this assessment as it is done in some other similar assessments which should be harmonise with. Alternatively, stronger justifictions to consider it as a retained species should be provided. Notably, several species of marine mammales, which are also not listed in CITES (listed in Table 8), but listed in Norvegian Red List, i.e. having the same status as golden redfish, are considered as ETP species. This means some is inconsistence term of classification of different species in this assessment.	Golden redfish has been classed as both retained and ETP in other assessments, This relates partly to the slight change in the status of the redlist over time (from unofficial to official. I have adjusted the text to reflect this change. Given this change there is therefore a good argument for classing this species as ETP. However, the implementation of Norwegian government provisions for the protection of S norvegicus are implemented through fishery management legislation. Futhermore there is close connection between management of the two redfish species. This supports allocation to retained species rather than ETP. The inconsistencies in allocation of ETP species have been noted by reviewer A and responded to there. Changes to the text have been made to clarify these issues

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.1.2	Yes	Yes	NA		
2.1.3	Yes	Yes	NA		
	Yes	Yes	NA		
2.2.1	Yes	Yes	NA		
2.2.2	Yes	Yes	NA		
2.2.3	Yes	Yes	NA		
2.3.1	Yes	Yes	NA		
2.3.2	Yes	Yes	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.3.3	Yes	No	NA	The UoA has a number of ETP species (it cannot be excluded that at least for some of them puopulatin decline was caused by fishing). Obtaining an adequate information on ETP species, due to their rarity, is really difficult via only research activities. Involvement of observers and, which is even more important, crew of fishing vessels is crucial for obtaining such information. The team describes some efforts towards quantification of ETP species interaction with fishing gear, but also mentions serious difficulties associated with such monitoring. Nonetheless, I agree that scores 60 are justified, but to score this PI 80, it is necessary for all three guideposts for all species the score be 80 or higher, which I do not see to be justified. In particularly, most of justification in the rationale for a) reflects situation in Norwegian waters (some even for Faroese fisheries), but only a little information is available for Russian waters. The rationale for b) and c) is completely based on justification for a), i.e. the situation is mostly describes again what is done in the Norwegian waters.	These points are well made and the issue is well rehearsed with previous MSC certifications in the Barents Sea. There are two issues here: the likelihood of significant encounters; and the capacity of fishing crew to provide data on encounters. The (limited) scientific information, including data collected by some of the MSC certified trawl operations in the barents Sea suggests that encounters with ETP are now rare. All vessels now have identification guides and will report the most easily identified species. Discussions with PINRO and IMR scientists however suggests that data collected by fishermen is scientifically inadequate, and they themselves only trust the data collected by scientific observers.. There is a significant scientific observer scheme for Russian vessels which is arguably superior to that of Norway, and this has been part funded by MSC certified Russian fisheries. WWF Russia has examined data collected by certified fisheries and scientific observers, as well as reference fleet data, and concludes that ETP encounters are not a serious issue for the Russian Trawl fleet. Although it is arguable that a condition be raised for increased crew ETP surveillance this is not widely supported by the scientists or the industry, and given data collected so far, appears to be unjustified

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
	Yes	Yes	NA		
2.4.1	Yes	Yes	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.2	Yes	No	NA	C: I am not convinced with the justification on successful implementation of the partial stratelgy. The rationale provided shows that some elements of the partial strategy are succesfully implemented, rather than that the partial strategy is implemented. Based on references supporting the rationale, it is too difficult to identify the source of information and to know more details about the situation (for instance, such reference as "meeting client"). A note that "skippers will avoid areas with significant hard coral or massive sponges" (p. 62) is quite a weak justification of avoiding benthos-rich areas as first, fish schoals are known to be associated with these areas, and they are prioruty for the skippers, and second, it can be quite possile that these areas were already "cleaned" for trawling before (see p. 61), and the repeated trawling prevens recovery of these "cleaned" areas. Given a weak observer coverage of this fishery, and not adopting of lower impact trawling gear, these arguments sound unjustifiably. Therefore I consider SG2.4.2.c should be downscored below 80. D: I think that in this case it is necessary at first to explicitely difine the strategy, because definition in this case is not obvious – it could be (i) to avoid damage of new areas or (ii) to to avoid damage of new areas and to recover already damaged (for instance, "cleaned") areas. In this respect, especially if to acept (ii) I do not see clear evidences of acheiveing the objectives.	The 80 guidepost here is set quite low…."some evidence". A partial strategy is not a coherent targeted set of measures, but rather elements that are likely to result in improved outcome status, together or individually. There is undobtedly some evidence to suggest that some elements are being implemented successfully and we therefore maintain the 80 score. It is widely accepted (if not self evident) that skippers will avoid areas with significant hard coral and sponge, and indeed are required by law to report and move on. The detailed mapping and fishing track analysis confirms that fishing vessels do indeed stick to areas already cleared. There is no argument that repeated trawling of these historical cleared areas is likely to hinder reversion to a previous habitat that may have existed prior to intensive trawling; but this has been accepted as the *status quo* for Barents Sea fisheries, and the emphasis has shifted to preventing additional change. The strategy for this company is similar to that of other certified companies and in line with harmonisation a score of 80 is justified. D a partial strategy does not require clear strategic objectives; rather there should be elements likely to prevent further damage or not hinder recovery should this take place.Given the long term status of large parts of the Barents Sea as modified by trawling there is no requirement under the

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
2.4.3	Yes	No	NA	B: Several sudies on impact of bottom trawl on the sediments have been done, but we are still rather far from understanding and quantifying these effects. In addition with difficulties of quantifying the trawl effect, this deal with significant climate variations and effect of alien species such as Far Eastern crabs (Red King crab and snow crab). Their effecrts are insufficiently addressed in the assessment. As effects of climate and alien species are difficult to quantify, it principally limits our undersanding of effects of bottom trawling. In addtion, in the analyses of effect of fisheries on habitats, the assessment mostly focuses on mechanical damage of substrate caused by bottom trawls. However, there are also other effects, in particularly marine litter, assiciated with fishing, which was found to be important in the UoA according to recent research (Buhl-Mortensen and Buhl-Mortensen, 2018, Front. Mar. Sci. 5: 42). Therefore on my opinion, one can't conclude that "Sufficient data are available to allow the nature of the impacts of the fishery on habitat types to be identified", and thus the current score (80) should be reduced. C: The current assessment does not demonstrate that on-board observer programme effectively addresses issues of P2. Indeed, the scientific observers are repeatedly mentioned in the report. Their presence is obligatory on the fishing vessels in the Russian zone, but their main task is collecting data on commercially important	B: The analysis presented in the background section demonstrations a remarkable knowledge of Barents Sea habitat types, and historic analysia of the impacts of fishing. Impacts have not been fully quantified hence a score of 100 is not possible. Of course this is inadequate to answer many subtle ecological questions, but by international standards it is impressive. Indeed the trend data and the changes associated with fishing is amongst the best in the world. There is always room for more research, and it will always be possible to define new or subsidiary habitat types; but the information available allows for a good identification of likely trawl impacts on a wide range of habitats and communities.This is consistent and harmonised with other certified fisheries.. C: The continual improvement in benthic habitat monitoring along with key elements of the benthic ecosystem under the joint PINRO/IMR ecosystem survey allos us to state that habitat distributions over time are measured. Observer coverage is hardly an issue here. Again, given the incredible complexity of benthic communities this falls far short a scientific ideal, but in terms of fishery and benthic management it is sufficient to measure outcome changes, fishing operations, and changes over time.

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
	Yes	Yes	NA		
2.5.1	Yes	Yes	NA		
2.5.2	Yes	Yes	NA		
2.5.3	Yes	Yes	NA		
	Yes	Yes	NA		
3.1.1	Yes	Yes	NA		
3.1.2	Yes	Yes	NA		
3.1.3	Yes	Yes	NA		
3.1.4	Yes	Yes	NA		
	Yes	Yes	NA		
3.2.1	Yes	Yes	NA		

Performance Indicator	Has all the relevant information available been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response
3.2.2	Yes	No	NA	D: The team argues that existing of protocols of meetings, press releases and a "simple website" allows to meet the requirement of providing explanations "for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity". However it is not evident from materials provided that the protocols themselves provide such information. Protocols normally just inform about decisions made. To actually justify the scoring, examples of explanations for actions or lack of actions in the mentioned or other publically available sources is needed to provide.	We agree with the reviewer that protocols do not always provide the rationale behind decisions. But in this case, the protocols from the JNRFC to a large extent show how the management system respond to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. As we note, that protocols are also accompanied by press releases that provide such rationale. Also, rationales are more thoroughly presented in the annual White Papers about Norway's fisheries agreements with other states, as well as on the websites of both Norwegian and Russian fisheries management bodies. The team nevertheless concludes that formal reporting does not take place; hence SG100 is not met.
3.2.3	Yes	Yes	NA		
3.2.4	Yes	Yes	NA		
3.2.5	Yes	Yes	NA		

Any Other Comments

Comments	Conformity Assessment Body Response

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process used to determine risk using the RBF led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.	Conformity Assessment Body Response:
1.1.1				
2.1.1				
2.2.1				
2.4.1				
2.5.1				

For reports assessing enhanced fisheries:

Does the report clearly evaluate any additional impacts that might arise from enhancement activities?	**Yes/No**	**Conformity Assessment Body Response:**
Justification:		

Fishery	Year	UoA stock	UoA gear	PR (A/B/C)	PI	PR Comm-ent Code	Peer Reviewer Justification (as given at Public Comment Draft Report (PCDR) stage)	CAB response to Peer Reviewer's comments (as included in the Final Draft Report)	CAB Res-ponse Code
Fishery	Assess-ment Start Year	Insert extra rows for P1 PIs if separate scores given for different UoA stocks	Insert extra rows for P2 PIs if separate scores given for different UoA gear types	Peer Revie-wer (A/B/C)	Perfor-mance Indica-tor (PI)	Is the CAB response to the PR's comments adequate?	PR's should describe any concerns with the CAB's responses to their initial comments, on either PI scoring (including the RBF) or conditions. Comments at this stage should summarise any initial comments made by the PR at the previous PRDR stage, and detail those responses of the CAB (as provided in the PCDR) which are regarded as either incomplete or inconsistent with the MSC requirements. The comments in this column should be summarised in the PR Comment Code Column H. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells where useful, using the Alt-return key combination. Detailed justifications are only required at this stage where answers given are one of the 'No' code options and the CAB responses are regarded as insufficient to address the PR's previous concerns. In other (Yes) cases, either confirm 'scoring agreed' here or identify any places where weak rationales could still be further strengthened (without any implications for the PI scores).	CAB response to the PR's PCDR stage comments (as included in the Final Draft Report). CABs should summarise their response to the Peer Reviewer comments in the CAB Response code column (to right), and provide justification for their response in this column.	See codes page for response options
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.1.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.1.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.1.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.2.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.2.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.2.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	1.2.4				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.1.1	No (scoring implications unknown)	According to FCR 1.3. "Species recognised by national legislation and/or binding international agreements to which the jurisdictions controlling the fishery under assessment are party. Species listed under Appendix I of CITES shall be considered ETP species for the purposes of the MSC assessment, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered". I think that this definition is quite clear. As that, it is not clear for me why species (S. norwegicus) recognised by the National legislation (although not listed in the Government regulation) is not considered as ETP species. If the assessment team has serious reasons to choose this option (i.e. listing in Governamental regulations rather than official recognition in the national redlist), but they they are unclear from the text.	There is some inconsistency/ambiguity under v 1.3 about the status of S norvegicus as retained bycatch or ETP, and it has been classified differently in different assessments. In the case we have followed the rationale that S norvegicus is retained bycatch and subject to retained bycatch regulations, which necessarily take account both of stock status and national ETP legislation. This is resolved under v 2 where any ETP must be classed as ETP. While we have no objection to rescoring as ETP, the scoring would be the same: ""The effects of the fishery are known and are highly likely to be within limits of national and international requirements for protection of ETP species" (since these limits are expressed through fishery legislation associated with the retained bycatch catch of Golden redfish). Similar arguments apply to the other PIs	Not accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.1.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.1.3				

Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.2.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.2.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.2.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.3.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.3.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.3.3	No (material score reduction expected to <80)	I understand the reasonings of the CAB to score this PI 80, and is aware about discussions on problems of monitoring ETP species in the Barents Sea bottow trawl fisheries. At the same time, there are also strong arguments to score this PI < 80 such as inadequacy of data collected by the crew and not full coverage of the fishery by the scientific observers - this is partly mentioned in the CAB response. The CAB also mentioned that science and industry do not widely support crew ETP survellaince, which, I believe, should be taken into consideration quite critically, because these parties (especially industries) may have conflicting interests in this situation. I think that in such indefinite situation, the better choice is to use any opportunity towards improvement the fishery management (i.e. to set up the condition), rather than to avoid such efforts, which has been unfortunately chosen by the CAB.	This is a difficult issue and there is no real consensus. The best solution is where the industry pays for more scientific observation; and this has been undertaken to a degree by one of the other larger MSC certified Barents Sea Trawl fisheries (Norebo/Ocean Trawlers). Despite considerable efforts, recording of ETP in this and other fisheries, as well as in the scientific surveys (eg Russian/Norwegian ecosystem survey; Norwegian reference fleet) has not revealed any significant ETP issues associated with trawling in the Barents Sea; and Russian WWF has not raised any particular concerns. We are therefore of the view that further efforts to engage fishing crew in collecting scientific information on ETP is unnecessary, and the the quality and possible bias of such information would in any case compromise its quality.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.4.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.4.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.4.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.5.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.5.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	2.5.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.1.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.1.2				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.1.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.1.4				

Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.2.1				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.2.2	No (material score reduction expected to <80)	The CAB response does not actually address the comment as just adds some information about where the explanations could be available, but no examples are provided at al, thus the response does not look convinceable.	The requirement for an 80 score on SId (which is what the team arrived at) is that information about fishery performance and management action is available on request and that explanation is provided for any action or lack of action as response to findings in research, monitoring and review activities. As argued by the team, such information, including about response to findings in research etc., is provided in protocols, minutes, websites and at the formal consultation arenas between managers, fishers and other stakeholders. The peer reviewer asks for examples, which have now been added to the rationale.	Accepted (no score change)
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.2.3				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.2.4				
Russian Federation Barents sea cod and haddock	2017	Sp/Stock A	Gear A	PR B	3.2.5				

APPENDIX 3. STAKEHOLDER SUBMISSIONS

No submissions by stakeholders have been received.

APPENDIX 4. SURVEILLANCE FREQUENCY

Surveillance level 3 is chosen as the fishery has no conditions and information required to very progress in the fishery can be accessed remotely.

Table A4: Fishery Surveillance Plan

Surveillance level	Year 1	Year 2	Year 3	Year 4
Surveillance level 3	off-site surveillance audits	off-site surveillance audits	off-site surveillance audits	1 on-site surveillance audits

APPENDIX 5 CLIENT AGREEMENT

On behalf of the group of fishing companies JSC "Strelets", JSC "Taurus", JSC "Eridan", I accept the Public Certification Report for the Russian Federation Barents sea cod haddock and saithe fisheries with the terms of certification detailed therein. I also confirm that information on fishing activities and scope of certification is up to date and correct.

Name: Igor Orekov

Place: Murmansk, Russia

Signature:

Date: 02.04.2019

Appendix 5.1 Objections Process

No objections have been raised

About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter and greener.