FOOD CERTIFICATION INTERNATIONAL LTD

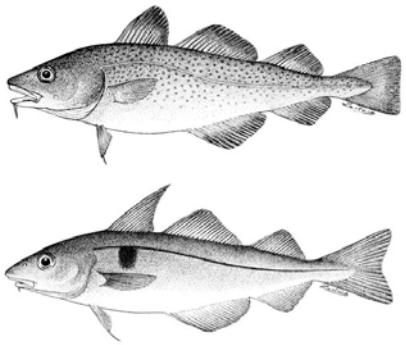
Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK

Tel: +44 (0) 1463 223 039 Fax: +44 (0) 1463 246 380 **www.foodcertint.com**

MSC SUSTAINABLE FISHERIES CERTIFICATION

The Barents Sea Cod & Haddock Fishery

Public Comment Draft Report



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Prepared By: **Food Certification International Ltd**

A company incorporated in Scotland No SC313289

Registered address: Findhorn House, Dochfour Business Centre, Dochgarroch, Inverness, IV3 8GY, Scotland, UK

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August 2010

Authors: T. Southall, P. Medley, G. Honneland, P. MacIntyre, M. Gill

Certification Body:

Food Certification International Ltd

Address:

Findhorn House

Dochfour Business Centre

Dochgarroch

Inverness IV3 8GY

Scotland, UK

Tel: +44(0) 1463 223 039

Email: melissa.mcfadden@foodcertint.com

Web: www.foodcertint.com

Client:

Ocean Trawlers/Three Towns Capital

Address:

Room 3508, 35/F., Wu chung House

213 Queen's Road East

Wanchai, Hong Kong

Contact: Mr Sergey Sennikov

Maritime Consulting Bureau Russia

183036 Murmansk, Starostina str., 49/1

Tel: +7 (8152) 637 637

Email: sas@maritimecb.com

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Glossary of Terms

ASCOBANS	(Bonn Convention's) Agreement on the Conservation of Small Cetaceans in the Atlanto-Scandian and Baltic.
ACOM	ICES Advisory Committee
ACFA	ICES Advisory Committee on Fisheries and Aquaculture
B_{pa}	Precautionary reference point for spawning stock biomas
B_{lim}	Limit biomass reference point, below which recruitment is expected to be impaired.
BBTA	Regional Level of the Russian Federal Fisheries Agency
CoC	Code of Conduct
CFP	Common Fisheries Policy
CR	Council Regulation
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing Mortality
F_{lim}	Limit reference point for fishing mortality that is expected to drive the stock to the biomass limit
F_{pa}	Precautionary reference point of fishing mortality expected to maintain the SSB at the precautionary reference point
FAM	MSC's Fisheries Assessment Methodology
FAO	United Nations Food and Agriculture Organisation
FSB	Russian Federal Border Service
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
IMR	Norwegian Institute of Marine Research
ITQ	Individual Transferable Quota
IUU	Illegal, Unregulated and Unreported fish catches.
IWC	International Whaling Commission
JNRFC	Joint Norwegian – Russian Fisheries Commission
MCS	Monitoring, Control and Surveillance
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield

NEAFC	The North East Atlantic Fisheries Commission
NEA	North East Atlantic
NGO	Non-Governmental Organisation
nm	Nautical mile
OSPAR	Oslo-Paris Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)
P1	MSC Principle 1
P2	MSC Principle 2
P3	MSC Principle 3
PINRO	Russian Polar research Institute of Marine Fisheries and Oceanography
PI	MSC Performance Indicator
PO	Producer Organisation
RAC	Regional Advisory Council
SONAR	Sound navigation and ranging
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UK	United Kingdom
UNCLOS	United Nations Convention on the Law of the Sea
VMS	Vessel Monitoring System
VPA	Virtual Population Analysis
WWF	World Wide Fund For Nature

Summary

» This report provides details of the MSC assessment process for the **Barents Sea Cod and Haddock trawl fishery**, on behalf of Ocean Trawlers / Three Towns Capital. The assessment process began in December 2008 and is due to be concluded in 2010.

» This assessment covers a fleet of sixteen Russian vessels. The vessels range in size from 40m to 62m and use a single demersal trawl net. All vessels have onboard processing facilities and land fish in the processed frozen form (either filleted on head on / gutted). In some instances (particularly for larger vessels in the fleet fishing more distant waters) transhipment is used to transport the frozen product to landing sites.

» The fishery takes place entirely within ICES areas I & II, mainly within Norwegian waters (80%), Russian waters and with limited fishing taking place in International waters.

» The fishery takes place throughout the year, although seasonal patterns are apparent, with the 1st quarter of the year dominated by landings from the Norwegian EEZ, an increased proportion of landings in the Svalbard Fishery protection zone in summer months, and increased landings from the Russian EEZ in the last 2 quarters of the year.

» Processing at sea does take place in this fishery (on the specified trawl vessels), and in some instances transhipment of frozen fillets, or 'head on gutted' fish also occurs. In all cases the transhipped product is landed to either Murmansk (Russia) or other specified NEAFC registered ports in Norway or the EU. The majority of the transhipped product is landed in to Holland. The risk factors associated with transhipment, in particular in terms of the potential for IUU fish to enter the supply chain is discussed in more detail in the report, along with a summary of the company policies to address this risk (in particular in **section 9** of the report).

» All vessels covered by the assessment are signed up to, and therefore legally bound by, the Ocean Trawlers "**Code of Conduct Contract**" which enshrines the company's '**Policy on Sustainable Fishery**'. This requires all vessels to keep an '**MSC logbook**' to record data on bycatch, ETP and habitat interactions. These are implemented at the time of assessment. Further details on these are provided in **section 2.2** of this report.

» A rigorous assessment of the wide-ranging MSC Principles and Criteria was undertaken by the assessment team and detailed and fully referenced scoring rationale is provided in the assessment tree provided in **Appendix 3** of this report.

» On completion of the assessment and scoring process, the assessment team concluded that **the Barents Sea Cod and Haddock Fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries**.

» There are a number of areas in which the fishery scored well. For example:

  › The status of the stock for both cod and haddock are excellent – a conclusion based on a good level of information and a reliable stock assessment.

  › The management decision rules that govern the exploitation of those stocks are, in the main, well established and robust.

- The available evidence suggests that the fishery is reasonably clean, with around 92% of catches being of the target stock (cod & haddock), with the remaining 8% of catches also being landed, and, in the main, not contributing to a decline in those species. Discarding of unwanted catch is illegal.
- There is an excellent level of bilateral cooperation between Russia and Norway in the management of the shared resources of the Barents Sea, through the Joint Norwegian Russian Fisheries Commission (JNRFC), which takes management decisions for both cod and haddock fisheries. In particular the level of scientific collaboration between researchers in Russian and Norway has greatly enhanced understanding of the Barents Sea ecosystem – understanding which directly influences management decisions.
- All of the key elements of an effective management system and fisheries administration are in place and, in the main, working well. This includes appropriate laws, representative structures, management review processes and control and enforcement mechanisms.
- Recent improvements in enforcement cooperation between Norway and Russia, and initiatives such as the NEAFC port state control rules and most recently the EU regulation on IUU fishing, all contribute to strengthening the control systems in place, which have resulted in a decrease in IUU landings of arctic cod and haddock from all fleets.

» By contrast there were also a number of which scored more poorly. As these were below the unconditional pass mark, they therefore trigger a binding **condition** to be placed on the fishery, which must be addressed in a specified timeframe (typically within the 5 year lifespan of the certificate). Full explanation of these conditions is provided in section 8 of the report, but in brief, the areas covered by these conditions are:

1. In the case of arctic cod, although harvest control rules have been agreed and assessed by ICES as precautionary, these are not implemented exactly as designed.
2. Accurate understanding of all fishing mortality is important for accurate assessment purposes. Although estimations are much improved in recent years, there appears to be further potential for improving the quality of estimations of IUU landings, discarding and potential high grading.
3. Stocks of some of the species which make up a minor share of the bycatch when targeting cod and haddock are in poor shape, with inadequate management to ensure that stocks will be rebuilt. In particular species of redfish and wolffish are vulnerable to over-exploitation and efforts should either be made to minimise capture of these species, or at a higher level improve the management controls on the fisheries for these species – in line with scientific advice.
4. Habitat impact (and management): Heavy trawl gear designed to catch species like cod and haddock has the potential to cause serious damage to seabed habitat forming communities, which may play an important role in the

ecosystem. The scale of the impact depends on a number of factors such as habitat species types, substrate type and frequency of disturbance. Appropriate management of habitat interactions could include development of less impacting fishing gear, preventing fishing activity in most vulnerable habitats, or some other measure. Although some such management has occurred, the overall level of present management and the potential level of impact (status) means that further work is required to ensure that serious or irreversible harm is highly unlikely.

5. There is the potential to improve management consultation processes. In particular it is evident that there are some NGOs with considerable knowledge and expertise in the Barents Sea ecosystem, eager to engage and inform policy in the Barents Sea, but currently with no obvious route into the fisheries consultation process. Similarly, there is little obvious opportunity for all interested stakeholders (particularly those not represented by an existing body) to contribute to the fishery consultation processes.

6. The precautionary approach is not explicitly stated in the Russian Federal Fisheries Act, or the fishery regulation for the Northern Basin (which govern the fishery under assessment), so there is a lack of clarity on the degree to which precaution is built into over management objectives. That said, there is a recognition that the international conventions that Russia is signatory to (such as the convention on biological diversity), are superior to federal and regional laws – therefore to some degree a precautionary approach is theoretically ensured.

» Full explanation of how the member vessels of the Ocean Trawlers / Three Town Capitals Group intend to meet these conditions is provided in the client action plan in provided in **section 10** of this report.

» In addition the assessment team made 3 recommendations. As these are not the result of a failure to meet the unconditional pass mark, they are non-binding; however in the opinion of the assessment team, they would make a positive contribution to on-going efforts to ensure the long term sustainability of the fishery. Details of these recommendations are provided in **section 8.4** of this report.

» For interested readers, the report also provides background to the target species and fishery covered by the assessment, the wider impacts of the fishery and the management regime, supported by full details of the assessment team, a full list of references used and details of the stakeholder consultation process.

1. Introduction

This report details the background, justification and results of Food Certification International's (FCI) assessment of the Ocean Trawlers / Three Towns Capital **Barents Sea Cod and Haddock** fishery, carried out by Food Certification International to the standard of the Marine Stewardship Council (MSC) sustainable fisheries programme.

1.1 Scope

First and foremost, the purpose of this report is to provide a clear and auditable account of the process that was undertaken by the team of FCI assessors. The report aims to provide clear justification for the assessment scores that have been attributed to the fishery, and identify the sources of information that have been used to support these. This should enable subsequent surveillance or even re-certification teams to rapidly pin-point where the key challenges lie within the fishery, and quickly highlight any changes which may affect the overall sustainability of the fishery.

In order to provide useful background and information for a wider readership it is also useful to provide a more qualitative account of the fishery in question. However, it should be reiterated that no primary research has been undertaken to inform this report. The report is therefore not intended to comply with the standard editing norms expected for scientific journals. Instead it is intended that the report should be sufficiently clear and unambiguous to be reviewed by fisheries specialists, whist remaining sufficiently accessible to provide insight for interested readers throughout the supply chain – including consumers. This is a challenging balance to strike without alienating either readership.

1.2 Report Structure

Early report sections provide the reader with a clear comprehension of the nature of the fishery, enabling a broader understanding of the issues debated by the team when scoring the fishery. For the purposes of precision, this begins with a description of the unit of certification, before expanding to outline some further background information, including details of the Client, the fleet, fishing operations and gear and the species itself.

Subsequent sections are then broadly aligned to the 3 MSC principles[1], which form the basic structure of the assessment, namely:

» **Principle 1:** Target stock status and harvest controls (summarised in **section 3**)
» **Principle 2:** Wider impacts of fishery operations (summarised in **section 4**)
» **Principle 3:** The management system (summarised in **section 5**)

Later sections of the report explain the procedures used to score the fishery, give details of the assessment team, and present the outcome of the team's deliberations. Finally the report provides a statement of the team's recommendations as to whether or not this

[1] *Further information on the contents of the MSC principles and criteria are contained in **Appendix 1**.*

fishery should go forward for certification to the standard of the Marine Stewardship Council, together with any conditions recommended.

It should be noted that in the main, the report seeks to give a descriptive overview in each of the requisite sections. For detailed critical analysis, supporting references and scoring justifications, it is important to refer to the scoring assessment tree in appendix 3.

1.3 Inspections & Consultations

The full MSC assessment process commenced (and was formally announced) in December 2008. Following an initial review of available information, and meeting with the client, it was decided to undertake a preliminary stakeholder consultation visit to Norway in July 2009 in order to have initial briefing consultations with both the Norwegian Directorate of Fisheries and WWF (Norway). In August 2009, two members of the team undertook vessel inspections in Hammerfest (Northern Norway), of vessels fishing and landing in the Norwegian Economic Zone.

The official site visit to Murmansk, Russia took place in December 2009, involving all 3 members of the assessment team, supported by an FCI staff member and a locally recruited assistant / translator. This enabled a scheduled programme of consultations to take place with key stakeholders in the fishery – including skippers, scientists, fishery protection officers, NGOs and representatives of other fishing fleets.

The final vessel inspection took place in March 2010, by one member of the assessment team visiting vessels landing to Hammerfest (Northern Norway), to verify that additional initiatives undertaken by the fishery were implemented and operational.

The scoring of the fishery against the MSC principles and criteria took place in Edinburgh from March 22nd 2010, to March 24th 2010.

A complete list of those stakeholders interviewed during the assessment can be found in **section 6.4** of this report.

2. The Fishery

2.1 The Unit of Certification

Prior to providing a description of the fishery it is important to be clear about the precise extent of certification. The MSC Guidelines to Certifiers specify that the unit of certification is **"**The fishery or fish stock (biologically distinct unit) combined with the fishing method / gear and practice (= vessel(s) and/or individuals pursuing the fish of that stock) and management framework**"**.

This clear definition is useful for both clients and assessors to categorically state what is included, and what is not. This is also crucial for any repeat assessment visits, or if any additional vessels are wishing to join the certificate at a later date. Two separate units of certification are covered in this assessment report, as set out below:

The fishery assessed for MSC certification is defined as:

Species:	Cod (*Gadus Morhua*)
Stock:	North East Arctic Cod,
Geographical area:	Within Russian, Norwegian and International waters - ICES Sub-area I & II. Beyond 12nm.
Harvest method:	Demersal Otter Trawl, by Russian Registered Trawlers specified in **section 2.3**
Management System:	The Barents Sea fisheries are managed bilaterally by Norway and Russia through the Joint Norwegian-Russian Fishery Commission which regulates fishing, determining management measures and setting quotas. Within the Russian EEZ, management is undertaken by the Federal Agency For Fisheries and BBTA who also undertake monitoring. Within the Norwegian EEZ, management is undertaken by the Norwegian Fisheries Directorate and monitored / controlled by the Norwegian Coastguard. Management is informed by ICES advice, supported nationally by the Institute of Marine Research (Norway) and PINRO (Russia).
Local systems:	As part of the certification process the client has developed a sustainability policy, an operational code of conduct and an MSC reporting logbook (details in **section 2.2**). All vessels have implemented this, and is therefore taken into account – in some defined instances – in scoring the fishery.

Species:	Haddock (*Melanogrammus aeglefinus*)
Stock:	North East Arctic Haddock
Geographical area:	Within Russian, Norwegian and International waters - ICES Sub-area I & II. Beyond 12nm.
Harvest method:	Demersal Otter Trawl, by Russian registered trawlers, specified in **section 2.3**.
Management System:	The Barents Sea fisheries are managed bilaterally by Norway and Russia through the Joint Norwegian-Russian Fishery Commission which regulates fishing, determining management measures and setting quotas. Within the Russian EEZ, management is undertaken by

	the Federal Agency For Fisheries and BBTA who also undertake monitoring. Within the Norwegian EEZ, management is undertaken by the Norwegian Fisheries Directorate and monitored / controlled by the Norwegian Coastguard. Management is informed by ICES advice, supported nationally by the Institute of Marine Research (Norway) and PINRO (Russia).
Local systems:	As part of the certification process the client has developed as sustainability policy, an operational code of conduct and an MSC reporting logbook (details in section 2.2). All vessels have implemented this, and is therefore taken into account – in some defined instances – in scoring the fishery.

2.2 Ocean Trawlers

The client for this certification is the Ocean Trawlers Group / Three Towns Capital ("The Group"). The Group was established in 1997 and are in the business of procuring, trading, reprocessing and selling of frozen seafood, with cod and haddock as the core species, and other pelagic species as secondary. The Group is fully vertically integrated along the value chain, from procurement to processing and retail across Europe and USA. Some details of the Ocean Trawlers Group is available at: http://www.oceantrawlers.com

The main groups of suppliers with contract links to the Group is Murmansk Trawl Fleet[2] (JSC Murmansk Trawl Fleet, JSC Murmansk Trawl Fleet-1 and Murmansk Trawl Fleet-4 Ltd.), Karat Group (JSC Karat, JSC Karat-1 and JSC Fishing Company Sogra) and Rybprominvest Group (JSC Rybprominvest and Alternativa Ltd.), but the exact details of these companies are included in the vessel list provided in **section 2.3**[3].

The Group therefore has long-term business relations with the suppliers and purchases cod and haddock (and other retained species) from Russian registered vessels operating in the Barents Sea; and it is these vessels, their impacts and the systems in place for their effective control and management that is the subject of this assessment.

In preparing for the MSC assessment, Ocean Trawlers have given consideration of how best to demonstrate that the fishery is sustainable – both in action and through appropriate monitoring and information gathering. In taking the fishery forward, Ocean Trawlers have implemented a number of steps, which are in place at the time of assessment. These are set out below:

2.2.1 Policy on Sustainable Fishery[4]

In January 2010 Three Towns Capital Ltd adopted a group policy, which includes, without limitation, the operations of all subsidiary companies, including Ocean Trawlers. Key elements of the policy include commitments to operate all of its business, including that of its suppliers and other parties in the companies "sphere of influence" in a manner which:

[2] *http://www.mtf.ru/eng/index.php*

[3] *Karat Group and Rybprominvest Group do not have websites since some reorganisation of those groups is not finalized.*

[4] *Full policy details are available at http://www.oceantrawlers.com/news/Sustainability%20policy.pdf*

- restores and enriches the environment, rather than deplete it;
- acknowledges the needs and interests of other parties (community groups, NGOs, the workforce, the public);
- is in strict compliance with, not just the letter of the UN Conventions of Conduct for Responsible Fisheries (the "UN Conventions"), the MSC Principles, the MSC Sustainability Definition, but also with both the *rationale and the overriding spirit* of these;
- ensures, and legally enforces if necessary, that the company, its suppliers and business partners shall:
  - ensure responsible conservation of fisheries resources and fisheries management and development;
  - ensure the continuous protection of living aquatic resources and their environments and coastal areas;
  - promote research on fisheries as well as on associated ecosystems and relevant environmental factors;
  - ensure that only selective and environmentally safe fishing gear and practices are used and further developed and applied, to the extent practicable, in order to maintain biodiversity and to conserve the population structure and aquatic ecosystems and protect fish quality;
  - minimise waste, catch of non-target species, both fish and non-fish species, and impacts on associated or dependent species;
  - ensure harvesting, handling, processing and distribution of fish and fishery products is carried out in a manner which will:
    - maintain the nutritional value, quality and safety of the products, reduce waste and minimize negative impacts on the environment;
    - ensure full traceability of each specific catch of fish from the fishing area all through the value added chain to the end user customer;
  - ensure that fishing facilities and equipment as well as all fisheries activities allow for safe, healthy and fair working and living conditions and meet internationally agreed standards adopted by relevant international organisations.

The policy then goes on to outline in more practical detail the requirements of the company, subsidiary companies and business partners in relation to:

- illegal, unreported and unregulated (IUU) fishing;
- bycatch & Discards;
- VMS and at sea inspections;
- transparency & Traceability;
- transhipment (specific details of these commitments are provided in **section 9** of this report).

2.2.2 Code of Conduct Contract

This is a legally binding contract between Ocean Trawlers and the vessel owning Supplier Company, which enshrines the goals and commitments laid out in the company's

sustainability policy (above). This includes consideration of vessel operation, labour, crew rights etc. In relation to fishing activity, some key points of relevance to this MSC assessment contained within the code of conduct state that the supplier must:

» forcefully and actively engage to prevent, deter and eliminate illegal, unreported and unregulated fishing (IUU);

» give due regard to the International Maritime Organization requirements for protection of the marine environment and the prevention of damage to or loss of fishing gear;

» not use dynamiting, poisoning and other comparable destructive fishing practices;

» ensure that documentation with regard to fishing operations, retained catches, discards, information required for stock assessment (as decided by relevant management and governmental bodies), is collected and forwarded systematically to those bodies;

» encourage the development and implementation of technologies and operational methods that reduce Discards. The use of fishing gear and practices that lead to Discards should be discouraged and the use of fishing gear and practices that increase survival rates of escaping fish should be promoted;

» record in the MSC Logbook all By-catch of commercial species, primarily those listed in Norwegian Regulation 48, which must thereafter be retained on board and will be counted against the quota for those species on landing of the catch;

» develop a more sophisticated sampling programme to provide statistically robust estimates of the By-catch of all species, including estimates of Discards, to allow an assessment of the impacts of By-catches in relation to the distribution, ecology and abundance of the species affected (commercial and, non-commercial fish);

» develop robust methods to assess and record the potential impact of demersal trawling on sensitive habitats, most notably identified areas of cold water coral. Where significant impact is identified the Parties must take immediate joint action to eliminate such negative impact.

2.2.3 MSC Logbook

The company have also developed and implemented on board all ships an MSC logbook. The signed code of conduct contract therefore makes compilation of the MSC logbook compulsory. The MSC logbook serves as an additional document for control and analysis of bycatch of endangered, threatened and protected species (ETP species) as well as bycatch of other non-commercial species during execution of fishery by the vessel. The master of the vessel is responsible for correct and timely filling in the MSC logbook.

The records in the MSC logbook shall be made every week during the entire year. In case ETP species or non-commercial bycatch species occurring in the catch, the date and the area of trawl (both longitude and latitude and international fishing zone) shall be specified.

At the time of assessment, these logbooks were implemented on board all vessels, but analysis of results has not yet been undertaken. This is expected at the time of first surveillance.

2.2.4 Observer Programme

Ocean Trawlers acknowledges that the assessment of marine biological resources and their environment as well as the conservation and management measures must be based on the best available science. The quality and utility of scientific data is greatly enhanced where independent information can be collected on a regular basis onboard fishing vessels.

There is considerable value in a Scientific Observers Scheme in the Barents Sea cod and haddock fishery due to the potential for negative impact on the habitats and ecosystem, by-catch of rare and threatened species, discarding and IUU.

The company is therefore committed to develop an independent observer programme, both to facilitate the work of the scientific community, whilst also demonstrating the company's compliance with the stated goals of its Sustainability Policy. The company has therefore reached agreement with the Russian regional scientific institution (PINRO) to place observers on the company's vessels. In doing so, this will also contribute to PINRO's own requirement to monitor marine biological resources on fishing vessels of private companies using scientific observers.

Scientific observers working on board Ocean Trawlers supplier's vessels will collect the following data:

» Gear characteristics and auxiliary equipment
» Catch composition by areas and fishing seasons
» Full utilisation of catches
» Discards of marine biological resources permitted to be fished
» By-catches and utilisation of species prohibited to fish, rare and threatened species
» By-catches of bottom (benthic) organisms including those belonging to threatened marine ecosystems
» By-catch of coldwater corrals and sponges
» Compliance of information recorded in the fishing logbook to the actual fishing activities

The contract will ensure that in 2010 the company pays for PINRO observers to be at sea for 150 days a year, representing around 5% coverage of fishing effort. For subsequent years the contract can be renegotiated depending on the results of the scheme. Any such observer work will be strategically spread over all seasons and all fishing areas to ensure that a characteristic pattern of fishing effort is observed.

2.3 Fishing Fleet & Fishing Method

There are 16 vessels which are included on this certificate, with a combined present Gross Registered Tonnage (GRT) of 23,471 tonnes – at an average of just less than 1,500 tonnes per vessel (although the largest vessel is just over 2,000t GRT and several 'smaller' vessels are less than 1,000 GRT). Typical vessel length is around 54m LOA and typical age is around 20 years at the time of assessment. The exact details of the fleet covered by this assessment are illustrated below:

Table 1: List of Barents Sea Cod & Haddock assessment member vessels[5]:

Vessel		EU No.	IMO No.	Year	GRT	LOA (m)	Ship Owner
M-0104	Shaytanov	36 H	8723622	1985	1410	52.7	JSC Karat
M-0105	Georgievsk	47 C	7945687	1981	1409	52.7	JSC Karat-1
M-0334	Izumrud	73B	7705063	1978	1556	55.31	JSC Fishing Company Sogra
M-0332	Amerlog	35 C	7607352	1977	1438	58.4	JSC Fishing Company Sogra
M-0410	Kapitan Gromtsev	19 F	8714310	1987	1565	62.0	JSC Rybprominvest
M-0407	Kapitan Durachenko	71 K	9108336	1994	1928	59.00	Alternativa Ltd.
M-0271	Nordkap	85 K	8913241	1990	1929	64.05	JSC Karat.
M-0278	Bukhta Naezdnik	28 G	8913253	1991	1899	64.05	JSC Karat-1
M-0200	Ivan Shankov	94 A	9137454	1996	837	40.8	JSC Murmansk Trawl Fleet
M-0201	Anatoliy Gugunov	93 A	9137466	1997	837	40.8	JSC Murmansk Trawl Fleet
M-0202	Boris Zaitsev	16 B	9137478	1997	837	40.8	JSC Murmansk Trawl Fleet
M-0204	Yakov Gunin	19 B	9137492	1997	837	40.8	JSC Murmansk Trawl Fleet
M-0269	Strelets	86 K	9158197	2003	2001	57,6	JSC Murmansk Trawl Fleet-1
M-0254	Korund	64 D	8710285	1988	1198	48,47	Murmansk Trawl Fleet-4 Ltd.
M-0058	Novator	12 G	8606824	1986	1895	62.25	JSC Murmansk Trawl Fleet
M-0059	Petr Petrov	01 F	8606848	1986	1895	62.25	JSC Murmansk Trawl Fleet

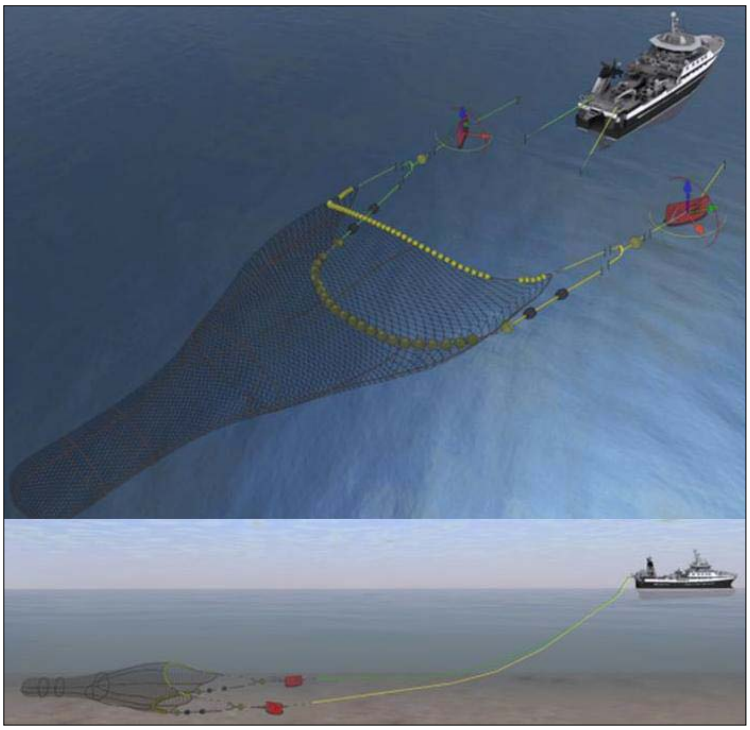
The assessed fleet are demersal stern trawlers able to fish offshore in all conditions with towed demersal gears for a variety of ground fish species - depending on licence and quota entitlements.

Both fisheries (cod and haddock UoCs) use the same system of capture – namely the demersal trawl, or bottom otter trawl – a gear designed and rigged to have bottom contact during fishing. A demersal trawl is a cone-shaped net consisting of a body, closed by a cod end and with lateral wings extending forward from the opening. The two towing warps lead from the vessel to the otter boards which act as paravanes to maintain the horizontal net opening. These boards weigh 2 - 4 tonnes and drag across the seabed (with considerable potential to disrupt seabed structure and habitat). The boards are joined to the wing-end by the bridles which herd fish into the path of the net. The net opening is framed by a floating headline and ground gear designed according to the bottom condition to maximise the capture of demersal target species, whilst protecting the gear from damage. On very rough substrates special rock hopper gears are used.

[5] *Vessels M0271 & M0278, the parent ship owning companies (Udarnik-2 Co Ltd.) and the corresponding cod & haddock quota were recently purchased by Karat Group. Vessel M-0271 was renamed Nord-Kap from its previous name of 'Sevrybkholodflot'.*

Figure 2.1: Images of 2 of the member vessels – Ivan Shankov & Stretlets:

Figure 2.2: Typical trawl gear configuration



Source: Rolls Royce

The trawl gear used by the certified fleet is designed and rigged to fish for demersal round fish – notably cod and haddock – over a range of grounds, including relatively rocky ground. In areas of relatively smooth seabed (e.g. sand or consolidated mud) the footrope can be relatively light and simple. On hard, rocky seabed, such as is found through much of the Barents Sea, a rockhopper footrope enables the trawl to pass over rough ground without becoming damaged or entangled. The length of the rockhopper and the diameter of the bobbins can and are adjusted according to seabed characteristics. Across the fleet the length of the rockhopper varies between 25 to 30m with rubber discs / bobbins up to 24 inches (610mm) in the central part of the net.

The regulations in force in Russian and Norway in accordance with the decisions of JNRFC provide that mesh size in the cod end shall be a minimum of 125mm water under Russian jurisdiction(both territorial waters and the 200nm exclusive economic zone) and 135mm in waters under Norwegian jurisdiction (including the territorial waters, economic zone, territorial waters of Svalbard and fisheries zone around Jan Mayen). In the 200-mile zone around Svalbard (fishery protection zone) Russian vessel can use 125mm (since Russia does

not recognize Norwegian jurisdiction over this sea area) but the vessels often use 135mm in order to avoid conflicts with the Norwegian Coast Guard and to avoid bycatch of small fish.

It has been agreed that in 2011 permitted mesh size will be standardised to 130mm over the entire fishing area. In addition, since January 1997, sorting grids have been mandatory for trawl fisheries in most of the Barents Sea and Svalbard area. Of the certified vessels, half (those owned by Murmansk Trawl fleet use 135mm mesh the entire time, even in Russian waters, whereas the other vessels will make use of 125mm mesh when in Russian waters

Instruments to monitor gear performance are common in modern bottom otter trawling. Such instruments monitor geometry (door distance, vertical opening, bottom contact, trawl symmetry), trawl depth water temperature and the weight of catch in the trawl is also closely monitored (catch sensors) to give an indication of the appropriate moment to haul.

Trawls are typically towed at speeds between 3 to 5 knots, in depths around 400m for around 3 to 5 hours between hauls, although this varies according to fish density and seabed characteristics meaning that tows can last as little as 15 minutes or as much as 12 hours.

2.4 Landings of Target Species[6]

The Barents Sea groundfish fishery has a long and important heritage. Historically, landings of cod and haddock from the Barents Sea have fluctuated, mainly reflecting stock status. For cod, landings of 900,000t were experienced in the 1970s, but landings dropped considerably as stock status declined (landings fell to 212,000t in 1990), before recovering steadily since then. Landings of haddock have seen perhaps a smaller degree of fluctuation in recent decades when compared with cod, although there have been periods of very low landings, corresponding to poor stock status, notably in the 1980s (landings falling as low as 20,000t in 1984), prior to the more recent recovery.

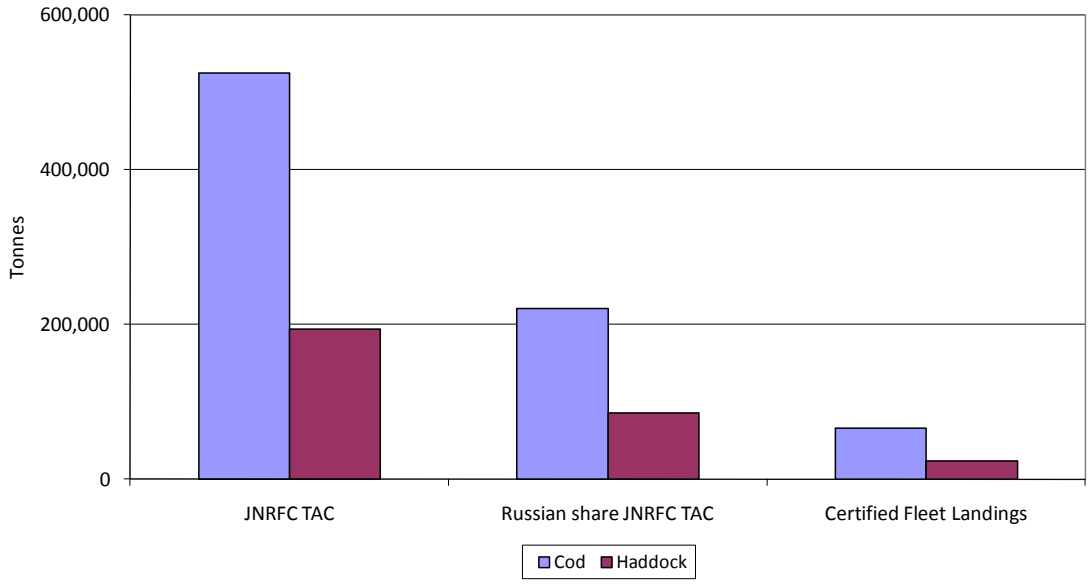
In 2009 the International Total Allowable Catch (TAC) for cod and Haddock was agreed by the Joint Norwegian-Russian Fisheries Commission at 525,000t for cod and 194,000t for haddock. Analysis of 2009 landings data provided by the assessment client[7], shows that the assessed fleet was responsible for catching **65,535t cod and 23,837t haddock.** The certified fleet therefore accounts for around 12 to 12.5% of the international TAC for both species, and accounts for just less than a third of the Russian allocation for both species. In 2010 the TACs agreed by JNRFC increased by just over 15% for cod to 607,000t, and increased by 25% for haddock, to 243,000t. It is anticipated that the certified fleet's share of this TAC will be broadly in line with the 2009 fishery. Formally - according to the 1975 agreements - cod and haddock are shared 50/50 between Russia and Norway. Russia then exchanges part of Russia its cod and haddock quotas for access to exclusive Norwegian stocks. In addition, a smaller share of the overall TAC for cod and haddock is allocated or traded with other nations. So although Norway and Russia share the majority of the eventual landings for both species (approaching 90%) there is small but significant proportion of total landings by other

[6] *Refer to report **section 4.1** for analysis of landings of non-target species (e.g. Saithe), which account for some 8% of all landings.*

[7] *These figures have been cross-referenced with an independent fleet report provided by PINRO.*

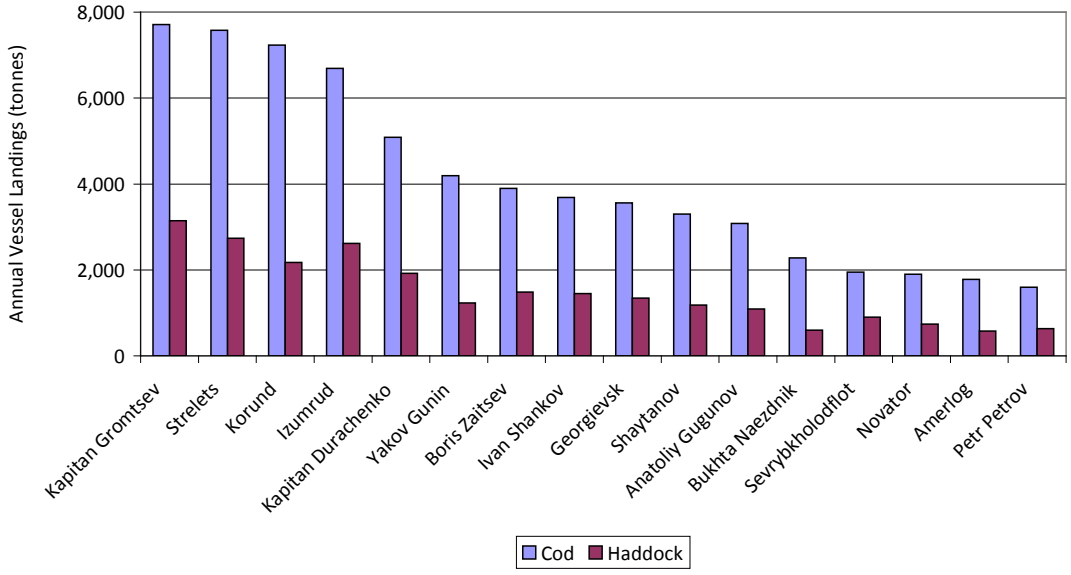
fleets including the EU, Faroes and Iceland. An approximate calculation of 2010 quota allocations shows that Norway receives 44.6% of cod and 47.9% of haddock, whilst Russia receives 42.6% of cod and 44.2% of haddock.

Figure 2.3: Certified Fleet Landings, as a share of JNRFC agreed TAC (2009)



Further analysis of the fleet landings data provided by the client, indicate that average vessel landings in 2009 were around 4,000t of cod and 1,500t haddock, however the largest catches were taken by 'Kapitan Gromtsev' with 7,710t cod and 3,144t haddock.

Figure 2.4: Target species landings of the certified vessels (2009)

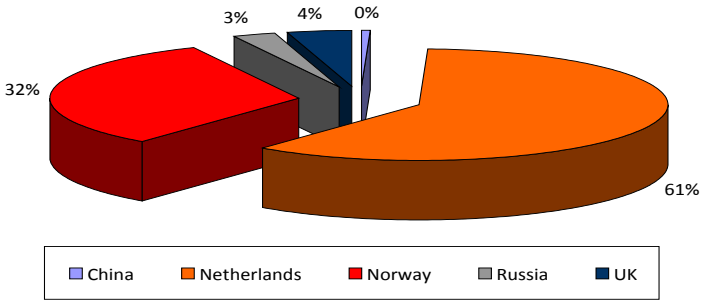


It should be noted that landings are not a direct indication of quota holdings. In Russia, quota is held by companies rather than vessels. A fuller explanation of the Russian quota allocation system and how quota is allocated within the country is provided in report **section 5**.

Landings from the certified fleet are made either directly or via transhipment. As the majority of fishing effort is outside Russian waters, the majority of landings are not made

into Russia. Around 86% product is landed in the headed / gutted form, with some 14% landed as fillets. Overall, the majority of landings are made into the Netherlands, with Norway also accounting for a large share of the landings of the certified fleet. The UK is an important landing destination for the small filleted share of the catch. Landings to Russia only account for a small percentage of overall landings. In simple terms, landings to the Netherlands and the UK are likely to be transhipped. Landings to Norway are most likely to be direct landings, and landing to Russia are likely to be a combination of both direct and transhipped landings.

Figure 2.5: Distribution of Landings (2008 &2009 combined)[8]



By far the most important single landing port was Velsen, in the Netherlands, which serves as the main landings route for transhipped, headed and gutted frozen product. The most important ports for direct landings into Norway are Hammerfest, Kirkenes and Tromso. Landings of filleted product into the UK are via Grimsby. The only landing port of note in Russia is Murmansk.

Figure 2.6: Main (>2%) Landings Ports (2007), as a proportion of total landings

Country	Port	%
Netherlands	Velsen	54%
	Ijmuiden	4%
Norway	Hammerfest	11%
	Kirkenes	10%
	Tromso	8%
	Allesund	3%
	Batsfjord	2%
	Other	2%
UK	Grimsby	2%
Russia	Murmansk	2%

Source Data: Provided by client

2.5 Fishing Distribution & National Jurisdictions

All fishing covered by this assessment takes place in ICES areas I&II. Politically, the picture of territorial seas ownership and access rights in the Barents Sea and Svalbard / Spitsbergen area is relatively complex. Following the United Nations conference on the Law of the Sea (UNLOSC, 1976), coastal states, including Norway and Russia, established 200 nautical mile exclusive fishing zones. The Barents Sea falls almost entirely within the 200 mile exclusive fishing zones of Norway and Russia, with the exception of a relatively small triangle of

[8] *Refer to report **section 9** for details of landing routes and destinations covered by this assessment. It should be noted that landings to China are NOT covered by this MSC assessment.*

international waters in the eastern Barents Sea (the Loophole) and a larger area between mainland Norway and Jan Mayen (sometimes known as the 'banana').

Until recently the exact delineation of the territorial waters of the two countries was not fully agreed, most notably the case in the so-called grey-zone, where Russia and Norway agreed on parallel jurisdiction (Stokke 2002). A provisional fisheries arrangement has been made via the Grey Zone Agreement of 11 January 1978, which applies for a year at a time and is renewed annually. During the boundary negotiations the Russian view has been that the boundary should follow the sector line between the former western frontier of the Soviet Union and the North Pole.

The exact delineation of the Barents Sea and the Arctic Ocean was finally agreed in April 2010[9], during the visit of the President of the Russian Federation to Norway, and a joint declaration was signed. However, this agreement is not in force yet since it requires some legal procedures to be performed by Russia and Norway (execution of the formal treaty, bilateral ratification of the treaty, exchange of the ratification documents etc.).

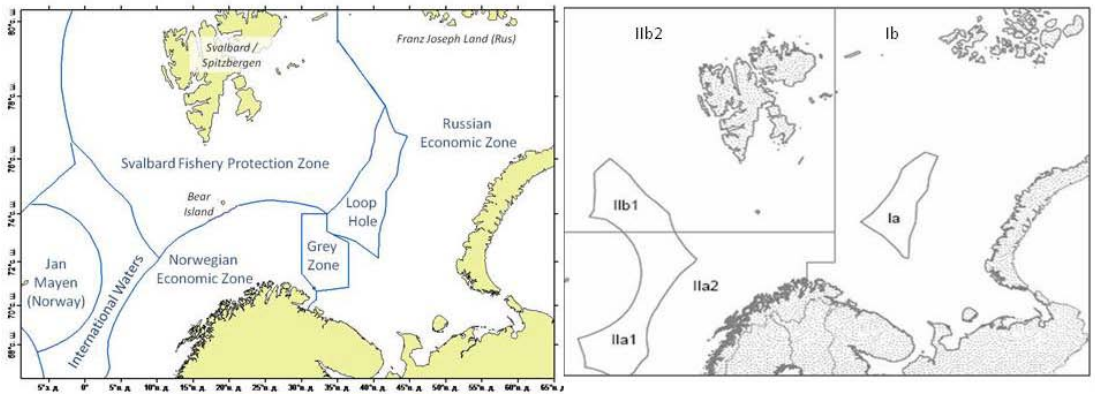
Even since the first agreements between Norway and Russia in the 1970s the situation with regard to territorial disputes has been relatively stable, and a good working relationship has been established with mutual access (to within 12nm) and reciprocal fishing rights. Given the political sensitivities, particularly given the past military importance of the area for Russia, the bilateral agreements that are in place have performed well, for three decades, in preventing any escalation of territorial disputes, and ensuring the sensible use and co-management of the Barents Sea[10].

From the perspective of fisheries management, monitoring control and surveillance is undertaken in all of the waters covered by the fleet, and all cod and haddock caught in the area is covered by the joint management agreements in place and the resulting quota. Further details on the fisheries management and enforcement regime in the area is provided in **section 5** of this report.

[9] *http://www.regjeringen.no/en/dep/smk/press-center/Press-releases/2010/Agreement-reached-between-Norway-and-the-Russian-Federation-in-the-negotiations-on-maritime-delimitation.html?id=601940*

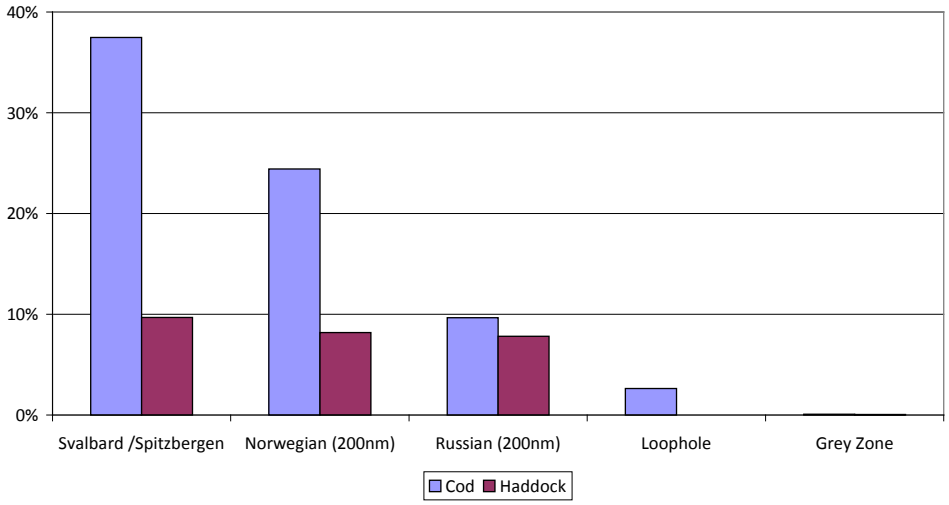
[10] *These issues are dealt with in detail in a Norwegian Government white paper on the High North (Report No. 30 (2004–2005).*

Fig 2.7: Chart showing national jurisdictions in the Barents Sea, and the corresponding ICES fishery management areas[11].



Data provided to the assessment team by PINRO, based on official landing statistics, shows a clear picture of the exact spatial distribution of fishing effort of the fleet within these various jurisdictions – both from the point of view of days at sea, and resulting landings. This clearly indicates the importance of Norwegian waters and the Svalbard zone.

Figure 2.8: Area distribution of landed catches by the certified fleet (2007 / 08 combined)

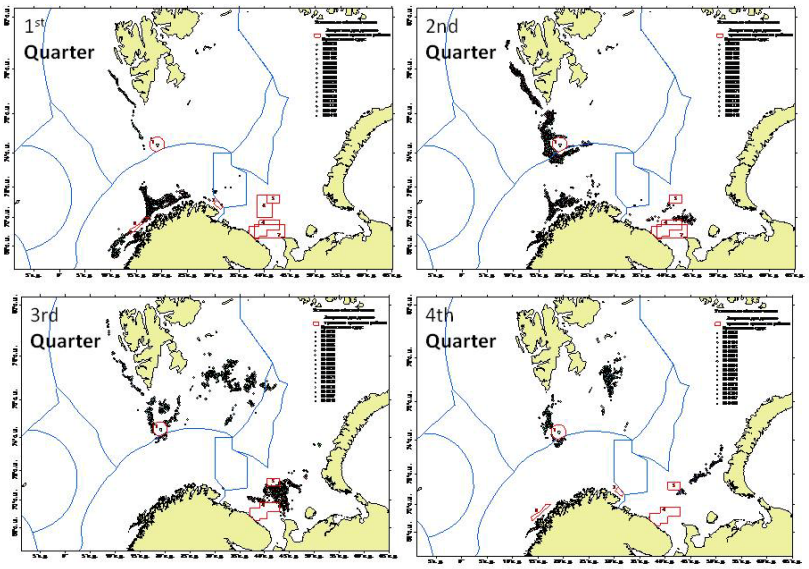


Source: Data provided by PINRO

Within this pattern there are seasonal variations, according to migration patterns of target stocks. The certified fleet concentrate fishing effort in the Norwegian economic zone in the 1st quarter of the year, and to a lesser extent the second quarter. Fleet fishing effort then moves North, into the Svalbard fishery protection zone during the early summer months, with significant concentrations of effort round Bear Island (to within 20nm). In the 3rd quarter fleet effort is more spread out across the Svalbard region, but with a significant concentration of effort closer to Murmansk in the Russian economic zone.

[11] *Chart is for indicative purposes only. The shape of the grey zone and loophole in the left hand image are based on images provided by PINRO.*

Figure 2.9: Seasonal spatial distribution of certified fleet fishing effort[12]



Source: PINRO analysis of fleet VMS data

2.6 Target Species - Cod

The first target species for the fishery under certification is cod (*Gadus Morhua*). As indicated initially, this report does not intend to provide a scientifically comprehensive description of the species. Interested readers should refer to sources that have been useful in compiling the following summary description of the species. These include:

» Fishbase:

http://www.fishbase.org/Summary/speciesSummary.php?ID=69&genusname=Gadus&speciesname=morhua&lang=English

» ICES Fishmap:

http://www.ices.dk/marineworld/fishmap/ices/default.asp?id=Cod

» Descriptions provided by national scientific bodies, such as Norwegian IMR:

http://www.imr.no/temasider/fisk/torsk/nordaustarktisk_torsk_skrei/111219/en

http://www.fisheries.no/Ecosystems-and-stocks/marine_stocks/fish_stocks/cod/north_east_arctic_cod/

The brief species characteristics described below provide only a general overview of the species and have not been used to inform the detailed scoring of the fishery. Instead scoring is based on more specific references referred to later in the report, and assessment tree (appendix 3).

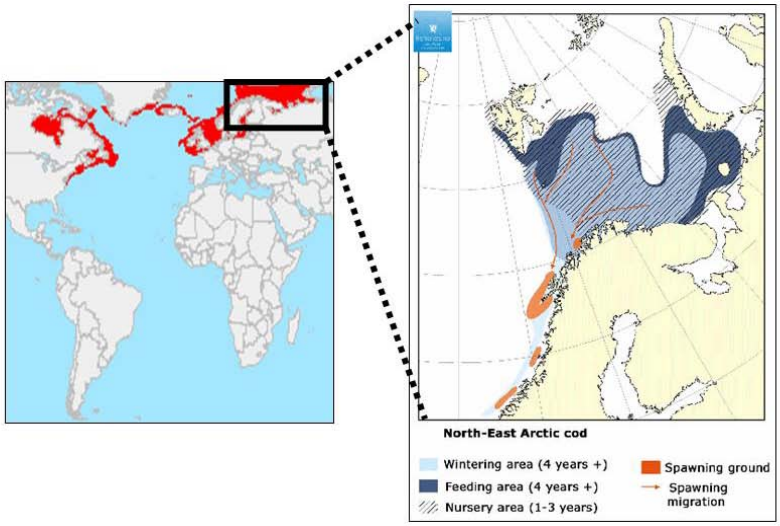
2.6.1 Geographic Range

Cod is a benthopelagic species (0 – 600m, but typically 150 – 200m), which is widely distributed in a variety of habitats in Northern temperate waters, from the shoreline down to the continental shelf and from the arctic polar front to a lattitude of around 35°N (up to

[12] *The key lists vessel names of the UoC (in Russian) - locations of all vessels are aggregated in the 4 images*

20°C). The North East Arctic stock in the Barents Sea, which is the subject of this assessment, is one of the most important cod stocks, along with the Icelandic stock. The populations of other stocks around Greenland, Newfoundland and the North Sea have declined dramatically in recent years.

Fig. 2.10: Global distribution of Atlantic Cod & the NE Arctic stock



Source: www.fishbase.org (Atlantic) and www.fisheries.no (NE Arctic)

2.6.2 Lifecycle

Cod are gregarious during the day, forming compact schools that swim between 30 and 80 metres above the bottom, and scatter at night.

The Barents Sea is the main nursery and feeding area for northeast Arctic cod, in sea temperatures above 0°C (south of the polar front). The main spawning areas are along the Norwegian coast. The main spawning period is March-April. Eggs and larvae are pelagic and drift from the spawning grounds to the Barents Sea, before adopting a demersal behaviour in late autumn.

The 3 and 4 year old immature cod move about in the Barents Sea when they follow the spawning capelin to the Norwegian coast in the spring, and in the summer, they leave the coastal area and disperse, feeding on capelin and herring over the Barents Sea when they are older, the young cod join the mature fish and make their first full spawning migration.

The earliest reported maturities for the Atlantic cod are at 2 years in its eastern (Oslofjord) and at 4 years in its western distribution. This is one of the world's most fecund fishes, with an average production of 1 million eggs per female (maximum production recorded is 9 millions eggs of a 34kg fish). The eggs and the larvae up to 2.5 months are pelagic; subsequently the postlarvae settle to the bottom.

2.6.3 Predator / Prey

The presence of cod usually depends on prey distribution rather than on temperature. Cod are voracious and omnivorous. Larvae and postlarvae feed on plankton, juveniles mainly feed on small crustaceans but these are progressively replaced by decapods. In the diet of mature cod, other fish species become more important than crustaceans although fish consumption varies seasonally – for example, deep-water cod show preference for herring

throughout the summer and autumn, but in winter and during the spawning period, they sustain themselves on mixed food in coastal areas. Aside from these core components of the diet, cod are benthic foragers feeding on species such as polychaetes and echinoderms. Feeding occurs at dawn and dusk, but small fish (of less than 20cm) feed continuously.

In the Barents Sea, Cod are an important predator species acting as a keystone species. It feeds on a wide range of prey, including larger zooplankton species, most available fish species and shrimp. Cod prefer capelin as a prey and feed on them heavily as they migrate into southern and central regions to spawn. Strong trophic relationships exist between cod, capelin and euphasiids.

Cannibalism within the cod species has also been shown to be a very important process in the population dynamics models and food web models that are central to the ICES assessments of Barents Sea cod.

2.7 Target Species - Haddock

The second target species for the fishery under certification is haddock (*Melanogrammus aeglefinus)*. As indicated initially, this report does not intend to provide a scientifically comprehensive description of the species. Interested readers should refer to sources that have been useful in compiling the following summary description of the species. These include:

» Fishbase:

http://www.fishbase.org/summary/SpeciesSummary.php?genusname=Melanogrammus&speciesname=aeglefinus

» ICES Fishmap:

http://www.ices.dk/marineworld/fishmap/ices/default.asp?id=Haddock

» Descriptions provided by national scientific bodies, such as Norwegian IMR:

http://www.imr.no/temasider/fisk/hyse/nordostarktisk_hyse/en

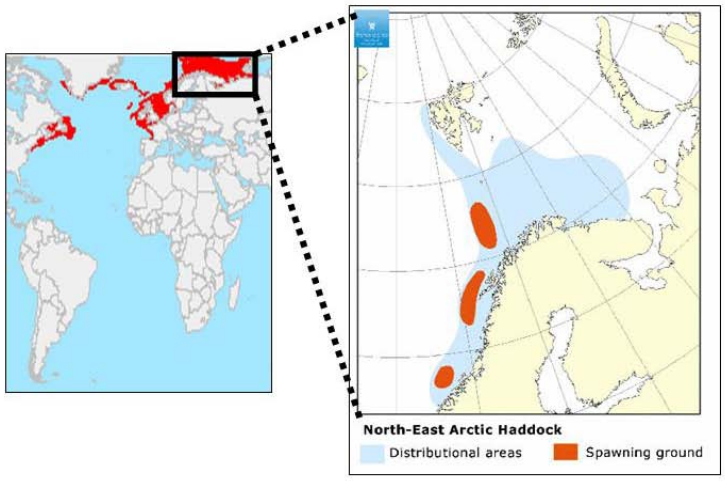
http://www.fisheries.no/Ecosystems-and-stocks/marine_stocks/fish_stocks/haddock/north_east_artic_haddock/

The brief species characteristics described below provide only a basic generalised overview of some key characteristics and have not been used to inform the detailed scoring of the fishery. Instead scoring is based on more specific references referred to later in the report, and assessment tree.

2.7.1 Geographic Range

Haddock is a demersal; marine species, widely distributed in temperate northern waters within the 10-450m depth range (79°N - 35°N, 76°W - 52°E). In the Northeast Atlantic haddock are distributed from the Bay of Biscay to Spitzbergen; the Barents Sea to Novaya Zemlya; (around Iceland); and more rarely, around southern Greenland. In the Northwest Atlantic, haddock is less widely distributed, but important populations occur from New Jersey to the Strait of Belle Isle.

Figure 2.11: Global distribution of Atlantic Haddock & North East Arctic Stock



Source: .fishbase.org (Atlantic) and .fisheries.no (NE Arctic)

The Northeast arctic sub population is distributed in the Barents Sea and along the Norwegian coast. The main spawning grounds are located along the Norwegian coast (between 70°30' and 73°N) and along the continental slope. Adults are most commonly found from 80 to 200m, over rock, sand, gravel or shells, usually at temperatures between 4° and 10°C.

2.7.2 Lifecycle

Haddock are batch spawners, but recruitment can be described as sporadic with good years following bad and vice versa. The reasons for this are poorly understood although it has been associated with the changes in the influx of Atlantic waters to the Barents Sea with water temperature at the first and second years of the haddock life serving as an indicator of year class strength and a steep rise or fall of the water temperature resulting in a marked effect on year class abundance.

Relatively little is known about haddock migration patterns although it has been shown that young haddock in the Barents Sea tends to remain within the Barents Sea, whilst larger fish undertake extensive migrations. Some spawning migration occurs along the coast of North Norway, with fish returning to the Barents Sea after spawning.

Depending on the region, spawning lasts from about January to June with fish moving to their spawning grounds in winter. These are at a depth of 50 to 200 metres where at this time the average temperature is about 5°C. The relevant spawning grounds for the Barents Sea are illustrated in **Figure 2.11**.

Female haddock produce between 0.1 and 2 million eggs. The planktonic eggs are slightly larger than one millimetre and crystal clear. Larvae hatch after one to two weeks and first on their own yolk supplies and then, at a length of 5.5mm, begin hunting for tiny crustaceans and other organisms from among the zooplankton. During this phase the young haddock remain in the open sea, near the surface, often seeking protection beneath the umbrellas of large Medusae (jellyfish).

After one or two years, when haddock have reached about 10cm they leave the pelagic habitat and become demersal. On average, the haddock caught today are between 40 and 60cm long and weigh 2 to 4kg. The maximum age of the haddock is said to be 20 years.

2.7.3 Predator / Prey

Haddock feed mainly on small bottom-living organisms including crustaceans, molluscs, echinoderms, worms and fishes although they can vary their diet and act as both predator and plankton-eater or benthos-eater. For example, during spawning migration of capelin, haddock prey on capelin but when the capelin abundance is low or when their areas do not overlap, haddock can compensate for the lack of capelin with other fish species, i.e. young herring or euphausids and benthos, which are predominant in the haddock diet throughout a year.

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 is observed in the consumption of haddock by marine mammals.

3. Target stock status & harvest controls (P1)

Principle 1 of the Marine Stewardship Council standard states that:

> ***A fishery must be conducted in a manner that does not lead to over fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.***

Principle 1 covers all fishing activity on the entire arctic cod & haddock stocks - not just the fishery undergoing certification. However, the fishery under certification would be expected to meet all management requirements, such as providing appropriate data and complying with controls, therefore demonstrably not adding to problems even if the problems will not cause the certification to fail.

In the following section the key factors which are relevant to Principle 1 are outlined. The primary source of information on this section is:

» AFWG (2009). Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02.

3.1 Status of the Stock & Reference Points

Both haddock and cod are in excellent condition, well above their biomass limit and trigger reference points (**Fig. 3.1**). Both fisheries are maintaining low fishing mortalities compared to their long term average and fishing mortalities at or below their targets (**Table 3.1**).

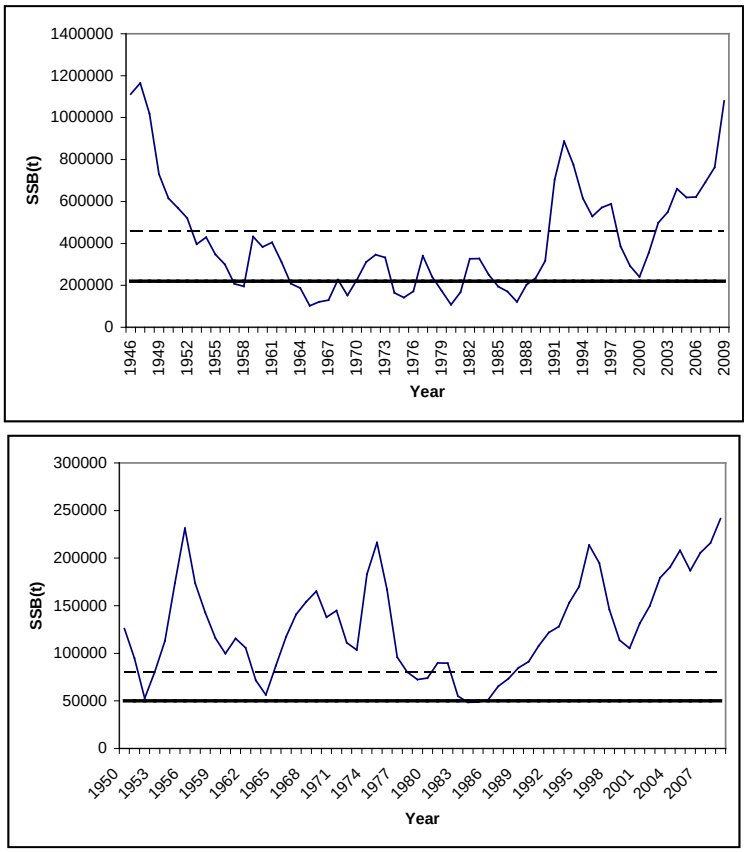
Table 3.1 Most recent status and reference points for Arctic cod and haddock

Reference Point	Arctic Cod	Arctic Haddock
B2009	1 079 210	241 483
Blim (limit)	220 000	50 000
Bpa (trigger)	460 000	80 000
F2008	0.30	0.34
Flim (limit)	0.74	0.49
Fpa (target)	0.40	0.35

Nb: *Biomass (B) = tonnes of spawning stock biomass. Fishing mortality (F) = average instantaneous annual mortality rate for ages 5-10 and 4-7 for cod and haddock respectively.*

The reference points have been developed and reviewed for both stocks over a number of years. The biomass limit reference points are used to define stock status and are based upon the stock recruitment relationships. Cod B_{lim} has been estimated from a change point regression (**Fig. 3.2**) based on the time series of recruitment and spawning stock size obtained from stock assessments. An attempt to estimate haddock B_{lim} using the same approach did not work and the current limit is based on "B_{loss}". This is the lowest observed biomass for which there is no evidence of a decline in recruitment, which in this case was the lowest biomass observed in the time series (**Fig 3.1**). The Arctic Fisheries Working Group (AFWG) notes that reference points for haddock need to be updated based on new data and a new benchmark assessment (part of the normal stock assessment process). The B_{pa} reference point is clearly a trigger point forming part of the harvest control rule, not a target reference point.

Figure 3.1 Stock status time series of cod & haddock

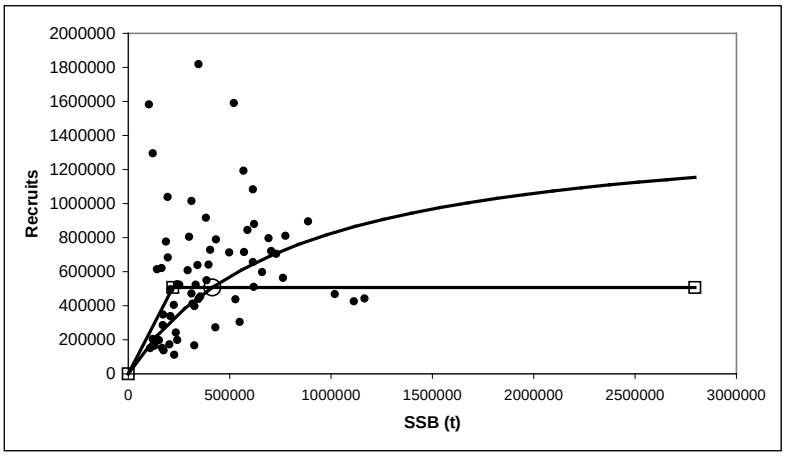


Nb: *Cod (top) and haddock (bottom) time series for the estimated spawning stock biomass relative to Blim (thick lower line) and Bpa (dotted upper line).*

The target reference point is defined based on fishing mortality. This allows catches to reflect changes in population size resulting from fluctuations in recruitment. Neither target fishing mortality is explicitly based on MSY, although available evidence suggests that the current reference points can be assumed to be proxies for F_{MSY}. The Arctic cod target allows for density dependent mortality for which there is direct evidence both in growth changes and, more specifically, in cannibalism. The resulting fishing mortality is therefore relatively high compared to standard approaches which do not take density dependent effects into account. For Arctic haddock, the fishing mortality is also relatively high compared to other candidates for reference points (such as 40% SSB per recruit). However, using a standard Berverton & Holt stock recruitment relationship (steepness=0.9 and curve fixed through the mean point for the SSB and recruitment time series, and assuming population model parameters used in the 2009 projection; see **Fig. 3.3**), it is less than the F_{MSY}, and therefore a reasonable value to apply. Haddock is also thought to exhibit density dependent growth, which would raise the target reference value.

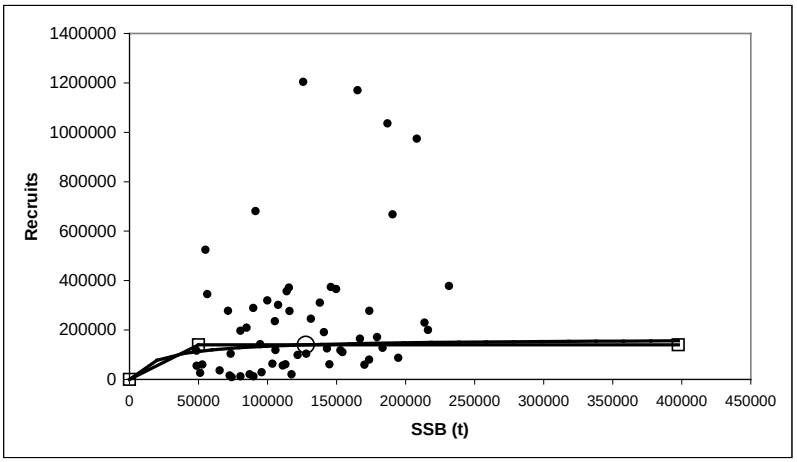
The target fishing mortalities have been tested through simulation and ICES has defined them as precautionary. The target fishing mortalities are also clearly producing relatively high biomass compared to historical levels (see AFWG 2009). JNRFC has requested reference points be developed based explicitly on MSY, so some revision may be expected, but radical changes to reference points are unlikely.

Figure 3.2 Stock recruitment relationship for arctic cod



Nb: *based on values estimated for the 2009 stock assessment. There is no clear relationship between the estimated SSB and the recruitment three years later. Two standard models used to derive reference points are illustrated. The change point regression attempts to estimate a critical point where low recruitments become more likely creating the "hockey stick" shaped line. An alternative, the Beverton and Holt stock recruitment model with a fixed steepness of 0.9, suitable for this species, is also shown, although this is not used by AWFG. Both models go through the mean point (O) of the recruitment and SSB.*

Figure 3.3 Stock recruitment relationship for arctic haddock.



Nb: *based on values estimated for the 2009 stock assessment (see Fig. 3.2). There is no clear relationship between the estimated SSB and the recruitment three years later. The recruitment fluctuates enormously for haddock regardless of the observed stock size; therefore the "hockey stick" stock recruitment is based on arbitrary lowest biomass observed. This is very similar, however, to the standard Beverton & Holt stock recruitment model with a fixed steepness of 0.9, suitable for this species.*

3.2 Harvest Strategy

The primary objective for both stocks is to maintain the level of exploitation at a level commensurate with high long term yields through controlling the Total Allowable Catch (TAC). It has been agreed to set the TAC based on estimated indicators which are routinely output from the annual stock assessment. The public stock assessment and scientific advice also include an assessment of the management performance in relation to its stated objectives. Decision on TACs and other management measures are made annual meeting of

the Joint Russian Norwegian Fisheries Commission (JRNFC), which is based on an agreement between Russia and Norway, and is responsible for agreeing management regulations and controls for the shared Barents Sea fish stocks.

In addition to TACs, the fisheries are regulated by mesh size limitations, a minimum catching size, a maximum bycatch of undersized fish, maximum bycatch of non-target species, closure of areas with high densities of juveniles, and other seasonal and area restrictions. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area. The effects of these regulations have not been evaluated, but they should, if applied correctly, decrease mortality on small fish and non-target species - all of which is desirable even if not quantified.

The fisheries are controlled by inspections of the trawler fleet at sea, by a requirement to report to catch control points when entering and leaving the EEZs, by VMS satellite tracking for some fleets, and by random inspections of fishing vessels when landing the fish. Keeping a detailed fishing logbook on-board is mandatory for most vessels, and large parts of the fleet report to the authorities on a daily basis.

There has been non-compliance with the TAC regulations, resulting in a significant amount of unreported landings in the past. The main mechanism used in avoiding quota control seems to be trans-shipping of fish from the Barents Sea. This has been identified as the main risk to the harvest strategy, affecting both the accuracy of the stock assessment and effectiveness of the harvest control rule. While the current situation has improved markedly, whether the current level of compliance is sustained will need to be monitored.

The other potentially significant source of unrecorded mortality is discarding. There is growing evidence of discarding throughout the Barents Sea for most groundfish stocks, despite discarding being illegal in Norway and Russia. This problem might affect haddock more than cod. Haddock are known to be released by longliners when below the minimum size and may be discarded when caught as bycatch with cod where they might be discarded if the haddock quota is being met faster than the cod quota. Beyond a regulation to ban discarding, this has not been addressed by management controls, but is being investigated through scientific observers.

Ecosystem factors are considered within the management process, but with the exception of some diet information which is used in the stock assessments, the issues are only considered qualitatively. However, a multispecies model based on the food web including capelin, cod and other species, is used to confirm the single species cod stock assessment. The recent reduction in fishing mortality for both haddock and cod should provide significant protection for the ecosystem as the fishing effort will have been much reduced. Some areas are closed to fishing, although these are relatively small and have only a low impact on the fishery.

3.3 Harvest Control Rules

The intention is to set TACs according to well-defined, agreed harvest control rules. ICES have evaluated both cod and haddock harvest control rules and concluded that they are in agreement with the precautionary approach.

The harvest control rule applied to Arctic cod was agreed at the 33rd meeting of the Joint Russian Norwegian Fisheries Commission (JRNFC) in November 2004:

> "The Parties agreed that the management strategies for cod and haddock should take into account the following:
>
> » conditions for high long-term yield from the stocks;
>
> » achievement of year-to-year stability in TACs;
>
> » full utilisation of all available information on stock development.
>
> On this basis, the Parties determined the following decision rules for setting the annual fishing quota (TAC) for North East Arctic cod (NEA cod):
>
> » estimate the average TAC level for the coming 3 years based on F_{pa}. 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 +/- 10% compared with the previous year's TAC;
>
> » if the spawning stock falls below B_{pa}, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{pa} at B_{pa}, to F= 0 at SSB equal to zero. At SSB-levels below B_{pa} in any of the operational years (current year, a year before and 3 years of prediction) there should be no limitations on the year-to-year variations in TAC."

The JNRFC set the TAC in 2009 above that indicated by the agreed harvest control rule because the biomass was well above the precautionary reference point. The earlier testing of the agreed harvest control rule presumed that the plan should be strictly followed for setting TAC, and this deviation from the rule is not therefore precautionary practice.

The new TAC was set based on a new harvest control rule, agreed by the parties, but which has yet to be tested by ICES. The new rule replaces the middle paragraph with:

» 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 +/- 10% compared with the previous year's TAC. In case the TAC calculated applying this rule means a fishing mortality (F) lower than 0.30 the TAC shall be increased up to the level that corresponds to the fishing mortality of 0.30.

This modified rule allows, in particular, higher catches when the stock is abundant, but should not affect the required decline in TAC should the stock fall.

A harvest control rule similar to Arctic cod was developed in 2004 for Arctic haddock. This harvest control rule was further modified in 2007 from a three-year rule to a one-year rule on the basis of the harvest control rule evaluation conducted by ICES. The current harvest control rule for haddock is:

» "TAC for the next year will be set at level corresponding to F_{pa}.

» The TAC should not be changed by more than ±25% compared with the previous year TAC.

» If the spawning stock falls below B_{pa}, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{pa} at B_{pa} to F= 0 at SSB equal to zero. At SSB-levels below B_{pa} 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."[13].

3.4 Information and Stock Assessment

3.4.1 Overview

The cod fishery is conducted both with an international trawler fleet and with coastal vessels using traditional fishing gears. Haddock are taken as bycatch in the cod trawl fishery and, to a lesser extent, in targeted trawl fishery and by longline.

Both assessments use a Virtual Population Analysis model to estimate fishing mortality and spawning stock size for determination of stock status and application of the harvest control rule. These models require catch-at-age, abundance indices as data and estimates of maturity-at-age, weight-at-age and natural mortality as input parameters. These data are obtained from landings reports, scientific surveys and catch sampling.

3.4.2 Total Catch Data

Landings by species are routinely reported. These constitute the official landings reported by the relevant government management authorities. In addition, the Arctic Fisheries Working Group adds other known sources of mortality which may not appear in the official statistics. There remains some confusion in designating catches between Arctic cod and Norwegian coastal cod, but this error does not affect the Arctic cod assessment.

Estimates of potential unreported landings of cod and haddock have been obtained by Russian and Norwegian specialists. Two series of cod IUU catch were made available to ICES for the years 2002-2008, and both were used in carrying out stock assessments, but the advice is based on the series with the higher estimate. A single series of haddock IUU catch 2002-2008 was also used for the haddock assessment, although these estimates are considered poor. Before 2002 IUU catch is assumed to have been negligible.

Discard estimates are not available and are assumed to be zero in the assessments. The effect of not accounting for discarding is unknown, but attempts are being made to address this issue.

3.4.3 Age, Length, Weight and Maturity Composition

Age, lengths and weights are routinely sampled from Norwegian, Russian and German landings. Age, length and weight are routinely sampled within the abundance surveys. These are used to estimate composition of the stock rather than catch. Maturity is also routinely

[13] *The cod management plan text is from the 2004 33rd session and haddock from 2007 36th session of The Joint Norwegian Russian Fishery Commission. The text reproduced here is translated from Norwegian to English and is therefore not the legally agreed text.*

sampled within the surveys and maturity-at-age is estimated for each year using generalized linear models with a logistic link function. There is a routine exchange programme of otoliths among ageing labs to estimate errors and improve methods.

Several Norwegian fishing vessels (13 oceanic and 21 coastal) provide regular sampling data for length and age. These data are used for estimating catch at age for the corresponding fleets. Russian fishing vessels with observers onboard provide similar information on catch length distribution and sample fish to receive data on length-age matrices.

Sampling of length and age from catches are used to break the total catch down into catch-at-age. Sampling coverage is therefore important for the stock assessment. Coverage of landings is considered adequate, but the IUU catch which is clearly excluded from sampling, must be assumed to have the same age composition. Discards age composition is not likely to be the same, and presents a significant problem for including discards in the stock assessment. Sampling error can be estimated for the age, length, weight and maturity composition for the catch and surveys, but is not currently used in the stock assessment.

3.4.4 Abundance Indices

Haddock and cod use three scientific survey indices and cod also uses a Russian trawl CPUE index. The indices are derived from acoustic and trawl survey data collected during winter and autumn in the Barents Sea and Lofoten. The surveys are designed to be unbiased in estimating the relative abundance of the stock. Surveys also sample age, length and weight data which are used to estimate age specific abundance indices and weight-at-age composition of the stocks.

Since 1997 all of the surveys used for model fitting have been affected by an incomplete coverage for some of the years, due to Norwegian vessels not been given access to Russian zone and Russian vessels not been given access to Norwegian zone. All indices affected have been corrected as far as possible, but these procedures still increase uncertainty in the indices.

Even where surveys have been properly implemented, they do not have a complete coverage of the haddock stock. This affects the coverage of year classes which may well induce errors in the perceived year class abundances. Coverage of the Arctic cod stock is more complete.

3.4.5 Other Information

Base natural mortality is assumed to be 0.2 $year^{-1}$ for both stocks, which is standard practice although it has not been scientifically justified. However, routine sampling of cod stomachs now allows cod predation to be accounted for and therefore the natural mortality of the younger cod and haddock age groups have been adjusted accordingly.

A cod stomach content data is recorded in a joint PINRO-IMR stomach content database. On average about 9,000 cod stomachs from the Barents Sea have been analysed annually in the period 1984-2008. These data are used to calculate the per capita consumption of cod and haddock by cod for each prey and predator age group.

Northeast Arctic cod is an important predator of other species in the ecosystem, notably capelin, but also other finfish. Changes in growth, maturity, and cod predation have been linked to the abundance of capelin. Similarly, annual consumption of cod by seals and

whales may be inversely related to capelin abundance. The management of Northeast Arctic cod will therefore have implications on the dynamics of these stocks.

Other information on the environment, such as various physical oceanographic indices and biomass of other species, such as capelin, are also collected and made available to the relevant fisheries scientists. Some, but not all, of these data are used.

3.4.6 Stock Assessment Model

The cod analytical assessment is based on catch-at-age data, using one commercial cpue series and three survey abundance indices. The haddock analytical assessment is also based on catch-at-age data, but uses three survey abundance series only. Available estimates of IUU catch are included in both assessments, but discards are assumed to be zero.

The main analytical model is the Extended Survivors Analysis (XSA) variant of Virtual Population Analysis. Virtual Population Analysis uses catch-at-age data to back-calculate the size of each age group. The XSA variant is a simple approach to fitting this type of model and is widely used by ICES for a number of stocks. Although it does not attempt to apply more modern computer intensive fitting techniques and lacks statistical rigour, it is still considered by ICES robust enough for stock assessment as long as the data are of good quality.

The main unusual feature of the assessments is the estimate of natural mortality which is adjusted for cod predation. Estimates of cod cannibalism and predation are included in the natural mortality for the cod and haddock assessments respectively. These estimates are derived each half year from the sampling and analysis of cod stomachs and this additional mortality applied through an iterative procedure as it depends on the estimated cod population size. Natural mortality due to cannibalism is by far the most significant source of mortality in cod ages 1-2, significant for age 3, but for ages 4 onwards a minor component in most years (see AFWG 2009).

The main uncertainties in the assessments derive from the biased catch statistics and the inconsistencies in the surveys. Bias in the catch statistics appears to have decreased in recent years. The surveys show some inconsistencies may be explained by the inadequate spatial coverage.

Among the diagnostics, there is a worrying retrospective pattern for haddock of over-estimating stock size and under-estimating fishing mortality for the most recent years. The reason for this is not fully understood. In contrast, the retrospective pattern for cod seems satisfactory. Retrospective patterns are often the result of problems in the data. Changes in the survey or in the perception of catches (e.g. changes in discarding practice or incorrect IUU estimation), can all cause retrospective patterns.

Sampling error is not accounted for in the current stock assessment method. Estimation of catch at age is based on sampling of catches. The error in the estimates caused by sampling can be considerable even if the total catch is known. The estimation of the abundance indices from surveys will also be affected by sampling error. The effect of not taking sampling error into account when fitting models to data may introduce bias in the resulting estimates.

Alternatives to the XSA model are routinely applied to Arctic cod. These were in 2009 a variant on the VPA approach (TISVPA) and application of an alternative multispecies model

(Gadget). The multispecies model is of particular interest as it is beginning to take account of ecosystem effects, but requires much more data. Both assessments broadly agree with the XSA assessment.

Alternative assessments were not conducted on haddock in 2009, but haddock has been identified as requiring a new benchmark assessment. This requires much more work than updating the current assessment, but should, among other things, review alternative assessment approaches which could eliminate some of the problems associated with the current XSA method.

Since 2008, the recruitment estimates for the short term projection has included information on environmental indices (ice coverage, temperature and oxygen saturation at the Kola section, air temperature at Murman coast, and capelin biomass) as well as survey indices available for the age 0-2 year classes.

The harvest control rules have been tested through simulations using FLR (www.flr-project.org) in applying management strategy evaluations (MSE). The MSE did not include all errors in the evaluations, but importantly the simulations did account for different levels of implementation error (where the catch may exceed the TAC, for whatever reason). In general, the simulations found the rules relatively robust to likely levels of error.

4. Environmental Elements (P2)

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.

4.1 Retained Bycatch

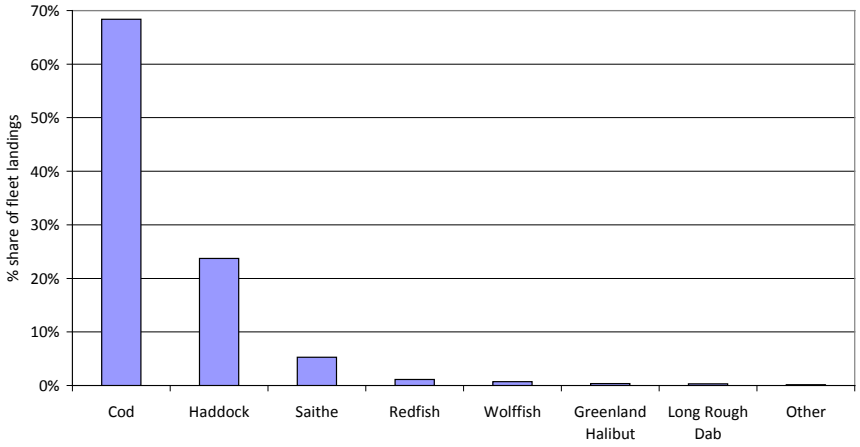
The Barents Sea trawl fishery for cod and haddock appears to have *relatively* low levels of bycatch. Several factors contribute to the low levels of bycatch, these include:

- the use of large mesh sizes (135mm in Norway & 125mm in Russia – to be harmonised to 130mm in all areas from 2011);
- discard bans in place for all key species in both the Norwegian and Russian zone (and Svalbard / Spitzbergen);
- use of separator grids (compulsory since 1997);
- move on rule / real time closures - to protect juveniles, or in event of high bycatch;
- permanently closed area to protect spawning / nursery grounds;
- the high concentrations of cod and haddock on the fishing grounds;
- experienced skippers and crews, knowing where best to target stocks;
- the good recent availability of target stock quotas (reflecting good stock status), combined with increased trade in quotas reduces the incentive to 'high grade' catches.

In spite of these measures, the fishery cannot be described as entirely clean, and according to landing figures for the certified vessels, retained non-target species accounted for around 8% of total landings. These figures are accurate and verifiable and so present a good picture of landings (as opposed to catches).

According to the landing statistics, aside from cod and haddock, the main retained species by volume (5%) was saithe. Other retained species included redfish (*Sebastes mentella & marinus*), wolffish (*Anarhichas lupus*), Long rough dab *(Hippoglossoides platessoides)*, Greenland halibut (*Reinhardtius hippoglossoides*), and small quantities of other flatfish such as plaice and flounder.

Figure 4.1: Retained species mix for the certified vessels (combined data 2007 /08)



Source: Data provided by PINRO

During the assessment scoring process, the stock status and management measures of these retained species is considered. Stocks of saithe, long rough dab and other flatfish are all considered to be in reasonable condition, or with good management in place. By contrast the status and management of redfish species and wolfish species is poorer. These issues are considered in more detail in the assessment tree scoring table.

4.2 Discarding[14]

The majority of fishing activity for the assessed fleet takes place in waters under Norwegian jurisdiction. In these waters, under section 15 of the 2009 Norwegian Marine Resources act, there is a duty to land all catches. In section 48 of Regulations amending the regulations relating to sea-water fisheries 20091221, further detail on the discarding ban is laid out, including listing all species that must be landed. This covers cod and haddock as well as most species either reported for, or potentially relevant to the fishery under assessment, such as saithe, Greenland halibut, redfish, wolfish, ling, lumpsucker, skate etc.

When fishing in waters covered by Russian jurisdiction any discarding of bycatch is also banned.

These strong discard bans covering all waters of the assessed fishery, combined with the initiatives / management measures listed above (in **4.1**), *should* therefore combine to mean that there is no discarding of fish in the fishery under certification. The captains of the 5 vessels visited the assessment team; all corroborated this, indicating that 'everything is landed'. Certainly the initiatives / management measures that are in place are a good example of ways to address the potential problem of discarding of fish in international fisheries, and are certainly ahead of many other high profile fisheries (including EU fisheries in this regard).

The main short comings for this approach to the problem of discarding, is that there is little or no market for many of the fish which must be landed. It is also very difficult to enforce

[14] *Discarding of either cod or haddock is dealt with under Principle 1, when addressing the stock status and management of each target species.*

(except when inspectors / observers are on board, or when the spotter plane is overhead). It is therefore possible that a small amount of discarding does take place undetected (across all trawl fisheries both in Norwegian and Russian waters).

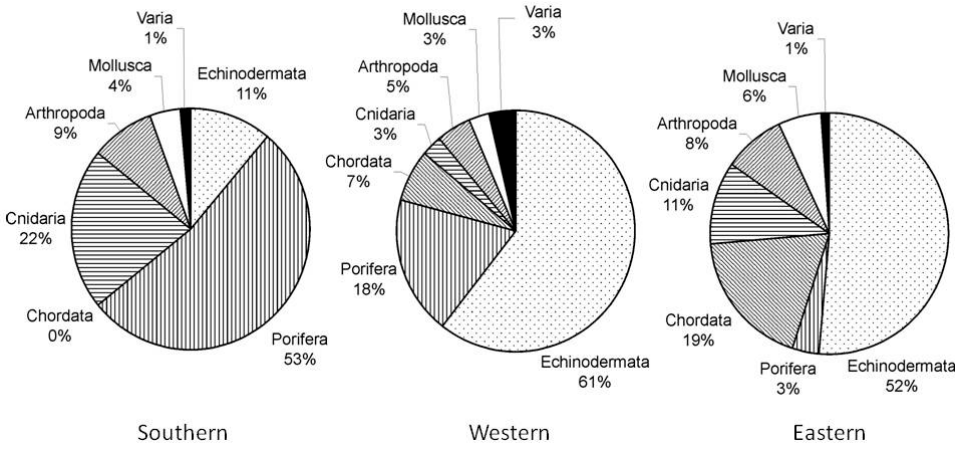
Various studies indicate this is likely to be the case. For example, Dolgov *et al* (2005) indicate that there is a discarded bycatch of skate species in trawl fisheries in the Barents Sea, which is not generally used for food and for which there is little Russian market. In this study, the main species caught in the trawl was Thorny skate (*Amblyraja radiate*) at a rate of around 10kg / hour of trawl, but the study goes on to conclude 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 Thorny skate'.

There is also likely to be a bycatch of macrobenthos. According to S.G. and N.V. Denisenko (Murmansk Marine Biological Institute of the Kola Branch of Russian Academy of Science), the mortality of bottom invertebrates in the Barents Sea due to removal by trawls in 1955-1986 annually amounted up to about one million tonnes, which often exceeded Russian total catch of main commercial fish species. The submission provided to the assessment team by PINRO provided data on bycatches of bottom invertebrates from trawl fishing operations in the last 5 years. This showed that in the areas where this fishery takes place (mainly eastern and southern) there is likely to be a bycatch of macrobenthos- amounting to several kilos per haul.

The main species present appear to be relatively abundant and productive species, such as starfish (*Cteno-discus crispatus*), brittlestars (*Ophiura sarsi*) and shrimp (*Sabinea septemcarinata*). Such species of benthic invertebrates are not listed in the Norwegian regulations governing discarding and are therefore permitted to be returned to the sea.

It is noted that macrobenthic biomass is lowest in areas which are more heavily trawled – in particular with fewer sessile community forming organisms, such as sponges (which are addressed in this assessment under 'habitat'). The difference in distribution is not solely caused by fishing, indeed it is concluded that 63% in the regional variation in bycatch biomass was caused by other factors, such as biological productivity, depth, temperature, salinity etc.

Fig 4.2: Taxonomic structure of macrobenthos bycatch in the Barents Sea Trawl Fishery



Source: PINRO

The combination of the discarding ban and the low level of detectablility / enforceability do present a problem for obtaining reliable information of what, if anything is actually discarded. Clearly any efforts at honest reporting of discarding for analytical purposes, is in effect an admission of law breaking. This is ironic, given that one of the great advantages of the discard ban is the benefit that landing all catches gives to reliable data collection.

The recently begun observer programme by PINRO scientists on board the certified vessels, along with the MSC on board log book, which includes accounts of discard species, will be an excellent way of quantitatively estimating discard levels, and informing future refinement of the management strategy. Clearly, in doing so, it will be important to clarify how this information can be used in the context of the Norwegian and Russian discard bans.

4.3 Endangered, Threatened and Protected Species (ETP)

Russia is a signatory to a number of conventions on species protection and management, notably the Convention on Biological Diversity, which sets out a general framework and national strategy. More specific proposals on species protection are made under the regional and global nature conservation conventions, primarily the Convention on International Trade in Endangered Species (CITES), which Russia is also a signatory to.

The Barents Sea is an important area for Marine mammals. The PINRO / IMR Joint Ecosystem work concludes that the most common marine mammal in the Barents Sea is the white-beaked dolphin (*Lagenorhynchus albirostris* – IUCN Least Concern).

Of the baleen whales, minke (*Balaenoptera acutorostrata* – IUCN Least concern), humpback *Megaptera novaeangliae* – IUCN least concern) and fin whales (*Balaenoptera physalus* – IUCN endangered) were the most numerous.

Only the last of these aforementioned marine mammal species is protected by CITES. Two other species of marine mammals which also occur in the Barents Sea are also protected by CITES: sei whale (*Balaenoptera borealis* – IUCN endangered) and blue whale (*Balaenoptera musculus* - IUCN endangered). The Joint PINRO / IMR ecosystem report states that blue and sei whales are rarer and occasionally observed in the Barents Sea.

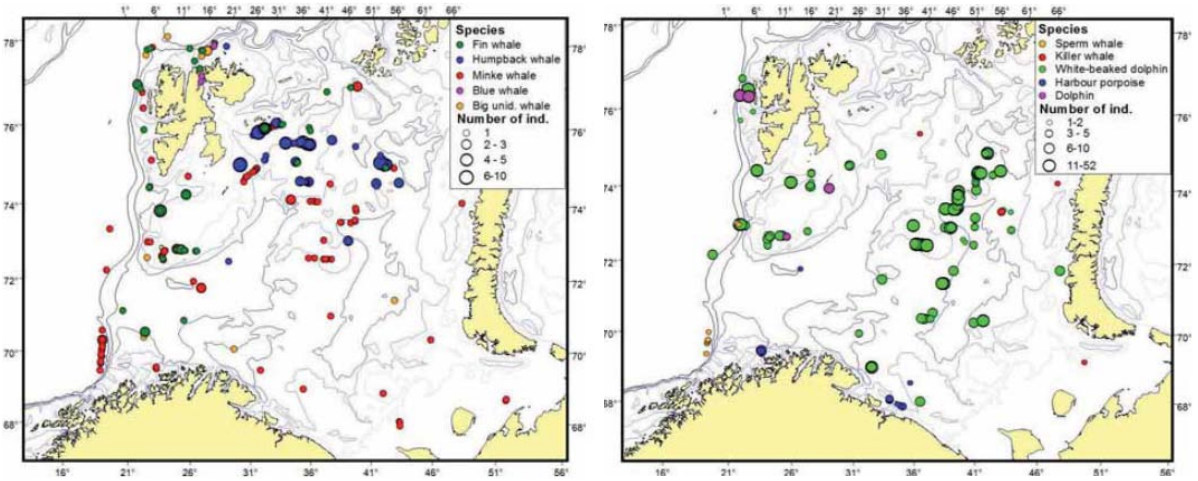
Harp Seals (*Pagophilus groenlandicu* - IUCN least concern) are also present in the Barents Sea, but are not protected by CITES. No elasmobranches species occurring in the Barents Sea are protected by CITES, although some of these species are listed by IUCN as critically endangered which do occur in the Barents Sea, such as flapper / blue Skate (*Dipturus batis*) Angel shark (*Squatina squatina)* and porbeagle (NE sub-population).

Table 4.3: Summary of key bird, mammal and elasmobranch species in the Barents Sea, with potential interactions with cod & haddock trawl fisheries.

Common Name	Species	IUCN Red List	Russian Federation Red Data Book	CITES
Birds				
Common Shag	*Phalacrocorax aristotelis*	LC	3	
Stellers Eider	*Polysticta stelleri*	V		
Black-legged kittiwake	*Rissa tridactyla*	LC		
Brunnich's guillemot	*Uria lomvia*	LC		
Little auk	*Alle alle*	LC		
Ivory Gull	*Pagophila eburnea*	NT	3	
Northern fulmar	*Fulmarus glacialis*	LC		
Common Guillemot	*Uria aalge*	LC		
Puffin	*Fratercula arctica*	LC		
Marine Mammals				
White sided dolphin	*Lagenorhynchus acutus*	LC	4	***x***
White beaked dolphin	*Lagenorhynchus albirostris*	LC	3	***x***
Harbour porpoise	*Phocoena phocoena*	LC	4	***x***
Hooded seal	*Cystophora cristata*	V		
Harp seal	*Pagophilus groenlandicus*	LC		
Bowhead whale	*Balaena mysticetus*	LC	1	***x***
Humpback whale	*Megaptera novaeangliae*	LC	1	***x***
Blue whale	*Balaenoptera musculus*	En	1	***x***
Fin whale	*Balaenoptera physalus*	En	2	***x***
Sei whale	*Balaenoptera borealis*	En		***x***
Minke Whale	*Balaenoptera acutorostrata*	LC		
Beluga Whale	*Delphinapterus leucas*	NT		
Elasmobranchs (sharks)				
Spiked Dogfish	*Squalus acanthias*	V		
Porbeagle (NE Subpop)	*Lamna nasus*	CE		
Blue / flapper skate	*Dipturus Batis*	CE		
Angel Shark	*Squatina Squatina*	CE		
Key				
IUCN	*CE = Critically endangered, En = Endangered, V = Vulnerable, NT = Near threatened, LC = Least Concern*			
Russian Red List	*1 = Endangered, 2 = Decreasing number, 3 = rare, 4 = uncertain*			

Although Russia is not a member of the North Atlantic Marine Mammal Commission (NAMMCO) - an international body for cooperation on the conservation, management and study of marine mammals in the north Atlantic – it does cooperate as a partner on projects. For example, PINRO are actively involved in the Trans-north Atlantic Sightings Survey (TNASS), to estimate the summer distribution and absolute abundance of cetacean populations in the North Atlantic which will represent a considerable enhancement of understanding of cetacean populations in the North Atlantic, in particular in Arctic regions.

Fig. 4.4: Distribution of toothed (r) and Baleen (l) whales – August – September 2008



Source: Joint PINRO / IMR Barents Sea ecosystem survey (2008)

NAMMCO provides a mechanism for cooperation on conservation and management for all species of cetaceans (whales and dolphins) and pinnipeds (seals and walruses) in the region, many of which have not before been covered by such an international agreement.

The Barents Sea is an important breeding ground for seabird and is home to unique sea bird colonies, including one of the world's largest puffin colonies. There is a good level of understanding of the bird composition of the Barents Sea, including regional and seasonal distribution patterns. For example, a good source of information is "The status of Marine Birds Breeding in the Barents Sea Region" by T. Anker-Nils *et al* (2000), which summarises the findings of collaborative research undertaken by seabird scientists in Russia and Norway, and serves as an invaluable and comprehensive source of information of seabird populations in the Barents Sea. Although seabird bycatch and mortality has been recorded from all types of commercial fisheries, it is recognised that this is most notably the case for longline, set gillnets and driftnet fisheries (SGBYC 2009).

In addition to CITES and the Russian redlist, Norway also produces a redlist –most recently in 2006. This list contains 31 marine species classed as extinct, endangered or vulnerable, including a number of whale and shark species, including the Blue skate (*Dipturus batis*), Thornback skate (*Raja clavata*), the Ivory gull (*Pagophila eburnean*), Common porpoise (Phocoena phocoena), Sooty and Balearic shearwaters (*Puffinus griseus, Puffinus mauretanicus*).

In summary, the only species relevant to this assessment (with the *potential* to interact with the gear), which are also protected by CITES, are whale and dolphin species. A review of the impact of Norwegian offshore demersal trawl fisheries on marine mammals is available through the ICES Study Group for Bycatch of Protected Species (SGBYC 2009). These results can reasonably be taken as applicable for the fishery under certification (same vessels, same gear, and same area). This concludes that larger offshore demersal trawl vessels "are regarded as having a relatively low risk for bycatches of marine mammals".

4.4 Habitat

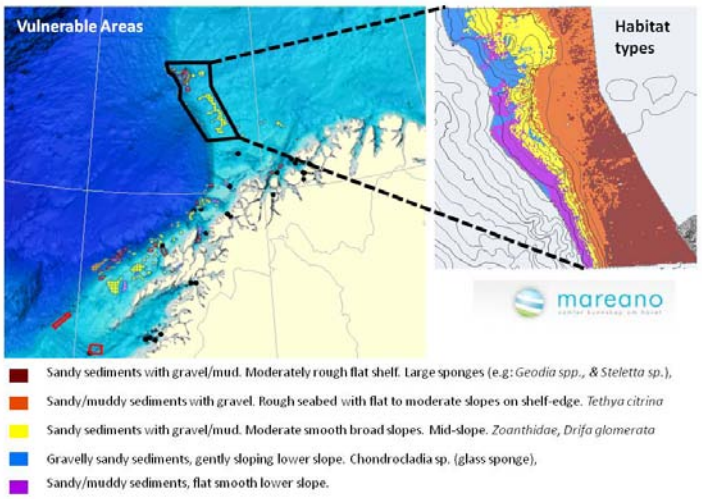
The gear used in this fishery is a heavy trawl gear with rock-hopper bobbins up to 24". It is therefore important that management and supporting information are adequate to address potential interactions. Such heavy demersal trawls are recognised as one of the more harmful fishing gears in terms of impact on bottom benthos and habitat forming communities and structures. Apart from destroying, damaging and removing benthic organisms from the harvested area, changes in the stratification of the upper layer of the seabed sediments can disturb natural development and structure of sublittoral communities.

This deleterious effect is often exacerbated by the fact that trawling is typically focused on small areas of the most locally highly productive areas of the shelf, well within reach and range of many important species of bottom fauna – although it is this same feature which can prove valuable for management and enable decisions to focus on appropriate mitigation (submission to assessment team from PINRO scientists).

There is, as yet, a lack of high resolution mapping over the entire rage of the Barents Sea – although the situation is improving. This to some extent serves as impediment to effective protection of vulnerable habitats from fishing activities – although it is arguable that even the amount that is currently known *is adequate to inform precautionary management*. With the advent of VMS for all large trawl vessels – including all of the vessels covered by this assessment – it is now possible to make a detailed and reliable assessment of fishing intensity, accurate at even relatively fine spatial scales.

What information that there is available on habitat types in the Barents Sea clearly shows that there are aggregations of large, non-mobile, long-living habitat-forming species, in particular large deep sea sponges (*Geodia* spp & *Stelletta* spp, *Tethya citrina, Thenea muricata*) mussel beds (*Modiolus modiolus*) and some reef species such as Zooanthidae and *Drifa glomerata*. Such deep sea communities serve as breeding, spawning and nursery areas for many fish species, and provide vital habitat for a variety of species. The richest communities of benthic animals are found along the Norwegian coast and the coast of Svalbard, where the hard-bottom communities display an unusually high richness of species. Reefs of *Lophelia petusa* are found closer inshore in Norwegian territorial waters and are therefore not thought to be in areas fished by the fishery under assessment.

Fig 4.5: Image extract from MAREANO project showing vulnerable habitat on shelf edge.



Source: adapted from MAREANO

Increasing understanding of the precise location of such species has resulted from the on-going work of the Norwegian MAREANO project to survey the seabed's physical, biological and chemical environment. The resulting interactive database provides exact details of the location of ecologically important benthic communities such as coral reefs and sponges with Norwegian waters.

There is also good understanding of the potential impacts of trawling and the negative effect of bottom trawling on benthos and habitats is thoroughly studied and well represented in scientific literature. A useful overview of a range of trawl benthic impact studies is presented in the FAO fisheries technical paper 472 (Løkkeborg 2005).

The main contribution to more locally specific scientific studies on impact of bottom trawling on benthic communities in the Barents Sea was made by S.G. Denisenko and N.V. Denisenko, who until the mid-1990s worked in Murmansk Marine Biological Institute of the Kola Branch of Russian Academy of Science and later worked in the Institute of Zoology of the Russian Academy of Science.

Having summarised the data of former soviet state company Sevrybpromrazvedka and Sevryba on fisheries in the Barents Sea in 1955 – 1985, S.G. and N.G. Denisenko (1991) undertook a quantitative estimation of the intensity and impact of bottom trawl operations on benthos in different parts of the Barents Sea. The results showed that the degree of a negative effect of bottom trawling on benthos depends on two main factors: the predominance of organisms with a specific life strategy (defined by sizes and life-span) and the degree of overlapping of trawling tracks during the fishing season.

It is populations of long-living species and communities formed by those organisms (such as large sponges, sea urchins, sea-cucumbers, gastropods and mussels) that are considered to be the most vulnerable for bottom trawling. Analysis of post capture mortality shows that these large long-living representatives of epifauna die even after a short stay on the deck during handling of catches.

Any overlapping of trawl tracks, continued over several years leads to further abrupt abundance decreases of these organisms. Small bottom organisms with a short life cycle are

less exposed to a direct mechanical impact of trawls. However, disturbance of stratification and muddying of the upper layer of sediments becomes an indirect cause of increase of mortality of this group of organisms due to higher intensity of feeding on those species by fish.

The analysis of long-term dynamics of biomass in the Barents Sea shows that bottom trawling has been a significant factor defining the long-term fluctuations of biomass and structure of bottom communities in the Barents Sea in the second part of the 20th century.

According to S.G. Denisenko (2007) 75-80% of gross biomass of benthic communities in the Barents Sea is formed by 15-20 species. Indication of degradation (decrease of biomass and reduction of area) were observed in areas of intensive bottom fisheries, including for many habitat-forming taxons, such as (but not limited to): large sponges (mostly of *Geodia* and *Thenea muricata* genus), mussel *(Astarte crenata* and *Tridonta borealis)*, sea urchins of *Strongylocentrotus* genus. A general pattern is observed with a shift toward more opportunistic, short-lived detritus eating organisms.

In particular, settlements of bottom filter-feeding organism in the western part of the Barents Sea were worst damaged. Large settlements of sponges that dominated in epifauna of this part of the sea in 1920s - 1930s were almost completely destroyed, resulting changes of trophic benthos structure of entire parts of the sea. The detailed analysis of long-term dynamics of bottom communities on the Kola Section (Denisenko 2001, 2005, Denisenko 2007) showed that during periods of highest fishing activity the decrease of benthos biomass was up to 70%.

Submarine observations by Aibulatov *et al.* (2005) in the southern part of the Barents Sea (up to 73°N) showed that the traces of trawling operations on the bottom are quite typical, with traces up to 3 – 4 m in width and 0.1 – 0.2m in depth with a 0.1 – 0.3m high excavated mound of sedimentary material at the edges of trenches.

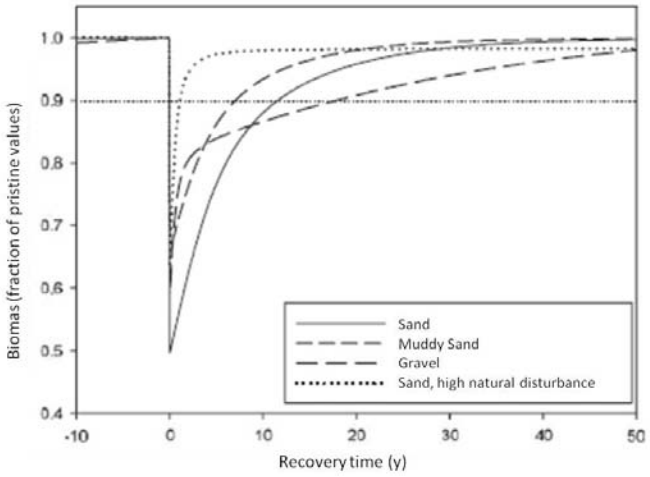
Beginning from 2004 PINRO in cooperation with Norwegian Institute of Marine Research (IMR) every year conducts an integrated ecosystem survey of the Barents Sea and a trawl survey of bottom and near-bottom species is a key element of this programme (Anon, 2006).

The obtained data suggest that it is high intensity of fishing in the southern part of the Barents Sea that is the reason for low indicators of biodiversity and zoobenthos bycatch biomass in this area. The north-east part of the Barents Sea can be characterized as having no impact of trawl fisheries and therefore the indicators of biodiversity and macrobenthos biomass observed in this area are fairly high.

When considering managing the impact of fisheries on habitats, it is important to have an understanding of the rate of recovery of habitat species if left in an undisturbed state. Denisenkov's detailed analysis of long-term dynamics of bottom communities in the Barents Sea (referred to above) showed that significant increases in benthic biomass were observed during periods of reduced fishing intensity during the Second World War. Subsequently, following the peak in fishing intensity in the post war years and the 1960s and 70s, recovery of areas and bioresources of the most common species, large taxons and trophic groups of zoobenthos was again observed. Rate of recovery is dependent on a number of issues – frequency of disturbance (natural and anthropogenic), productivity, substrate type and species. Hiddink *et al* 2006 modelled benthic recovery rates following trawling events, and

showed recovery rates typically in the range of 2.5 to 6 years with the fastest recovery being observed in mud habiats. In the Barents Sea although the majority of the habitats may fall within the more dynamic and sedimentary range (hence quicker recovery), it is notable that some of the species composition and the substrate types on the shelf edge may show far slower recovery characteristics. Reef forming, cold water coral species on hard substrates have the slowest recovery rate.

Fig 4.6: Modelled benthic community recovery rates following single trawling event (research undertaken in the North Sea).



Source: Hiddink *et al* 2006.

From a management perspective, Hiddink *et al* (2006) point out that not only is it important to understand the state of the benthic ecosystem and habitat, and the rate of recovery, but also the pressure that it is under. In short, there should be a direct management link between the frequency of fishing activity and the rate of recovery of ecosystems. As this assessment points out in **Appendix 3** (assessment tree), management of trawl activity in the Barents Sea is not yet at this point – but lack of information is not an impediment to effective management.

At present, in Norwegian waters, the management of habitat impacts includes the closure to bottom fishing of five marine protected areas, established under the fisheries legislation to specifically protect coral reefs:

» Sula Reef (Sularevet, 1999)

» Iverryggen Reef (2000)

» Røst Reef (Røstrevet, 2003)

» Tisler and Fjellknausene Reefs (2003)

In Russian waters, although closed areas - both seasonal and permanent - are a regularly applied fisheries management tool, the focus for the majority of these closures is either to protect spawning and nursery areas, certain commercial species (e.g. red King crab). The assessment team are not aware of any area closures to trawling, specifically designed to protect vulnerable habitats.

4.5 Ecosystem Impacts

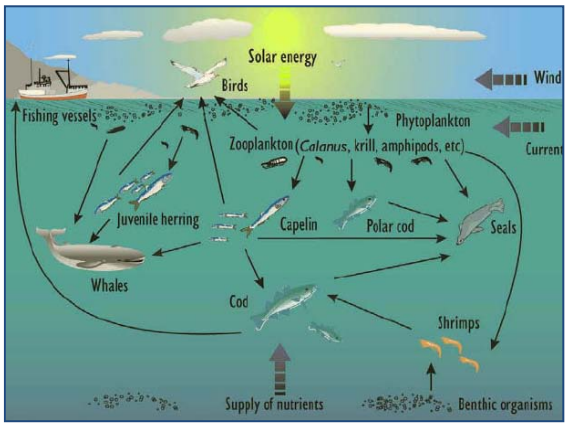
It is not intended to give a lengthy and detailed description of the ecosystem in this report, but instead focus on those areas which are most relevant to the fishery assessment. An interesting source of further information and overview is available at:

http://www.barentsportal.com/barentsportal09/

In addition, an annual ecosystem report is produced each year by scientists IMR (Norway) and PINRO, which provides a thorough overview of the ecosystem and seeks to provide the managing authorities with scientific based advice in order to allow the authorities to make optimal management decisions regarding the long term utilization of the resources in the Barents Sea area. The most recent of these is the Joint IMR / PINRO State of the Barents Sea Ecosystem Report (Stiansen *et al* 2009). In addition, the ICES arctic fisheries working group (AFWG) also provide a good and detailed overview of the Barents Sea Ecosystem. The ICES working group on Regional Ecosystem Description also provide a useful summary of the Barents Sea ecosystem.

Although the Barents Sea ecosystem is one of the most productive and commercially important ecosystems in the world, the ecosystem is relatively simple with few fish species of potentially high abundance. These are Northeast Arctic cod, haddock, Barents Sea capelin, polar cod and immature Norwegian Spring Spawning herring. The last few years there has in addition been an increase of blue whiting migrating into the Barents Sea.

Fig 4.7: Simplified food web of the Barents Sea



Source: Norwegian Institute of Marine Research

Northeast Arctic cod is the dominant predator in the Barents Sea ecosystem and the species probably has a stabilising effect on the ecosystem. This is because cod is an opportunistic predator that chooses the most abundant and favourable prey items and thus contributes to dampen outbreaks in prey populations. In addition, at times when prey is generally scarce, cannibalism on younger age classes quickly regulates the cod population to the availability prey.

This role of the cod as a top predator in the Barents Sea is similar to the role of cod in other North Atlantic shelf ecosystems. In the Barents Sea cod remains abundant and there has been no shift from predator dominated (cod) state to a prey (capelin or herring) dominated state. This is in spite of the low levels of spawning stock biomass of both cod and haddock during the 1970s (cod) and 1980s (cod and haddock).

In the Barents Sea, the system seems quite resistant to current levels of anthropogenic impact. However, high fishing pressure has had some effect, resulting in on average smaller individuals meaning that over time the Barents Sea has become potentially more susceptible to large outbreaks and fluctuations in the stocks of small pelagic schooling fish such as capelin and herring. Recent modelling studies support the conclusion of cod's key role in the ecosystem and shows that changes in cod mortality from either fishing or cod cannibalism levels have the largest potential effect on the overall equilibrium of the ecosystem (Lindstrøm *et al* 2009).

It is noted that recent increases in Norwegian spring spawning herring may have an unbalancing effect and even threaten the role of cod as a dominating species in the system. As long as harvesting of cod is kept below the long-term sustainable limit, and a large herring stock does not impair cod recruitment, the Northeast Arctic cod stock might continue to be relatively strong. However, intensive fishing has probably reduced the ability of the cod to affect the large fluctuations in the stocks of capelin and juvenile herring in the Barents Sea.

In managing potential habitat and ecosystem impacts, industry and management authorities are guided by relevant conventions and agreements, such as The UN Convention on Biological Diversity.

The waters of the Barents Sea (and a sizeable portion of the Russian EEZ) are covered by OSPAR Region 1 – Arctic waters. In spite of this, the Russian Federation is not party to the OSPAR or any of its work areas such as the Biological Diversity and Ecosystems Strategy which is concerned with all human activities which can have an adverse effect on the ecosystems and the biological diversity of the North East Atlantic and sets ecological quality objectives, requires assessments of threatened species and habitats and the development of an ecologically coherent network of marine protected areas and the assessment of human activities which may adversely affect ecosystems.

Russia has attended various meetings with observer status and it is understood that many of the key issues covered by OSPAR are addressed with Russia, via bilateral agreements for the region with Norway. None the less this remains an anomaly, meaning that Russia is not bound by all aspects of the agreement. By contrast, although not directly relevant to this assessment, it is nonetheless interesting to note that the Russian Federation is party to the Helsinki convention (ratified in 1999), which has similar intent but which covers the Baltic Sea.

The Norwegian Government have also developed and ecosystem management plan for the Barents Sea / Lofoten. As such a large proportion of the certified fisheries takes place in Norwegian jurisdiction this is relevant. Furthermore the plan also highlights the need for and potential focus for future ecosystem management cooperation with the Russian Federation.

The fleet covered by this assessment does have robust and comprehensive systems in place to minimise any wider ecosystem impacts and all are fully compliant with (and regularly inspected against) International MARPOL standards of pollution prevention. More sophisticated assessments of impact such as carbon foot printing or waste from fish processing are not required as part of the MSC assessment.

5. Administrative context (P3)

Principle 3 of the Marine Stewardship Council standard states that:

> ***The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.***

In the following section of the report a brief description is made of the key characteristics of the management system in place to ensure the sustainable exploitation of the fishery under assessment.

5.1 Governance & Policy

5.1.1 Legislative Framework

The Russian Federation has signed and ratified relevant international agreements such as the 1982 United Nations Law of the Sea Convention (UNCLOS) and the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Straddling Stocks Agreement). Russia ratified both UNCLOS and the Straddling Stocks Agreement in 1997. The Russian Constitution of 1993 states that the provisions of international agreements entered by the Russian Federation stand above those of national law.

The Federal Fisheries Act of the Russian Federation was signed in December 2004. It contains eight chapters (with 57 articles) on i) general provisions; ii) the right to aquatic biological resources; iii) fisheries; iv) fishing rights to users; v) fisheries management; vi) protection of aquatic biological resources and their environment; vii) dispute settlement; and viii) concluding provisions. Chapter 3 on fisheries is the most extensive, including explicit consideration of industrial, coastal, research, recreational and artisanal fisheries. A major revision of the Federal Fisheries Act was made in 2007. Many of the changes were purely technical, but there were substantial ones as well, notably the introduction of mandatory landing in Russia of catches taken in the Russian EEZ. Several changes were aimed at improving enforcement (see below). Since the Federal Fisheries Act is a framework law, the new provisions could not be implemented directly. In the following years, a number of regulations below the level of federal law were adopted, providing the 'mechanisms' for implementation.

Most fisheries regulations apply at the level of fishery basin. Since 1965, the Soviet Union/Russian Federation has been divided into a number of fishery basins (currently eight), among which the Far Eastern and the northern are the most important. The current fisheries regulations of the Russian northern fishery basin – the regions bordering on the Barents and White Seas – were adopted in February 2009, providing, among other things, rules for closed areas, fishing gear (e.g. mesh size), by-catch and minimal allowable size of different species. It is these regulations which are applicable to the fishery under assessment.

The Federal Fisheries Act, including its subordinate legislation, does not exist in a legal vacuum. A number of laws and regulations pertaining to other areas regulate important aspects of the fisheries sector. Among these are the Law on the Exclusive Economic Zone of the Russian Federation, the Law on Fauna, the Tax Code and the Customs Code.

5.1.2 Consultation, Roles & Responsibilities

A number of bodies of governance, industry organizations and research institutions are involved in the management of Russian fisheries. The widespread involvement of user groups is a heritage from Soviet times, when there was no clear dividing line between government and industry, although there were well-established procedures and arenas for government consultation with user groups such as shipowners, the fish-processing industry and labour unions. 'Departmental' (*vedomstvennye*) research institutes were also highly integrated in all aspects of fisheries management. Although user-group influence in Russian fisheries management was at its height in the 1990s, when the regional and basin-level fisheries councils (see below) were effectively in control of quota allocation in their respective regions, extensive consultation with industry and science still remains.

Industry Representation

There is continuous informal dialogue between Russian fisheries management bodies and the fishing industry, including individual shipowners, associations of shipowners or the processing industry. In the northern basin, the large 'traditional' shipowners like Murmansk Trawl Fleet, normally have direct access to government, while the Union of Fishery Enterprises in the North represents some 60 smaller fishing companies (accounting for 30-35 % of supplies in the northern basin). Both the Union and Murmansk Trawl Fleet are also represented on the Joint Norwegian–Russian Fisheries Commission (JNRFC).

A more formal arena for interaction between the Russian fishing industry and the government are the advisory bodies - the so-called fishery councils - found at both federal, basin (here: the northern basin) and regional (here: Murmansk county) 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. Although basin and regional level fishery councils have existed since Soviet times, the 2004 Federal Fisheries Act made them mandatory. These councils advise on a wide range of fishery-related issues, including fleet operations; 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 councils consist of representatives of the fishing industry, federal executive authorities, executive bodies of the Russian federal subjects (the regions), research institutions and some non-governmental organisations, including the indigenous populations of the North, Siberia and the Far East. The current regulations of the Northern Basin Scientific and Fishery Council were given in 2002. Corresponding regulations for the Murmansk Territorial Fishery Council were issued 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.

Figure 5.1: The advisory bodies (fishery councils) relevant to Murmansk County fisheries

Level	Advisory body		Authority
Russian Federation	Public Council	→	Federal Fisheries Agency
Federal fishery district	Basin Scientific and Fishery Council (Northern Basin)	→	
Murmansk region	Territorial Fishery Council	→	Government of the Murmansk region

Scientific Advice

Since Soviet times, Russia has maintained an extensive system of fisheries research in oceanography, biology of marine organisms, resource assessment, fishing gear and processing technology, among other things. A substantial part of this work was traditionally done outside Soviet/Russian waters to meet the demands of the distant-water fishing fleet. The federal Russian research institute for fisheries is VNIRO, the All-Russian Scientific Institute for Fisheries Research and Oceanography. Regional institutes are found in the different fishery basins, in the northern basin PINRO (Knipovich Scientific Polar Institute for Marine Fisheries Research and Oceanography) in Murmansk, with its affiliate SevPINRO in Arkhangelsk (mainly responsible for marine mammals and inland fisheries).

In the early 1990s, the research institutes became organised in a new way, as federal state unitary enterprises. The led to a drop in direct financial support but by way of compensation the institutes received large research quotas - a share of which were fished by commercial fishing companies, to enable research activities at sea, but also enable some economic benefit from the sale of catches. From 2007–2009 new regulations were implemented, making it illegal for the institutes to benefit financially from the research quotas and public financing of the research institutes were again increased. However, the total outcome seems to have been a net loss for the institutes' budgets of some 20 % on average.

In the northern basin, scientists from PINRO and VNIRO participate in international cooperation in ICES and have excellent levels of research collaboration with Norway in the Joint Commission, as well as under bilateral cooperation agreements between the Norwegian Institute of Marine Research on the one hand and PINRO and VNIRO on the other. It is primarily PINRO that has been involved in this international cooperation. For instance, a PINRO scientist was until recently head of the ICES Arctic Fisheries Working Group.

National Management Bodies

The Federal Fisheries Agency (*Rosrybolovstvo*) which is responsible for fisheries management in the Russian Federation was established following a reorganisation of Russian federal bureaucracy in 2004, and succeeds the former Russian State Committee for Fisheries (which in turn succeeded the Soviet Ministry of Fisheries). Initially placed under the Ministry of Agriculture as a strictly implementing agency, it regained responsibility for policy formation in 2007, from when it has been directly subordinate to the Government.

The most important aspect of the 2004 reform was the introduction of three categories of federal bodies of the executive powers, clearly stating their respective responsibilities, as outlined below:

federal ministries (*ministerstva*)	define state policy and perform normative and legal
federal agencies (*agentstva*)	implement state policy and provide services to the population
federal services (*sluzhby*)	control and monitoring functions.

From 2004 to 2007, the Ministry of Agriculture was responsible for policy making in Russian fisheries, while the Ministry's Veterinary Service was responsible for fisheries enforcement (except physical inspections in the Russian EEZ; see below). Since 2007, however, all these functions are again assembled in one body of governance, the Federal Fisheries Agency. The change came after intense lobbying from the Russian fisheries complex. Despite its lower formal status, the Federal Fisheries Agency has wider powers in its particular field than many ministries. A main point behind the 2004 reform was to divide political, implementing and controlling functions between different bodies of governance, among other things aimed at reducing corruption in the Russian bureaucracy. Contrary to this purpose, the role of the Federal Fisheries Agency is by no means limited to the implementation of government policy and in recent years the Federal Fisheries Agency has been increasingly active in policy making and legislative work and has also regained responsibility for fisheries control (except in the EEZ). Additionally, efforts are on-going in the agency to assume an even greater role in policy formation, even lobbying for fisheries to have a dedicated ministry.

The establishment in 2008 of a Governmental Fisheries Commission for development of the Fisheries Complex is yet another indication of the political will to reform the Russian fisheries sector. According to its statutes, the commission's main role is to ensure efficient cooperation and coordination between different federal bodies of governance on fisheries-related issues, as well as to consider proposals in the area of fisheries policy, including legislative initiatives. The commission and its working groups bring together representatives of interested federal bodies of governance and the fishing industry. It meets at least quarterly and is led by 1st Prime Minister. Since the Federal Fisheries Agency does not have ministerial status, the 1st Prime Minister also represents fisheries issues in the Government. Until recently, many attempts at improving the regulative framework for the fisheries sector have failed due to inter-agency tugs-of-war and other conflicts of interest. Since 2007 it is likely that the commission has played an important role in facilitating the adoption and implementation of the large number of new regulations, which were previously thwarted by inter-agency differences.

Quota Allocation

From 2000 to 2003 quota auctions were trailed as a method of allocating catches. In 2003, the government introduced a fee on quota shares, with quotas allotted for five years ahead, based on the individual shipowner's proven catch capacity (track record) over the last three (now: five) years. A minimum threshold level was also established for different categories of vessels, aimed at reducing the number of marginal actors in the Russian fishing industry. If a company received an annual quota lower than the threshold level, it would have to merge with another company with a quota in order to achieve the threshold level and so retain the right to participate in fisheries. Another alternative would be for the company to quit the fishing business and auction off its fishing rights to other fishing companies. The effect was reduced fleet capacity and the removal of older vessels.

An inter-ministerial commission under the leadership of the Federal Fisheries Agency carries out quota distribution of fish stocks that are shared with other states (where TAC is set at the international level, such as in the Barents Sea). The amendments to the Federal Fisheries Act in 2007 extended the allocation of quota shares to ten years in order to spur investments in the renewal of the ageing Russian fishing fleet. The second major change, the introduction of mandatory landing in Russia of catches taken in the Russian EEZ, is aimed to secure deliveries of fish to the Russian fish-processing industry (thereby furthering employment objectives), increase the availability of relatively cheap fish products on the Russian market (furthering nutrition objectives) and reduce the possibilities for Russian fishermen to overfish their quotas (furthering control objectives). Although mandatory landing of catches in Russia does not mean that fishing companies are forced to *sell* their catches to Russian buyers (also foreign buyers operate on the Russian market), a new economic incentive has been introduced to make this option more attractive: a reduction of quota levies to only 10% of the full rate for those who sell their fish at home.

Enforcement

Traditionally, the Ministry of Fisheries/State Committee for Fisheries has been responsible for all fishery-related issues in Russia, including enforcement of fisheries regulations. In 1997, the President decided to transfer responsibility for enforcement in the Russian EEZ from the State Committee for Fisheries (which subsequently became to Agency) to the Federal Border Service (which was incorporated into the Federal Security Service (FSB) in 2003). The Federal Border Service inspects fishing vessels at sea during fishery operations (based on spot checks) or transhipment, to see whether the catch log, fishing gear and catch on board are in compliance with the requirements of fishery regulations.

The Federal Fisheries Agency and its regional branches continued to enforce fishery regulations in Russian territorial waters and convention areas – in addition to inland fisheries. It also continues to administer the system for closing and opening of fishing grounds in cases where excessive numbers of undersized fish are detected in the catches. Inspectors from Murmanrybvod, the local enforcement branch of the Agency, can close a 'rectangle' (a square nautical mile) on site for a period of three days. After three days, the 'rectangle' is re-opened if scientists from PINRO make no objections (in practice, if the proportion of undersized fish in catches does not continue to exceed legal limits.

In 2006/2007, a regional branch of the Federal Fisheries Agency was established; the Barents and White Sea Territorial Administration of the Federal Fisheries Agency (the BBTA), which serves as the implementing agency in the northern basin. Quota control in the northern basin is performed by the BBTA) who carry out physical inspections in port and also carry out inspections at sea in Russian territorial waters and outside the Russian EEZ (e.g. in the Barents Sea Loophole and the Fishery Protection Zone around Svalbard, declared by Norway in 1977). The VMS data are also collected and analysed by the BBTA.

Regional influence: The regional executive authorities in north-western Russia (the governors) established their own fisheries departments in the early 1990s. As mentioned, they had significant influence on quota allocation in the 1990s, until the quota auctions were introduced. Since the current quota allocation system was introduced in 2003, their role has been limited to administering a limited coastal fishery.

5.1.3 Objectives

The Federal Fisheries Act defines the concept of 'protection and rational use' of aquatic biological resources as the main goal of Russian fisheries management. This concept was widespread in Soviet legislation for the protection of the environment and exploitation of natural resources, and has remained so in the Russian Federation. 'Rational use' might often be given the upper hand over 'protection', but the concept bears some resemblance to the internationally recognized ideal of sustainability, in so far as the emphasis is on long term and sustained use of the resource, supported by science for socio-economic purposes.

The 2009 strategy for the development of the Russian fisheries complex until 2020 defines as its major objectives to ensure social and economic development of the Russian Federation and turn the country into one of the world's leading fishery nations. A main goal is to reduce export of raw fish and re-build an economically sustainable fish-processing industry in Russia.

Since the break-up of the Soviet Union, different governmental structures have emphasised different goals and objectives for the country's fisheries management. The federal body responsible for fisheries management – whether the State Committee for Fisheries or Federal Fisheries Agency – tend to stress employment and food independence, with deliveries to Russian ports as its main practical objective, whilst, on the other hand, The Ministry of Economic Development and Trade, typically advocates an objective of increased revenues to the federal budget and increased transparency in the quota allocation process.

Typically in recent years, the fisheries agency has had the upper hand. The first indication that a new wave of legislative reform was underway came when the President made his annual speech to the Federal Assembly (the upper house of the Federal Parliament) in April 2007. For the first time, fisheries-related issues were given more than a passing mention in the President's address on the state of the nation, calling on the Government to prioritise objectives which improve customs control, prevent overfishing; restore the shipbuilding industry and ensure quota is taken by Russian companies.

Simultaneously the Federal Fisheries Agency used their increased policy influencing role to, advocate objectives of social welfare, food security and national independence, including more minor branch objectives such as increasing fish consumption by making fish products more affordable by redirecting Russian catches to Russian ports and reducing the country's dependence on imported seafood.

5.1.4 Incentives for Sustainable Fishing

Different foreign studies, among them several from the WWF, have estimated annual Russian fisheries subsidies at US$0.5bn. – US$1.6bn. One study assessed that only slightly less than half of this was 'good' subsidies, contributing to sustainable fisheries. Several of these studies are based on one source only, the federal programme *Ryba* ('fish'), which was aimed mainly at renewal, and modernisation of the fishing fleet, but which has seen little or no implementation.

Most studies point out that state subsidies to the Russian fisheries sector are very modest compared to Soviet subsidies. Russian authorities have emphasised that the fisheries sector is now a net donor to the state budget. In an interview in 2008, the Head of the Federal Fisheries Agency said that the sector contributes an annual 20 bn. roubles (US$0.68bn) to

the federal budget, while it receives only 8 bn. (US$0.27bn). In 2009, the entire federal budget for issues administered by the Federal Fisheries Agency was just over 15.5 bn. roubles (US$0.52bn.), around twice as much as the previous year according to officials. The majority of this budget went to management, research and education. Just less than a quarter of the budget was spent on items that may directly or indirectly increase capacity, such as spending on infrastructure or provision of beneficial bank loan rates to fishing and processing companies in order to finance equipment, or modernisation of vessels and factories. Few of the investments and subsidies go towards projects *directly* increasing fishing capacity, and no such investments have been identified for the fleet under assessment.

The *indirect* effect on fishing capacity of improving port infrastructure and processing or storage facilities is at best uncertain. There is high demand for Russian-caught fish – and a well-developed infrastructure for handling the catches in many neighbouring countries. Thus it may be argued that a development of Russian onshore infrastructure would serve to redirect Russian-caught fish to Russia, but not necessarily to increase total fishing capacity. Statements by officials clearly indicate substantial underuse of initially allocated budget funds in 2009. The figures from the Federal Fisheries Agency suggest a much more modest level of subsidy than the international studies cited above: US$0.14bn although, a certain sum may come from other sources, e.g. regional budgets, and in the form of tax exemption and loan guarantees.

The current targeted programme for the fisheries sector (2009–2013) is directed towards three main areas: shipbuilding, port infrastructure and fish restocking plants. The original budget for the programme was 62bn. roubles (US$2.1), around half of which was supposed to come from the federal budget. Due to the financial crisis, budget funding of the programme has since been cut dramatically. The part of the programme which is to be funded via the federal budget will go towards large infrastructure projects, construction of research and inspection vessels and modernisation of restocking plants. The projects aimed at renewal and modernisation of the fishing fleet and the processing industry are all to be financed by 'non-budget sources'. The programme does not specify what this means, beyond a sentence mentioning private investors and credit institutions.

The Federal Fisheries Agency has worked actively with state banks, such as the agricultural bank Rosselkhozbank, in order to secure loans for companies in need of investment capital. Another targeted programme for civilian shipbuilding (2009–2016) also contains projects directed towards the fishing fleet. This programme will finance R&D work aimed at developing prototypes of fishing vessels to be built at Russian shipyards, but it will not finance shipbuilding.

Both the Russian fisheries authorities and industry organisations have repeatedly called for more state support, including subsidies, for the fisheries sector, but the overall impression is that the Government is not generally in favour of direct subsidies. Despite this, in 2009 the Government introduced a new form of subsidies aimed at fleet renewal and modernisation of the processing industry again focusing on preferential loan repayment.

5.2 Fishery Specific Management System

5.2.1 Compliance & Enforcement

The Federal Fisheries Agency (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 and accumulated reports each 15th day from all fishing vessels, as well as VMS data. It also administers the system for closing and opening of fishing grounds and inspects fishing vessels in port, in Russian territorial waters and in convention waters outside the Russian EEZ, notably the Barents Sea Loophole and to some extent also in the Protection Zone around Svalbard.

The Federal Border Service under the FSB inspects fishing vessels within the Russian EEZ, including the Adjacent Area between the Norwegian and Russian EEZs (the so-called Grey Zone). When Russian vessels fish in the Norwegian EEZ or the Protection Zone around Svalbard, they are inspected by the Norwegian Coast Guard. When they land fish in Norwegian ports, they are inspected by the Norwegian Directorate of Fisheries. When they land in other European ports, they are subject to the NEAFC port state control scheme. Also of relevance here is the new EU IUU regulation, whereby all imports of fish products in to the EU (even in the processed form via import from China) must have documentation from the designated national authority (BBTA), to state it is legally landed.

The OT vessels undergoing assessment take 80 % of their fish in waters subject to Norwegian enforcement, and deliver all but 3 % of cod and haddock outside Russia, either directly to Norwegian ports or through other NEAFC states via transhipment to transport vessels at sea (see introductory sections of this report). (Fish caught in the Russian EEZ is since summer 2009 taken to Murmansk for customs clearance, but is then transhipped for export.)

There are three potential problems with the Russian enforcement system: i) lack of physical surveillance; ii) lack of coordination between different enforcement bodies; and iii) possible corruption. First, there are indications, including comments from captains during this assessment process that although inspections by the Russian authorities in the Russian EEZ are as rigorous as inspections by the Norwegian Coast Guard, it is acknowledged that they are less frequent, although possibly on the rise. For instance, an MRAG IUU risk assessment commissioned by OT in 2009 states that prior to mid-2008 there was a ten-year interval where there were no inspections in the in the Russian EEZ in the Barents Sea at all. This is in line with anecdotal evidence from interviews with Russian and foreign captains fishing in the area. During assessment consultations with representatives of the Federal Border Service / FSB in Murmansk, no figures were given about inspection frequency, but it was indicated that 90% of all transhipments taking place in the Russian EEZ are now inspected.

Regrettably, BBTA were not able to meet with the assessment team during the site visit to Murmansk, but anecdotal evidence from captains indicates that the BBTA have a couple of old inspection vessels, taken over from the old civilian inspection service Murmanrybvod. These occasionally conduct inspections in Russian territorial waters, the Barents Sea Loophole and the Protection Zone around Svalbard. OT's own inspection overview statistics indicate that none of the certified vessels were inspected in Russian territorial waters or the

Russian EEZ in 2007 (one vessel was inspected once by Russian enforcement authorities in the Loophole and one in the Svalbard Zone). In 2008, one of the vessels was inspected three times in Russian waters, and two vessels were inspected once there (two vessels were inspected once in the Svalbard Zone, and one vessels was inspected three times in the Loophole).

Second, there has at times been a lack of coordination among the different bodies of governance involved in Russian fisheries enforcement. The transfer of responsibility for enforcement in the EEZ to the Federal Border Guard in 1997/98 was highly unpopular in Russia's fisheries complex, and there was allegedly very limited contact between the Border Guard and the State Committee for Fisheries in the first years after the reorganisation. The 2004 reform in the Russia's federal bureaucracy (see above) added confusion as the Federal Veterinary Service under the Ministry of Agriculture was to take over the enforcement functions of the former State Committee for Fisheries. The new (and *de facto* elevated) status of the Federal Fisheries Agency since 2007 has probably improved the situation and site visit consultations suggest that cooperation between the Federal Border Service/FSB and the BBTA is good. The two bodies partly undertake the same control functions, as the FSB also receive catch data from the vessels, but the suggested benefit of this is an extra layer of security / enforcement.

Third, there are indications that Russia has relatively poor corruption controls. For example, the Worldbank's Worldwide Indicator of Governance[15] project suggested Russia was well below the 25th percentile of global nations in terms of corruption controls. According to Russian media reports, the fisheries sector has also had problems controlling corruption. Something that has been admitted by Russian fishery authorities, who point out that corrupt practices undermine efforts to cope with illegal fisheries. The media regularly bring news about cases brought to court where fisheries corruption has been uncovered, but these mostly relate to the Russian Far East or sturgeon catch in the Caspian Sea. In Russian fisheries debate, the northern basin is generally characterised by law and order, perhaps as a result of the tight cooperation with Norway through the JNRFC. Nevertheless, according to a follow-up document to the 2006–2007 joint assessment by the Norwegian and Russian Auditor Generals (see below) from September 2009, the Russian Public Prosecutor states that there is a corruption problem within the Russian bodies of fisheries management, and that sanctions are still too mild to deter fishermen from violations. Read in its context, this could be interpreted as relevant also for the Barents Sea fisheries.

An effective enforcement system does not in itself constitute an effective system of deterrence. There has to be a sufficient risk of conviction in court, and the punitive measures have to be sufficiently severe to deter possible transgressors. Several of the 2007 amendments to the Federal Fisheries Act were aimed at correcting perceived flaws in existing enforcement and prosecution practices. One new provision simplifies the procedures for revoking fisheries licences and specifies the conditions for this punitive measure, which will probably make it easier to use in practice. Further, it is now explicitly stated in the law that VMS data can be used to convict offenders. If this measure can be implemented, it will be a great victory for the fishery authorities, who have fought other

[15] *http://info.worldbank.org/governance/wgi/sc_country.asp*

bureaucratic structures and industry lobbyists for years for the right to use VMS data as proof in court.

The Norwegian Directorate of Fisheries has estimated Russian overfishing in the Barents Sea after the turn of the millennium, reaching its height at around 100,000 tonnes in the mid-2000s. Since then, considerable steps have been taken which have substantially improved the situation, and a steady decline in IUU has been observed. Although the Russian authorities (and scientists) acknowledge that IUU has been a problem in the past, and that there has been a substantial recent improvement, they do not accept the Norwegian IUU estimation methodology and therefore question its resulting figures. None the less, both countries have collaborated on devising an agreed assessment methodology for IUU.

It is assumed that the practice of transhipment of fish at sea for delivery in third countries made overfishing possible by enabling vessels to report incorrect figures to Russian authorities, knowing that these would not be cross-checked with the transhipment landings. The problem, hence, was mainly believed to be the combination of i) infrequent or insufficient physical inspections in Russian waters (i.e. the perceived area of most overfishing); ii) lack of communication between port state and flag state authorities; and iii) lacking prosecution of offenders on the Russian side.

According to both Russian and Norwegian enforcement authorities, prosecution of offenders on the Russian side has improved markedly the last couple of years, the FSB often using evidence provided by Norwegian enforcement authorities to go to court. Further, it is assumed that the NEAFC port state control regime has largely solved the second of the three problems. There is also evidence that inspections in Russian waters have increased since 2007 – which is logical following the attention given to overfishing by the Russian political leadership since then.

For the present assessment, it is of importance that the certified vessels take around 80% of their combined cod and haddock catches in waters subject to enforcement by the Norwegian Coast Guard. Inspection statistics reveal that each of the 16 vessels was controlled by Norwegian authorities nearly six times on average in both 2007 and 2008, i.e. once every second month. If we assume that the Coast Guard's physical inspections are effective in revealing discrepancies between reported catches and the amount of fish actually on board, there is limited possibility for overfishing since a trip normally lasts 2-3 months. Norwegian authorities inspect all landings from Russian vessels in Norwegian ports. We assume that the BBTA effectively keeps track of reported catch by Russian vessels. If a vessel shall be able to overfish, it will have to underreport catches. None of the inspections by Norwegian authorities of the 16 OT vessels in 2007 and 2008 revealed underreporting of catch. (There was one violation of Norwegian by-catch regulations, one violation of gear restrictions/round strap length and one minor violation of Norwegian log book procedures.

All inspections in the Svalbard Zone resulted in a written warning since Russia has not formally accepted this zone as Norwegian and deny its captains to report active to the Norwegian Directorate of Fisheries. This should be regarded as a formality. Norway and Russia have for more than three decades agreed to disagree on the formalities, but the practical fisheries management cooperation between the two countries is good also in this ocean area. To sum up, there is reason to believe that the OT vessels are subject to comparatively effective enforcement, and there is no evidence of them overfishing their

quotas in recent years, nor that they engage in any other kind of systematic IUU fishing. The widespread information about corruption in Russian fisheries management, acknowledged even by the country's own fishery authorities, nevertheless makes it difficult to conclude that there is a high degree of confidence that fishers comply with the management system under assessment.

5.2.2 Decision Making & Dispute Resolution

Disputes between Norway and Russia are solved in the JNRFC. Since 1993, there is a so-called Permanent Committee under the Commission, which meets 3-4 times a year between the annual sessions in the Commission itself. The same year, direct contact was established between the two countries' enforcement bodies. Modern communication technology has also facilitated daily contact between Norwegian and Russian agencies involved in research, regulation and enforcement.

As described above, in Russian fisheries management there is a well-established system of consultation with user groups, through the fishery councils at different levels and directly between user groups and government, which proactively seeks to avoid conflict between fishery sub-sectors. Both quota allocation and other regulatory measures are subject to such consultation, although there is sometimes a lack of transparency about how such decisions are taken, and it is not clear that all stakeholders are able to fully contribute. For example it is not clear that environmental NGOs (e.g. WWF), are able to contribute as an active stakeholder in the management process. In fisheries elsewhere in the world, there is increasing recognition that facilitating the active representation of groups with a focus interest and expertise on marine environmental and status, can play an important role in the movement toward strategic ecosystem based management, designed to ensure sustainable industries. In most cases, such NGOs typically play an executive / advisory / official observer role and do not directly contribute to management decisions. This has proven effective for example in the recent EU regional advisory councils, and has contributed toward moving fishery objectives toward longer term stability, rather than short term profit.

If shipowners or captains are fined by either Norwegian or Russian enforcement authorities, they have the opportunity to take the case to court. A number of alleged fishery violations are each year taken to court in both Norway and Russia, some decided in favour of the shipowners/captains, some in the favour of the country's enforcement body.

5.2.3 Management Evaluation

Internal review of the management system is performed by the fishery councils at different levels and by the Federal Fisheries Agency, which in turn reports to the 1st Deputy Prime Minister, who is responsible for fisheries management in the Russian Government. The Federal Fisheries Agency can also report to the President about its activities. In the Federal Fisheries Agency, there is regular review of the performance of the agency's regional offices. Recommendations from the regional fishery councils are important in the regional offices' feedback to the federal office.

Regular external review is performed by the Russian Auditor General. The latter in 2005 invited its Norwegian counterpart to conduct a parallel audit of the Barents Sea fisheries. After this work was finished in 2007, the two parties continue to monitor developments in regular follow-up meetings.

6. Background to the Evaluation

6.1 Assessment Team

Assessment team leader: Tristan Southall

This evaluation was led by Tristan Southall, an experienced fisheries assessor who has worked as both principles 2 and 3 experts on a number of previous MSC assessments, including the Scottish Pelagic assessments for both herring and mackerel. More recently Tristan led the IPSG Mackerel Assessment and has also been involved in the development and trialling of a new MSC assessment methodology, based on risk analysis, for use in data deficient situations.

When not assessing the sustainability of fisheries Tristan specialises in fishing and marine industry consultancy, combining detailed understanding of marine ecosystems with broad experience of fishing and aquaculture industry systems, infrastructure and management. This provides him with an informed position which balances the needs of marine ecosystems, biodiversity and wider environment with the practicalities of the industry operation. Bridging these two important areas enables sustainably-minded consultancy, able to interpret and advise upon the impacts of different management decisions on both marine ecosystems and economics.

Tristan's professional experience also includes the evaluation of fisheries on sub-sea environments, analysis of fishery and fleet performance, and a wide range of fisheries and aquaculture planning and management studies, all of which seek to combine both socio-economic and environmental perspectives. Tristan has recently coordinated EU fisheries training and promotion activities – covering all aspects of sustainable fisheries management and control.

Expert Advisor: Martin Gill

Martin Gill, the Managing Director of FCI, coordinated the assessment process, and participated as a team member during the assessment as required. Martin is a marine biologist and fisheries specialist, a former staff member of the Copenhagen-based Eurofish international fishery development organisation, and is a shareholder and board member of Food Certification International.

Martin was appointed as Executive Director of Food Certification (Scotland) Ltd in June 2002 and led a successful management buyout in early 2007. He joined from a five year period with FAO EASTFISH, a Food and Agriculture Organisation of the United Nations project providing a fish marketing and investment service for Central and Eastern Europe based in Copenhagen. (This project is now known as Eurofish). Among other duties he acted as the founding editor of the organisation's Eurofish magazine.

A graduate in Marine Biology from University College, Swansea, he was also a former Editor of World Fishing magazine for 5 years and has contributed since 1992 to the Encyclopaedia Britannica Book of the Year with the commercial fisheries section.

Expert team member: Dr Paul Medley

Dr Medley is an experienced stock assessment specialist, will assist with analysis of the fishery management systems in place, assessment of stock health. He is a fishery biologist

and population dynamicist with particular experience with respect to pelagic fisheries, shellfish and small-scale fisheries, and wide experience with MSC pre-assessment and full assessments. Dr Paul Medley is an experienced fishery scientist and population analyst and modeller, with wide knowledge and experience in the assessment of pelagic stocks (amongst a range of marine fish stocks and ecosystems). He has travelled widely and worked with a range of fishery systems and biological stocks, both as principal researcher and as evaluator. He is familiar with MSC assessment procedures, having participated in the first MSC full assessment – Thames herring – and is currently working with the MSC on the development of guidelines for certification of small scale, data poor fisheries. He has also participated in the full assessment of the South Georgia toothfish fishery, and with a number of pre-assessments. He is familiar with a wide range of fisheries in the North East Atlantic, and other parts of the world, and over the period 2000 to 2005 he has been serving with the Centre for Independent Experts, University of Miami, as an evaluator of various US fishery research programmes. He is based in York.

Expert team member: Dr Geir Hønneland

Geir Hønneland is Research Director of the Fridtjof Nansen Institute, Norway. He holds a Ph.D in political science speaks Russian fluently and has followed the developments of Russian fisheries politics for one and a half decades. Among his books are Russian Fisheries Management: The Precautionary Approach in Theory and Practice (Martinus Nijhoff Publishers, 2004) and Implementing International Environmental Agreements in Russia (Manchester University Press, 2003) (including fisheries agreements), and he has published a number of articles about Russian fisheries management in peer reviewed journals.

Geir also has wide range of evaluation experience, e.g. for the FAO relating to the FAO Code of Conduct for Responsible Fisheries. Geir has also produced a country study of Russian fisheries management for the OECD. Geir is based near Oslo in Norway. A more comprehensive presentation can be found at the FNi´s website: http://www.fni.no/cv/cv-geh.html

6.2 Public Consultation

Public announcements of the progression of the assessment were made as follows:

Date	Announcement	Method of notification
24.12.08	notification of commencement of assessment	notification on MSC website
17.02.09	nomination of Assessment Team candidates	notification on MSC website
	solicitation of inputs to stakeholder consultation and assessment	email, phone and mail
23.07.09	announcement of Assessment Tree and Scoring Guideposts	notification on MSC website
21.10.09	announcement of assessment visit and convening of stakeholder consultation meetings	direct email, notification on MSC website
30.11.09 – 04.12.09	assessment visit	Advertisement on Intrafish
29.04.10	notification of Proposed Peer Reviewers	Notification on MSC website
13.08.10	notification of Public Comment Draft Report	Notification on MSC website
date	notification of Final Report	Notification on MSC website
date	Notification of Public Certification Report	Notification on MSC website

6.3 Stakeholder Consultation

6.3.1 Extent of Available Information

At the time this assessment was undertaken, a number of MSC assessments had already been completed (detailed below) and findings presented in published assessment reports. These formed an important background resource for the assessment team – collating and reporting on available stock and fishery information, as well as highlighting areas of stakeholder and assessment team concern.

A total of 21 stakeholder individuals and organisations having relevant interest in the assessment were identified and consulted during this assessment. The interest of others not appearing on this list was solicited through the postings on the MSC website, and by advertising on the website 'Intrafish'.

Initial approaches were made by email and followed up by phone. Issues raised during correspondence were investigated during research and information gathering activities, and during interviews.

Most stakeholders contacted during this exercise either indicated that they had no direct interest in this fishery assessment, or that they had no particular cause for concern with regard to its assessment to the MSC standard.

6.3.2 Stakeholder Issues

Written and verbal representations were provided to the assessment team expressing a range of views, opinions and concerns. The team is of the view that matters raised have been adequately debated and addressed as a part of the scoring process for this fishery, and that none of the issues raised, therefore, require separate attention beyond that represented in this report.

6.4 Interview Programme

Following the collation of general information on the fishery, a number of meetings with key stakeholders were scheduled by the team to fill in information gaps and to explore and discuss areas of concern. Meetings were held as follows:

Name	Position	Organisation
Mr Sergei A. Sennikov	Client contact	Ocean Trawlers Group, Murmansk
Captain of "Petr Petrov"	Vessel Captain	Ocean Trawlers Group, Murmansk
Captain of "Novator"	Vessel Captain	Ocean Trawlers Group, Murmansk
Captain of "Boris Zaytsev"	Vessel Captain	Murmansk Trawler Fleet, OT, Hammerfest
Captain of "Ivan Shankov"	Vessel Captain	Murmansk Trawler Fleet, OT, Hammerfest
5th Captain	Vessel Captain	Murmansk Trawler Fleet, OT, Hammerfest
Frode Oyan	Contact	Hammerfest Frys terminal AS (Cold Store)
Dr Yuriy Lepesevich	Research Director	Knipovich Polar Research Institute of Marine Fisheries & Oceanography (PINRO)
Dr Eveniy Shamray	Head of Laboratory of Bioeconomics & Short-term Prediction	PINRO
Dr Yuriy A Kovalev	Head of Laboratory of Mathematical Support for Stock	PINRO

	Assessment	
Dr Nathalie A Anisimova	Researcher for Laboratory of Commercial Invertebrate	PINRO
Dr Stanislav Fomin (Dr Konstantin Zugurovsky)	Marine Programme Coordinator Barents Sea (Head of Conservation Department)	WWF Russia
Maren Eskmark (Nina Jensen)	Head of Conservation Department	WWF Norway
Mr Dmitry Skiba	Deputy of State Inspection Department	Murmansk Marine State Inspection PU FSB
Mr Svyatoslav Zilin	Head of Communication Department	Murmansk Marine State Inspection PU FSB
Mr Vasiliy Nikitin	General Director	Union of Fish Industrialists of the North
Mr Tikhonchyk Valeriy	1st Deputy of General Director	Union of Fish Industrialists of the North
Mr Alexander Nikolaenko	Main specialist for production	Union of Fish Industrialists of the North
Ms Karina Zadvornaya	Member of Union of Fish Industrialists of the North	Murmanseld 2
Arzu Zaplatina	Member of Union of Fish Industrialists of the North	Murmanseld 2
Ilia Kudrun	Member of Union of Fish Industrialists of the North	Vega
Oleg Ors	Member of Union of Fish Industrialists of the North	Vega
Alexander Borisov	Member of Union of Fish Industrialists of the North	Murman Seafoods
Vladimir Rubnikov	Member of Union of Fish Industrialists of the North	Relit Ltd
Alexey Kolish	Member of Union of Fish Industrialists of the North	Karelian Seafood
Alexander Malinnikov	Member of Union of Fish Industrialists of the North	LKT
Mr Sergey Balyaboo	Head of Committee	BBTA (Committee of Fishery's Complex)
Ms Victoria Tolkacheva	Main Specialist in Fisheries	BBTA (Committee of Fishery's Complex)
Dr Einar Ellingsen Dr Tor Glistrup	Enforcement and Control	Norwegian Directorate of Fisheries
Mr Evenko Anatolij	Representative	Association of Coastal Fish Industrialist and Farms of Murmansk (Aquaculture & Coastal Fisheries)

6.5 Other Certification Evaluations and Harmonisation

Four assessments have been undertaken which have some direct relevance to this assessment, and have been referred to both in reporting on scoring this fishery to ensure a workable degree of harmonisation. These are:

» Domstein Longliner Partners North East Arctic cod

http://www.msc.org/track-a-fishery/certified/north-east-atlantic/domstein-longliner-partners-north-east-arctic-cod

» Domstein Longliner Partners North East Arctic haddock

http://www.msc.org/track-a-fishery/certified/north-east-atlantic/domstein-longliner-partners-north-east-arctic-haddock

» Norway North East Arctic offshore cod

http://www.msc.org/track-a-fishery/certified/north-east-atlantic/Norway-north-east-arctic-offshore-cod

» Norway North East Arctic offshore haddock

http://www.msc.org/track-a-fishery/certified/north-east-atlantic/Norway-north-east-arctic-offshore-haddock

No major harmonisation issues have been identified and it has not been necessary to hold a harmonisation meeting between certification bodies.

6.6 Information Sources Used

The principal sources of information used in this assessment process derive from information presented to the team by the client and fishery managers, by information derived as a result of interviews and consultations with members of the fishing industry, processors, regulators, and other stakeholders, and as a result of literature search.

The primary sources of information on this stock and the fishery are the:

» report of the ICES Arctic Fisheries Working Group (AFWG) 2009;

» ICES Advice 2009 - 3.4.1 Cod in Subareas I and II (Northeast Arctic cod);

» ICES Advice 2009 - 3.4.3 Haddock in Subareas I and II (Northeast Arctic);

» joint IMR / PINRO State of the Barents Sea Ecosystem Report (Stiansen *et al* 2009).

Taken in combination these provide a clear consolidated view of the stock, the fisheries that exploit the stock, and the science behind advice on the management of the stock and the regional ecosystem. In addition a number of other sources have been used in this assessment, which is detailed in full in the reference list provided in **Appendix 2**.

7. Scoring

7.1 Scoring Methodology

Process

The MSC is dedicated to promoting "well-managed" and "sustainable" fisheries, and the MSC initiative focuses on identifying such fisheries through means of independent third-party assessments and certification. Once certified, fisheries are awarded the opportunity to utilise an MSC promoted eco-label to gain economic advantages in the marketplace. Through certification and eco-labelling the MSC works to promote and encourage better management of world fisheries, many of which have been suggested to suffer from poor management.

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles:

» **MSC Principle 1** - Resource Sustainability

» **MSC Principle 2** - Ecosystem Sustainability

» **MSC Principle 3** - Management Systems

A fuller description of the MSC Principles and Criteria and a graphical representation of the assessment tree is presented as **Appendix 1** to this report.

The MSC Principles and Criteria provide the overall requirements necessary for certification of a sustainably managed fishery. To facilitate assessment of any given fishery against this standard, these Criteria are further split into Sub-criteria. Sub-criteria represent separate areas of important information (e.g. Sub-criterion 1.1.1. requires a sufficient level of information on the target species and stock, 1.1.2 requires information on the effects of the fishery on the stock and so on). These Sub-criteria, therefore, provide a detailed checklist of factors necessary to meet the MSC Criteria in the same way as the Criteria provide the factors necessary to meet each Principle.

Below each Sub-criterion, individual 'Performance Indicators' (PIs) are identified. It is at this level that the performance of the fishery is measured. Altogether, assessment of this fishery against the MSC standard is achieved through measurement of 31 Performance Indicators. The Principles and their supporting Criteria, Sub-criteria and Performance Indicators that have been used by the assessment team to assess this fishery are incorporated into the scoring sheets (**Appendix 3**).

Scoring of the attributes of this fishery against the MSC Principles and Criteria involves the following process:

» Decision to use the MSC Default Assessment Tree contained within the MSC Fishery Assessment Methodology (FAM v2)

» Description of the justification as to why a particular score has been given to each sub-criterion

» Allocation of a score (out of 100) to each Performance Indicator

In order to make the assessment process as clear and transparent as possible, the Scoring Guideposts are presented in the scoring table and describe the level of performance necessary to achieve **100** (represents the level of performance for a Performance Indicator that would be expected in a theoretically 'perfect' fishery), **80** (defines the unconditional pass mark for a Performance Indicator for that type of fishery), and **60** (defines the minimum, conditional pass mark for each Performance Indicator for that type of fishery). The Assessment Tree and Scoring Guideposts for the Barents Sea Cod and Haddock Fishery are shown as **Appendix 3** to this report.

Scoring outcomes

There are two, coupled, scoring requirements that constitute the Marine Stewardship Council's minimum threshold for a sustainable fishery:

» The fishery must obtain a score of 80 or more for each of the MSC's three Principles, based on the weighted average score for all Criteria and Sub-criteria under each Principle.

» The fishery must obtain a score of 60 or more for each Performance Indicator.

A score below 80 at the Principle level or 60 for any individual Performance Indicator would represent a level of performance that causes the fishery to automatically fail the assessment.

7.2 Barents Sea Scoring Outcomes

The assessment team convened a scoring meeting from 22nd to the 24th March 2010 in Edinburgh (UK). The fully justified output of these meetings is shown in the scoring sheets forming **Appendix 3** to this report. The scores allocated to the assessment tree at individual performance indicator level are shown in **Figure 7.1**. Any instances where a score of below 80 has been allocated at Performance Indicator level – and thus triggering the placing of a condition to bring that element up to good industry practice - are indicated in **red**.

Figure 7.1: Summary of the scores for Barents Sea Cod & Haddock Fishery.

Principle 1 – Stock Status / Harvest Control Rules			Cod	Haddock
1.1.1	Outcome (status)	Stock status	100	100
1.1.2		Reference Points	80	80
1.1.3		Stock Rebuilding		
1.2.1	Management	Harvest Strategy	75	80
1.2.2		Harvest control rules & tools	80	80
1.2.3		Information & monitoring	75	75
1.2.4		Assessment of stock status	90	85

... Continues on following page

Principle 2 – Wider Ecosystem Impacts			
2.1.1	**Retained Species**	Outcome (status)	**75**
2.1.2		Management	**75**
2.1.3		Information	**90**
2.2.1	**Bycatch**	Outcome (status)	**80**
2.2.2		Management	**85**
2.2.3		Information	**80**
2.3.1	**ETP Species**	Outcome (status)	**80**
2.3.2		Management	**80**
2.3.3		Information	**80**
2.4.1	**Habitats**	Outcome (status)	**60**
2.4.2		Management	**75**
2.4.3		Information	**80**
2.5.1	**Ecosystem**	Outcome (status)	**90**
2.5.2		Management	**80**
2.5.3		Information	**95**

Principle 3 – Management / Governance			
3.1.1	**Governance & Policy**	Legal & customary framework	**95**
3.1.2		Consultation, roles & responsibilities	**75**
3.1.3		Long term objectives	**75**
3.1.4		Incentives for sustainable fishing	**80**
3.2.1	**Fishery-specific Management System**	Fishery specific objectives	**90**
3.2.2		Decision making processes	**80**
3.2.3		Compliance & enforcement	**80**
3.2.4		Research plan	**90**
3.2.5		Management performance evaluation	**80**

Further details are provided below on those areas where current practices are considered to be below good industry practice. In all cases however, these are not sufficiently below best practice to warrant an automatic failure (i.e. none score less than 60).

In each of these cases a condition is placed upon the fishery as a requirement of certification, further explanation of the attached conditions[16] is provided in **section 8.3**. And further elaboration on the justification for the scores is provided in the relevant performance indicator in the assessment tree in **Appendix 3**.

[16] *In some cases several of the issues of concern raised in the scoring and outlined here, are covered by a single condition.*

8. Certification Recommendation

The target Eligibility Date is the 27th of February 2010.

8.1 Overall Scores

The Performance of the Barents Sea Cod & Haddock fishery in relation to MSC Principles 1, 2 and 3 is summarised below:

MSC Principle	Fishery Performance	
	Arctic Cod	Arctic Haddock
Principle 1: Sustainability of Exploited Stock	Overall : 85 PASS	Overall : 85 PASS
Principle 2: Maintenance of Ecosystem	Overall : 80 PASS	Overall : 80 PASS
Principle 3: Effective Management System	Overall : 83 PASS	Overall : 83 PASS

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria.

It is therefore recommended that the **Barents Sea Cod and Haddock Fishery fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries**.

Following this decision by the assessment team, and review by stakeholders and peer-reviewers, the recommendation will be presented to the FCI Certification Sub-Committee to certify this fishery.

8.2 Conditions

The fishery attained a score of below 80 against a number of Performance Indicators. The assessment team has therefore set a number of conditions for continuing certification that Ocean Trawlers / Three Towns Capital, as the client for certification, is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification.

As a standard condition of certification, the client shall develop an 'Action Plan' for meeting the conditions for continued certification, to be approved by Food Certification International.

The conditions are associated with 6 key areas of performance of the fishery, each of which addresses one or more Performance Indicators. Conditions, associated timescales and relevant Performance Indicators are set out below.

Condition 1	Elements of the Arctic Cod harvest strategy work together towards achieving management objectives.
Performance Indicators:	Arctic Cod PI 1.2.1
Timelines	2 years of certification
Summary of issues	While the elements for a good responsive harvest strategy are present, the management process has not consistently implemented the agreed harvest control rule, but has seen fit to override the rule due to current high biomass levels. The TAC for 2009 was set above the catch corresponding to the agreed management plan and has been set in a similar fashion over the last few years.
Suggested Action	The JNRFC needs to apply the agreed rule and implement over a number of years so that it can be evaluated in practice. If the rule is not meeting expectations, it can and should be revised and the new rule applied and tested in a consistent way. Arbitrary overriding of the agreed rule is not precautionary.

Condition 2	Ensure good information on all fishery removals from the stock.
Performance Indicators:	Both Cod & Haddock: PI 1.2.3, 1.2.2
Timelines	5 years of certification
Summary of issues	It is unclear whether there is sufficient information on all fishery removals. At recent AFWG meetings there has been evidence of both mis/under-reporting of catches and discarding throughout the Barents Sea for most groundfish stocks in recent years. While IUU appears to have declined significantly, this trend needs to continue and IUU catches need to be reduced to a negligible level. There are no estimates of discards for NEA cod and NEA haddock. While uncertainty in catch estimates cannot be eliminated altogether, the risk to the harvest control rule and uncertainty of catches in the stock assessment needs to be reduced to an acceptable level.
Suggested Action	The SG80 will only be met on the provision that IUU catches have continued to decline and discarding estimates improve. To encourage further reduction, Ocean Trawlers should: » Increased observer coverage to monitor unrecorded mortality (discards). » Encourage inspections of its own and other vessels; » Apply practices that help inspectors rapidly verify catch quantity by species » Conduct transshipment at designated sites where inspectors may have access to the vessel (not in international zones).

(The test of the practice applied by Ocean Trawlers to itself should be, if all vessels applied this practice, all landings would be reported correctly, *even if they had the intent to misreport*. This should be encouraged as an industry standard).

Condition 3	Ensure a partial strategy of demonstrably effective management measures for retained species (with objective basis for confidence).
Performance Indicators:	Both Cod & Haddock: PI 2.1.1 & 2.1.2
Timelines	5 years of certification
Summary of issues	At least two or three of the species caught as a retained bycatch in the fishery are not 'highly likely to be within biologically based limits' and lack adequate partial management strategy. Given current stock status and trends there is (as yet) a lack of objective basis for confidence that the measures in place are effective. Redfish (*Sebastes mentella*), wolfish (*Anarhicas minor*) and, to a lesser extent, Greenland halibut are all components of the target species bycatch. Although not necessarily 'main' components of the catch, elasmobranches species should also be included in this. All are potentially vulnerable to over-exploitation and either lack adequate management controls or stock status is low with limited obvious signs of recovery.
Suggested Action	There are at a number of possible approaches to address this issue – some perhaps more achievable at fleet level, others requiring more input from other entities (science / management). For example: » Operational changes to reduce bycatches of these species. › Gear modifications › Fishing strategy based on analysis of catching patterns » Implementation of scientific advice, enhanced management controls. » Where risks are identified, appropriate measures to mitigate should be implemented.

Condition 4	Ensure the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
Performance Indicators:	Both Cod & Haddock: PI 2.4.1, 2.4.2
Timelines	5 years of certification
Summary of issues	Heavy trawl gear has the potential to cause serious habitat damage. Given the available information and apparent management it is not yet possible to conclude that this is 'highly unlikely' in this fishery. The nature of any impact depends on a number of factors such as gear configuration, frequency of fishing disturbance (of a given seabed), habitat species vulnerability, seabed characteristics. Management and mitigation efforts should be tailored accordingly.
Suggested Action	There are a number of potential approaches to move toward a partial strategy for habitats which ensures that serious or irreversible harm to habitats is highly unlikely - some perhaps more achievable at fleet level, others requiring more input from other entities (science / management). For example: » Specifically addressing the issue of gear impact by development of lighter / less impacting gear, such as semi-pelagic gears for targeting demersal species as trailed in Norway and the EU. » Further analysis of fishing patterns relative to habitat areas, to explore potential for further strategic closed areas – or fishing areas where lighter gears are possible. » Continued recording and analysis of sessile benthic species in bycatch – for example, as a further consideration during observer work.

Condition 5	Ensure the consultation process provides opportunity for all interested and affected parties to be involved.
Performance Indicators:	Both Cod & Haddock: PI 3.1.2
Timelines	5 years of certification
Summary of issues	There is some evidence that revisions of fishing regulations do not appear to facilitate involvement from / consultation with all interested and affected parties – including non prepresented public (including fishermen), NGOs and potentially even state nature conservation bodies. It is also noted that NGOs are not able to participate in the JNRFC meetings (even as observers). There is a wealth of relevant expertise, that could potentially add to such constructive dialogue, in a way which should in the long term enhance (rather than threaten) the industries long term viability.
Suggested Action	Work with the authorities to ensure that all relevant consultation processes are open, and actively seek and facilitate the participation of all interested parties – including those which may not traditionally have had a role in the consultation process. In particular those with relevant expertise – including areas relating more to MSC principle 2 (i.e habitats, ETP species and ecosystems) should be engaged.

Condition 6	Ensure clear long-term objectives are explicit within management policy, which are consistent with the precautionary approach.
Performance Indicators:	Both Cod & Haddock: PI 3.1.3
Timelines	5 years of certification
Summary of issues	Although the Russian Federation has ratified international agreements which adopt the precautionary approach (such as the 1992 Convention on Biological Diversity), and which are legislatively superior to Federal Acts. There remains some question over practical application and in particular how the defined objective stated in Russian fisheries law of protection and rational use, is interpreted in practice. For example, in event of scientific uncertainty is there a presumption toward more precautionary management decision making.
Suggested Action	Work with the authorities to clarify how questions of risk and uncertainty are approached in management decision-making, in particular in the absence of clear scientific evidence. Strive for such considerations to be given more explicit prominence in future drafts of federal acts or northern basin rules.

NB: In case of conditions 1, 2, 5 & 6 – contact has been made with relevant entities (PINRO and BBTA) to alert them of the proposed condition, and provide them with an opportunity to state if the conditions are unreasonable or unworkable.

8.3 Recommendations

In addition to the above Conditions, it is also considered that there are areas of performance that the team would like to see improvements in, despite the fact that they relate to Performance Indicators where the client vessels scored 80 or better.

The assessment team has made a number of recommendations. These are not required to maintain certification but would improve the performance of the fishery against the MSC

Principles and Criteria. Accordingly, the action taken and timescales are at the discretion of the client.

Recommendations are made in respect of:

Assessment Sampling Bias (1.2.4) – The Russian and Norwegian surveys are showing an apparent lack of co-operation in allowing access to each other's zone. While science is often able to make good abundance indices, they can severely affect stock assessments through sampling problems because the data sets are small and therefore sensitive to sampling, but very influential. It is quite possible that the survey rather than discards or IUU catch is the main cause of problems in the haddock stock assessment. This is an unnecessary problem, and every effort should be made to encourage resolution. Continued unreliable survey indices could lead to rejection of the stock assessment and a subsequent condition.

ETP species identification and reporting (2.3.2, 2.3.3) – In preparing for the MSC assessment process, the client fishery has developed an MSC logbook to report interactions with ETP species (among other things). This has been implemented on board vessels along with a comprehensive list of ETP species that should be recorded. This list and supporting documentation should be refined to focus on those species most likely to interact with the fishery, and provide clear species identification guidance, such that new crew members can become quickly trained and actively engaged in MSC logbook reporting.

Traceability / transparency (3.2.3) – It is recognised that the company has made considerable strides toward demonstrating its commitment to operating in sustainable, open, transparent and fully compliant manner. Successful certification is deserved recognition for this, however, this should not be seen as the end point and on-going efforts in this area should be strongly encouraged.

Discarding data (2.2.3) – Although there is a strong ban and enforcement control on the discarding ban, there remains some questions over its practical implementation, in particular over the fate of non-marketable fish. Given the strength of the discard ban, it is possible that information about discarding is not captured. It would be advisable to seek to address this issue by working with scientists, regulators and enforcement agencies (both Russian and Norwegian) to seek clarification and a workable solution.

9 Limit of Identification of Landings

This assessment relates only to the fishery defined in **Section 2.1** up to the point of landing of arctic cod and haddock from the 16 vessels identified in table 1 of this report to shore facilities (either storage or processing facilities) that have been approved to the MSC Chain of Custody Standard. The point of landing is typically the point of change of ownership of the product – from catching supplier into the processing chain.

9.1 Traceability

Traceability up to the point of first sale has been scrutinised as part of this assessment and the positive results reflect that the systems in place are deemed adequate to ensure fish is caught in a legal manner and is accurately recorded.

» Transhipment of frozen processed product takes place from the certified trawl vessels to non-specified transport (reefer) vessels. This is a known risk area, and is one area which in the past has been an implicated route for IUU product to enter the market. To address this risk factor Ocean Trawlers advocates the operation and maintenance of a transparent and robust chain of custody together with systems to ensure the integrity of such chain of custody. The following binding contract commitments (several of which reiterate NEAFC Port State control legal commitments) are agreed with supplier companies in relation to transhipment: not charter or in other way involve in transhipment operations vessels that:

  › appear on any black lists;

  › were involved in any IUU activities even if such infringements did not lead to black-listing of the vessel;

  › flying the flag of convenience;

» ensure that transport vessels to be involved in transhipment from Russian fishing vessels are registered under the flag of NEAFC Contracting Parties or NEAFC Cooperating Non-Contracting Parties;

» not undertake transhipment will in the high seas or outside the regulatory areas of regional organisations;

» ensure that all transhipment operations are in the areas where fishery inspectors may have access to the vessels;

» comply with the national reporting regulations applied in the area of transhipment;

» ensure that all vessels (both fishing vessels and reefers) comply with the national and international VMS requirements;

» ensure that chartered reefers must secure that fish of TTC/OTH's suppliers is placed separately from other fish;

» preferably charter only a designated number of reefers during the year.

In addition to above measures undertaken by the company, the report and assessment trees describe these control, monitoring, enforcement and recording systems that ensure traceability in more detail, but briefly traceability can be verified by:

- accurate reporting – log books and sales notes (regularly inspected and cross-checked);
- verified landings data (including data on other retained species) are used for official monitoring of quota up-take and national statistics;
- a high level and sophisticated system of at-sea monitoring, control and surveillance, in Norwegian waters and a complete and improving system in Russian waters, including routine boarding and inspection, spotter planes, reporting to checkpoints when crossing international boundaries, reporting pre and post transhipment, VMS;
- close cooperation between Norwegian and Russian regulatory and enforcement authorities and no immunity from prosecution in other jurisdictions, and increasingly close cooperation with EU regulatory and enforcement authorities at the point of transhipment landing;
- reporting prior to landing with limited tolerance;
- a high level of inspection of landings prior to unloading – in particular for direct landings in Norway;
- NEAFC port state control, which came into force in May 2007 and which requires authorisation from the vessel flag state (in this case Russia) to the port state before foreign fishing vessels will be authorised to land frozen fish products in the ports;
- the new European Union IUU regulation(EC no 1224/2009) which came into force on the 1st January 2010 and which is designed to ensure full traceability of all marine fishery products traded with the European Community and illuminate the prospect of IUU fish entering the European market. This is achieved by means of a catch certification scheme in cooperation with third countries (such as Russia). 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 (in this instance BBTA in Russia) 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 product.

The above is considered sufficient to ensure fish and fish products invoiced as such by the fishery originate from within the evaluated fishery and no specific risk factors have been identified.

9.2. Processing at Sea etc

All vessels are equipped to carry out some degree of processing at sea, freezing and packaging. This is permitted within the scope of this certificate and has been considered as part of this assessment. However, only identifiable product in the form of fillets or headed (head off) and gutted frozen product is covered by the assessment. These are typically presented block frozen, wrapped and sealed in brown paper packaging, clearly labelled (including the vessel name). Unloading and onward transport is typically on pallets, wrapped in transparent film.

Other forms of fish products that may emanate from the certified vessels are not covered by this assessment and are therefore not eligible to carry the MSC logo. These include fishmeal, roe, by catch species.

9.3 Point of Landing

The product certified as sustainable in this assessment must only be landed to the following NEAFC registered ports:

» Russia – Murmansk

» Norway – Tromso, Kirkenes, Hammerfest, Allesund, Batsfjord, Honningsvag

» Netherlands – Ijmuiden, Velsen-Noord

» UK - Grimsby

Landings into any other ports, either by the fishing vessel or the transhipment vessel – including into China or other NEAFC ports not specified above – are NOT covered by this assessment, therefore any product landed by this route ceases to be certified as sustainable and is not eligible to carry the MSC logo.

In exceptional circumstances the fleet may be forced to land into other ports than those listed above. In this instance, in order for the product to remain eligible for certification, the only additional ports which may be landed to are other NEAFC ports in the EU and Norway, and only then into appropriately certified chain of custody and where there is sufficient capacity to handle the product. The client should notify FCI at the time of the surveillance audit of the quantity and reasons for any such exceptional landings

9.4 Eligibility to Enter Chains of Custody

Only frozen fillets, or frozen headed and gutted NE Arctic cod (*Gadus Morhua*) and haddock (*Melanogrammus aeglefinus*) caught in ICES areas I and II, by vessels specified in **Table 1** of this report and caught in the manner defined in the Unit of Certification (**section 2.2**) shall be eligible to enter the chain of custody, and only then where fish is landed, either directly or via transhipment to ports specified in **section 9.3** of this report.

First point of sale must be to an MSC Chain of Custody certified business, with fish typically sold direct to processing factories. Chain of Custody will commence from when the product first arrives at port, either via the trawl vessel or from the transhipment vessel (i.e. product in transhipment is covered by this fishery assessment rather than by a chain of custody assessment). There are no restrictions on the fully certified product entering further chains of custody, but in order to continue to be certified (and therefore carry the MSC logo, all subsequent steps in the supply chain must be MSC Chain of Custody certified.

The Target Eligibility Date for this fishery will be the 1st March 2010. This means that any fish landed by the certified fleet following that date will be eligible to enter the chain of custody as certified product. The rationale for this date is that it meets with the client's wish, for commercial reasons, for the date to be set at the earliest point at which the methodology

allows. The measures taken by the client to account for risks within the traceability of the fishery – and therefore generating confidence in the use of this date for target eligibility – can be found in the Traceability subdivision of this section of the report (pp. 61-62).

10. Client Agreement to the Conditions

The agreed and signed client Action Plan to meet the Conditions of Certification outlined in **section 8** serves as a client agreement to those conditions, as detailed below:

10.1 Client Action Plan

The Ocean Trawlers / Three Towns Capital Group agrees to make all necessary efforts to meet the Conditions set forth in the FCI's BSCH Preliminary Draft Report determining that the Barents Sea Cod and Haddock fisheries executed by the Group are sustainably managed under the MSC Principles and Criteria for Sustainable Fisheries.

The Group, along with contracted supplier companies are fully committed to sustainable and rational exploitation of marine living resources. Accordingly, and arising from the conditions of certification, the group will undertake to implement the following **action plan** in relation to the conditions of certification.

Condition 1 Ensure elements of the Arctic Cod harvest strategy work together towards achieving management objectives - evidenced by adherence to the agreed and tested harvest control rule.

Action 1

Within 2 years of certification the Group undertakes to:

» keep a close watch on the assessment of the amended harvest control rule for NEA cod agreed by JNRFC on the 38th session performed by ICES as requested by Russian and Norway to define if the amended harvest control rule complies with the precautionary principle;

» encourage a consistent application of the harvest control rule for NEA cod by JNRFC through participation of its suppliers in corresponding forums and advisory councils as well as promote its stand point in connection with the coming session of JNRFC;

» in case there are evidence that the TAC for NEA cod may be set at a level higher than advised by ICES in accordance with the harvest control rule (based on the official standpoints of the fishery associations and official entities) the Group will contact (by mail or phone) Russian and Norwegian authorities and fishery scientific institutions (PINRO, VNIRO, IMR) in order to clarify the reasons for such increase and make feasible actions (send an official statement of the Group etc) to influence such development. The results of such consultations will be submitted to the certification body as report;

» keep a close contact with Russian scientific fishery institutions to obtain reliable information on current development of the harvest control rule for NEA cod.

Condition 2 Ensure good information on all fishery removals from the stock.

Action 2

The information available at this date indicates that new analysis on the IUU fishing performed by the Norwegian and Russian authorities acting according to the decisions of the JNRFC proved that no unregistered catch by Russian vessels was observed. The results of this work are expected to be presented at the coming session of the JNRFC. The Group will follow the official estimations of IUU catches of cod and haddock in order to keep abreast of the advice of the corresponding scientific and managerial bodies to reduce the risk of any IUU catches in fisheries performed by the Group

» The Group will consistently apply its Sustainable Fishery Policy and Code of Conduct to ensure correct reporting of all catches. Besides the Group undertakes to:

» keep a close watch on the results of all inspections performed on the vessels of the Group by Russian, Norwegian and international control and surveillance authorities;

» encourage feasible initiatives to simplify the control and surveillance of the fisheries executed by the Group including physical inspections;

» conduct transhipment operations at designated sites where inspectors may have an access to the vessel (not in international zones);

» implement practices to ensure monitoring of unrecorded mortality (discards);

» contact Russian and Norwegian authorities (by mail or phone) to clarify gaps in the fishery regulations regarding non-target and non-marketable fish taken as bycatch in cod and haddock fisheries and bycatch of fish that based on organoleptic evaluation cannot be used for any human consumption;

» submit annual reports on the execution of the Sustainable Fishery Policy and Code of Conduct by the suppliers to the certification body within the period of the condition.

Condition 3 Ensure a partial strategy of demonstrably effective management measures for retained species (with objective basis for confidence).

Action 3

During the execution of cod and haddock fisheries by the Group the bycatch of redfish, Greenland halibut, spotted wolf-fish (Anarhicas minor) and other demersal fishes is unavoidable, which is recognised by corresponding scientific institutions and fishery authorities.

In order to meet the condition 3 within 5 years of certification the Group undertakes to:

» keep a close watch on the development of fishing gears and implement legally approved gears to decrease the impact of the fisheries executed by the Group on the stocks potentially vulnerable to over-fishing or assessed as not within safe biological limits;

» implement scientific observers scheme to enable collection of the samples necessary for assessment of the stocks status of the species captures as bycatch in cod and haddock fisheries and retained;

» submit annual reports on the execution of the scientific observers scheme to the certification body;

» implement feasible mitigation measures to reduce or avoid impact on species mentioned in condition 3 as advised by corresponding official scientific institutions and organisations (PINRO, ICES etc);

» implement scientific advice and enhanced management controls.

Condition 4 Ensure the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

Action 4

The Group recognises that currently used heavy trawl gear has the potential to cause serious damage of associated bottom habitats and therefore within 5 years of certification undertakes to

» encourage the development of lighter fishing gear and keep a close watch on similar developments in other countries;

» encourage implementation of legally approved fishing gears that can substitute heavy trawl gears;

» in cooperation with fishery scientists analyse the data collected during the Scientific Observers Scheme on the vessels of the Group to tune the fishing effort of the vessels to avoid area with vulnerable bottom habitats as defined by official scientific institutions and organizations (PINRO, IMR, ICES etc);

» implement feasible mitigation measures advised by corresponding official scientific institutions and organisations (PINRO, IMR, ICES etc) to reduce the potential to cause serious damage of associated bottom habitats;

» continue collection of data on all species captured by trawl gears during cod and haddock fisheries executed by the Group (proper registration in implemented MSC logbook on all vessels);

» submit annual reports on MSC logbook data to the certification body.

Condition 5 Ensure the consultation process provides opportunity for all interested and affected parties to be involved.

Action 5

The Group recognizes that NGOs and other nature conservation organizations and bodies as stakeholders aimed at establishment of a constructive dialogue can make a significant contribution to the management of marine biological recourses in order to ensure sustainable and long-term yield. The established advisory bodies both on federal and regional levels can provide a splendid opportunity for all stakeholders including NGOs and other nature conservation organizations and bodies to contribute to the management of marine biological resources with their relevant expertise pari passu with other stakeholders participating in such fishery advisory bodies.

Within 5 years of certification the Group undertakes to:

» encourage a wider representation of NGOs and other nature conservation organizations and bodies in the advisory bodies established in Russia;

» keep a close watch on publications of relevant NGOs and other nature conservation organizations and bodies in the field of fishery and management of marine biological recourses.

Condition 6 Ensure clear long-term objectives are explicit within management policy, which are consistent with the precautionary approach.

Action 6

The law system in Russia provides that the international treaties shall prevail over federal and regional legal acts. The 1992 Convention on Biological Diversity ratified in Russia with federal law of 17.02.1995 No 16-FZ fully complies with the definition of international treaty as specified in the Resolution of the Plenum of Supreme Court of the Russian Federation of 10.10.2003 No 5. In this sense the obligations of the Russian Federation to implement precautionary approach are supreme in comparison with other legal acts regulating the same sphere and all decision-making process shall comply with this Convention on Biodiversity.

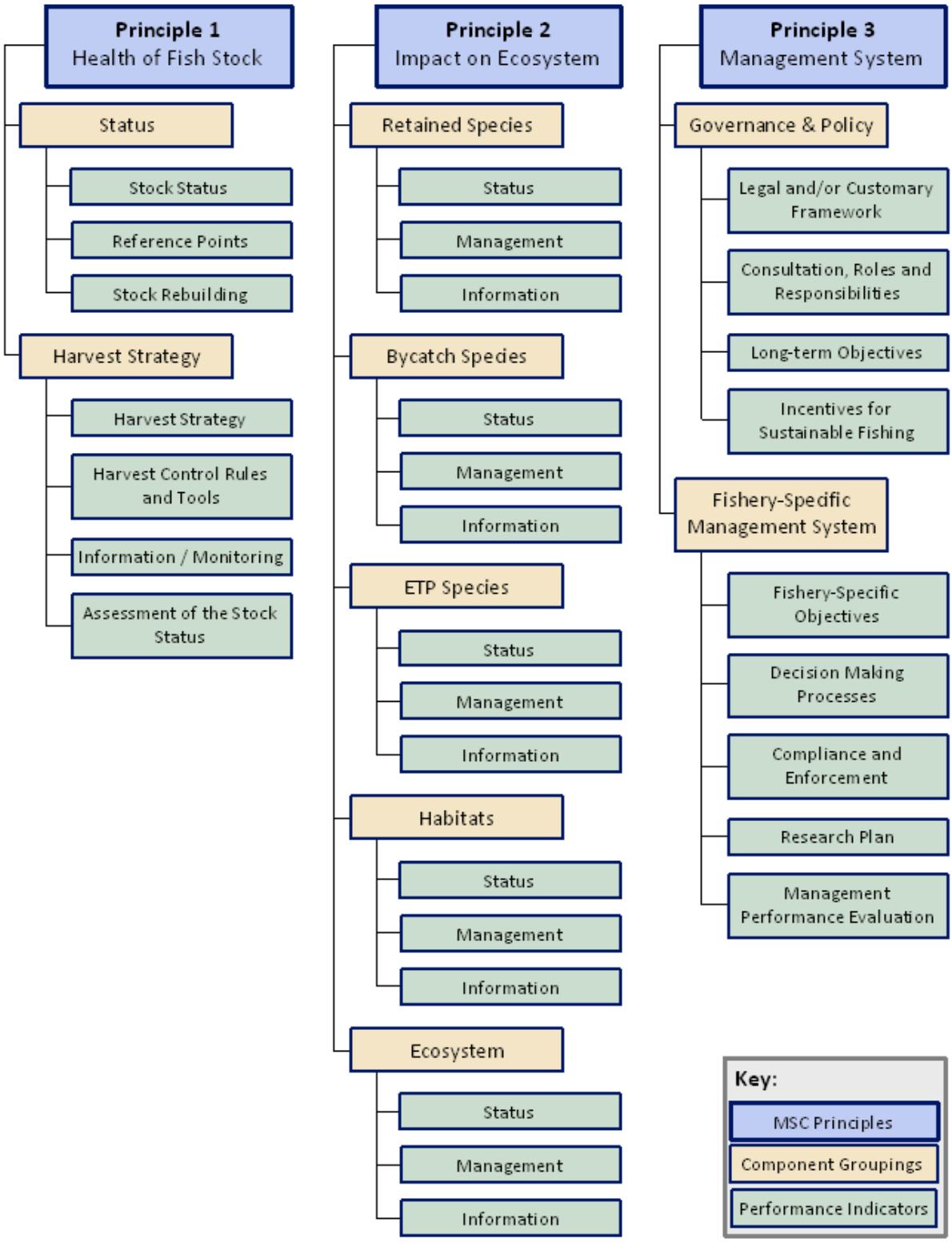
Within 5 years of certification the Group undertakes to:

» encourage a more explicit prominence in future drafts of federal acts or northern fishery basin rules to ensure a better link to principles of sustainable development and precautionary approach in fisheries management.

***

This Action Plan was submitted to FCI by “the Group” in May 2010.

Appendix 1 – MSC Ps & Cs



Below is a much-simplified summary of the MSC Principles and Criteria, to be used for over-view purposes only. For a fuller description, including scoring guideposts under each

Performance Indicator, reference should be made to the full assessment tree, complete with scores and justification, contained in **Appendix 3** of this report. Alternately a fuller description of the MSC Principles and Criteria can be obtained from the MSC website (www.msc.org).

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

Intent:

The intent of this Principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short-term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Status

» The stock is at a level that maintains high productivity and has a low probability of recruitment overfishing.

» Limit and target reference points are appropriate for the stock (or some measure or surrogate with similar intent or outcome).

» Where the stock is depleted, there is evidence of stock rebuilding and rebuilding strategies are in place with reasonable expectation that they will succeed.

Harvest strategy / management

» There is a robust and precautionary harvest strategy in place, which is responsive to the state of the stock and is designed to achieve stock management objectives.

» There are well defined and effective harvest control rules in place that endeavour to maintain stocks at target levels.

» Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

» The stock assessment is appropriate for the stock and for the harvest control rule, takes into account uncertainty, and is evaluating stock status relative to reference points.

Principle 2

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

Intent:

The intent of this Principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Retained species / Bycatch / ETP species

» Main species are highly likely to be within biologically based limits or if outside the limits there is a full strategy of demonstrably effective management measures.

» There is a strategy in place for managing these species that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species.

» Information is sufficient to quantitatively estimate outcome status and support a full strategy to manage main retained / bycatch and ETP species.

Habitat & Ecosystem

» The fishery does not cause serious or irreversible harm to habitat or ecosystem structure and function, considered on a regional or bioregional basis.

» There is a strategy and measures in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.

» The nature, distribution and vulnerability of all main habitat types and ecosystem functions in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery and there is reliable information on the spatial extent, timing and location of use of the fishing gear.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

Governance and policy

» The management system exists within an appropriate and effective legal and/or customary framework that is capable of delivering sustainable fisheries and observes the legal & customary rights of people and incorporates an appropriate dispute resolution framework.

» Functions, roles and responsibilities of organisations and individuals involved in the management process are explicitly defined and well understood. The management system includes consultation processes.

» The management policy has clear long-term objectives, incorporates the precautionary approach and does not operate with subsidies that contribute to unsustainable fishing.

Fishery specific management system

» Short and long term objectives are explicit within the fishery's management system.

» Decision-making processes respond to relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner.

» A monitoring, control and surveillance system has been implemented. Sanctions to deal with non-compliance exist and there is no evidence of systematic non-compliance.

» A research plan provides the management system with reliable and timely information and results are disseminated to all interested parties in a timely fashion.

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Appendix 3 – Assessment Tree / Scoring sheets

The following Assessment Tree includes description of the scoring guideposts (SGs) and performance indicators (PIs) used to score the fishery. The Assessment tree provides detailed justification for all scores attributed to the fishery, in a way which is clearly auditable by future assessors.

Principle 1 for cod is presented first, followed by principle 1 for Haddock. For principles 2 and 3 the assessment tree for cod and haddock are combined, with no variation in scores.

Principle 1 – Arctic Cod

1	**A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.**

1.1	**Management Outcomes**

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.1	**Stock Status** The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	It is <u>likely</u> that the stock is above the point where recruitment would be impaired.	It is <u>highly likely</u> that the stock is above the point where recruitment would be impaired. The stock is at or fluctuating around its target reference point.	There is a <u>high</u> <u>degree of certainty</u> that the stock is above the point where recruitment would be impaired. There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u>.

Score:	**100**

The high stock biomass strongly indicates, in relation to the current reference points, that the stock status is good, with a high degree of certainty that status has been in the desired region over recent years.

Justification

There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
The spawning stock biomass is well above B_{lim}, the point where recruitment would be impaired. ICES classifies the stock as having full reproductive capacity and being harvested sustainably. The SSB has been above B_{pa} since 2002 and current biomass has recovered to biomass levels observed at the start of the time series (1946). It is therefore highly **unlikely** that the current level of the spawning stock biomass is impairing recruitment.
There is a <u>high degree of certainty</u> that the stock has been fluctuating around its target reference point, or has been above its target reference point, <u>over recent years</u>.
The SSB has been above B_{pa} since 2002 and therefore has been well within the target region over this period. Fishing mortality was reduced from well above F_{lim} in 1999 to below F_{pa} in 2007. The high biomass can be attributed in part to higher than expected recruitment, although more recent surveys indicate that cod recruitment will probably fall during 2009-2011 and therefore biomass is likely to decline. However, the fishing mortality is now in the range that is associated with high long-term yield, and if this is maintained, the working group believes that the stock should remain above B_{pa}.

References

ICES(2009) 3.4.1 Cod in Subareas I and II (Northeast Arctic cod). ICES Advice 2009, Book 3. pp.1-12.

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.2	**Reference Points** Limit and target reference points are appropriate for the stock.	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. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. 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. For low trophic level species, the target reference point takes into account the ecological role of the stock.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues. 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.

Score:	**80**

The reference points meet the SG80, but are not sufficiently precautionary to meet the SG100, so a score of 80 is awarded.

Justification

Reference points are appropriate for the stock and can be estimated.

Reference points have been set for fishing mortality and spawning stock biomass, which are appropriate for the stock, available data and analyses. They were agreed in 2003 (ICES 2003: ACFM 11). The values are B_{lim} = 220 000 t, B_{pa} = 460 000 t, F_{lim} = 0.74 and F_{pa} = 0.40. Calculations based on yield per recruit gave $F_{0.1}$ =0.15 and F_{max} =0.28. The reference points have been estimated based on past output from stock assessments.

The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.

B_{lim} is based on a "change point regression". The stock recruitment relationship is weak, but there are a group of lower recruitments at the lowest stock sizes below this limit. These have been used to estimate safe stock levels, where there is no evidence of recruitment decline. Although there is a fishing mortality limit (F_{lim} = 0.74) under the current harvest control rule it does not appear to have any purpose.

The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.

The target reference point is the fishing mortality target (F_{pa}). Evaluation of the harvest control rule has shown that F_{pa} is consistent with high long-term yields and a low risk of depleting the productive potential of the stock.

The biomass reference point related to the target (B_{pa}) is a trigger point for the harvest control rule. B_{pa} has been set at 460 000 t which is the lowest SSB estimate having >90% probability of remaining above B_{lim}. Although B_{pa} can be used to set the region containing the target biomass, it is not the target itself. The target biomass depends on the target F_{pa} which is used to set the total allowable catch as part of the harvest control rule.

The reference points are not explicitly based upon MSY. The JNRFC has agreed that the long-term objective should be maximum sustainable yield (MSY) and a re-evaluation is being undertaken which could lead to changes in the reference points and associated control rule. As the target F is currently considered "consistent with high long term yields", it can be treated as an MSY proxy in the meantime, but updating reference points will be required to continue to meet this performance indicator.

The fishing mortality target reference point is set at a relatively high level. In general, F_{max} (maximum yield-per-recruit) is usually higher than F_{MSY}. The current target (F_{pa}=0.4) is set well above F_{max} (0.25). This is justified due to the effects of density dependent growth and mortality. There is empirical evidence of cannibalism, used in the stock assessment, which indicates adult density dependent mortality. There is also some indication of higher weight-at-age at the more recent lower stock densities (although this could be due to other causes besides density). Analyses taking account of density dependent mortality suggest F_{MSY} will be between 0.3 and 0.4, so the current target remains at the upper end of this range. Therefore, although a relatively high fishing mortality target may turn out to be close to F_{MSY}, there is a lack of scientific evidence confirming this. Therefore, the current reference points are not sufficiently precautionary to meet the SG100.

Cod is not a low trophic level species.

References

ICES (2009) 3.4.1 Cod in Subareas I and II (Northeast Arctic cod). ICES Advice 2009, Book 3. pp.1-12.
ICES (2009) Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02.
Y. A. Kovalev, V. A. Korzhev (2004) Is the inclusion of NEA cod cannibalism data into assessment a step forward or two steps back? Working Document № 9 to the AFWG, May 2004
Kovalev, Y. A., Bogstad, B. (2005) Evaluation of maximum long-term yield for Northeast Arctic cod. 11th Norwegian-Russian Fisheries Science Symposium, Murmansk, Russia 15-17 August 2005: "Ecosystem Dynamics and Optimal Long Term Harvest in the Barents Sea Fisheries".

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.3	**Stock Rebuilding** Where the stock is depleted, there is evidence of stock rebuilding.	Where stocks are depleted rebuilding strategies which have a reasonable expectation of success are in place. Monitoring is in place to determine whether they are effective in rebuilding the stock within a specified timeframe.	Where stocks are depleted rebuilding strategies are in place. 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.	Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the shortest practicable timeframe.

Score:	**–**
Rebuilding is not required and this performance indicator does not apply.	
Justification	
References	

1.2	Harvest Strategy (management)			
(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.1	**Harvest Strategy** There is a robust and precautionary harvest strategy in place	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points. The harvest strategy is likely to work based on prior experience or plausible argument. Monitoring is in place that is expected to determine whether the harvest strategy is working.	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 may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.	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. 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. The harvest strategy is periodically reviewed and improved as necessary.

Score:	**75**

While all the elements of the harvest strategy are in place and working, there has been a breakdown in application of the agreed harvest rules. Therefore, the fishery meets all SG60 and all but one of the SG80, indicating the score should be 75.

Justification

*The harvest strategy is responsive to the state of the stock, but the elements of the harvest strategy are **not** working together towards achieving management objectives reflected in the target and limit reference points.*

The elements for a good responsive harvest strategy are present. There is an agreed harvest control rule which is based on annual stock assessment and independent scientific advice. The management decision making appears well informed and consideration is given to a wide number of issues besides stock size, including ecosystem considerations. The historic performance of the assessment and harvest strategy is routinely presented and provides an overview of the changes in the perception of the state of the stock in relation to SSB, fishing mortality and recruitment. However, the management process is not implementing the agreed management plan (harvest control rule), but has seen fit to override the rule due to current high biomass levels. The TAC for 2009 was set above the catch corresponding to the agreed management plan and has been set in a similar fashion over the last few years. The JNRFC noted that for 2010, they would follow a new rule which is undergoing testing. The testing of the agreed management plan presumed that the plan should be strictly followed for setting the TAC. As the agreed plan is not what is being implemented, it cannot be verified whether the current harvest strategy, which has allowed departures from the plan, is precautionary. It is important that once a policy is agreed, it is adhered to as there are always pressures each year to depart from the agreement, which the rule itself should already be taking account of.

Although the TAC remains the main control, other technical measures are applied to improve the performance of the fishery. These include minimum mesh size, minimum landing size, a maximum bycatch of undersized fish and/or non-target species and seasonal or permanent areas closed to fishing to protect juveniles and bycatch species. The number of vessels allowed to operate in the fishery are limited by licences. The effects of these regulations have not been evaluated, although data exist which might allow an evaluation to take place. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area.

The harvest strategy may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.

The catches are well monitored with the exception of the IUU catch and discards (see PI 1.2.3). In addition, age and survey information provide an independent assessment of the performance of the harvest strategy as they give independent information on biomass and the exploitation rates. ICES undertakes annual assessments using all available information, for which the reports are publicly available.

Given that the current harvest strategy has not been in place long and has yet to be properly implemented, it cannot be considered to be fully evaluated. However, monitoring is in place and the recent recovery of stock biomass strongly indicates overall objectives are being met as fishing mortality has been reduced to levels more consistent with long-term sustainable exploitation.

*The harvest strategy has **not** yet been reviewed.*

The harvest strategy is subject to review through the normal management processes. Parts of this review are made public, such as reports from ICES on management performance. However, no external or special reviews of the overall management strategy

have been undertaken.

References

ICES (2009) 3.4.1 Cod in Subareas I and II (Northeast Arctic cod). ICES Advice 2009, Book 3. pp.1-12.
ICES (2009) Report of the Arctic Fisheries Working Group, 21 - 27 April 2009. ICES CM 2009/ACOM:02.
JNRFC/SR (2009) Scientific Report for the Protocol from the 38th Session of the Joint Norwegian-Russian Fisheries Commission

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.2	**Harvest control rules and tools** There are well defined and effective harvest control rules in place	Generally understood harvest control 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. There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	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. The selection of the harvest control rules takes into account the main uncertainties. Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	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. The design of the harvest control rules take into account a wide range of uncertainties. Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

Score: **80**

Well defined harvest control rules (management plan) have been agreed, been declared as precautionary by ICES. The available evidence indicates that the tools have become sufficiently effective to apply the necessary control, meeting the 80 guideposts.

Justification

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.

A management plan has been agreed since 2004 with the objectives of maintaining high long-term yield, year-to-year stability, and full utilization of all available information on stock dynamics. The plan aims to maintain F at F_{pa} = 0.40 and restrict between-year TAC change to ±10% unless SSB falls below B_{pa}; in this case the target F should be reduced. The target fishing mortality has so far only been achieved in 2007 and 2008.

Based on evaluations made in 2006 and 2007, ICES considers the management plan to be in accordance with the precautionary approach. If conditions change to outside the range assumed in management plan evaluation (with respect to biological conditions, assessment quality, and implementation error), the management plan would be revised.

The selection of the harvest control rules takes into account the main uncertainties.

The rule has been tested through computer simulation against the main sources of implementation error. The worst levels of implementation error tested in 2007 of around 40% indicated that there was less than 3% chance for which the agreed HCR no longer is precautionary. The evaluation did not take into account models of cod cannibalism in the population model, although this is likely to improve the stability of the rule. Simulations do show that the rule has attributes which should maintain good performance, notably the limitation on TAC change when the biomass falls below B_{pa}.

It is not possible to say that the rule is designed, as the testing has occurred after the rule was proposed. The current rule has no stated principle underpinning its construction such as MSY or a defined acceptable risk level. JNRFC has now requested development of a rule based on MSY.

Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.

Norwegian and Russian authorities have the administrative mechanisms and enforcement infrastructure to ensure compliance with this rule. The JNRFC agrees the TAC and quotas for each nation's fleet participating in the North-East Arctic cod fishery and the fishery can be closed when quotas are taken. The activity and catch landing of all fishing vessels is subject to regular monitoring. Catches are monitored and counted against the TAC during the year.

Although TAC regulations are in place, there has been a significant amount of unreported landings in the past. The main way used to evade quota control seems to have been trans-shipping of fish from the Barents Sea. Unreported landings will reduce the effect of management measures and will undermine the intended objectives of the harvest control rule. It is therefore important that management agencies ensure that all catches are counted against the TAC. The estimates of unreported landings have been reduced considerably from 2006 to 2008, which can probably be attributed to the introduction of port state control in the NEAFC area from 1 May 2007. For 2008, the Norwegian estimate of 15 000 t unreported landings is around 3% of the international reported catch and appears sufficiently low not to undermine the effectiveness of the harvest control rule. Assuming that IUU catches in future are at or lower than the 2008 level as expected (monitored by surveillance audits), the evidence indicates that tools are effective in controlling exploitation to the required levels. However, the evidence does not yet clearly show that the HCR works, which is required to meet SG100.

References

ICES(2009) 3.4.1 Cod in Subareas I and II (Northeast Arctic cod). ICES Advice 2009, Book 3. pp.1-12.
ICES (2009) Report of the Arctic Fisheries Working Group, 21 - 27 April 2009. ICES CM 2009/ACOM:02.
ICES (2007) Report of the Arctic Fisheries Working Group, Vigo, Spain 18-27 April 2007. ICES C.M. 2007/ACFM:16, 651 pp.

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.3	**Information / monitoring** Relevant information is collected to support the harvest strategy	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. 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.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. 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. There is good information on all other fishery removals from the stock.	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 relevant to the current harvest strategy, is available. 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 the inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.

Score:	**75**

Information for monitoring and research purposes is comprehensive, except the presence of significant IUU catches and discarding implies estimates of removals are too unreliable to meet all SG80.

Justification

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 relevant to the current harvest strategy, is available.

There is a comprehensive range of data available for the Barents Sea fisheries, including complete fleet information, biological data on the stocks and extensive environmental indices. These are not all used in the harvest strategy.

Environmental indices and information on cod diet is used to inform the stock assessment and improve estimates of abundance and status. Estimates of cannibalism are included in natural mortality. In addition, since 2008, the recruitment predictions have included information on environmental drivers (ice coverage, temperature and oxygen saturation at the Kola section, air temperature at Murman coast, and capelin biomass).

The life history of cod in the Norwegian and Barents Seas is well known and documented, including spawning ground areas where eggs, larvae and juvenile fish disperse. There is agreement over the separation between the Norwegian coastal cod stock and arctic cod stock.

Various oceanographic and ecosystem data, including water temperatures and the abundance of other relevant species. While information may not be directly used in the stock assessment, ecological relationships relevant to management advice have been assessed. The management of Northeast Arctic cod will have implications on the dynamics of prey and predator populations. For example, Northeast Arctic cod is an important predator on other species in the ecosystem, notably capelin. Changes in cod growth, maturity, and cannibalism are linked to the abundance of capelin, whereas annual consumption of cod by seals and whales may be inversely related to capelin abundance.

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.

The harvest control rule requires accurate estimates of the exploitable biomass, spawning stock biomass, and fishing mortality. These estimates are obtained from the stock assessment (see PI 1.2.4), which requires catches, age composition and abundance indices.

The fisheries are controlled by inspections of the trawler fleet at sea, i.e. by a requirement to report to control points when entering and leaving the EEZs, VMS satellite tracking, and by random inspections of fishing vessels when landing the fish. Keeping a detailed fishing logbook on-board is mandatory for most vessels, and large parts of the fleet report to the authorities on a daily basis. Landings are reported, although enforcement has not been complete, with significant transshiped landings thought to have escaped detection in the past.

Age, weight, length and maturity composition data are taken using random sampling from landings and survey catches. Routine otolith exchanges among laboratories are carried out for both cod and haddock to validate ageing. Discrepancies are seldom more than 1 year, and the results show an improvement over time, despite still observing discrepancies for cod in the magnitude of 15-30%. There is some systematic difference between countries. Catches are converted to catch-at-age based on age and length samples.

Cod stomach content data is recorded in a joint PINRO-IMR stomach content database. On average about 9 000 cod stomachs from the Barents Sea have been analysed annually in the period 1984-2008. These data are used, among other things, to calculate the per capita consumption of cod by cod for each half-year.

Annual surveys are conducted. One commercial catch-per-unit-of-effort data (cpue) series and three survey series are used as indices of stock abundance. The current survey approach has been applied since 1995. A combination of coordinated acoustic and trawl surveys are carried out each year by Russia and Norway in the Barents Sea and by Norway on the Lofoten spawning grounds. In addition, cpue are gathered from various fleets and the Russian trawl data are used as an index in the assessment. Survey data exist for the period 1981-2008, and complete series are available 1994-2008.

The area coverage of surveys has been incomplete in 1997, 1998, 2002, 2003, 2006 and 2007 mainly due to lack of shared access to the Norwegian and Russian Economic Zones. The survey indices were corrected for the assessment as far as possible, but this problem can only be eliminated by better co-operation between the Norwegian and Russian authorities.

The biases in catch estimates and survey indices do not invalidate the stock assessment. However, significant improvements in catch monitoring and consistency of the abundance surveys will be required to meet the SG100 guidepost.

It is unclear whether there is sufficient information on all fishery removals.

At recent AFWG meetings it has been recognized that there is growing evidence of both substantial mis/under-reporting of catches and discarding throughout the Barents Sea for most groundfish stocks in recent years. There are no estimates of discards for NEA cod, NEA haddock, redfish or Greenland halibut. Estimates in future may be available from observer programs and comparison of at sea versus port sampling.

There is growing evidence of discarding throughout the Barents Sea for most groundfish stocks, despite discarding of commercial fish being illegal in Norway and Russia. While attempts to obtain better discard data continue, the lack of information adds to the uncertainty in the assessment. However, there does not seem to be currently any incentive to discard arctic cod.

Illegal, unregulated and unreported (IUU) catches have been a problem in the Barents Sea. Since 2002, when the Norwegian and Russian governments reached agreement on a harvest control rule (HCR) and tighter catch reporting, there has been a significant recent improvement. Two series of IUU catch were made available to ICES for the years 2002-2008, but the advice is based on one series only (the higher IUU catch estimate). An IUU catch estimate allows a valid stock assessment to be completed, but contributes to uncertainty in results.

The highest risk occurs where controls are likely to be least effective, and most uncontrolled landings are likely to be through transshipment. As implied by the World Bank Governance Indicators, landings and subsequent trade of fish within Russian jurisdiction may also be higher risk of being unrecorded. Although the problems may not be fully resolved and some IUU fishing continued in 2008, the Russian and Norwegian governments have agreed to maintain pressure for full catch disclosure and established a protocol whereby the unreported catches can be estimated and appropriate adjustments made to catch data for stock assessment purposes.

Only 3% of the Ocean Trawlers catch in 2008/9 were landed in Russia, although a significant proportion is still transshipped. Ocean Trawlers are undertaking a series of initiatives, some also required for chain of custody, designed to rule out any contribution to unreported catches. In co-operation with PINRO, Ocean Trawlers are taking on additional independent scientific observers which will report on at-sea activities and provide information for the assessment and monitoring.

Therefore the SG80 will be met only if IUU catches continue to decline and that reported IUU catches in 2009 or later will be less than the Norwegian estimate of 15 000 t.

References

ICES (2009) Report of the Arctic Fisheries Working Group, 21 - 27 April 2009. ICES CM 2009/ACOM:02.

Stransky, C., Baumann, H., Fevolden, S., Harbitz, A., Høie, H., Nedreaas K. H., Salberg, A., Skarstein, T.H. (2007) Separation of Norwegian coastal cod and Northeast Arctic cod by otolith morphometry. ICES CM 2007/L:10

MRAG (2009) Barents Sea Cod and Haddock: Control System and IUU Risk Assessment. Final Report HK1228 to Ocean Trawlers, November 2009.

Worldbank Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/index.asp

(Cod)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.4	**Assessment of stock status** There is an adequate assessment of the stock status	The assessment estimates stock status relative to reference points. The major sources of uncertainty are identified.	The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The assessment takes uncertainty into account. The stock assessment is subject to peer review.	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. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. The assessment has been internally and externally peer reviewed.

Score:	**90**

The stock assessments meet the SG80 and include major life history features, alternative assessment approaches and some external review partially meeting the SG100, and therefore is scored at 90.

Justification

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.

The stock size is estimated on an annual basis and its status relative to biological reference points is assessed. The assessment methodology and level of accuracy is sufficient to apply the harvest control rule effectively.

The principal assessment model is the XSA version of virtual population analysis. The model is suitable for the available data. XSA is a generic age structured stock assessment, and one of the many variants of VPA. It is used by ICES for a number of stocks, has been widely tested and is generally considered robust as long as the catch-at-age and survey data are reliable. Species and stock-specific parameters are used in the model as appropriate.

There is a significant body of research and monitoring data on growth and reproduction. The mature fish aggregate along the Polar front to feed in summer where their annual growth increment and fecundity is significantly influenced by the abundance of, primarily, capelin and to a lesser extent, herring. Growth (weight at age) and maturity are estimated each year, taking account of their variability in the assessment.

The assessment method also includes an estimate of the consumption of cod by cod, which is thought to be a significant source of mortality particularly of 3 and 4 year old fish. Therefore, some adult density dependent mortality is accounted for in the assessment.

The assessment takes uncertainty into account.

The major uncertainties are identified in the annual assessments and their implications examined and reported as part of the management advice. However specific advice is presented as a table of options for fishing mortality (TAC), but does not report outcomes in relation to the uncertainties in the data and assessment. The main uncertainties in this assessment derive from the biased catch statistics and inconsistencies in the surveys.

Biased catch statistics have been considered through generating alternative unreported catch figures which have been added to the total catch in the stock assessment and accounts for the IUU catch. The effect of IUU catches has also been assessed with respect to the HCR. It was concluded that at the higher levels of estimated IUU, the HCR may not be delivering precautionary management and therefore the precautionary nature of the HCR is conditional on low IUU catches (see PI 1.2.2). Considerable effort has been spent in recent years decreasing IUU catch making data collection more reliable in estimating catches, thereby decreasing uncertainty in the assessment.

The survey results from the two last years are not consistent with the results from the previous years. Some of this inconsistency may be explained by inadequate spatial coverage of surveys in 2006/2007 (see PI 1.2.3). With the elimination of IUU catch, this would probably be the main source of error. Although the sampling bias is unknown, it has been identified by the assessment and should be eliminated as it is only a problem of co-operation between the management authorities.

Estimates of sampling error are to a large degree lacking or are incomplete for the input data used in the assessment. However, the uncertainty has been estimated for some parts of the input data, and the harvest control rule has been tested against suspected data error levels, covering the main uncertainties.

The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.

As well as XSA, alternative software for fitting VPA models has been used over the years. In 2009, TISVPA and a "survey calibration" method were applied to the same data. These give basically the same results as XSA, although XSA continues for the main assessment for consistency.

Since 1999, a new assessment model (Fleksibest now Gadget) has been used to provide an alternative assessment approach. This is a multispecies model of the cod life cycle, and allows more informed advice based on ecosystem considerations. The results from the GADGET model is in broad agreement with the XSA model in that the current stock size is close to the highest values seen over the last 20 years. There is some indication in the model results that recruitment may now be dropping from the recent high levels.

The assessment has been internally and externally peer reviewed.

The assessment is subject to internal review through the working group process, which produces a consensus report. The report itself is externally reviewed and reviewers' comments are published as an annex to the report. The review is by correspondence, and although not in depth (for example, reviewers cannot request sensitivity runs for that year's assessment), still allows independent assessment of the working group's results which has a demonstrable impact within the management cycle.

References

ICES (2009) Report of the Arctic Fisheries Working Group, 21 - 27 April 2009. ICES CM 2009/ACOM:02.

ICES (2008) Report of the Arctic Fisheries Working Group (AFWG). 21-29 April 2008, ICES Headquarters, Copenhagen . ICES CM 2008/ACOM:01. 542 pp.

ICES (2007) Report of the Arctic Fisheries Working Group, Vigo, Spain 18-27 April 2007. ICES C.M. 2007/ACFM:16, 651 pp.

Principle 1 – Arctic Haddock

1	**A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.**

1.1	**Management Outcomes**

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.1	**Stock Status** The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing	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. The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired. 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.

Score:	**100**

The high stock biomass strongly indicates, in relation to the current reference points, that the stock status is good, with a high degree of certainty that status has been in the desired region over recent years.

Justification

There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
Based on the 2009 estimate of SSB and 2008 estimate of fishing mortality, ICES classifies the stock as having full reproductive capacity and being harvested sustainably. The SSB has been above Bpa since 1989. It is therefore highly **unlikely** that the current level of the spawning stock biomass is impairing recruitment.
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.
The SSB has been above B_{pa} since 1989 and therefore has been well within the target region over this period. Fishing mortality was reduced from above F_{lim} in 1988 to below Fpa in 2000-2002. It has since then been kept below F_{lim} and has fluctuated around F_{pa}. It has been very close to F_{pa} 2006-08. The high biomass can be attributed in part to higher than expected recruitment. Recruitment at age 3 has been at or above average since 2000. The year-classes 2004-2006 are estimated to be very strong, although surveys indicate that the year-classes 2007 and 2008 are below average and therefore biomass is likely to decline. The fishing mortality is now in the range that is associated with high long-term yield, and if this is maintained, the working group believes that the stock should remain above B_{pa}.

References

ICES(2009) 3.4.3 Northeast Arctic haddock (Subareas I and II). ICES Advice 2009, Book 3. pp.19-28.

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.2	**Reference Points** Limit and target reference points are appropriate for the stock.	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. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. 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. For low trophic level species, the target reference point takes into account the ecological role of the stock.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues. 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.

Score:	**80**

Justification

Reference points are appropriate for the stock and can be estimated.

Reference points have been the same since 2000 and are based on spawning stock biomass and fishing mortality estimated from research and stock assessment outputs. These are appropriate for the available data and the type of fishery and species. B_{lim} (50 000 t) is based on B_{loss} – the lowest biomass observed in the time series for which there is no evidence of recruitment impairment. B_{pa} (80 000 t) is set at B_{lim}*1.67, although no specific reason given for this, this is acceptable if B_{pa} is used as a trigger in the harvest control rule rather than target. F_{lim} (0.49 $year^{-1}$) is the median value of F_{loss}, the fishing mortality which would produce biomass around B_{loss} in the long term. The target fishing mortality, F_{pa} (0.35 $year^{-1}$) is defined as F_{med}, which is the fishing mortality rate on an equilibrium population with a SSB/Recruitment equal to the inverse of the median of the time series of observed Recruitment/SSB. This is appropriate where no recruitment overfishing has been observed.

The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.

The limit reference point biomass is the lowest biomass estimated from the time series 1950-2008. This is justified based on the lack of any evidence of a reduced recruitment over the range of biomass estimated during this period.

The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.

The target reference point is the fishing mortality target (F_{pa}). The current management plan sets target fishing mortality at 0.35 whilst the SSB is above Bpa. The expected target biomass should fluctuate above the B_{pa} level with this fishing mortality. Evaluation of the harvest control rule has shown that F_{pa} is consistent with high long-term yields and a low risk of depleting the productive potential of the stock.

In 2006 the data used in the assessment were revised for the entire time series, and some additional catches previously not included have been added. The reference points have not been updated accordingly and the current estimated F_{med} is much lower than target being used. While the current F_{pa} target is within the possible range of F_{MSY} estimates, it is not clear where the current value lies in relation to MSY or whether it is precautionary enough. ICES states that "Candidates for reference points consistent with high long-term yields and a low risk of depleting the productive potential of the stock are in the range of $F_{0.1}$-Fpa.

ICES states that the target fishing mortality, is within the range that is expected to lead to high long-term yields and low risk of depleting the productive potential (F0.1 = 0.20 - Fpa = 0.35). There is no explicit statement about maximum sustainable yield (MSY). However, the JNRFC has agreed that the long-term objective should be MSY, and a review of reference should be conducted by ICES.

The reference points are not explicitly based upon MSY. The JNRFC has agreed that the long-term objective should be maximum sustainable yield (MSY) and a re-evaluation is being undertaken which could lead to changes in the reference points and associated control rule. As the target fishing mortality is currently considered "consistent with high long term yields", it can be treated as an MSY proxy in the meantime, but updating reference points will be required to continue to meet this performance indicator. Therefore, there is a lack of scientific evidence confirming the relationship of the target fishing mortality to MSY, so

the current reference points are not sufficiently precautionary to meet the SG100. Haddock is not a low trophic level species.
References
ICES(2009) 3.4.3 Northeast Arctic haddock (Subareas I and II). ICES Advice 2009, Book 3. pp.19-28. ICES (2009) Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02. ICES (2006) Report of the Workshop on Biological Reference Points for North East Arctic Haddock (WKHAD) 6–10 March 2006 Svanhovd, Norway. ICES CM 2006/ACFM:19

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.1.3	**Stock Rebuilding** Where the stock is depleted, there is evidence of stock rebuilding.	Where stocks are depleted rebuilding strategies which have a reasonable expectation of success are in place. Monitoring is in place to determine whether they are effective in rebuilding the stock within a specified timeframe.	Where stocks are depleted rebuilding strategies are in place. 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.	Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the shortest practicable timeframe.

Score:	**–**

Justification

Rebuilding is not required and this performance indicator does not apply.

References

1.2	Harvest Strategy (management)			
(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.1	**Harvest Strategy** There is a robust and precautionary harvest strategy in place	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points. The harvest strategy is likely to work based on prior experience or plausible argument. Monitoring is in place that is expected to determine whether the harvest strategy is working.	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 may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.	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. 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. The harvest strategy is periodically reviewed and improved as necessary.

Score:	**80**

The harvest strategy is well defined and appears to be fully implemented. There is evidence overall that objectives are being achieved, although the management plan has not been in place long enough to allow full evaluation. Therefore the harvest strategy meets all SG80, but none of the SG100.

Justification

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 elements for a good responsive harvest strategy are present. There is an agreed harvest control rule which is based on annual stock assessment and independent scientific advice. The management decision making appears well informed and consideration is given to a wide number of issues besides stock size, including ecosystem considerations. The historic performance of the assessment and harvest strategy is routinely presented and provides an overview of the changes in the perception of the state of the stock in relation to SSB, fishing mortality and recruitment. The harvest rule was implemented in 2009 and the TAC set according to the rule. In 2010, TAC was set at 243 000 t, which was in accordance with the harvest control rule (management plan).

Although the TAC remains the main control, other technical measures are applied to improve the performance of the fishery. These include minimum mesh size, minimum landing size, a maximum bycatch of undersized fish and/or non-target species and seasonal or permanent areas closed to fishing to protect juveniles and bycatch species. The number of vessels allowed to operate in the fishery are limited by licences. The effects of these regulations have not been evaluated, although data exist which might allow an evaluation to take place. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area.

The harvest strategy may not have been fully tested but monitoring is in place and evidence exists that it is achieving its objectives.

The catches are well monitored with the exception of the IUU catch and discards (see PI 1.2.3). In addition, age and survey information provide an independent assessment of the performance of the harvest strategy as they give independent information on biomass and the exploitation rates. ICES undertakes annual assessments using all available information, for which the reports are publicly available.

Given that the current harvest strategy has not been in place long and has yet to be properly implemented, it cannot be considered to be fully evaluated. However, monitoring is in place and the recent relatively high stock biomass strongly indicates overall objectives are being met as fishing mortality has been reduced to levels more consistent with long-term sustainable exploitation.

*The harvest strategy has **not** yet been reviewed.*

The harvest strategy is subject to review through the normal management processes. Parts of this review are made public, such as reports from ICES on management performance. However, no external or special reviews of the overall management strategy have been undertaken.

References

ICES(2009) 3.4.3 Northeast Arctic haddock (Subareas I and II). ICES Advice 2009, Book 3. pp.19-28.

ICES (2009) Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02.

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.2	**Harvest control rules and tools** There are well defined and effective harvest control rules in place	Generally understood harvest control 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. There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	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. The selection of the harvest control rules takes into account the main uncertainties. Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	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. The design of the harvest control rules take into account a wide range of uncertainties. Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.

Score: **80**

Well defined harvest control rules (management plan) have been agreed, been declared as precautionary by ICES. The available evidence indicates that the tools have become sufficiently effective to apply the necessary control, meeting the 80 guideposts.

Justification

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.

JNRFC has agreed a management plan since 2004 with the objectives of maintaining high long-term yield, year-to-year stability, and full utilization of all available information on stock dynamics. It was modified in 2007 from a three-year rule to a one-year rule on the basis of the HCR evaluation conducted by ICES. The plan aims to maintain F at F_{pa} = 0.35 and restrict between-year TAC change to ±25% unless SSB falls below B_{pa}; in this case the target F should be reduced. The target fishing mortality has effectively been achieved over the last 3 years (2006 – 2008).

ICES evaluated the modified management plan and concluded that it is in agreement with the precautionary approach. The agreed management plan implies landings of 243 000 t in 2010 (maximum 25% change in TAC from 2009, keeping F below F_{pa}). This projection includes all landings and therefore the TAC must also account for unreported landings. If conditions change to outside the range assumed in management plan evaluation (with respect to biological conditions, assessment quality, and implementation error), the management plan would be revised.

The selection of the harvest control rules takes into account the main uncertainties.

The rule has been tested through computer simulation against the main sources of implementation error. The worst case implementation error/IUU tested in 2007 of around 40% gave an effective F of 0.57 (much higher than the intended target), but still only resulted in less than 3% chance of falling below the biomass limit reference point. Simulations show that the rule has attributes which should maintain good performance, notably the limitation on TAC change when the biomass falls below B_{pa}.

It is not possible to say that the rule is designed, as the testing has occurred after the rule was proposed. The current rule has no stated principle underpinning its construction such as MSY or a defined acceptable risk level. JNRFC has now requested development of rules based on MSY.

Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.

Norwegian and Russian authorities have the administrative mechanisms and enforcement infrastructure to ensure compliance with this rule. The JNRFC agrees the TAC and quotas for each nation's fleet participating in the North-East Arctic cod fishery and the fishery can be closed when quotas are taken. The activity and catch landing of all fishing vessels is subject to regular monitoring. Catches are monitored and counted against the TAC during the year.

Although TAC regulations are in place, there has been a significant amount of unreported landings in the past. The main way used to evade quota control seems to have been trans-shipping of fish from the Barents Sea. Unreported landings will reduce the effect of management measures and will undermine the intended objectives of the harvest control rule. It is therefore important that management agencies ensure that all catches are counted against the TAC. The estimates of unreported landings have been reduced from 2005 (25%) to 2008 (4%), which can probably be attributed to, among other things, the introduction of port state control in the NEAFC area from 1 May 2007. However for haddock, estimates remain imprecise. The current estimate of approximately 5 900 t unreported landings appears sufficiently low not to undermine the effectiveness of the harvest control rule. Assuming that IUU catches in future are at or lower than the 2008 level as expected (monitored by surveillance audits), the evidence indicates that tools are effective in controlling exploitation to the required levels. However, the evidence does not yet clearly show that the HCR works, which is required to meet SG100.

References

Protocol of the 36th Session of The Joint Norwegian Russian Fishery Commission, 10 October 2007
ICES (2009) 3.4.3 Northeast Arctic haddock (Subareas I and II). ICES Advice 2009, Book 3. pp.19-28.
ICES (2009) Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02.
ICES (2007) Report of the Arctic Fisheries Working Group, Vigo, Spain 18-27 April 2007. ICES C.M. 2007/ACFM:16, 651 pp.
ICES (2006) Report of the Workshop on Biological Reference Points for North East Arctic Haddock (WKHAD) 6–10 March 2006 Svanhovd, Norway. ICES CM 2006/ACFM:19

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.3	**Information / monitoring** Relevant information is collected to support the harvest strategy	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. 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.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy. 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. There is good information on all other fishery removals from the stock.	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 relevant to the current harvest strategy, is available. 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 the inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.

Score:	**75**

Information for monitoring and research purposes is comprehensive, except the presence of significant IUU catches and discarding implies estimates of removals are too unreliable to meet all SG80.

Justification

Sufficient and some comprehensive relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.

There is a comprehensive range of data available for the Barents Sea fisheries, including complete fleet information, biological data on the stocks and extensive environmental indices. These are not all used in the harvest strategy. However, information on ecological interactions and life history is not complete for haddock compared to cod, for example, which has resulted in some problems in the stock assessment.

Environmental indices are used to inform the stock assessment and improve estimates of abundance and status. North-east Arctic haddock are known to respond to three principal environmental influences: location of the Polar Front; the strength of the West Spitzbergen and North Cape currents; and the abundance of capelin. Variation in the recruitment of haddock has been associated with the changes in the influx of Atlantic waters to the Barents Sea and water temperature in the first and second years of the haddock life cycle is one of the factors that determine year-class strength. Estimates of cod predation are included in haddock stock assessment natural mortality, but density dependent mortality is not accounted for. Annual consumption of haddock by seals and whales may be inversely related to capelin abundance, although this interaction is not used in the assessment. Much of the life history of haddock in the Norwegian and Barents Seas is well documented, including spawning ground areas where eggs, larvae and juvenile fish disperse. The stock assessment includes the majority of the NEA stock although there may be some overlap with the North Sea stock.

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.

The harvest control rule requires accurate estimates of the exploitable biomass, spawning stock biomass, and fishing mortality. These estimates are obtained from the stock assessment (see PI 1.2.4), which requires catches, age composition and abundance indices.

The fisheries are controlled by inspections of the trawler fleet at sea, i.e. by a requirement to report to control points when entering and leaving the EEZs, VMS satellite tracking, and by random inspections of fishing vessels when landing the fish. Keeping a detailed fishing logbook on-board is mandatory for most vessels, and large parts of the fleet report to the authorities on a daily basis. Landings are reported, although enforcement has not been complete, with significant trans-shipped landings thought to have escaped detection in the past.

Age, weight, length and maturity composition data are taken using random sampling from landings and survey catches. Changes in growth are accounted for by the time series of weight and age observations. Routine otolith exchanges among laboratories

are carried out for both cod and haddock to validate ageing. The results show an improvement over time, with haddock age readings showing that the frequency of a different reading (usually ±1 year) has decreased from above 25% in 1996-1997 to about 10% at present. Catches are converted to catch-at-age based on age and length samples.
Cod stomach content data is recorded in a joint PINRO-IMR stomach content database. On average about 9 000 cod stomachs from the Barents Sea have been analysed annually in the period 1984-2008. These data are used, among other things, to calculate the per capita consumption of haddock by cod for each half-year.
Annual surveys are conducted. Three survey series are used as indices of stock abundance. The current survey approach has been applied since 1995. A combination of coordinated acoustic and trawl surveys are carried out each year by Russia and Norway in the Barents Sea and by Norway on the Lofoten spawning grounds. Survey data exist for the period 1981-2008, and complete series are available 1994-2008.
The area coverage of surveys has been incomplete in 1997, 1998, 2002, 2003, 2006 and 2007 mainly due to lack of shared access to the Norwegian and Russian Economic Zones. The survey indices were corrected as far as possible. The survey indices were corrected for the assessment as far as possible, but this problem can only be eliminated by better co-operation between the Norwegian and Russian authorities.
The biases in catch estimates and survey indices adversely affect the stock assessment (see PI 1.2.4). Significant improvements in catch monitoring and consistency of the abundance surveys will be required to meet the SG100 guidepost.
It is unclear whether there is sufficient information on all fishery removals.
At recent AFWG meetings it has been recognized that there is growing evidence of both substantial mis/under-reporting of catches and discarding throughout the Barents Sea for most groundfish stocks in recent years. There are no estimates of discards for NEA cod, NEA haddock, redfish or Greenland halibut. Estimates in future may be available from observer programs and comparison of at sea versus port sampling.
There is growing evidence of discarding throughout the Barents Sea for most groundfish stocks, despite discarding of commercial fish being illegal in Norway and Russia. Discarding is known to be a (varying) problem in the longline fisheries related to the abundance of haddock close to, but below the minimum landing size. While attempts to obtain better discard data continue, the lack of information adds significantly to the uncertainty in the assessment.
Illegal, unregulated and unreported (IUU) catches have been a problem in the Barents Sea. Since 2002, when the Norwegian and Russian governments reached agreement on a harvest control rule (HCR) and tighter catch reporting, there has been a significant improvement. The highest risk occurs where controls are likely to be least effective, and most uncontrolled landings are likely to be through transhipment. As implied by the World Bank Governance Indicators, landings and subsequent trade of fish within Russian jurisdiction may also be higher risk of being unrecorded. Although the problems may not be fully resolved and some IUU fishing continued in 2008, the Russian and Norwegian governments have agreed to maintain pressure for full catch disclosure and established a protocol whereby the unreported catches can be estimated and appropriate adjustments made to catch data for stock assessment purposes.
Only 3% of the Ocean Trawlers catch in 2008/9 were landed in Russia, although a significant proportion is still trans-shipped. Ocean Trawlers are undertaking a series of initiatives, some also required for chain of custody, designed to rule out any contribution to unreported catches. In co-operation with PINRO, Ocean Trawlers are taking on additional independent scientific observers which will report on at-sea activities and provide information for the assessment and monitoring.
The IUU catches are around 10-15% of the catches, but they do not influence the assessment very much. Non-reported landings (IUU) for the period 2002-2008 were estimated ranging from 6 000 t to 40 000 t, of which the last three years are considered relatively imprecise. The WG assumes that before 2002 IUU fisheries was low or negligible. Including or not including the time-series of unreported landings into assessment affects the perception of the stock, but does not affect the advice since the agreed 25% maximum annual change in TAC is in effect.
The SG80 will only be met on the provision that IUU catches have continued to decline and discarding estimates improve.

References

ICES(2009) 3.4.3 Northeast Arctic haddock (Subareas I and II). ICES Advice 2009, Book 3. pp.19-28.
ICES (2009) Report of the Arctic Fisheries Working Group, 21 27 April 2009. ICES CM 2009/ACOM:02.
MRAG (2009) Barents Sea Cod and Haddock: Control System and IUU Risk Assessment. Final Report HK1228 to Ocean Trawlers, November 2009.
Worldbank Worldwide Governance Indicators http://info.worldbank.org/governance/wgi/index.asp

(Had)	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
1.2.4	**Assessment of stock status** There is an adequate assessment of the stock status	The assessment estimates stock status relative to reference points. The major sources of uncertainty are identified.	The assessment is appropriate for the stock and for the harvest control rule, and is evaluating stock status relative to reference points. The assessment takes uncertainty into account. The stock assessment is subject to peer review.	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. The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. The assessment has been internally and externally peer reviewed.

Score:	**85**

The stock assessment meets all the SG80 and includes an effective external review process meeting one SG100, and therefore is scored at 85.

Justification

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.

The stock size is estimated on an annual basis and its status relative to biological reference points is assessed. The assessment methodology and level of accuracy is sufficient to apply the harvest control rule effectively.

The principal assessment model is the XSA version of virtual population analysis. The model is suitable for the available data. XSA is a generic age structured stock assessment, and one of the many variants of VPA. It is used by ICES for a number of stocks, has been widely tested and is generally considered robust as long as the catch-at-age and survey data are reliable. Species and stock-specific parameters are used in the model as appropriate.

There is a significant body of research and monitoring data on growth and reproduction. Growth (weight at age) and maturity are estimated each year, taking account of their variability in the assessment. There is thought to be some density dependent mortality in haddock, but this is not accounted for in the current assessment. Estimates of cod predation on young haddock are included in the natural mortality. The assessment includes estimates of IUU catch for 2002-2008.

The assessment takes uncertainty into account.

The major uncertainties are identified in the annual assessments and their implications examined and reported as part of the management advice. However specific advice is presented as a table of options for fishing mortality (TAC), but does not report outcomes in relation to the uncertainties in the data and assessment. The main uncertainties in this assessment derive from the biased catch statistics and inconsistencies in the surveys.

Biased catch statistics have been considered through generating alternative unreported catch figures which have been added to the total catch in the stock assessment and accounts for the IUU catch. Considerable effort has been spent in recent years decreasing IUU catch making data collection more reliable in estimating catches, thereby decreasing uncertainty in the assessment.

The survey results from the two last years are not consistent with the results from the previous years. Some of this inconsistency may be explained by inadequate spatial coverage of surveys in 2006/2007 (see PI 1.2.3). With the elimination of IUU catch, this would probably be the main source of error. Although the sampling bias is unknown, it has been identified by the assessment and should be eliminated as it is only a problem of co-operation between the management authorities.

Estimates of sampling error are to a large degree lacking or are incomplete for the input data used in the assessment. However, the uncertainty has been estimated for some parts of the input data, and the harvest control rule has been tested against suspected data error levels, covering the main uncertainties.

The assessment has been tested and problems identified. Some alternative hypotheses and assessment approaches have been explored.

It was noted by the review that the diagnostics suggest XSA may not be entirely suitable for the population dynamics and/or the available data. There is a retrospective diagnostic of over estimating stock size and under estimating fishing mortality in the most recent years for reasons which are not fully understood. The problem can be caused by discarding and/or IUU, changes in

natural mortality or problems with the consistency of the survey. For example, the working group suspects that the discarding might present a serious problem and possible density dependent mortality is not accounted for. The problem is not so severe that the assessment was rejected.
As well as XSA, alternative software for fitting VPA models has been used over the years, but not adopted. A new benchmark assessment is now due, which would address a number of concerns with model structure and issues arising from the assessment. The problems identified with the diagnostics and issues over the appropriateness of the model for this fishery means that the current approach is not robust enough to meet the SG100.
The assessment has been internally and externally peer reviewed.
The assessment is subject to internal review through the working group process, which produces a consensus report. The report itself is externally reviewed and reviewers' comments are published as an annex to the report. The review is by correspondence, and although not in depth (for example, reviewers cannot request sensitivity runs for that year's assessment), still allows independent assessment of the working group's results which has a demonstrable impact within the management cycle.

References

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ICES (2008) Report of the Arctic Fisheries Working Group (AFWG). 21-29 April 2008, ICES Headquarters, Copenhagen. ICES CM 2008/ACOM:01. 542 pp.
ICES (2007) Report of the Arctic Fisheries Working Group, Vigo, Spain 18-27 April 2007. ICES C.M. 2007/ACFM:16, 651 pp.

Principle 2 – Cod & Haddock

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

2.1	Retained non-target species

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.1	**Status** 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.	Main retained species are likely to be within biologically based limits or if 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 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.	Main retained species are highly likely to be within biologically based limits, or if outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that retained species are within biologically based limits. Target reference points are defined and retained species are at or fluctuating around their target reference points.

Score:	**75**

Justification

There is good, accurate and verifiable data on the species retained by client vessels, provided to the assessment team by PINRO. This shows that on average over all boats, over the fishing year, approximately 92% of the retained catch is cod or haddock (dealt with under P1). Of the remaining 8%, the **main** species (interpreted on the basis of volume, but informed also by vulnerability) were:

- Saithe (5%) – the assessment of saithe stock status shows that spawning stock biomas is well above the precautionary level (Bpa) and fishing mortality is well below the precautionary limit (Fpa). This represents a high degree of certainty of the species being with biologically based limits. Additionally that target fishing mortality in the management plan is evaluated as being consistent with high long term yields. (both100 SGs met).
- Redfish *Sebastes Mentella* (1%) – more overlap with the fishery than the other redfish (*Sebastes marinus*). The status of the stock is known to be poor – near a historical low, but with some small recent positive signs - with ICES advice for 2010 being that there should be no directed trawl fishery. In spite of this advice NEAFC have set a quota for a directed fishery in international waters in 2010 of 8,600t, albeit with seasonal restrictions and other management measures and the majority of the redfish landings are either the result of the NEAFC directed fishery or as a bycatch in shrimp and pelagic blue whiting / herring fisheries. The ICES arctic fisheries working group recommends at catch limit of 14 000 tons, to cover landings taken as bycatch, *not as a directed fishery*. The NEAFC fishery (8,600t) is therefore over and above the recommended ICES catch. Landings by the certified fleet represent around 1% of the fleets total landings. Although this is within the bycatch limits set by management, it still represents over a third of the recommenced catch. However, in the context of this fishery the measures in place (bycatch limits, closed areas and seasons, landing controls) are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species. Score – 70.
- spotted catfish / wolfish (*Anarhicas minor*) (1%), are a large, long lived species, found offshore and associated with cod (other wolfish more inshore). These life history traits make them vulnerable to over exploitation. 70
- Greenland halibut (1%): although the population size is low, there is a partial strategy of demonstrably affectivlve management measures (bycatch limits, MLS, quota control). It is notable that overall catches now appear to be in line with scientific advice. The landings of the certified fleet, when targeting cod or haddock account for around 3% of the

TAC for the species – so this fishery is unlikely to hinder recovery. Score 80

- Long rough dab (<1%) – also makes a small contribution to retained catches, however this productive species is rated as the third most abundant species in the Barents Sea (Barents ecosystem review – page 31) score 100

Taken in combination, athough the main retained species (saithe) scores well, other main retained species are regarded as vulnerable and therefore score poorly. Overall this means the performance indicator does not meet the unconditional pass mark and a condition is raised.

References

ICES Advice 2009 - 3.4.4 Saithe in Subareas I and II (Northeast Arctic)
ICES Advice 2009. 3.4.5 Beaked redfish (*Sebastes mentella*) in Subareas I and II
ICES Advice 2009. 3.4.7 Greenland halibut in Subareas I and II
AFWF 2009.
Stiansen & Filin (2008) Joint PINRO / IMR Report of the state of the Barents Sea Ecosystem in 2007, with Expected Situation and Considerations for Management
http://www.neafc.org/system/files/%252Fhome/neafc/drupal2_files/rec3_redfish_i_ii_2010_rev1.pdf

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.2	**Management strategy** 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.	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. The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	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 some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. There is some evidence that the partial strategy is being implemented successfully.	There is a strategy in place for managing retained species. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its overall objective.

Score: 75

Justification

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.
When considering management to minimise impact of fleet operation on retained species (before considering more species specific stock management strategies), there is a good strategy for reducing impact on non-target retained species (i.e maximising catches of cod & haddock), which includes, targeted and appropriate use of closed areas, sorting grids, move on-regulation, vessel experience, communication among fleet, PINRO information, large mesh size. Overall this perhaps lacks the fully cohesive and responsive elements of a comprehensive strategy – but can certainly be considered at least a partial strategy. At this level there is evidence of implementation and objective basis for confidence in the partial strategy (80).
At the level of species management, for those species identified as 'main' in 2.1.1 – Dab and saithe have full management strategies, based on information about the species, which are implemented, achieving their aims and expected to work – 100
For the remaining species, all have a some form of appropriate partial strategy, with evidence of it being implemented successfully (e.g: TAC, MLS, bycatch limits, closed areas and monitoring), however this stops short of being a full strategy including (for example) management reference points and clear management targets. In all cases, the contribution of this fleet is not expected to hinder recovery.
The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).
Although for some of these remaining species it can be argued that there is some objective basis for confidence in the partial strategy (e.g AFWG indicates that *Sebastas mentella* is showing positive signs, with a recent increase in stock abundance, but expected poor recruitment), in the main there is a lack of objective basis for confidence that the partial strategy will work. In particular it remains difficult to objectively judge the efficacy of the partial management strategy for species such as Greenland halibut and spotted wolfish – indeed even for *Sebastes mentella*, it is more realistically too early to argue in the objective basis for confidence in the partial strategy – particularly given the on-going NEAFC fishery in international waters.
Taking these elements in combination, although in most regards the unconditional (80) scoring guideposts are met, the lack of objective basis for confidence in management strategies – in particular for some of the more minor, but none-the-less vulnerable species, means that the overall score for the performance indicator fall just below the 80 mark and a condition is therefore triggered.

References

NEAFC regs ://www.neafc.org/system/files/%252Fhome/neafc/drupal2_files/rec3_redfish_i_ii_2010_rev1.pdf
Regulation relating to sea-water fisheries No 1878 of 22.12.2004 (Forskrift om utøvelse av fisket i sjøen nr 1878 av 22.12.2004).

The reference is made to section 48 of this Regulation. http://www.fiskeridir.no/english/fisheries/regulations
Order of the Federal Fisheries Agency No 13 of the 16th of January 2009 on adoption of the Regulation on fisheries in the Northern fishery basin.ICES Advice 2009 - 3.4.4 Saithe in Subareas I and II (Northeast Arctic)
ICES Advice 2009. 3.4.5 Beaked redfish (*Sebastes mentella*) in Subareas I and II
ICES Advice 2009. 3.4.7 Greenland halibut in Subareas I and II
AFWF 2009.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.1.3	**Information / monitoring** 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.	Qualitative information is available on the amount of main retained species taken by the fishery. Information is adequate to qualitatively assess outcome status with respect to biologically based limits. Information is adequate to support measures to manage main retained species.	Qualitative information and some quantitative information are available on the amount of main retained species taken by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main retained species. 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 strategy).	Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations. Information is sufficient to quantitatively estimate outcome status with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective. Monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species.

Score:	**90**

Justification

Accurate and verifiable information is available on the catch of all retained species and the consequences for the status of affected populations.

Accurate and verifiable landings data is recorded, checked and passed to appropriate authorities. The assessment team have been provided with exact break down of landings for all certified vessels, with seasonal and regional trends. The management strategy which prevents discarding in Norwegian and Russian waters is specifically designed to capture information. The information provided by ICES is comprehensive for several of the main species, and broadly sufficient for the other species (representing 1% of less of the total fleet landings. ICES advice specifically addresses the issue of information quality and availability and focuses research and monitoring effort accordingly. For all species, information is available of species distribution, key growth parameters and life cycle stages.

The landings data provides information is sufficient to estimate outcome status with respect to biologically based limits, for all species. For some species however this does not relate to a quantitative understanding of stock status, so does not yet support a high degree of certainty. Similarly, for some of the retained species, the lack of detailed understanding about stock dynamics means that the landings information obtained is only adequate to support a partial strategy to manage main retained species and not adequate to support a comprehensive strategy, or enable a high degree of certainty.

The level of monitoring of retained species is conducted in sufficient detail to assess ongoing mortalities to all retained species, albeit, in some instances, uncertainty about the quantified status of the resource means that the although the monitoring of the level of mortality is accurate, determining the impact of this removal on stock status remain, remains relative.

In addition to the considerations above, it is relevant to also note the client fisheries undertaking to implement (and fund) an independent observer programme, placing PINRO scientist on board vessels. This will further strengthen the quality of the information obtained.

References

ICES Advice 2009 - 3.4.4 Saithe in Subareas I and II (Northeast Arctic)
ICES Advice 2009. 3.4.5 Beaked redfish (*Sebastes mentella*) in Subareas I and II
ICES Advice 2009. 3.4.7 Greenland halibut in Subareas I and II
AFWF 2009.
Vessel log books
FSB *Pers comms*.
PINRO Submission to the assessment team.

2.2	Discarded species (also known as "bycatch" or "discards")

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.1	**Status** 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.	Main bycatch species are likely to be within biologically based limits, or if outside such limits there are mitigation measures in place that are expected to ensure that the fishery does not hinder recovery and rebuilding. If the status is poorly known there are measures or practices in place that are expected result in the fishery not causing the bycatch species to be biologically based limits or hindering recovery.	Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	There is a high degree of certainty that bycatch species are within biologically based limits.

Score:	80

Justification

Main bycatch species are highly likely to be within biologically based limits or if outside such limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.

Discarding of juveniles, or over quota target species (cod / haddock) is dealt with under P1. Discarding of other listed species (including all those of potential relevance to this assessment) is banned in both Russian and Norwegian waters and therefore *technically* does not occur. However, both in Norwegian and Russian jurisdictions there is recognition that the discard ban is difficult to enforce, and in the case of some species has the potential to be unworkable – for example, where legislation requires species to be landed for which there is no obvious market, or even waste / fishmeal destination. Species which are not included on the Norwegian list can still be discarded in Norwegian waters.

It is probable that some macrobenthos is legally discarded. Research shows that this is likely to be dominated by abundant and productive benthic invertebrate species such as starfish (*Cteno-discus crispatus*) and brittlestars (*Ophiura sarsi*). Smaller benthic species such as shrimp (*Sabinea septemcarinata*) are less likely to be caught in the 130mm mesh.

In relation to the fishery under certification, there are no known fish species which are likely to occur in the trawl which would particularly trigger discarding and all 5 captains interviewed reported that everything is landed. In is possible however, that some low value species, such as flounder could be discarded. This is legal under Norwegian legislation as the species is not listed in section 48 of the Norwegian fisheries legislation. Past research (not with the certified vessels) has also indicated that skate (discarding of which is banned under Norwegian legislation) species have been caught in Barents Sea trawl fisheries and are typically discarded due to lack of Russian market. In trawl survey undertaken by Dolgov *et al* (2005) thorny skate (*Amblyraja radiate*) was caught at a rate of around 10kg / hour of trawl, but 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 thorny skate. More recent work has indicated a 55% skate post capture survival following trawl – albeit based on a small survey size, and in a different area. It is noted that the critical determinant of survival rate is cod end weight, indicating that measures which seek to reduce bycatch rate in trawls with have a further benefit of increasing skate survival rates.

Because of this potential interaction with skate and other low value fin fish species, the theoretical potential to discard, and the lack of certainty due to lack of independent verification of discarding, it is not possible to conclude this performance indicator with a high degree of certainty, therefore the assessment team have not awarded maximum points.

References

Vessel captains. *Pers comms.*

Norwegian Fisheries Directorate *pers comms.*

Regulation relating to sea-water fisheries No 1878 of 22.12.2004 (Forskrift om utøvelse av fisket i sjøen nr 1878 av 22.12.2004). The reference is made to section 48 of this Regulation. http://www.fiskeridir.no/english/fisheries/regulations

Order of the Federal Fisheries Agency No 13 of the 16th of January 2009 on adoption of the Regulation on fisheries in the Northern fishery basin.ICES Advice 2009 - 3.4.4 Saithe in Subareas I and II (Northeast Arctic)Dolgov, A. V., A. A. Grekov, I. P. Shestopal, and K. M. Sokolov. (2005). By-catch of Skates in Traw and Long-Line Fisheries in the Barents Sea. J. Northw. Atl. Fish.

Sci., 35: 357-366
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

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.2	**Management strategy** 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.	There are measures in place, if necessary, which are expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. The measures are considered likely to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/species).	There is a partial strategy in place, if necessary, for managing bycatch that is expected to maintain main bycatch species at levels which are highly likely to be within biologically based limits or to ensure that the fishery does not hinder their recovery. There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or the species involved. There is some evidence that the partial strategy is being implemented successfully.	There is a strategy in place for managing and minimising bycatch. The strategy is mainly based on information directly about the fishery and/or species involved, and testing supports high confidence that the strategy will work. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.

Score:	**85**

Justification

There is a strategy in place for managing and minimising bycatch.
The strategy consists of a discard ban (both in Russian and Norwegian economic zones), use of large mesh size, move on rule (real time closures), compulsory use of separator grid in the trawl configuration to serve as a bycatch reduction device, and appropriate use closed areas to protect key life stages and important nursery and spawning areas.
There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or the species involved.
Good understanding about the gear characteristics, the likely bycatch species, their location and status – including locations of key lifestyle stages, means that there can be objective confidence in the strategy – however this is not fully tested for all species.
There is some evidence that the partial strategy is being implemented successfully.
The is clear evidence of the implementation and enforcement of real time closures, mesh size regulations, separator grid and – when inspectors are on board vessels – the discard ban. However, without a higher level of independent observer coverage it cannot be argued that there is clear evidence of all aspects of the strategy being implemented, leading to intended changes.

References

Regulation relating to sea-water fisheries No 1878 of 22.12.2004 (Forskrift om utøvelse av fisket i sjøen nr 1878 av 22.12.2004). The reference is made to section 48 of this Regulation. http://www.fiskeridir.no/english/fisheries/regulations
Order of the Federal Fisheries Agency No 13 of the 16th of January 2009 on adoption of the Regulation on fisheries in the Northern fishery basin.ICES Advice 2009 - 3.4.4 Saithe in Subareas I and II (Northeast Arctic)

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.2.3	**Information / monitoring** Information on the nature and amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	Qualitative information is available on the amount of main bycatch species affected by the fishery. Information is adequate to broadly understand outcome status with respect to biologically based limits. Information is adequate to support measures to manage bycatch.	Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery. Information is sufficient to estimate outcome status with respect to biologically based limits. Information is adequate to support a partial strategy to manage main bycatch species. 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 effectiveness of the strategy).	Accurate and verifiable information is available on the amount of all bycatch and the consequences for the status of affected populations. Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty. Information is adequate to support a comprehensive strategy to manage bycatch, and evaluate with a high degree of certainty whether a strategy is achieving its objective. Monitoring of bycatch data is conducted in sufficient detail to assess ongoing mortalities to all bycatch species.

Score: 80

Justification

Qualitative information and some quantitative information are available on the amount of main bycatch species affected by the fishery.

There is no evidence for discarded bycatch, and strong laws in place in both Russian and Norwegian waters to prevent discarding. A key purpose of this legislation is to improve the information base for assessments of less commercial species, and so that all fishing related mortality can be accurately and verifiably established. However, at the time of assessment, it cannot yet be accurately and verifiably determined that no discarding takes place, due to lack of independent observation. As part of the MSC assessment process, the client group have initiated an observer programme, with PINRO scientists. Once results from this are analysed and disseminated it may provide a basis for higher scores.

Information from independent research carried out by both Russian and Norwegian scientists also provides useful quantitative understanding of typical discard patterns in Barents Sea trawl fisheries. When applied across the whole fleet, and across a number of years, this become more qualitative.

Information is sufficient to estimate outcome status with respect to biologically based limits.

For all of the main retained species, assessments of fishing mortality are sufficiently accurate, and none of the assessments have indicated that discarding in the demersal trawl fishery presents a problem either to stock status, or to the information required to establish outcome status. This is not so for all fisheries in the area, for example the *Sebastes mentella* assessment specifically points to uncertainty in the information in relation to discarding in the shrimp fisheries.

Information is adequate to support a partial strategy to manage main bycatch species.

The information which informs the partial staretegy is mainly focused on bycatch reduction measures such as closed areas, move on rules, mesh size regulations and gear selectivity regulations. In most cases the key information to inform such strategies relates to the biology of the bycatch species, in particular key characteristics (such as size at maturity, response to capture etc) and lifecycle (nursery grounds / spawning areas / seasonality). In all cases information is sufficient to support this strategy. In order for information to be sufficient to support a comprehensive strategy, there would need to be more on-going, fleet specific data (based on onboard observations), to enable dynamic modification of fishing practices in event of unacceptable impacts.

Sufficient data continue to be collected to detect any increase in risk to main bycatch species....

The level of data available at the time of assessment – given the discard ban and apparent lack of discarding – is sufficient, certainly for the main bycatch species in the fisheries. However, this stops short of being continuous and on-going and does not cover all species. For example, were independent observations available, including quantitative figures on macrobenthos, then a

higher score could be achieved.
The new MSC logbook which has been implemented by the client vessels does require data for discards to be recorded, but this data is not yet available to inform the assessment.

References

Dolgov, A. V., A. A. Grekov, I. P. Shestopal, and K. M. Sokolov. (2005). By-catch of Skates in Traw and Long-Line Fisheries in the Barents Sea. J. Northw. Atl. Fish. Sci., 35: 357-366
Stiansen & Filin (2008) Joint PINRO / IMR Report of the state of the Barents Sea Ecosystem in 2007, with Expected Situation and Considerations for Management

2.3	Endangered, Threatened and Protected (ETP) species

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.1	**Status** The fishery meets national and international requirements for 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.	Known effects of the fishery are likely to be within limits of national and international requirements for protection of ETP species. Known direct effects are unlikely to create unacceptable impacts to 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. Direct effects are highly unlikely to create unacceptable impacts to ETP species. Indirect effects have been considered and are thought to be unlikely to create unacceptable impacts.	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. There is a high degree of confidence that there are no significant detrimental effects (direct and indirect) of the fishery on ETP species.

Score: 80

Justification

A full explanation of the ETP species in the area of the fishery is provided in report section 4.3, clearly indicatin ghtose protected by law (CITES). For the purposes of scoring, focus is placed on CITES species likely to interact with the fishery – notably dolphins.

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.

Direct effects are highly unlikely to create unacceptable impacts to ETP species.

Although there is the potential for demersal trawl fisheries to interact with cetacean species, it is recognised (and supported by evidence) that the majority of cetacean bycatch derives from pelagic pair trawling and set nets, gill nets or drift nets. For example, although not directly applicable to the certified fishery it is useful to note the EU fleet segments that require monitoring under EC Council Regulation 812/2004, which clearly shows the need to focus monitoring effort on pelagic and set net gears. The review of the impact of Norwegian offshore demersal trawl fisheries on marine mammals is available through the ICES Study Group for Bycatch of Protected Species (SGBYC 2009). These results can reasonably be taken as applicable for the fishery under certification (same vessels, same gear, same area). This concludes that larger offshore demersal trawl vessels "are regarded as having a relatively low risk for bycatches of marine mammals".

Without exact figures for the fishery in question, supported by independent observation it is not possible to conclude that 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.

Barents Sea elasmobranch species are not protected by CITES and are therefore not technically covered in an ETP assessment, however, given the presence critically endangered of shark species such as Porbeagle (*Lamna nasus*) and Angel shark (*Squatina squatina*) and the increased potential for capture in demersal trawl gears, it warrants consideration here. These species are considered by the ICES Working Group on Elasmobranch fisheries (WGEF) who issue advice. For Porbeagle in the Barents Sea, ICES advice is that there should be no targeted fishing for porbeagle on the basis of their life history and vulnerability to fishing. In addition, measures should be taken to prevent bycatch of porbeagle in fisheries targeting other species, particularly in the depleted northern areas. Since 2007 directed porbeagle fishing has been banned in Norwegian waters. Post capture mortality experiments show some elasmobranch species to be relatively resilient to the effects of trawl capture (compared to other fish species), with estimated mortalities potentially well below 50%, but very dependent on cod end weight. Although the effects of the fishery are unlikely to create unacceptable impacts, it is appropriate that management strategies should include consideration of elasmobranch species.

Indirect effects have been considered.....

Indirect effects of fisheries on ETP species may include issues such as ghost fishing, removal of prey and oil / waste pollution. Ghost fishing is not an issue in the certified fisheries. Where gear become entangled, for example on seabed obstructions, it can and is recovered, often by releasing one side and hauling the other, or in some cases by using hooks if necessary. Gear is expensive and there is little economic sense in giving up on a recovery attempt. The main determinants of whale and dolphin species abundance is zooplankton and capelin abundance in the Barents Sea, in this sense the certified fishery is unlikely to be of consequence. All vessels are fully MARPOL compliant, with excellent waste and oil handing protocols. Pollution from the certified vessels is therefore not likely to impact on ETP species.

References

Northridge, S.P., 1984 World review of interactions between marine mammals and fisheries. FAO Fish.Pap., (251):190 p.

SGBYC (2009). Report of the Study Group for Bycatch of Protected Species (SGBYC), 19– 22 January 2009, Copenhagen, Denmark. ICES CM 2009/ACOM:22. 117 pp.
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Mandelman J. W. & Farrington M. A (2007). The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (*Squalus acanthias*). Fisheries Research. Volume 83, Issues 2-3, February 2007, Pages 238-245
ICES Advice (2009)1.5.1.3 New information on impact of fisheries on components of the ecosystem
Stiansen & Filin (2008) Joint PINRO / IMR Report of the state of the Barents Sea Ecosystem in 2007, with Expected Situation and Considerations for Management

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.2	**Management strategy** 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 or irreversible harm to ETP species; - ensure the fishery does not hinder recovery of ETP species; and - minimise mortality of ETP species.	There are measures in place that minimise mortality, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species. The measures are considered likely to work, based on plausible argument (eg general experience, theory or comparison with similar fisheries/species).	There is a strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to be highly likely to achieve national and international requirements for the protection of ETP species. There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved. There is evidence that the strategy is being implemented successfully.	There is a comprehensive strategy in place for managing the fishery's impact on ETP species, including measures to minimise mortality, that is designed to achieve above national and international requirements for the protection of ETP species. 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. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is evidence that the strategy is achieving its objective.

Score: 80

Justification

There is a strategy in place for managing the fishery's impact on ETP species .....

There is a strategy which is appropriate to the scale of the potential interaction. Russia has ratified a number of conventions on species protection and management, including the Convention on Biological Diversity and CITES which establish overarching objectives for ETP species conservation. Russia is also a signatory to NAMMCO (the North Atlantic Marine Mammal Commission) and along with IWC, which do advocate measures to reduce bycatch of marine mammals and accurate recording to inform scientific understanding and abundance estimates. ICES also plays a key role in the strategy to minimise impacts on ETP species, in particular through the work of the Study Group on Protected Species (SGBYC) and the working group on marine mammal ecology (WGMME) through which issues relating to ETP species are identified and managed. This includes highlighting the main focus for research (across all national fleets) and coordinated testing of mitigation approaches.

At the level of the certified fleet, there have been recent additions to the strategy. In particular, the introduction of an MSC logbook on all vessels will require captains to record any interaction with ETP species. This data will be aggregated for the entire fleet and submitted to PINRO scientists for assessment. This data will be applicable to work of ICES (highlighted above) and will enable adjustments in operational practices if unacceptable impacts are identified. The new client initiative observer programme has also commenced and this should generate data to further inform the ETP strategy. At vessel level, bars over the hopper down into the processing deck, and an open stern mean that in event of capture of an elasmobranch, the animal could be released with minimum additional damage over and above that suffered in the trawl net.

There is an objective basis for confidence that the strategy will work, based on some information directly about the fishery and/or the species involved.

The degree of confidence in the efficacy of the strategy is principally informed by the understanding of the level of potential impact of the gear with ETP species, as detailed in 2.3.1 – in short given the lower risk associated with ETP interactions with demersal trawl fisheries, the strategy in place gives objective basis for confidence.

There is evidence that the strategy is being implemented successfully.

The key ICES working groups (WGEF, SGBYC & WGMME) have been active in recent years, and continue to influence the development of legislation – notably EU, but also Norwegian (which is of course relevant to the certified fleet due to area of operation). Although Russia does not give country reports to these, it does submit reports to NAMMCO. At fleet level, the assessment team saw evidence of the new MSC logbook with ETP reporting requirement, in use on board the certified vessels – although aggregated data has not yet been generated.

References

Ocean Trawlers Code of Conduct

CITES list of parties: http://www.cites.org/eng/disc/parties/alphabet.shtml
WGMME (2009). Report of the Working Group on Marine Mammal Ecology (WGMME), February 2–6 2009, Vigo, Spain. ICES CM 2009/ACOM:21. 129 pp.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.3.3	**Information / monitoring** 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.	Information is adequate to broadly understand the impact of the fishery on ETP species. Information is adequate to support measures to manage the impacts on ETP species Information is sufficient to qualitatively estimate the fishery related mortality of ETP species.	Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts. Sufficient data are 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 with a high degree of certainty. 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. Accurate and verifiable information is available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.

Score:	**80**

Justification

Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species, and if so, to measure trends and support a full strategy to manage impacts.

Joint PINRO / IMR Report on the State of the Barents Sea ecosystem gives a good explanation of the ETP species which occur in the Barents Sea including their spatial and temporal distribution and lifestyle characteristics. There is a long history of marine mammal survey work informing abundance estimates in the Barents Sea, using several different survey from mark-recapture experiments, breeding surveys (harp seals - since the mid 1980s) and more recently transect surveys either by ship (for whales) or spotter plane (for cetaceans). In part the necessity for these surveys derives from ICES advice, which states that any the quotas for harvesting marine mammal species commercially must be based on estimates which are less than 5-years old. Not all species receive the same level of monitoring and inevitably those which are most threatened or those with commercial value receive most attention.

Annual vessel monitoring surveys undertaken by the Norwegian Institute of Marine Research target minke whales and other large baleen whales and provide abundance estimates every 6 years. Since 2002 the distribution patterns of marine mammals in the Barents Sea have also been observed from research vessels during the Joint PINRO / IMR ecosystem survey, further enhanced by aircraft observations and observations from fishing and coastguard vessels.

In addition VMS data gives precise details about vessel location and fishing patterns, to enable the potential for interaction to be determined. The final piece of information to support a full strategy to manage impacts is an understanding of the gear interaction with key ETP species, which Norway submits to the ICES SGBYC, for trawl fisheries in the Barents Sea.

Sufficient data are available to allow fishery related mortality and the impact of fishing to be quantitatively estimated for ETP species.

It is possible to derive a quantitative estimate of the level of ETP capture for the certified fleet by extrapolation of data of other relevant fleets (such as the Norwegian fleet using the same gear in the same fishing areas), informed by understanding of areas and times of vessel operation and species distribution.

As part of the MSC assessment process the client group have initiated and implemented 2 key activities which will further enhance the quality and local fleet specific level of data available on ETP interactions. An observer programme has been initiated, placing PINRO observers on board vessels to generate valuable data, including on ETP interactions. Secondly the MSC logbook which is now in use on all certified vessels will record all ETP species interactions.

Accurate and verifiable information is not available on the magnitude of all impacts, mortalities and injuries and the consequences for the status of ETP species.

Although extensive knowledge has gradually been built up that enables scientists to estimate the size of the stocks of certain marine species (e.g: minke whale, harp seal, polar bear) in the area. The estimates for some other species is less certain, and lack the same degree of systematic survey, meaning that data for most of the species are not good enough to capture smaller-scale population trends or provide a basis for sound management.

References

Barents Sea Portal:
Norwegian Ministry of the Environment (2006). Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands. Report No. 8 to the Storting (2005–2006), recommendation of 31 March 2006 by the Ministry of the Environment.

2.4	Habitat

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.1	**Status** The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	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.

Score:	60

Justification

The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

The fishing gear used in the certified fleet is a relatively heavy trawl gear, with rock hopper gear. Such heavy trawl gears are known to impact on habitat structure and function. Although consultations with captains did not indicate large capture of sessile and vulnerable habitat forming species, such as corals, there were indications that rocks are sometimes brought up in the nets. The degree to which the impact of trawl gear on habitats can be regarded as 'serious or irreversible' is dependent on the nature and function of the habitats and a determination of an acceptable rate of recovery in event of trawl operations ceasing. Irreversibility may imply regime change or loss / extinction of key habitat species (i.e. recovery would never occur), whereas serious may imply major change in the structure and diversity of species assemblages.

Benthic biodiversity studies in the Barents Sea show that in general, although biomas was shown to decrease from the 1920s to the 1960s (attributed in part to both climatic factors and intensive fishing activity), recent years have seen a steady increase in benthic biomas from 2005-2007 across the Barents sea, but with the notable exception of the Western slope / shelf edge, where more sessile and vulnerable species, such a sponges benefit from harder substrate, high primary production and strong currents to resuspend food. In spite of some local decline, benthic species which are potentially vulnerable to trawl impact remain well represented in survey data and there is no indication of benthic species being threatened with local extinction.

There is considerable natural variation in the distribution of benthic habitat forming species, due to factors such as productivity, substrate type and sedimentary environment, as result in some areas of fishing activity, benthic communities are likely to be more dymanic and less vulnerable to impact. In these areas it could be strongly argued that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.

However, fishing activity also has the ability to further influence the natural variation in benthic community assemblages. For example, data suggest that it is high intensity of fishing in the southern part of the Barents Sea that is the reason for low indicators of biodiversity and zoobenthos bycatch biomass. By contrast the north-east part of the Barents Sea with less trawl intensity can be characterized higher levels of biodiversity and macrobenthos biomass.

In terms of recovery of habitat species if left in an undisturbed state. Studies of long-term dynamics of bottom communities in the Barents Sea showed that significant increases in benthic biomas were observed during periods of reduced fishing intensity during the Second World War. Subsequently, following the peak in fishing intensity in the post war years and the 1960s and 70s, recovery of areas and bioresources of the most common species, large taxons and trophic groups of zoobenthos was again observed. Rate of recovery is dependent on a number of issues – frequency of disturbance (natural and anthropogenic), productivity, substrate type and species. Benthic recovery rates following trawling events, are typically in the range of 2.5 to 6 years with the fastest recovery being observed in mud habiats. In the Barents Sea although the majority of the habitats may fall within the more dynamic and sedimentary range (hence quicker recovery), it is notable that some of the species composition and the substrate types on the shelf edge may show far slower recovery characteristics. Reef forming, cold water coral species on hard substrates have the slowest recovery rate (potentially well beyond the 2.5 – 6 year range noted above for large reef forming species).

The main species of coral (e.g *lophelia* sp) which would be particularly vulnerable to trawl impact (potentially qualifying as a serious / irreversible impact) are located in Norwegian coastal waters – largely within 12nm and therefore beyond the area fished by the certified vessels. Furthermore, the Norwegian authorities have closed 5 such areas to trawl fishing. In the areas still fished by the certified fishery, the principal areas of potential threat / risk are on vulnerable sessile species along the shelf edge and in waters around Svalbard and the Norwegian coast – in particular sponge species but also some coral species. For now there is no protection in the form of closed areas for these species (aside from the exclusion zones around Svalbard and Bear Island), however it is likely that a cessation in fishing activity would result in gradual recovery of these habitats. It is therefore unlikely that the certified fishery would reduce habitat structure and function to the point where there would be serious or irreversible harm – however, given the lack of habitat protection, and the obvious potential of such heavy trawl gear to have an impact it cannot be concluded that any such impact is *highly* unlikely to be serious.

References

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Løkkeborg S. 2005. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO fisheries technical paper 472, 69 p.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.2	**Management strategy** 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.	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance. The measures are considered likely to work, based on plausible argument (e.g general experience, theory or comparison with similar fisheries/habitats).	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 some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved. There is some evidence that the partial strategy is being implemented successfully.	There is a strategy in place for managing the impact of the fishery on habitat types. The strategy is mainly based on information directly about the fishery and/or habitats involved, and testing supports high confidence that the strategy will work. There is clear evidence that the strategy is being implemented successfully, and intended changes are occurring. There is some evidence that the strategy is achieving its objective.

Score: 75

Justification

There are measures in place that are expected to achieve the Habitat Outcome 80 level of performance.

measure to mitigate habitat impacts include, as a foundation, as reasonable level of information based on a long time series of benthic / seabed research, which is on-going, indeed habitat mapping efforts are currently receiving high priority. The information base is also complemented by research into habitat impacts of gear types (both locally specific and interpreted from other studies). Resulting management measures, which specifically addresses habitat impact has largely focused on closing inshore waters and waters around Svalbard and Bear Island to large trawl vessels (the certified fleet can only fish to within 12 nm in both the Russian and the Norwegian economic zone) and closure of vulnerable reef areas in Norwegian waters. Further closures also have a habitat benefit in Russian waters, although these are generally aimed at protecting certain commercial fisheries (i.e juvenile / spawning ground closures), and have not therefore necessarily been selected on the basis of habitat characteristics. The fishing pattern of the fleet (based on concentrations of target cod and haddock) means that habitats in the North Eastern Barents Sea experience far less habitat disturbance – although this is more coincidence rather than strategy, and does little to protect more vulnerable habitats, typically concentrated in more productive areas, where fishing effort is greatest.

In particular in the Russian context, this therefore stops short of being a strategy for habitat, and does not yet specifically or proactively consider the question of the impact of trawl gears on habitat. The assessors are not aware of any significant consideration (in a Russian context) of gear type innovations to mitigate habitat impact. In a Norwegian context given then improved information base, specific consideration in the Barnet Sea Ecosystem Management Plan, innovation in gear design and closures specifically to protect certain habitat types, it can be argued that there is a partial strategy.

There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or habitats involved.

Given that 80% of fishing activity takes place in waters covered by the Norwegian habitat partial strategy (including identifying and protecting vulnerable habitats), and that overall fishing effort is far reduced from its peak in the 1970s, and that the pattern of fishing effort leaves many areas lightly trawled, it can be argued that there is some objective basis for confidence. Certainly there is good representation of the most vulnerable habitats – likely to suffer serious or irreversible harm – being protected, such that loss or localised extinction of species is highly unlikely.

There is some evidence that the partial strategy is being implemented successfully.

Closures are well enforced, thanks to VMS and at sea enforcement. Research is on-going and regularly updated and feeds directly into management decision-making.

References

MAREANO Seabed mapping project - *http://www.mareano.no*

Vessel captains *pers comms.*

PINRO *pers comms*

Norwegian Ministry of the Environment (2006). Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands. Report No. 8 to the Storting (2005–2006), recommendation of 31 March 2006 by the Ministry of the Environment.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.4.3	**Information / monitoring** 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.	There is a basic understanding of the types and distribution of main habitats in the area of the fishery. Information is adequate to broadly understand the main impacts of gear use on the main habitats, including spatial extent of interaction.	The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery. 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, timing and location of use of the fishing gear. 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).	The distribution of habitat types is known over their range, with particular attention to the occurrence of vulnerable habitat types. Changes in habitat distributions over time are measured. The physical impacts of the gear on the habitat types have been quantified fully.

Score: 80

Justification

The nature, distribution and vulnerability of all main habitat types in the fishery area are known at a level of detail relevant to the scale and intensity of the fishery.

There is an opportunity for understanding of habitat types in the area of the fishery to be much improved. The areas of habitat that the MAREANO project have already mapped in detail give an indication of the level of information that is achievable, as this ambitious project continues and expands. The project has already identified main vulnerable areas. Even before this project existing work by both PINRO and IMR provided good understanding of seabed substrate types and characteristic benthic infauna in different areas of the Barents Sea.

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, timing and location of use of the fishing gear.

There is excellent information available from VMS on the exact location of fishing activity, which allows both the spatial extent and timing to be determined. There is also sufficient data on the nature of impacts of trawl gears. Studies from elsewhere in Northern European seas are relevant, as is international experience. Over and above this body of readily applicable international research, there is more localised (Barents Sea) research on the impacts of trawl gears. In particular, the work by S.G. Denisenko and N.V. Denisenko (Murmansk Marine Biological Institute & later the Institute of Zoology of the Russian Academy of Science) has strengthened understanding the impact of bottom trawling on benthic communities in the Barents Sea.

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).

The first phase of the MAREANO project will continue through 2010 to fill knowledge gaps related but still focusing on priority mapping along the shelf break and on the continental shelf in the western part of the survey area - areas regarded as especially ecologically important and vulnerable. The annual joint Norwegian / Russian ecosystem survey also undertakes benthic sampling, including grab samples to continue the time series of long benthic community composition trends. This productive bilateral research cooperation is set to continue. The certified fleet have also initiated an observer programme, placing PINRO scientists on board vessels and further enhancing the level of on-going monitoring.

References

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2.5	Ecosystem

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.1	**Status** The fishery does not cause serious or irreversible harm to the key elements of ecosystem structure and function.	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.

Score:	90

Justification

The fishery is highly unlikely to disrupt the key elements underlying ecosystem (and there is some evidence to support this).

Two ICES working groups – (both the Arctic Fisheries and the regional ecosystem description WG) provide a comprehensive and annually updated review of ecosystem status. Additionally, Russian and Norwegian scientists come together annually as part of the Joint Russian - Norwegian Commission on Environmental Cooperation (in co-operation with the Joint Russian-Norwegian Fisheries Commission) to provide a comprehensive description of the Barents Sea ecosystem which gives a scientific basis for development of an ecosystem-based management plan for the Russian part of the Barents Sea and contribute to the further development of ecosystem-based management already in place in the Norwegian Barents Sea Management Plan. The resulting annual Barents Sea ecosystem status report provides comprehensive information about key ecosystem components, presents trends and highlights the expected future situation.

There are also a number of ecosystem modelling projects which inform management of key commercial species. These include EcoCod (developed in 2005 to estimate cod MSY taking into account a range of ecosystem factors), Biofrost (multispecies model for Barents Sea – main emphasis cod / capelin dynamics), Gadget (Multispecies interactions between cod, herring, capelin & minke whale (& krill) in the Barents Sea).

The ecosystem description work shows that although The Barents Sea remains relatively clean from pollution, it can no longer be regarded as a pristine ecosystem. There is evidence that many of the key elements of the ecosystem are in good shape, and there are good understanding of the factors affecting the negative change in other ecosystem elements. Of relevance to the cod and haddock, both stocks are increasing and harvested at sustainable levels. Capelin, a key species in the ecosystem in terms of food web dynamics, is also at high stock levels. Although stocks of saithe (an important bycatch species in this fishery) have declined in recent years, ICES concludes that current exploitation levels remain sustainable. By contrast, stocks of Greenland halibut and redfish are at low levels but there are indications that the Greenland halibut stock is increasing and there are signs of improved recruitment in deep-sea redfish. In both cases however the low stock levels are not caused by the fishery under assessment, but rather by other targeted fisheries or by high bycatch levels in other fisheries.

Higher temperatures, declining sea ice and lower recent recorded zooplankton levels are all driving change in the ecosystem – also beyond the immediate influence of the fishery under assessment. The continued declining population trends and breeding failure of several seabird species, such as northern fulmar, black-legged kittiwake, razorbill, Atlantic puffin and common guillemot are experiencing declines is similar to patterns elsewhere in the Northeast Atlantic. This is probably caused by food shortage, predation from an increasing population of white-tailed eagles and lagged effects from previous by-catch in (particularly long line and gill net fisheries) fisheries. Again, the fishery under assessment is highly unlikely to play a significant role in this. For marine mammals, although it can be concluded that the fishery is highly unlikely to disrupt that key element, there is less of a firm evidence base and the exact dynamics between seabirds and marine mammals affect their prey populations is less well established – for this reason it is not possible to score maximum points.

References

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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.2	**Management strategy** There are measures in place to ensure the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function.	There are measures in place, if necessary, that take into account potential impacts of the fishery on key elements of the ecosystem. The measures are considered likely to work, based on plausible argument (eg, general experience, theory or comparison with similar fisheries/ ecosystems).	There is a partial strategy in place, if necessary, that 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 partial strategy is considered likely to work, based on plausible argument (eg, general experience, theory or comparison with similar fisheries/ ecosystems). There is some evidence that the measures comprising the partial strategy are being implemented successfully.	There is a strategy that consists of a plan, containing 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. The measures are considered likely to work based on prior experience, plausible argument or information directly from the fishery/ecosystems involved. There is evidence that the measures are being implemented successfully.

Score:	**80**

Justification

There is a partial strategy in place, if necessary, that 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 partial strategy is considered likely to work, based on plausible argument (eg, general experience, theory or comparison with similar fisheries/ ecosystems).
In the Norwegian zone (where 80% of the certified fleet fishing effort takes place) there is a Barents Sea ecosystem management plan. The policy goals and objectives in the plan are taken into account in the new Norwegian Marine Resources Act, bringing about, for example, the requirement to retain catches of the key species, thus improving the information and understanding of mixed fisheries, the closure of key spawning or nursery grounds, the protection of key habitat areas (cold water coral) and compulsory gear restrictions (separator panel and large mesh size). Even without a formalised Ecosystem Based Barents Sea Management Plan for the Russian zone, most of the above measures also apply.
A fundamental part of the partial strategy is the 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.
When considering marine environmental management in the Barents Sea at a bilateral / strategic level, Norway and Russia have had a Joint Commission on Environmental Protection since 1988. In 2005 a Marine Environment group was established under this commission, with the aim of enhancing the cooperation on ecosystem-based management of the Barents Sea. Of similar note, although Russia is not currently part of OSPAR, the Norwegian ecosystem based management plan for the Barents Sea states that the Norwegian authorities will:

> *work to standardise and harmonise Norwegian and Russian environmental monitoring in the Barents Sea; this will include continuing assist Russia in introducing OSPAR standards, which will facilitate Russia's entry into the OSPAR cooperation in the long term.*

There is some evidence that the measures comprising the partial strategy are being implemented successfully.
There is evidence of area closures (and VMS tracking to confirm compliance), there is evidence of research cruises and resulting status reports, and there is evidence of ecosystem elements being given key consideration at fisheries management level – both in the form of ICES advice and in the deliberations of the JNRFC.

Were an ecosystem management plan in place for the Russian Barents Sea, higher scores would have been achieved for this performance indicator.

References

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	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
2.5.3	**Information / monitoring** There is adequate knowledge of the impacts of the fishery on the ecosystem.	Information is adequate to identify the key elements of the ecosystem (e.g. trophic structure and function, community composition, productivity pattern and biodiversity). Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Information is adequate to broadly understand the functions of the key elements of the ecosystem. Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail. The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known. 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 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 adequate to broadly understand the key elements of the ecosystem. Main interactions between the fishery and these ecosystem elements can be inferred from existing information, and have been investigated. The impacts of the fishery on target, Bycatch, Retained and ETP species and Habitats are identified and the main functions of these Components in the ecosystem are understood. 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. Information is sufficient to support the development of strategies to manage ecosystem impacts.

Score:	**95**

Justification

Information is adequate to broadly understand the key elements of the ecosystem.

Understanding of food web dynamics related to both cod and haddock is reasonably well advanced for the Barents Sea, with good quantitative information as a result of stomach content analysis of both cod and haddock, which gives considerable insight into the dynamic relationships with prey species such as capelin. This information sufficient to parameterise ecosystem models, and in so doing underpins both the formulation of annual stock management advice, and in the case of Norway, the development of the Barents Sea ecosystem management plan. In spite of this good and regularly updated data there remain some key questions about the exact ecosystem dynamics in the Barents Sea. For example:

- Future impacts of further ocean warming:
  - On quality, quantity, and timing of primary production?
  - On relationship between phytoplankton, zooplankton and the spawning of major fish stocks?
- Impacts of recent large populations of pelagic fish (Capelin and Atlanto-cscandian herring):
  - On zooplankton community and the recruitment of cod and capelin?
  - On top-predators?

In spite of these areas of uncertainty, information does enable a broad understanding.

Main impacts of the fishery on these key ecosystem elements can be inferred from existing information, but may not have been investigated in detail.

The exact impact of the certified fishery may not have been fully quanitifed in detail, with a relative lack of observer coverage, or scientific work on these vessels, however the work carried out by observers and reference fleets elsewhere – in particular by

Norwegian researches, and to some extent by Russian scientists, is more than adequate to enable main impacts to be inferred. Certainly sufficient for management purposes.

The main functions of the Components (i.e. target, Bycatch, Retained and ETP species and Habitats) in the ecosystem are known.

There is a good understanding of the function of key ecosystem components, such as target species (cod & haddock), bycatch species (saithe), ETP species (marine mammals) and habitats (productive nursery areas). There does remain opportunity for improving the quantifiable level of understanding of the certified fishery on some of these components – notably habitats, as referred to in 2.3. However in spite of this:

Sufficient information is available on the impacts of the fishery the components and elements to allow the main consequences for the ecosystem to be inferred (i.e. for management purposes).

Information is sufficient to support the development of strategies to manage ecosystem impacts.

The simulation models developed for the Barents Sea using data collected over many years, including stomach content analysis of cod and haddock research and other investigations enable the main consequences for the ecosystem to be inferred and tested. As ecosystem management strategies and our understanding of the data requirements for ecosystem based management improve, the is the opportunity for regular refinement of data collection methodologies and priorities – meaning that data remains tailored to the management strategies designed to mitigate ecosystem impacts.

References

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Principle 3 – Cod & Haddock

3	The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable

3.1	**Governance and Policy**

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.1	**Legal and/or customary framework** The management system exists within an appropriate and effective legal and/or customary framework which ensures that it: - Is capable of delivering sustainable fisheries in accordance with MSC Principles 1 and 2; - 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.	The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system. 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 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 is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. 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 or fishery is attempting to comply in a timely fashion with binding judicial decisions arising from any legal challenges. 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 is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. The management system incorporates or is 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. The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges. The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

Score:	**95**

Justification

The management system is generally consistent with local, national or international laws or standards that are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2.

The Russian Federation has signed and ratified relevant international agreements such as the 1982 Law of the Sea Convention and the 1995 Straddling Stocks Agreement. The Russian Constitution of 1993 states that the provisions of international agreements entered by the Russian Federation stand above those of national law. The Federal Fisheries Act of the Russian Federation was signed in December 2004 (revised in 2007). This is a framework law, and a number of supporting legal documents have been issued in recent years to implement the intensions behind the 2007 revision. Concrete regulations are given at the level of fishery basins. Current regulations for Russia's northern fishery basin were adopted in 2009, providing, among other things, rules for closed areas, fishing gear (e.g. mesh size), by-catch and minimal allowable size of different

species.

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.

Disputes between Norway and Russia are solved in the JNRFC, or in its Permanent Committee. In Russia, most disputes are solved within the system for fisheries management, not requiring judicial treatment. There is a well-established system of consultation with user groups, through fishery councils at different levels and directly between user groups and government. Quota allocation and other regulatory measures are subject to such consultation. The process is transparent for actors within the Russian fisheries complex, and it is considered – although not tested and proven – to be effective. Internal fishery infringements are processed and dealt with by the enforcement bodies, and fishermen and shipowners have the possibility to bring their case to court instead of accepting a fine.

The management system or fishery acts proactively to avoid legal disputes or rapidly implements binding judicial decisions arising from legal challenges.

The management authority (Federal Fisheries Agency) or its constituent components are not subject to continuing court challenges. The management system acts proactively – in the JNRFC and in the fishery councils (described for the SG above) at various levels in Russia – to settle any disagreements outside the judicial system.

The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom on people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.

The rights of fishery-dependent communities are explicitly stated in the Federal Fisheries Act. As fisheries were assembled in large production entities in Soviet times, 'fishery-dependent community' largely equals big cities with considerable fishing activities. This is particularly the case in the northern basin, with Murmansk as the region's 'fishery capital'. Hence, it can be argued that this provision is also implemented in practice. The Federal Fisheries Act states that 'the small indigenous peoples of the North, Siberia and Far East' (ethnic groups with a 'traditional' lifestyle and consisting of less than 50,000 people) shall be given access to fish resources in order to secure their livelihood. It lists 'fisheries to protect the traditional lifestyle of small indigenous peoples of the North, Siberia and the Far East' as one of seven 'types of fisheries' (along with, e.g., 'industrial fisheries', 'coastal fisheries' and 'fisheries for scientific and control purposes'). The Act further states that quotas for such fisheries are distributed by the executive power of Russia's federal subjects (i.e. regional authorities). In Murmansk County, the indigenous Sámi, consisting of some 2,000 people, live in inland Kola Peninsula and are not engaged in ocean fisheries. A small part of the Russian Barents Sea quota (2-3 %) was from 1998 given to Nenets Autonomous District, located north of Arkhangelsk County, but there is no indication that this quota share goes to further the traditional lifestyle of the Nenets, whose main traditional livelihood is hunting and reindeer herding.

References

- Federal Fisheries Act of the Russian Federation, 2004
- Geir Hønneland and Anne-Kristin Jørgensen (2003), 'Implementing International Fisheries Agreements in Russia: Lessons from the Northern Basin', *Marine Policy* 26(5): 359–367
- Geir Hønneland and Frode Nilssen (2001), 'Quota Allocation in Russia's Northern Fishery Basin: Principles and Practice', *Ocean & Coastal Management* 44: 471–488.
- Protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission
- Regulations for Conduct of Fishery in the Northern Fishery Basin, 2009

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.2	**Consultation, roles and responsibilities** 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.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood. The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	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. 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 consultation process provides opportunity for all interested and affected parties to be involved.	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. 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. The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.

Score:	**75**

Justification

Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for areas of responsibility and interaction.

A number of bodies of governance, industry organizations and research institutions are involved in the management of Russian fisheries. The formal arena for interaction between the Russian fishing industry and the government are the advisory bodies, the so-called fishery councils, found at both 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. The Rules of Procedures for Basin Scientific and Fishery Councils in the Russian Federation were approved 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.

Russia has an extensive system of fisheries research in oceanography, biology of marine organisms, resource assessment, fishing gear and processing technology, among other things. Research institutes subordinate to the Federal Fisheries Agency are highly integrated in the management process and also participate in the fishery councils at different levels.

The Federal Fisheries Agency is the federal body responsible for fisheries management in the Russian Federation. Despite the intention of the 2004 reform of Russia's federal bureaucracy to limit the role of agencies to implementing functions, the Federal Fisheries Agency has since 2007 been in charge of policy making and control as well, reflecting Soviet and Russian practice up till 2004 of having one federal agency responsible for all aspects of fisheries management. There are a few exceptions, with aquaculture under the Ministry of Agriculture and enforcement in the Russian EEZ under the Federal Border Service (since 2003 part of the Federal Security Service, the FSB). The Barents and White Sea Territorial Administration of the Federal Fisheries Agency (the BBTA) was established in 2006/2007 as the implementing body of the Federal Fisheries Agency in the northern basin, located in Murmansk.

The functions, roles and responsibilities of organisations and individuals involved in the management system are explicitly defined and seem well understood for all areas of responsibility and interaction, and the management system demonstrates consideration of the information.

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.

There is a strong Russian (and previously Soviet) tradition of stakeholder consultation in the management process. The fishery

councils at different (referred to above) shall consist of representatives of the fishing industry, federal executive authorities, executive bodies of the Russian federal subjects (the regions), research institutions and non-governmental organisations, including the indigenous people of the North, Siberia and the Far East. 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.

However, a major shortcoming of the system is that NGOs outside the traditional fisheries complex are not included, notably environmental NGOs, in spite of obvious interest and relevant expertise in issues relating to marine management (note the considerable wealth of relevant NGO papers on the Barents Sea). The assessment team did not see evidence that there is any serious opportunity for non-governmental organisations, or indeed any other interested parties to contribute as an active stakeholder in the management process. It cannot therefore be concluded *that the consultation process provides opportunity for all interested and affected parties to be involved*.

References

- Federal Fisheries Act of the Russian Federation, 2004
- Geir Hønneland (2004), *Russian Fisheries Management: The Precautionary Approach in Theory and Practice*, Leiden and Boston: Martinus Nijhoff Publishers/Brill Academic Publishers
- Anne-Kristin Jørgensen (2009), 'Recent Developments in the Russian Fisheries Sector'. In Wilson Rowe, Elana (ed.), *Russia and the North*. Ottawa: University of Ottawa Press, pp. 87-106
- Order on the Formation of the Public Chamber with the Federal Fisheries Agency, 1998
- Pers. comm., representative of the Murmansk branch of the WWF, Murmansk, December 2009
- Pers. comm., representatives of Murmansk regional authorities, Murmansk, December 2009
- Pers. comm., representatives of the Union of Fishery Enterprises in the North, Murmansk, December 2009
- Resolution on the Northern Basin Scientific and Fishery Council and Working Group of the Northern Basin Scientific and Fishery Council, 2002
- Resolution on the Working Order of the Territorial Fishery Council of Murmansk County, 2005
- http://www.wwf.ru/about/what_we_do/seas/fish/eng/

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.3	**Long term objectives** 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.	Long-term objectives to guide decision-making, consistent with 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.

Score:	**75**

Justification

Long-term objectives to guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are implicit within management policy.

Russian fisheries law defines protection and rational use of aquatic biological resources as the main goal of the country's fisheries management. The concept 'protection and rational use' was widespread 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 some resemblance to the internationally recognized ideal of sustainability, in so far 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 2009 strategy for the development of the Russian fisheries complex until 2020 defines as its major objectives to ensure social and economic development of the Russian Federation and turn the country into one of the world's leading fishery nations. A main goal is to reduce export of raw fish and re-build an economically sustainable fish-processing industry in Russia.

The precautionary approach to fisheries management is not mentioned explicitly in these documents, but it might be argued that the requirements to protect aquatic biological resources and take the best scientific knowledge into account implicitly involve a precautionary approach. It should also be mentioned that according to the 1993 Russian Constitution, the provisions of international agreements entered by the Russian Federation stand above those of national law. The Russian Federation has signed and ratified a number of international agreements which adopt the precautionary approach, including the 1992 Convention on Biological Diversity and the 1995 Straddling Stocks Agreement, and works actively in international organisations or arrangements which explicitly adhere to the precautionary approach to fisheries management, such as ICES and the JNRFC. It can therefore be argued that the precautionary approach is at least implicit within management policy. Since the provisions of international agreements entered by the Russian Federation stand above those of internal legal acts in Russia, it could also be argued that the precautionary approach is already explicit in Russian law. However, since the precautionary approach is not mentioned in the Federal Fisheries Act or other fisheries legislation brought to the assessment team's attention, the 80 guideposts cannot be reached, although the management system in question is clear approaching 80.

References

- Federal Fisheries Act of the Russian Federation, 2004.
- Geir Hønneland (2004), *Russian Fisheries Management: The Precautionary Approach in Theory and Practice*, Leiden and Boston: Martinus Nijhoff Publishers/Brill Academic Publishers.
- Geir Hønneland and Anne-Kristin Jørgensen (2003), *Implementing International Environmental Agreements in Russia*, Manchester and New York: Manchester University Press.
- Anne-Kristin Jørgensen (2009), 'Recent Developments in the Russian Fisheries Sector'. In Wilson Rowe, Elana (ed.), *Russia and the North.* Ottawa: University of Ottawa Press, pp. 87-106.
- Law on the Exclusive Economic Zone of the Russian Federation, 1998
- Maritime Doctrine of the Russian Federation, 2001
- Strategy for the Development of the Fisheries Complex of the Russian Federation until 2020, 2009

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.1.4	**Incentives for sustainable fishing** The management system provides economic and social incentives for sustainable fishing and does not operate with subsidies that contribute to unsustainable fishing.	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 negative 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 that they do not contribute to unsustainable fishing practices.

Score:	**80**

Justification

The management system provides for incentives that are consistent with achieving the outcomes expressed by MSC Principles 1 and 2 and seek to ensure that negative incentives do not arise.

Fishing companies and fish-processing plants can apply for support to the Federal Fisheries Agency for support to cover annual interest on loans taken up to buy equipment. The current targeted programme for the fisheries sector (2009–2013) is directed towards three main issue areas: shipbuilding, port infrastructure and fish restocking plants. The part of the programme which is to be funded via the federal budget will go towards large infrastructure projects, construction of research and inspection vessels and modernisation of restocking plants. The projects aimed at renewal and modernisation of the fishing fleet and the processing industry are all to be financed by 'non-budget sources'. The programme does not specify what this means, beyond a sentence mentioning private investors and credit institutions. Both the Russian fisheries authorities and industry organisations have repeatedly called for more state support, including subsidies, for the fisheries sector, but the overall impression is that the Government is not generally in favour of direct subsidies. Despite this, in 2009 the Government introduced a new form of subsidies aimed at fleet renewal and modernisation 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. Representatives of the Union of Fishery Enterprises in the North stipulate that one new vessel will replace three old ones, and they present the initiative as a measure to combat overfishing. The number of vessels in the northern fishery basin has steadily declined during the post-Soviet period, from 400-500 in the early 1990s to 200-300 today. 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.

At national level, the management system provides economic and social incentives for sustainable fishing. These include:

- Penalties for infringements / non-compliance
- New system of quota allocation (enhanced by the adoption of clear harvest control rules) 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-capitalising and being forced to fish illegally following unexpected quota shortages.

The assessment team has not been provided with documentation that the management system explicitly considers incentives in a regular review of management policy or procedures to ensure that they do not contribute to unsustainable fishing practices.

References

- *Pers. comm.,* representatives of the Union of Fishery Enterprises in the North, Murmansk, December 2009
http://www.fish.gov.ru/activities/DocLib/Концепция%20развития%20рыбного%20хозяйства.aspx
http://fish.gov.ru/activities/DocLib/Экономическое%20развитие%20отрасли/Инвестиции/Субсидии.aspx

3.2	Fishery- specific management system

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.1	**Fishery- specific objectives** The fishery has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.	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.

Score: **90**

Justification

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, 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. Among the 'management obligations' listed are to apply the precautionary approach and base the Commission's work on the best scientific data available. Hence, although some P2 objectives are included, these are less well defined and not measurable than the P1 objectives, therefore the 100 performance indicator is not fully met.

References

- Annual Joint Norwegian–Russian Research Programmes for the Barents Sea, attached to the protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission
- Basic Principles and Criteria for Long-term, Sustainable Management of Living Marine Resources in the Barents and Norwegian Seas, issued by the Joint Norwegian–Russian Fisheries Commission in 2002
- Protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.2	**Decision-making processes** The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives.	There are informal decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. 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.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. 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 use the precautionary approach and are based on best available information. Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. 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. Decision-making processes use the precautionary approach and are based on best available information. Formal reporting to all interested stakeholders describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.

Score: **80**

Justification

There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.
There are established decision-making processes in the JNRFC and its Permanent Committee 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 authority, 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.
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.
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 by-catch, endangered species and effects of fishing gear on habitats, and these are taken into account in decision-making.
Decision-making processes use the precautionary approach and are based on best available information.
The JNRFC formally states that it uses the precautionary approach and bases its management on best available scientific information. ICES has evaluated both the cod and haddock harvest control rules as precautionary.
Explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
The protocols from meetings in the JNRFC are distributed within the fishing industry of the two countries and published on the websites of national fisheries management authorities, in Norwegian and Russian. This meets the requirement of providing explanations for action, but stops short of being formal reporting to all interested stakeholders.

References

- Basic Principles and Criteria for Long-term, Sustainable Management of Living Marine Resources in the Barents and Norwegian Seas, issued by the Joint Norwegian–Russian Fisheries Commission in 2002
- Geir Hønneland (2006), *Kvotekamp og kyststatssolidaritet: Norsk-russisk fiskeriforvaltning gjennom 30 år* ('Quota Battles and Coastal State Solidarity: Norwegian–Russian Fisheries Management through 30 Years, Bergen: Fagbokforlaget. Published in Russian by PINRO Press in 2007.

- Protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission
- AFWG 2009

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.3	**Compliance and enforcement** Monitoring, control and surveillance mechanisms ensure the fishery's management measures are enforced and complied with.	Monitoring, control and surveillance mechanisms exist, are implemented in the fishery under assessment and there is a reasonable expectation that they are effective. Sanctions to deal with non-compliance exist and there is some evidence that they are applied. 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.	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. Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence. 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 no evidence of systematic non-compliance.	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. Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence. 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. There is no evidence of systematic non-compliance.

Score:	**80**

Justification

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.

The OT vessels undergoing assessment take 80 % of their fish in waters subject to Norwegian enforcement, and deliver all but around 3 % of cod and haddock outside Russia, either directly to Norwegian ports or through other NEAFC states via transhipment to transport vessels at sea. The Norwegian Directorate of Fisheries inspects all landings by Russian vessels in Norwegian ports, while the Norwegian Coast Guard performs spot checks at sea (in the Norwegian EEZ and the Protection Zone around Svalbard), including inspections at check points that foreign vessels have to pass when entering or leaving the Norwegian EEZ.

In the Russian EEZ, The Russian Federal Fisheries Agency (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 and accumulated reports each 15th day from all fishing vessels, as well as VMS data. It also administers the system for closing and opening of fishing grounds and inspects fishing vessels in port, in Russian territorial waters and in convention waters outside the Russian EEZ, notably the Barents Sea Loophole and to some extent also in the Protection Zone around Svalbard. The Federal Border Service under the FSB inspects fishing vessels within the Russian EEZ, including the Adjacent Area between the Norwegian and Russian EEZs (the so-called Grey Zone). When Russian vessels fish in the Norwegian EEZ or the Protection Zone around Svalbard, they are inspected by the Norwegian Coast Guard. When they land fish in Norwegian ports, they are inspected by the Norwegian Directorate of Fisheries. When they land in other European ports, they are subject to the NEAFC port state control scheme. Fish caught in the Russian EEZ is since summer 2009 taken to Murmansk for customs clearance, but is then transhipped for export.

Concerns about the Russian enforcement system have been raised by the media and NGOs, among others. Potential problems include lack of physical surveillance at sea and potential for corruption. There are reports that inspections in the Russian EEZ have been infrequent in some periods in the past, but the FSB claims to inspect 90 % of all transhipments taking place in the Russian EEZ. The BBTA occasionally inspects in Russian territorial waters, the Barents Sea Loophole and the Protection Zone around Svalbard. Russia generally scores poorly in terms of control of corruption (for example scoring well below the 25th percentile of countries according to the World Bank Worldwide Governance Indicators Project), and there is a tendency in Russian media to label the fisheries complex as one of the most corrupt sectors of Russian politics and economy. This is openly admitted by Russian fishery authorities. It should be noted, however, that such statements mostly refer to the situation in the Russian Far East or sturgeon catch in the Caspian Sea. In Russian fisheries debate, the northern basin is generally portrayed as characterised by law and order, largely as a result of the tight cooperation with Norway. Nevertheless, according to a follow-up document to the 2006–2007 joint assessment by the Norwegian and Russian Auditor Generals (see below) from September

2009, the Russian Public Prosecutor states that there is a corruption problem within the Russian bodies of fisheries management, and that sanctions are still too mild to deter fishermen from violations. Read in its context, this could be interpreted as relevant also for the Barents Sea fisheries.

Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.

Sanctions to deal with non-compliance exist in both Norwegian and Russian fisheries management. The Russian system makes wide use of administrative fines, unlike Norwegian fisheries management. Both systems refer serious cases to the judicial system. According to both Russian and Norwegian enforcement authorities, prosecution of offenders on the Russian side has improved markedly the last couple of years, the FSB largely using evidence provided by Norwegian enforcement authorities to go to court.

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.

The Norwegian Directorate of Fisheries has estimated a Russian overfishing in the Barents Sea after the turn of the millennium, reaching its height at around 100,000 tonnes in the mid-2000s. Since then, through the combined efforts of Norwegian and Russian authorities, and implementation of new measures and regulations by NEAFC, such as port state control, the analysis of estimated IUU landings shows a substantial pattern of improvement. Russian authorities do not acknowledge the Norwegian documentation, nor the concrete figures, although there has been improved cooperation of the methodology used for assessment of IUU. It is assumed that the practice of transhipment of fish at sea for delivery in third countries made overfishing possible, after Russian vessels had largely landed their fish in Norway during the 1990s. The assumption is that the vessels reported incorrect figures to Russian authorities, and that neither Russian nor Norwegian authorities had the possibility to check whether the figures were correct. Admittedly, the Norwegian Coast Guard carries out thorough physical checks of how much fish is in the vessel's hold during inspection and compares this with the vessel's reports to both Norwegian and Russian authorities. The problem, hence, was mainly believed to be the combination of i) infrequent or insufficient physical inspections in Russian waters (i.e. overfishing was mainly conducted by vessels fishing only there); ii) lack of communication between port state and flag state authorities; and iii) lacking prosecution of offenders on the Russian side. As noted above, prosecution of offenders on the Russian side has improved markedly the last couple of years. Further, it is assumed that the NEAFC port state control regime has largely solved the second of the three problems. There is also evidence that inspections in Russian waters have increased since 2007 – which is logical following the attention given to overfishing by the Russian political leadership since then, although no proof that the Russian enforcement system now works effectively. It has not been documented that Russian inspectors perform the same physical checks of each fishing vessel's hold, as Norwegian inspectors do. The possible problem with corruption among Russian inspectors also persists.

For the present assessment, it is of importance that the vessels OT has applied for certification of, take 80 % of their fish in waters subject to enforcement by the Norwegian Coast Guard. Inspection statistics reveal that each of the 16 vessels were controlled by Norwegian authorities nearly six times on average in both 2007 and 2008, i.e. once every second month. If we assume that the Coast Guard's physical inspections are effective in revealing discrepancies between reported catches and the amount of fish actually on board, there is limited possibility for overfishing since a trip normally lasts 2-3 months. Norwegian authorities inspect all landings from Russian vessels in Norwegian ports, and liase directly with BBTA, to enable BBTA to effectively keep~~s~~ track of reported catch by Russian vessels. None of the inspections by Norwegian authorities of the 16 OT vessels in 2007 and 2008 revealed underreporting of catch. (There was one violation of Norwegian by-catch regulations, one violation of gear restrictions/round strap length and one minor violation of Norwegian log book procedures.

There is reason to believe that the OT vessels are subject to comparatively effective enforcement, and there is no evidence of them overfishing their quotas in recent years, nor that they engage in any other kind of systematic IUU fishing. The widespread information about corruption in Russian fisheries management, acknowledged even by the country's own fishery authorities, nevertheless makes it difficult to conclude that there is a high degree of confidence that fishers generally comply with the management system under assessment.

There is no evidence of systematic non-compliance.

It follows from the discussion under the preceding SG that there is no evidence of systematic non-compliance in the Barents Sea fisheries at the moment. The Russian overfishing claimed by Norwegian authorities after 2000 seems to have been eliminated. There is no evidence of the OT vessels overfishing their quotas in recent years or of them being engaged in any other kind of systematic IUU fishing. None of the certified vessels are on any existing Black Lists.

References

- Barents Sea Cod and Haddock Control System and IUU Risk Assessment, MRAG, 2009
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- World Bank. Worldwide Governance Indicators Project. http://info.worldbank.org/governance/wgi/index.asp
- Geir Hønneland (2000), *Compliance in the Barents Sea Fisheries*, PhD dissertation, Department of Political Science, University of Oslo.
- Geir Hønneland (2004), *Russian Fisheries Management: The Precautionary Approach in Theory and Practice*, Leiden and Boston: Martinus Nijhoff Publishers/Brill Academic Publishers

- Anne-Kristin Jørgensen (2009), 'Recent Developments in the Russian Fisheries Sector'. In Wilson Rowe, Elana (ed.), *Russia and the North*. Ottawa: University of Ottawa Press, pp. 87-106
- Overview of inspections of OT vessels in 2007 and 2008
- Pers. comm., captains on OT vessels, Hammerfest, August 2009, and Murmansk, December 2009
- Pers. comm., representatives of the Federal Border Service/FSB, Murmansk, December 2009
- Pers. comm., representatives of the Norwegian Directorate of Fisheries, Bergen, July 2009
- Pers. comm., representatives of Murmansk regional authorities, Murmansk, December 2009
- Protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission
- Report from the Parallel review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals (Document nr. 3:2 (2007–2008) from the Norwegian Auditor General)
- Olav Schram Stokke (2009), 'Trade Measures and the Combat of IUU Fishing: Institutional Interplay and Effective Governance in the Northeast Atlantic', *Marine Policy* 33: 339–349.

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.4	**Research plan** The fishery has a research plan that addresses the information needs of management.	Research is undertaken, as required, to achieve the objectives consistent with MSC's Principles 1 and 2. Research results are available to interested parties.	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. Research results are disseminated to all interested parties in a timely fashion.	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. Research plan and results are disseminated to all interested parties in a timely fashion and are widely and publicly available.

Score:	**90**

Justification

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.

The JNRFC produces annual research plans and long-term research strategies, sufficient to achieve the objectives consistent with MSC Principles 1 and 2, but they do not address the questions raised under Principle 3. However, 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 organisations, 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):

- AFWG – Arctic Fisheries Working Group
- WGRED - Working Group for Regional Ecosystem Description

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. Taken in combination it can be concluded there is therefore a strategic approach which delivers reliable and timely information.

Research results are disseminated to all interested parties in a timely fashion.

The JNRFC research plan and research results are disseminated to all interested partied in a timely fashion and are widely and publicly available on the internet. Again this appears to go further than ICES.

The annual reports of ICES working groups and study groups are publically available on the ICES website. In addition they are disseminated to interested parties in a timely fashion – in particular they are disseminated to decision-makers, in time for annual fishery allocation negotiations. However, this stops short of being widely and publically available, as the results are not presented in an accessible form (easy to find), to enable all interested parties (including public / consumers) to quickly interpret the findings – without significant prior knowledge or expertise.

References

- Protocols from the annual sessions in the Joint Norwegian–Russian Fisheries Commission
- AFWG 2009
- WGRED 2009

	Criteria	60 Guideposts	80 Guideposts	100 Guideposts
3.2.5	**Monitoring and management performance evaluation** There is a system for 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.	The fishery has in place mechanisms to evaluate some parts of the management system and is subject to occasional internal review.	The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review.	The fishery has in place mechanisms to evaluate all parts of the management system and is subject to regular internal and external review.

Score:	**80**

Justification

The fishery has in place mechanisms to evaluate key parts of the management system and is subject to regular internal and occasional external review.

Internal review of the management system is performed by the fishery councils at different levels and by the Federal Fisheries Agency, which in turn reports to the 1st Deputy Prime Minister, who is responsible for fisheries management in the Russian Government. The Federal Fisheries Agency can also report to the President about its activities. In the Federal Fisheries Agency, there is regular review of the performance of the agency's regional offices. Recommendations from the regional fishery councils are important in the regional offices' feedback to the federal office.

Regular external review is performed by the Russian Auditor General. The latter in 2005 invited its Norwegian counterpart to conduct a parallel audit of the Barents Sea fisheries. After this work was finished in 2007, the two parties continue to monitor developments in regular follow-up meetings.

ICES has reviewed the harvest control rules for cod and haddock.

In addition, at a more routine operative level, there is a comprehensive system of routine **monitoring** of information relevant for management decision-making and stock assessment purposes. The monitoring programme in place principally focuses on landings from the fishery, i.e. quota uptake. Due to the systems described in 3.2.3 this monitoring now forms a substantially more accurate reflection of actual fishing mortality. Additional monitoring is also in place to provide sufficient information to support stock assessment purposes (for example length / weight monitoring).

High quality, well-documented procedures exist to reduce harvest in light of monitoring results. These can be quickly implemented (near real-time recording of catch levels and quota uptake – and annual review of stock status).

At ICES level the majority of the evaluations undertaken are 'internal'. However, ICES work brings together a wide range of national scientists, in so doing so builds external perspectives into the assessments. Additionally this work is periodically externally reviewed. However, this stops short of regular external review, therefore the 100 SG is not met.

References

- Federal Fisheries Act of the Russian Federation, 2004
- Report from the Parallel review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals (Document nr. 3:2 (2007–2008) from the Norwegian Auditor General)
- AFWG 2009

Appendix 4 – Peer review reports

Peer Reviewer A

Peer review of the draft MSC assessment report for the Barents Sea Cod and Haddock Fishery, as prepared by T. Southall, P. Medley, G. Honneland, P.MacIntyre and M. Gill (Food Certification International Ltd) for Ocean Trawlers/Three Towns Capital.

This review is in three parts, commenting on the presentation, accuracy and interpretation of the information and evidence used as a basis for the assessment of the above fishery, on the scoring table, and on the overall recommendation for certification including the suitability of the attached conditions. Throughout, I have identified the section(s) of the report at which my comments are aimed, and have not commented where I am content with the information provided or the conclusions reached.

Presentation

The presentation of information is generally comprehensive and, in most parts, supports the scoring marks given. However, I question the need to provide exhaustive detail (e.g. 4.4 Habitat, where a revision should aim to focus attention on potential UoC impacts and help readability by omitting unnecessary detail, e.g. Figure 4.6; and 5.1.2 Consultation, Roles & Responsibilities and subsequent sections, where the historical detail is unnecessary unless it explains an issue of relevance to the current assessment), and to repeat detail in the scoring table comments, where there is often more information provided than in the main report (for example, at 1.2.3 Information / monitoring, where it is sufficient just to summarise details already given in the body of the assessment report and refer appropriately). Given the size of this report, the assessment team's aim, to balance accessibility and provide insight for non-specialist readers with sufficient and unambiguous detail for review by fisheries specialists, is not being met. FCI: Point noted and accepted. Much of the length of the report (including section 5.1.2) relates to explanation of the fishery and the Russian management system. This is longer than typical in a fishery assessment, as it was felt important to catch as much relevant information and description, given the paucity of available literature on the management systems – particularly given the main market for the product is in Europe. In reviewing the report we have tried to shorten and simplify further.

The use of footnotes giving sources of information should not be extended to published references, where authors and date (covered in Appendix 2 – References) are sufficient. The scarcity of source references, other than rather general websites, suggests that the authors are relying on others to attest to the veracity of much of the information presented. This lack of critical appraisal would be less of a worry if more internationally-reviewed publications were cited. FCI: Footnotes referencing published sources have been removed, and only clarifications or web addresses or relevance remain as footnotes. Carefully sourced references and critical appraisal is focused in the assessment tree, which is used to justify scores in the fishery, the report deliberately remains more generally descriptive.

2.1: the Unit of Certification: you consider that there are two separate units of certification covered by this assessment, but the only difference in the two "fisheries" appears to be the target species and 2.3 Fishing Fleet & Fishing Method suggests that there are no gear or

operational differences when fishing for cod or haddock (see Certification recommendation below). FCI: The recommendation for UoC comes following pre-assessment and certainly before scoring has been undertaken. The similarity in scores only became apparent following scoring. As noted by the reviewer, keeping 2 separate UoCs does enable future flexibility in scoring if conditions change.

2.2.1: you note that, in preparing for the MSC assessment, Ocean Trawlers have implemented a number of steps to demonstrate that the fishery is sustainable. However, the group Policy on Sustainable Fishery was only adopted in January 2010 and, though a final vessel inspection took place in March 2010 to verify that additional initiatives undertaken by the fishery were implemented, this seems too brief a period to provide evidence that the fishery is operating sustainably. The same applies to the Code of Conduct, use of MSC logbooks and observer programme, the operation of all of which should be verified at an early annual surveillance visit (see suggestion for an additional condition). FCI: This is reflected in the scoring, and no credit is given for 'evidence of results' of the Code of Conduct. The first annual surveillance audit will indeed focus carefully in this area.

2.4 Landings of Target Species: is there a difference between the International TACs and the Russian TACs for cod and haddock, or is the latter actually a national quota allocation of the former? FCI: Yes, latter is national quota of former – amended.

Neither in this section, nor in 2.5 Fishing Distribution & National Jurisdictions, is there any suggestion that the fishery specifically targets cod or haddock (though the species do have different distributions in the Barents Sea). Is the purpose of using two UoCs to enable continued certification of the cod or haddock fishery should the other prove unsustainable (NB time series of cod SSB shows long periods below B_{pa} and around B_{lim})? FCI: See comment above.

There is no information presented on the History of the fishery for Barents Sea cod and haddock, which would enable an appreciation of its present apparently buoyant status. For this we need to see a time series of catches/landings (and landings by the UoC), together with information on recruitment and fishing mortality from the stock assessments (see 3.4.6). FCI: Paragraph added to give historical context to current landings at the start of 2.4

Figure 2.9, Seasonal spatial distribution of certified fleet fishing effort: it is difficult (in the pdf version supplied) to make out fishing activity intensity levels in the figure keys: maybe consider more explanation in the figure caption? FCI: Footnote added to clarify key. In fact key is in Russian and relates to vessels of the UoC, rather than intensity.

2.6 Target Species: I understand your reluctance to provide too much detail here, but it is not sufficient just to refer the reader to some general summary description of the species distribution and biology, whilst presenting an uncritical overview. For example, to say that "some groups of small cod are relatively stationary, whilst individuals or groups may perform astonishingly long migrations, sometimes from native waters never to return, at rates of the order of 5km per day (with a maximum recorded sustained speed of 25.7km/day)", provides nothing of relevance to this assessment. It would be useful if the details provided for cod and haddock covered the same issues with equal weight. FCI: more general and vague references, including the sentence highlighted above, have been removed. In terms of species description, the MSC Fisheries Certification Methodology

requires the report to include "Species types ..... other resource attributes and constraints". This requirement is met.

3.1 Status of the Stock & Reference Points: you state that the biomass limit reference points for both cod and haddock are correctly based upon the stock-recruitment relationships, but then say that there is no clear relationship between estimated SSB and recruitment three years later. This is contradictory. Also, no evidence is presented that the current target fishing mortalities (do you mean current F or target F?) are producing relatively high biomass compared to historical levels, since no F trends are shown. This is of particular concern given your statement that "there is a worrying retrospective pattern for haddock of over-estimating stock size and under-estimating fishing mortality for the most recent years."

FCI: The methods applied to estimate the reference points are correct. The text has been altered to clarify this point. The target fishing mortality has resulted in higher biomass. A lot of detail has already been provided on the approaches used and more so a reference is provided for this point. There is a retrospective pattern, but this is more a problem for the projections not evaluation of past performance, being referred to above. The retrospective pattern is taken into account in the scoring.

3.2 Harvest Strategy: noting that there has been non-compliance with the TAC regulations, resulting in significant unreported landings in the past, and growing evidence of discarding groundfish throughout the Barents Sea, it would be useful here to explain whether the UoC fleet have been involved (and see comments against 1.2.3 Information/monitoring).

FCI: As noted in 3.2.3 there is no evidence of systematic non-compliance in the Barents Sea fisheries at the moment. The Russian overfishing claimed by Norwegian authorities after 2000 seems to have been largely eliminated. There is no evidence of the OT vessels overfishing their quotas in recent years or of them being engaged in any other kind of systematic IUU fishing. We are much more concerned now with future activity and making sure that the UoC fleet can demonstrate that it all its activities are legal. One vessel in fleet has been involved in some more recent disputed activity over discarding, although the evidence we have indicates that this activity is within acceptable bounds (i.e. small amounts of product released during processing due to rotting). Clearly, this is an area that will be kept under surveillance.

3.4.5 Other Information: you suggest that stomach sampling allows cod predation to be accounted for and the natural mortality of the younger cod and haddock age groups adjusted accordingly: to what extent? … and what about the impact of other predators?

FCI: A little more detail has been added to the text due to the importance of this factor on the assessment and advice.

After 3.4.6 Stock Assessment model, I would have expected some detail of the outcome of the latest assessment, though note that SSB trends are presented under 3.1. At least, the time series of F and recruitment for both stocks should be visible, and are required to support the statements against 1.1.1 stock status.

FCI: This information is available from the working group report (AFWG 2009) and, probably best from the advice (ICES 2009) referred to in the scoring table. SSB is presented because it is used as the basis for PI1.1.1. We do not think it necessary to reproduce more detail which is easily available in the original source documents.

4.1 Retained Bycatch and 4.2 Discarding: you note that the Barents Sea trawl fishery for cod and haddock appears to have relatively low levels of by catch, in part due to discard bans for all key species (and therefore an incentive to move away from grounds where discards could be high). Consequently, landing figures for the UoC vessels should present a good picture of fish catches (not just landings, since discarding is banned), certainly in comparison with many other fisheries where discarding bans are not in force. To say that a recent CCTV trial in Denmark has provided an unprecedented level of understanding of catches, ignores many other studies (direct observer, fisher self-sampling and video) that have been conducted in Europe over the last 20 years. FCI: Reference to Danish project perhaps not entirely relevant and goes beyond scope of assessment report, therefore removed.

In view of comments against 1.2.3 Information/monitoring, it would be useful here to clearly explain what is known (or assumed) about the level of discarding of cod and haddock, and whether this creates significant uncertainties in the stock assessments. FCI: Discarding of cod and haddock is dealt with under principle 1

4.3 Endangered, Threatened and Protected Species (ETP): would it not have been more in keeping with the assessment report's intent to minimise detail (and potential confusion) to just name those ETP species that are known or suspected to be impacted by the UoC (apparently only whale and dolphin species, for which ICES regards as having a relatively low risk for by catch, plus porbeagle and angel shark)? Table 4.3, listing key bird, mammal and elasmobranch species with potential interactions with cod & haddock trawl fisheries is misleading in light of the above (and see recommendation on ETP species identification and reporting). FCI: Point noted, however where past assessments have undertaken this more streamlined approach (only highlighting where interactions exist), there has been a call for a more through overview of all potentially relevant ETP species, such as we have done in this instance. On balance given the importance of the Barents Sea for so many ETP species, this degree of thoroughness seems warranted.

4.5 Ecosystem impacts: the claim that fishing pressure has not reduced populations of cod in the Barents Sea to the low levels seen elsewhere ignores the history of the fishery (which is not covered in the assessment report), and the possibility that the increase in cod abundance since the early 1990s may be as much a function of climate/environment change as due to a decrease in fishing pressure. FCI: Comparative reference to other areas removed for simplicity and objectivity. Reference also added to the lower levels of SSB in the 1970s and 1980s, to highlight that the current abundance has not always been typical.

The last 5 paragraphs in this section sit more comfortably in section 5.2 Fishery Specific Management System. FCI: Last 5 paragraphs have particular relevance to ecosystem management.

Scoring Table, Appendix A

I have only commented where there appears to be a conflict between comments, the evidence provided in the report, or the mark given.

At 1.1.1 Stock status (haddock), you suggest that there has been "higher than expected" recruitment since 2000. Since there is no S/R relationship for haddock, for which recruitment is known to vary considerably, there can be no expectations.

FCI: The expected haddock recruitment is obtained from the geometric mean of estimated past recruitments.

Against 1.2.1 Harvest strategy (cod and haddock), you note that technical measures applied to the fishery include seasonal or permanent areas closed to fishing to protect juveniles and by catch species (mentioned at 4.1, to protect spawning/nursery grounds). However, you provide no information on where these are situated, whilst suggesting (at 3.2 Harvest Strategy) that these are relatively small and have a low impact on the fishery. So, do they actually improve the performance of the fishery (for cod and haddock, and in relation to catches of *Sebastes mentella*)?

FCI: It is unclear what the performance of these particular technical measures are. It is not possible for their impact to be measured as simple additive form and we are unaware of any assessment of this type. Currently, the fishing mortality will be the dominant control for all these species and the main driver in fishery performance. The closed areas we believe encourage fleets to adhere to TACs while reducing discarding. These additional technical measures have been implemented as a risk averse measure. We consider them in this sense.

1.2.3 Information / monitoring, *relevant information is collected to support the harvest strategy* (cod and haddock): See comments against 4.1 and 4.2 above. The score of 75 appears to reflect the assessment team's concern that there is insufficient information on all fishery removals, especially discards and IUU catches, but which in themselves do not invalidate the stock assessments (hence the score of 90 for cod and 85 for haddock against 1.2.4).

FCI: The aim is to avoid double scoring the same issue. PI1.2.4 is scored conditional upon the data being adequate. Our concerns with the information going into the assessment are raised here.

Under 2.1.2 Management Strategy, *designed to ensure the fishery does not pose a risk of serious or irreversible harm to retained species*, there are a number of conflicting statements. You say that there is a good strategy for reducing impact on non-target retained species, but fail to provide any evidence that the measures involved are actually designed to minimise catches of the most vulnerable species (e.g. redfish, wolffish, Greenland halibut). This is reflected in Condition 3, where you say that "At least two or three of the species caught as a retained by catch in the fishery are not 'highly likely to be within biologically based limits' and lack adequate partial management strategy", and this is at variance with your comments here and suggests that the "evidence of implementation and objective basis for confidence in the partial strategy" is not strong. This is probably reflected in your overall mark of 75. FCI: The word 'designed' does not appear in any of the scoring guideposts, so it is difficult to determine the exact importance of the word when scoring, however the 2nd scoring guidepost in the 100 column perhaps most closely implies 'designed'. This scoring guidepost is not met.

When looking at retained and bycatch strategy, in practice the assessors look both at the steps to reduce overall levels of non target species caught in fishing operations, and at the stock management measures which relate to the main bycatch species. These 2 types of management are addressed in turn.

2.2.1 Discard species status: if discarding of all species of potential relevance to this assessment is banned in both Russian and Norwegian waters, but you have well-founded

reservations about the adequacy of enforcement, monitoring and reporting, how can one judge that the main by catch species are highly likely to be within biologically based limits or whether there is a partial strategy of demonstrably effective mitigation measures in place? A mark of 90 appears much too high. This argument also applies to 2.2.2, Management strategy, where a mark of 75 (in line with 2.1.2) appears appropriate, and for 2.2.3, Information/ monitoring, which is clearly inadequate. I suggest that a condition, requiring demonstration that the new MSC logbook scheme has been successfully implemented by the client vessels and is providing discard data (not just for ETP species, as per recommendation) that can be used to inform the assessment, could help here. FCI: This is a tricky issue to score and resolve, given that there is a total ban on discarding of main species in the jurisdictions of the fishery. The assessors were mindful to harmonise with the recently certified Norwegian fishery (same waters, same gear, same species, same regulations) which awarded 95 (status), 90 (management), and 80 (information). Even unchanged the scores for this assessment are already well below these scores. However the reviewers points are noted, and do indeed reflect the concerns of the assessors, therefore the status score is further reduced from 90 to 80. Management and information scores remain unchanged (management score is rightly higher than for retained species, to reflect the discard ban and other measures).

Certification recommendation

The performance of the Barents Sea Cod and Haddock Fishery has been assessed against MSC Principle 1 (Sustainability of Exploited Stock) for each species and for Principals 2 (Maintenance of Ecosystem) and 3 (Effective Management System) for the fishery as a whole. Given that the marks for P1 are the same (and attract conditions that could equally apply to both species), I suggest that the notion of having two separate units of certification (cod and haddock) is dropped. Based on the evidence provided in the assessment report (though with some reservations that the scoring against by catch species is too high), I agree with the assessment team's recommendation that the Barents Sea Cod and Haddock Fishery be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries. FCI: Points addressed above.

Most of the shortcomings in the performance of the fishery against MSC Principles set out in the assessment are adequately reflected in the six Conditions set, to which I would add one other dealing with information on by catch species. This would require that the new MSC logbook scheme is demonstrated to have been successfully implemented by the client vessels and provides discard data (not just for ETP species) that can be used to inform the assessment (within 2-3 years, say). FCI: this proposed additional condition has not been added, this is based on the fact that the logbook is already implemented, and will be checked at the time of audit, scores have been adjusted down (on the advice of the peer reviewer) and are now substantially lower in this area, than in the Norwegian fishery which this assessment seeks to harmonise with, and finally because a condition requiring the reporting of a banned activities is likely to be unworkable. A recommendation has however been added to address this point.

Peer Reviewer B

Reviewer's Comments: Ecocertification assessment – Barents sea cod and haddock

Overall the assessment is clearly written and addresses all the relevant issues. I find many points where the narrative (report) and justification (scoring) is incomplete or unconvincing, however. These are all addressed in the specific comments below.

2.1 (pg 7). The description of which vessels are part of the group seeking certification is clear as it stands. However, the report would be improved if there was information on how a vessel becomes part of the group and how stable (in terms of membership) this group of vessels has been over recent years. FCI: The client can propose to the Certification Body that a vessel joins the certificate, but only where it is adequately demonstrated that a vessel is fully compliant with the operational practices on which the assessment is based. This will be checked by audit.

2.2.1 – This is a strong policy and certainly MSC compliant. It is also a new policy. If it represents a codification of practices that were being followed anyway, then I suppose the assessment will be straightforward. However if this policy represents a change in practice for some fleet components, then the evaluation may find evidence of past activities that were not consistent with MSC standards. This combination of circumstances would have to move much of the assessment to evaluating the evidence for how effectively the policy is guiding practice now, what reasons there are to expect compliance with the policy to remain high in future. That would be a much more difficult assessment. FCI: the scoring guideposts typically reflect a scale of degrees of implementation, and evidence of impact. As such the strong, but nonetheless new, nature of the code is reflected in the scoring. The code is generally credited with being implemented (this was carefully checked by the assessors), rather than yet delivering hard evidence of results.

2.2.3 (pg 10) "The contract will ensure that in 2010 the company pays for PINRO observers to be at sea for 150 days a year, representing around 5% coverage of fishing effort. For" 5% observer coverage is not enough for reliable monitoring of even target catch, let alone bycatchs. Nor is it sufficient to ensure compliance with the Code and Sustainability Contract for the feel. FCI: An ideal (and well funded) national observer programme would indeed have greater coverage; however the fact that the fishery has taken the initiative to self fund observer work, demonstrates a strong commitment to operating sustainably and represents a huge improvement on the prior situation. This will also provide a valuable indication of performance, and enable scientists to also obtain good data on wider P2 elements of the fishery.

2.3 (pg 12). "On hard, rocky seabed, such as is found through much of the Barents Sea, a rockhopper footrope enables the trawl to pass over rough ground without becoming damaged or entangled". This is also the type of seafloor that experiences the greatest impacts form heavy, mobile gears. This suggests there is high risk of gear-induced habitat impacts that will be problematic in the assessment of "ecosystem sustainability". FCI: This is addressed in habitat status, and associated condition (2.4.1).

2.6 (Cod) and 2.7 (Haddock). (pages 16-20). Cod and haddock are among the most thoroughly studied groundfish on the planet. I agree that it would unhelpful to expect a full literature review of the vast literature on these species. However, I would prefer some

specific references – if possible to work done in the area where the assessed fishery operates - for the major sections on the species' biologists, instead of weblinks to sites which have long lists of references. Not all the references in those sites are fully consistent with each other, and they come from the full ranges of the species. Some key life history features of these species do vary among stocks, and some of the variation is relevant to sustainability of alternative exploitation patterns and levels. Without the key specific reference being listed for each topic, readers are left guessing at which papers and what evidence really was the basis for the descriptions here, and, more importantly, for the scorings conducted later in this assessment. This is a problem that can and should be fixed. FCI: Sections 2.6 and 2.7 are merely general introductions to the species and do not directly relate to the scoring. This point has been added. The MSC Fisheries Certification Methodology requires the report to contain an 'outline of the fishery resources including particulars of life histories as appropriate'. Section 4 and the assessment tree scoring references make clear that the key document informing scoring of the target species is the ICES Arctic Fisheries Working Group Report.

2.6.3 – (pg 18): The text on predator and prey never mentions cannibalism, yet that has been a very important process in the population dynamics models and food web models that are central to the ICES assessments of Barent's Sea cod. This is important enough that it should be acknowledged in the description. In fact, the entire section on Predator / Prey *only* discusses cod as a predator, and what its prey are. There is no discussion of predation *on* various ages of cod – or any other source of natural mortality for cod. FCI: Reference to cannibalism added.

2.6.2 and 2.7.2 (pgs 17 and 19). It is a matter of judgement how concise a summary of life history is sufficient for an assessment report. However, I would have expected at least a bit on oceanographic transport mechanisms relative to egg and larval distribution. Both cod and haddock display large and multiyear patterns in year class strength. Their causes are not fully known, but there a general understanding of key processes has emerged from a great deal of research. These patterns have important implications for harvest strategies, reference levels, and stock status, and there should be at least a paragraph or two about them in this introduction, including references, to provide the basic knowledge for the later scoring of factors affected by these processes. FCI: It is indeed a matter of judgement, and given these points do not in themselves influence scoring outcomes, and given the stated aims of providing a clear and concise report for a wide readership, it is judged that the existing description is adequate.

3.1 (pg 24). It is noted that the effectiveness of the management measures has not been tested. This is a shortcoming that one would expect a certified fishery to have a plan to address. The management measures individually are reasonable, and most are ones that are common in fisheries of this scale. Nonetheless, these are stocks which periodically experience a few years of substantially lower than usual productivity. At those times management needs tools whose effectiveness is well documented, and which can provide responses quickly. Hence a fishery committed to the spirit of the MSC process as well as letter would want the effectiveness of the major management tools evaluated under the conditions when their effectiveness would matter most. That clearly has not been done. The reference points have been tested with simulations, but not many of the tools, and for

management measures, more than simulations are often needed to establish confidence in the tools themselves and not just confidence in the rules which trigger their use.

FCI: The overall management performance is being tested – this is the most important component of the harvest strategy. This will include the effectiveness of the management measures. Adjustment of measures should lead to the fishery meeting its targets which is evaluated independently through stock assessment. This is the ultimate and most reliable test of whether measures are truly effective. Evidence available suggests that measures are effective (data indicating reduction in catch, reduce fishing activity and so on), but we agree that we "would want the effectiveness of the major management tools evaluated under the conditions when their effectiveness would matter most", but we believe that this can only happen over time and during real operation of the fishery.

More serious are the non-compliance with TACs, primarily through trans-shipping, and discarding. The historical problems with both of these poor fishery practices for Barents Sea cod and haddock are well know. As I understand certification, the behaviour only of the fleet seeking certification is being evaluated in the assessment, so the problems do not have to be solved globally for a specific fleet to warrant certification. However for that fleet, evidence has to be strong that un-reporting of some catches, and discarding in general but most particularly unreported discarding, are both fully controlled and for all intents and purposes do not occur. I will be looking for that evidence at the appropriate place in the assessment and scoring material.

And there is another condition that has to be met, of course. Even if the fleet seeking certification has demonstratively controlled and largely eliminated under-reporting of catches and discards, the activities of other uncertified fleets cannot be so detrimental the stock status suffers. If that is the case, the stock would not meet some of the P1 standards on its own right, want would have to be scored accordingly. FCI: These points are addressed and P1 does relate to all removals not just that of the fishery under assessment.

3.3 (pg 25): regarding the provision of the harvest control rule that "if the spawning stock falls below B_{pa}, the procedure for establishing TAC should be based on a fishing mortality that is linearly reduced from F_{pa} at B_{pa}, to F= 0 at SSB equal to zero." As I have told ICES directly during a review of their revised HCRs, I do not consider this rule consistent with a precautionary approach, nor consistent with several key international agreements. In particular, by not having F reach 0 until SSB reaches zero, this HCR allows directed exploitation on stocks well below the state when productivity is impaired, and actually allows fishing to continue until the mature biomass of a stock is actually extirpated. If I were scoring a fishery I could not give a score as high as 60% to a stock being managed with an HCR that allowed non-zero F when a stock was far below any biologically based limit reference point, and allowed some level of directed fishing even when a stock met not just the IUCN decline criterion for risk of extinction (a criterion I agree can be questioned for many marine fish), but met the abundance and range criteria.

FCI: We would share the reviewer's concerns with this HCR at a theoretical level and we are pleased to see these concerns have been raised with ICES. Clearly, once the stock falls below Blim, fishing mortality should ideally be zero. From a scoring point of view, the HCR does meet the guideposts as written. ICES has declared this HCR as precautionary and ICES being the scientific authority, we would need good clear reasons why they are incorrect in relation

to MSC. We have not carried out any technical review of the assessment or HCR evaluations. The main requirement on the HCR is that the slope defining the decline in fishing mortality is steep enough so that the expected productivity of the stock would ensure the stock increased in size when below Bpa. If this is the case, the behaviour of the HCR below Blim is academic. If the stock should fall below Blim, the HCR would have to be redesigned as it has failed (we do not consider the HCR to be a static device applied blindly under all circumstances) and the fishery would lose MSC certification immediately. For mixed fisheries, setting fishing mortality at zero in any HCR is over-optimistic as target fish are taken as bycatch in other fisheries. This proposed HCR is realistic and therefore the simulation testing perhaps more valid. We also understand that reference points and by extension the HCR will be re-evaluated with respect to MSY, and we will see whether more account is taken of the reviewer's concerns then.

3.4.2 (pg 26). "Discard estimates are not available and are assumed to be zero in the assessments. The effect of not accounting for discarding is unknown, but attempts are being made to address this issue." This is quite a serious hole in the information, particularly because there is narrative information that in at least in some years discarding can be large. I would expect a requirement that reliable discarding information be available for both species by early in the certification period. If this proves intractable for some fleets not seeking certification, then one would expect at least reliable discard data for the certified fleet and a strategy adopted in the assessment that is robust to plausible levels of discarding (and assumes, until reliable evidence to the contrary is available, that discards as in the neighbourhood of historical moderate to high discard levels. FCI: Discarding is banned, this strong and sustainably minded policy could have the perverse effect of making information on discarding harder to obtain. Addressing this with a condition would be unworkable, but a recommendation has been added.

3.4.5 "Since 1997 all of the surveys used for model fitting have been affected by an incomplete coverage for some of the years, due to Norwegian vessels not been given access to Russian zone and Russian vessels not been given access to Norwegian zone. All indices affected have been corrected as far as possible, but these procedures still increase uncertainty in the indices." This was remarkable to read, after all the text earlier in section 2 on how well Norway and Russia are cooperating in the management of these stocks. If they cannot even agree to give each other's research vessels access to species' ranges for surveys, I have to wonder how deep that cooperation really is. This is another issue that one would expect to be addressed as part of the ongoing improvement of a fishery, consistent with MSC objectives. FCI: Section 2 does not imply a perfect working relationship, but a workable and improving one. In some instances there has been an agreement to disagree, but the fact remains that the level of cooperation is perhaps better now than ever.

3.4.6 (pg 28) "Among the diagnostics, there is a worrying retrospective pattern for haddock of over-estimating stock size and under-estimating fishing mortality for the most recent years. The reason for this is not fully understood. … Retrospective patterns are often the result of problems in the data." This is a problem that has led to serious management errors in many stocks, and should be reflected appropriately in the scoring. It is fine to say "problems in the data" but as best I know, the data problems are almost always some form of inaccurate catch reporting or else a consistent change in natural mortality (and there is no hint of the latter occurring, as best I can infer from the rest of this assessment).

FCI: This problem was taken into account in the scoring.

3.4.6. (pg 28) "simulations did account for different levels of implementation error (where the desired TAC is not achieved for whatever reason). In general, the simulations found the rules relatively robust to likely levels of error." Is this a non-standard use of the phrase "TAC is not achieved'? Usually that is used to mean that the fisheries could not take the full quota and some was left in the sea. Particularly in light of the comments on assuming discards are zero for haddock, and under-reporting is only estimated roughly, I would think the management problem of concern for robustness (and conservation) is when the quota is overshot, not under-taken.

FCI: The text has been clarified.

4.2 (pg 30-31). This is a good discussion of the issues with discards, but it raises concerns about the degree to which the fishery demonstrably meets the MSC standards. Even if discarding of fish catches is actually around 8%, it is 8% of pretty big numbers (over 500,000 t for cod and nearly 200,000 t of haddock). This is a LOT of bycatch, and at as noted some of the species known to be taken have low productivities and can sustain only low rates of mortality. I'd want to see more than the histogram in Fig 4.1 to be able to say with confidence that bycatch is sustainable for all species taken as bycatch. FCI: The scale of the fishery is not in itself a criterion of assessment as in theory a large unit of certification or a small unit of certification is likely to have the same proportionate impact. The 8% figure relates to retained species not discards.

The macrobenthos is also a concern. All we are told is that up to 25 years ago it was a million tons a year for the entire Russian fleet of those years, and now we infer it is less, although by an unknown amount, less where it is being repeatedly impacted by fishing, and we have some species composition and know that there are habitat effects. This is hardly enough to assess sustainability of impact on benthos. FCI: There is a strong condition to address habitat (and by association) benthic impacts.

The discussion of the complexity of the issues associated with discarding – particularly the awkward combination of a ban on discards that can only deter reporting and a very low level of independent observers – brings out the issues well. The discussion makes it hard to see how these aspects of the fishery are demonstrably compliant with the standards for certification. FCI: this leads to a far deeper discussion of whether it is more sustainable to not have a discard ban. The imposition of the discard ban was motivated by a desire to have sustainable fisheries, and on balance it is highly likely to have had a positive effect, as a result, in assessments, fisheries with discard bans generally have scored higher, but the associated issues or loss of information, is being given increasing recognition. The scores in relation to discards have been substantially decreased as a result of peer review, and are now well below the supposedly harmonised fisheries.

4.3 (pg 32) "No elasmobranches species occurring in the Barents Sea are protected by CITES, although some of these species are listed by IUCN as critically endangered which do occur in the Barents Sea, such as flapper / blue Skate (*Dipturus batis*) Angel shark (*Squatina squatina)* and porbeagle (NE sub-population)." If the impact of the fishery on elasmobranches does not qualify for consideration under ETP species because no government body has listed them, that's fine. However it just means that the impacts are considered as part of the sustainability of bycatches. They are a part of the overall

assessment and have to be considered somewhere. FCI: The impact on these species was considered. In scoring, the assessment team have scored 'main' species only (this means that highest scores are not possible). Data from PINRO indicates that these species were not a main component of the bycatch.

4.4 (pg 33-38). This is a good discussion of the issues, at about the right level of detail for the general issues. What's missing is the specific basis for how this particular fleet will be scored on the habitat criteria for this assessment. FCI: This is discussed in the scoring table. To avoid repetition the report aims to provide the overview, whilst the scoring table provides the specifics.

4.5 (pg 37) Same comment about the weblink as for 2.6. The description of the ecosystem relationships is good and about the right level of detail. However the documentation is almost nonexistent. There is a huge amount of information on the Barent's Sea web portal. The summary should at least provide the names of a couple of the papers or reports on the portal that would be particularly appropriate as sources of more detail and scientific validation. FCI: The second paragraph now more clearly states the key ecosystem sources.

4.5 (pg 38) "However, intensive fishing has probably reduced the ability of the cod to affect the large fluctuations in the stocks of capelin and juvenile herring in the Barents Sea." If this is really the case than the fishery on cod has already affected ecosystem structure and function detrimentally, and management of cod should give priority to restoring this functional role. The MSC certification assessment should also take this existing harm to ecosystem function into account. FCI: The MSC standard in relation is ecosystem focuses on whether there has been 'serious or irreversible harm'. This sentence in the report does not contradict this, and the issue receives proper consideration.

5.1.2 (pg 42-3) the history lesson on national management agencies is very interesting, at least to a person like me who does not know the Russian fisheries management system at all. However, it makes me a little anxious about how one can score some of the P3 questions for a 5 year certification when there have been so many significant changes in management structure and regulatory bodies over the past decade. One thing that would help the report is to make it a little clearer exactly what the management structure will be in 2011 when the certification would kick in. With all the history is sometimes is a little confusing which agencies have which roles *now.*FCI: It is precisely because of the changes that have occurred in recent years that the assessment team have chosen to give such a comprehensive description. Any country may make changes to the fishery management structures during the lifetime of a certificate, and the MSC audit process is designed to accommodate this.

5.1.3 (pg 44-45) There is clearly no shortage of objectives for this fishery. The questions are which ones have priority when there are trade-offs to be made, and where are the conservation-related objectives. To me the most telling part of this section is the statement "the President's address on the state of the nation, calling on the Government to prioritise objectives which improve customs control, prevent overfishing; restore the shipbuilding industry and ensure quota is taken by Russian companies." This more or less acknowledges that there have been too many not wholly compatible objectives, with the suite not being particularly effective in guiding the fishery in any particular direction at all. It also acknowledges that objectives related to sustainability haven't been prominent enough.

5.2.1 (pg 46-47\8) The information on the history of enforcement in this fishery is interesting, but the last paragraph on page 46 also poses many questions about the ability of the fishery to score well enough to warrant certification. If surveillance and enforcement has tightened up for the period of potential certification, then that part of the story needs to be told particularly clearly. The information on page 48 about 80% of the catch in this particular fleet being subject to more effective Norwegian enforcement is mildly reassuring, but only mildly so. FCI: The assessment team have sought to give a clear and frank description of the situation of monitoring, control and surveillance in Russian fisheries – this includes highlighting some of the weaknesses, but also some of the more recent positive steps. In order to meet the 80 standard the MSC requires there to be an MCS system in place, with consistently applied sanction and evidence of compliance. These points are all met – hence the award of a score of 80. However scoring at 80 acknowledges that the system may not be fully *comprehensive* nor does it necessarily enable a *high degree of confidence*. For harmonised comparison, the equivalent Norwegian fishery assessment (same species, same vessels, same area) scored 95 for this performance indicator, which provides clear indication of the precautionary position taken by the assessors on this assessment.

5.2.2 (pg49-50) The text itself even suggests that there is less than full clarity of the roles of various parties in some aspects of decision-making, and therefore in the appeal and dispute-resolution process as well. A little fine-tuning of some of the earlier sections of 5.1; especially of 5.1.2; might help make this section clearer. 5.1.2 explains what organizations and interests participate in which governance bodies, but could be more explicit about which decisions get made but which components of the participants. Also the lack of full access to the decision-making and appeal processes by ENGOs and other interested parties who don't have a direct financial interest in these fisheries is really at odds with the spirit (and possibly letter) of the MSC certification standards, and make make scoring well on some of the criteria difficult. FCI: A condition addresses this point.

Conditions

Conditon 1: Appropriate and should be completed at least by year 2. FCI: As stated.

Condition 2: The condition is about "removals" but the actions focus mostly on monitoring of landings and trans-shipped fish and not total catches. The action with regard to increasing observer coverage (or equivalent technological surveillance) should be the first rather than last action, and the increase needs to be substantial – not just, say, as doubling from 5% to 10%). Certification of this fishery should not be prevented by failure of other fleets to improve their provision of reliable information on all catches (at least not until the inaccuracies seriously undermine the assessments and management). However this fishery needs to be held to a very high standard, at least until a time series of accurate data on total catches has been assembled, and the adequacy of lower coverage levels can be demonstrated. For the fleet seeking certification, this should be achieved in 2-3 years, whereas improvements in the total suite of fisheries can be given longer. FCI: The actions concentrate on the perceived greatest areas of uncertainty of 'removals'. The increase in observers has been shifted to the first action (although these are not prioritised). The expectation on this fishery is defined by the MSC standard.

Condition 3: Either this Condition should be expanded or an additional one added to ensure reliable information on the catches of sensitive and vulnerable elasmobranches and macrobenthos species is collected, and when adequate information is available, sustainability of impacts is assessed. Where risks are identified, appropriate measures to mitigate should be implemented for these species as well as redfish, wolfish and Greenland halibut. Actions to improve information should start immediately, with the assessments completed and management needs identified and addressed by the 5th year. FCI Text added to include elasmobranches and mitigation.

Condition 4: This is one of those open-ended conditions which could prompt significant debate about if and when it will have been met. Even the recommended actions are value and give little guidance on what type and level of activity by the fishery is enough and what is not enough. If my suggestion for a full assessment of habitat impacts within the FAO Guidelines for deep-sea fisheries were to be taken, a requirement to complete that assessment in year 1 and complete a full program of action to address any identified risks by the first audit would be clear and unambiguous to evaluate. The resultant program of action would also be much more specific than anything that could be developed to address the condition as it is currently presented. FCI: The actions are deliberately not too prescriptive. The condition will have been met when the 80 guidepost for both PIs are met. This will be reviewed and updated during audit.

Condition 5: Reasonable in intent, but depends in part on actions that cannot be taken or managed by the fishery (changes in how government agencies allow participation in government processes. I'm not sure this is realistic or fair – but if it is possible it will certainly take all of the five years to achieve fundamental changes in governance. As a realistic additional action under the condition, the fishery could be tasked to set up in year 1 at least a fully open and inclusive consultation process for its own operations. All concern parties (harvesters, processors, ENGOs, community leaders etc) would have full access to at least the information on the certified fleet's activities. The process could discuss any concerns by participants, and make recommendations for the certified fleet to act in ways that improve its performance, whether the entire fishery makes the same change or not. This places the certified fleet in a leadership role for improving fisheries, which is completely appropriately. FCI: requiring actions by others can appear to be unfair on the fishery, but if the fishery does not meet the standard and a condition is triggered, sometimes there is little choice. We have checked with the relevant entities that the condition is reasonable and achievable.

Condition 6 Appropriate but should be achieved in less than the full five years. FCI: 5 years is a maximum figure.

All the recommendations are reasonable and appropriate.

All the proposed actions by the fishery (pages 64-66) are reasonable in concept. Effectiveness depends on how enthusiastically the actions are pursed. More concrete statements of levels of activity are needed for many of the proposed actions. However, I concur that it is premature to assembled a detailed plan of action on each condition under the certification process is slightly further along. However, at that time it would also be necessary to have contingency plans in place. These contingency plan should clarify what the industry intends to do if some of the outcomes "keep[ing] and close watch on" things do

not live up to the MSC standards and benchmarks, and *how* the industry intends to "encourage" and "implement" many of the actions that are listed. FCI: Whilst contingency plans are indeed a good idea, these are not a requirement for the action plan according to the MSC methodology. The surveillance audit will take a close look at all of the points raised here.

9.1 Transhipment (pg 61). The text acknowledges the perception (with lots of evidence) that transhipments are a key avenue for IUU fish to reach markets. The text on pg 61 shows the will of the fleet seeking certification to deal with this problem. I note one of the binding guidelines is that "ensure that all transhipment operations are in the areas where fishery inspectors may have access to the vessels; I would think that there would be no problem with going one more step and requiring that fishery inspectors be notified in advance of any transhipments, so inspectors always have the choice of whether a particular exchange needs to be monitored or inspected. To reach full transparency I would think all transhipments would have be in the presence of an independent inspector, but that might not be logistically feasible. However, I can't think why it would be much of an operational burden to not just require that vessels be in areas where inspectors could have access to them, but that inspectors know that a transhipment will occur enough in advance that they can choose to be present if they feel it is appropriate for full catch documentation. FCI: Notifaction of transhipment is already a requirement.

9.1 (pg 62). The list of measures in the final set of bullets looks reasonable. I can't help thinking that the first and last (logbooks and EC regulation 1224/2009) are central to the effectiveness of the whole process. The reliability of each would be highly questionable in a culture that had not dealt with the corruption referenced in parts of the P3 text. If the fishery is certified, I would expect this issue to be something the annual audit would scrutinize carefully. FCI: Indeed.

Comments on Scoring and Justification for Criteria

Cod

1.1.2 The score is appropriate in my view, but in the justification there is another issue with the F reference level. Not only is it possibly not appropriately comparable with F_{msy}, but the cannibalism term in the equations used to justify the relatively high target F has a dangerous consequence when the stock is in decline (whatever the cause). Unless the formulation has changed in very recent years, the density-dependent term is non-linear and provides very strong compensation when SSB is in the low part of the range of historical biomasses. This ensures that when the spawning biomass is low, the stock *must* produce very large numbers of recruits, ensuring that assessment will say the stock will increase strongly in the coming few years. So far this has not caused lasting problems for the stock, but during the stock decline nearly a decade ago, it certainly supported a spike in fishing mortality when the stock declined. If there is compelling evidence that cannibalism is a major loss of biomass when the adult biomass is large, then a reference F that allows a higher exploitation rate when the stock is very large would be justified and would not be inconsistent with the PA. However, it is very counter-precautionary to have a formulation that always reduces non-fishing mortality as SSB declines, and basically can eliminate m (drive the natural mortality term to a very small value) when SSB is very low. (and I concede this may have been

changed in the most recent years.) However the formulation used about a decade ago actually was unconstrained so the cannibalism term could become positive when SSB was small enough. I believe this was fixed, but the assessors should look very carefully at the precise formulation in the current assessment models.

FCI: We do not carry out a technical review of the model. Our understanding is cannibalism is based on observations from samples and is in addition to a base natural mortality of 0.2 $year^{-1}$ and primarily affects only ages 1-3. This is used to estimate past natural mortality and in common with VPA techniques, gives a better idea of what has happened rather than what will happen. It has two main effects, a better estimate of current biomass and higher target fishing mortality. The way the assessment has been done and the results seem reasonable and have no obvious flaw. This does not mean there are not technical problems, but these can be raised and dealt with through the scientific working group and review process.

1.2.1 The score below 80 is appropriate and the justification for the score is clear and addresses the major issues.

*1.2.2 As explained in my comment on section 3.3 (pg 25) I do not agree that the harvest control rule is consistent with the PA. To be consistent with the PA, the control rule would have to recommend an F of zero when SSB is at the limit reference point (defined functionally as the biomass at which stock productivity is impaired), and not an F of zero only when SSB was zero. It is acknowledged that management may not be able to reduce every source of fishery-related mortality to zero at B_{lim}, but the control rule for the fishery most definitely should be setting that as the goal of management when SSB is at or below B_{lim}. If I were evaluating a fishery I would not be able to award a passing score on this criterion to any control rule producing directed catches and a management F > 0 when a stock is between 0 and B_{lim}.

FCI: See comments above.

1.2.3 I concur that a score below 80 is warranted on this criterion. The ecological information available on the stock is impressive. However, the lack of reliable information on total catches (not just landings) and possible biases in sampling of catches are serious concerns. It is clear that the authorities are working to correct the most serious aspects of IUU fishing, and the fleet seeking certification is serious in trying to ensure reliable catch reporting by its members. Given the information in the assessment report on all the changes in management (and especially of resources for management) of the total fishery over the past 10-15 years, there is even cause to question if the progress made to date on IUU fishing will remain intact into the future. And there is certainly cause to question if the catch records are now complete and reliable. Even the fleet seeking certification is going to have to have greater independent documentation of the accuracy of its *catch* reporting (not just landings and trans-shipments), whether through on-board observers or other validated technological methods. If the fleet seeking certification does produce transparently reliable catch information for its operations, there still will be a scoring challenge here if other fisheries remain leaky enough that inaccuracies in reporting by other fleets is high enough to affect accuracy of the stock assessments. FCI: Noted.

1.2.4: I agree that it is a mature and biologically complete assessment model. However, my concern about the cannibalism term, discussed at length in 1.1.2 is also relevant here. There are only certain conditions when it is relevant to the assessment model, but those are

conditions when the stock is below long-term average and declining, and those are not good conditions for a stock assessment model to have a serious weakness.

FCI: We agree that if the science is incorrect, a problem is created for the assessment advice and this particular problem could lead to over-estimating TACs. All assessments can lead to overestimating TACs with particular problems. The cannibalism is based on observations and not on a model, and therefore the model does represent the best scientific advice available. Data collection is good enough (cannibalism, age compositions and surveys) to detect errors over time. There is a reasonable limit on fishing mortality which will decline with biomass and therefore on the face of it, (and as tested ICES) the HCR should be robust enough to safely allow its evaluation.

Haddock

1.1.2 I've never liked B_{loss} as the basis for a biomass reference level, but I cannot come up with an alternative I could justify any better. Likewise for the ad hoc way that B_{pa} has been set as an arbitrary percentage of B_{lim} .

FCI: We understand that reference points are being re-evaluated to be justified based on MSY.

1.1.3 I agree the criterion does not apply, but the statement in the justification that "The stock status is unknown, so rebuilding is not required' cannot be what the assessors mean to say. We just heard in 1.1.1 that the stock status is known quite well. The reasons that rebuilding is not required is that the stock is well above its biomass reference level and not in need of rebuilding.

FCI: The text has been corrected.

1.2.2 I have two problems with the harvest control rule for haddock. One is the same problem that I highlighted in my comments on 1.2.2 for cod. A control rule have F reach zero only at the point when SSB reaches zero is not consistent with the PA, by condoning directed fishing on a stock where productivity is impaired. My other concern is with the symmetric buffering of changes on TAC to not greater than + or – 25% per year. In a stock where variance in year-class strength is large by groundfish standards, strong and weak year-classes can appear quickly in a stock. This buffering of changes in TAC limits the ability for management to take swift and adequate conservation action when recruitment is weak. One might be reassured by the proviso that "However, we are not told how much F can be reduced, and my concern that F declines to the origin rather than (B_{lim}, 0) is highly relevant here. More concerning is the observation back in report on the stocks and fishery that there have been periods of strong retrospective pattern in the assessment of this stock. These patterns tend to be strongest when a stock enters a period of swift decline. Hence not only does the catch buffering rule prevent management from responding fully to rapid declines in stock status, such declines are likely to be underestimated and detected late. Together these concerns make me question if the present score is sufficiently well justified.

FCI: See comments for Arctic Cod HCR. In addition, the HCR states that "there should be no limitations on the year-to-year variations in TAC." when the biomass falls below B_{pa}. This appears to deal with the second concern here. The retrospective pattern is a concern and scores do reflect this.

1.2.3 I agree with a scoring below 80 for this criterion and the with the justification given for the scoring.

1.2.4. If I were scoring I'm not sure I would be able to give a score above a minimum pass for an assessment where strong retrospective patterns occur periodically (I don't think the current one is not the only time this stock assessment has had a strong and multi-year retrospective pattern), and particularly seem to be present in the years leading into the certification period, *and* where, as the justification text says, there are reasons wot question whether XSA actually represents some of the key biological relationships accurately. I would certainly consider withholding a score above a minimum pass until a new benchmark review for the stock were completed, and there would be documentation available of what analytical experts think about the assessment model formulation.

FCI: The key point here is that there evidence that the stock assessment is developing and does take account of the best scientific evidence available. Current limitations of the assessment have been taken into account. Benchmark reviews are regularly conducted and withholding scores based on where the assessment is in this cycle would not lead to consistent treatment of the process.

2.1.1. I have three concerns with this evaluation. First, even if redfish is only 1% of the catch of the fleet seeking certification, it is 1% of a big number. If the entire cod and haddock fleet is also achieving that 1% bycatch level, it represents over 7000 t of redfish (1% of 500 kt cod + 200 kt haddock), and only a 2% bycatch rate makes the total bycatch equal to the entire bycatch recommended by the Arctic Fisheries WG. It seems as well that that "recommended" bycatch was not based on a sustainable catch of redfish but of what bycatch could be expected from other fisheries. I'm not at all sure a science assessment working group should be making such recommendations to begin with – or if they are, I believe they should label clearly as operational recommendations and not consistent with the PA applied to the bycatch species. However, if we accept the 14,000 t as a management benchmark (whether it is a precautionary benchmark for a depleted stock or not), we are only asking the certified fleet to reduce bycatch by 50% compared to the fleet as a whole (1% vs 2%). These very small percentages are probably dominated by rounding error rather than precise numbers, so I don't want to make too much of them. But for a depleted stock I would expect something more ambitious than a 50% reduction from the fleet as a whole. Moreover, if some of that 14,000 t from the AFWG is for other fisheries completely, then the 1% of catch in this fleet and fishery is even a greater concern. FCI: Condition 3 addresses this point, and also harmonises with the equivalent Norwegian MSC certified fishery. The scale of the fishery is not in itself a criteria in the assessment, although the assessors do examine total catch and compare this to the theoretical catch. With redfish in particular, the principle concern and main reason for continued concern over stock status, is the on-going directed fishery for redfish. The key problem for the species remains the directed fishery, and the certified fishery is well below its bycatch limits.

Second, whatever the bycatch of redfish, the statement that "the measures in place (bycatch limits, closed areas and seasons, landing controls) are expected to ensure that the fishery does not hinder recovery and rebuilding of the depleted species "

seems optimistic and weakly justified. In the part of the assessment on catch monitoring it was conceded that *independent* onboard catch monitoring is poor, so we have no

independent evidence that bycatch limits would actually be respected if they were to prove limiting on catches of target species. We also need some evidence that the closed areas and seasons are timed and placed to bring redfish bycatches not just down, but down to levels where recovery and rebuilding would not be hindered. Perhaps that evidence exists, but I am not aware of it, not have I seen it referenced in this assessment report. FCI: It should be noted that the assessors have chosen to address this point in the subsequent PI (2.1.2), where it is concluded that for '*Sebastes mentella*, it is more realistically too early to argue in the objective basis for confidence in the partial strategy', and this triggers a condition. When comparing with the score with the harmonised Norwegian fishery, the retained management score awarded here of 75 is already well below the score of 90 for the Norwegian fishery. This highlights the precautionary stance taken by the assessors on this point.

Third, as noted in comments on the report, somewhere there needs to be an accounting for bycatches of particularly vulnerable species like elasmobranches. Because the Russian and Norwegian authorities have chosen not to classify many species of sharks, skates and rays as ETP species, this is the most appropriate place to consider the sustainability of bycatches of such species in this fishery. No information on them is presented, but they are a major factor in many other trawl bycatch assessments. FCI: These species did not show up in the PINRO data presented for the certified fleet, however specific reference has now been made to these species in the condition relating to retained species.

To me, each of these considerations would support arguments for an even lower score than the one awarded in this assessment.

2.1.2 This is a reasonable evaluation, although there should also be consideration in the justification for a strategy for ensuring impacts on elasmobranches taken as bycatch are sustainable as well. FCI: Elasmobranches did not feature as a main species, however reference has been added to the appropriate condition.

2.1.3 Given that the criterion refers only to *retained* species, accurate recording of *landings* may be a sufficient to base a scoring on this criterion. However this is only the case if there is cause for confidence that there is absolutely no discarding of a portion of the catch of retained species. (it is the level of *catch*, not landings, of course, that determines the risk posed by the fishery to species retained *by the gear* - not just retained by the vessel). We have heard in both the narrative report and some other scoring justifications that notwithstanding a discard ban, there is little independent verification that discarding does not occur. Moreover with bycatch caps apparently in place, there is an obvious incentive to discard catches of species which, if retained, would limit the fishery before the quota is obtained. Unless a strong justification can be given for confidence that there is little or no discarding of part of the catch of retained species, it would be hard to support a score that is quite high on this criterion. FCI: This point is addressed in 2.2

2.2.1 The discussion of the potential concerns with impacts of discards does touch all the major concerns. However, in my view the potential for detrimental impacts on less common (and less productive) elasmobranches and uncommon (and less productive) macrobenthos are tossed off too lightly. We apparently have no reliable data on all but the most common elasmobranches and macrobenthos in the bycatches, so it is hard to see a basis for confidence that the bycatches are not having a detrimental impact on these

populations. In addition, the studies I know of that reported high survival rates of skates were in cases where tows are not long and total catches are not too large. I'm not so concerned that the study cited was in a different part of the Barents sea and with different vessels, but it is necessary to at least document that tow lengths, depths, and catch weights of the fleet seeking certification and the fleet in that study were comparable. FCI: This has now been included in the condition.

2.2.3 I have to question the statement that "none of the assessments have indicated that discarding in the demersal trawl fishery presents a problem either to stock status, or to the information required to establish outcome status' The justification text does go on to say that the assessment WG does think the uncertain information on redfish bycathc may affect the assessment. To me it also may affect the stock status, given the WG concludes that the stock is likely below its reference values and should not be fished, and then has to recommend a bycatch allocation nonetheless. And here is yet another case where my concern about the absence of independent verification of compliance with the regulatory ban on discards seems greater than that of the assessors. FCI: redfish has been assessed under retained species.

2.3.1 to 2.3.3 – If this is where the assessors choose to consider all elasmobranches and not just those listed as ETP species by Norway and/or Russia, then there is much more than porbeagle that needs to be taking into account (see comments on 2.1.1 and 2.2.1). This is particualrl the case with regard to 2.3.3. The information on bycatches of the less common and / or less productive elasmobranches (and macrobenthos, some of which may well qualify as ETP species, were appropriate assessments to be done by the jurisdictions) seems almost non-existent. And with these species not covered by the discard bans and not supported by markets, there is no reason to expect information quantity and quality to improve without directed action. To me 2.3.3 in particular seems to fall up short of a pass, until there is some high quality bycatch data from much of the fleet, for *all* the macrobenthos (not necessarily all to species, but at least all to units where conservation evaluations can be undertaken and measures, as needed, could be implemented. FCI: Macrobenthos will be addressed in the habitats work, whilst elasmobranches will be addressed by the work on retained species management. The actions prior to assessment (including ETP Logbook and increased observer work) will result in the data the peer reviewer requests – this will be assessed again at the time of annual audit.

2.4.1 – Several concerns with this scoring and justification.

The statement 'consultations with captains did not indicate large capture of sessile and vulnerable habitat forming species, such as corals," provides a false sense of security. It has been well documented with experimental work and monitoring of fisheries that large mesh trawl gear, fished in commercial operating mode, retains very little coral and sometimes even little sponge, even when substantial coral may have been encountered on the seafloor. Absence of corals and other fragile macrobethos in commercial mobile bottom gear cannot be taken as suggestive of absence of impact, if the gear was fished in areas where vulnerable and sensitive macrobenthos could have been encountered. FCI: The score of 60 reflects this. The fishery will have considerable work to undertake to bring this score up to 80 in time for recertification in 5 years time.

For the rest, there are judgement calls to be made on what level of impact on habitat structure and function are serious and irreversible. These judgements are partly about the nature and recoverability of the impacts, partly about what is interpreted as structure and function of habitat, and a lot on the scale of the impacts (impacts are always going to be serious in the path of the gear; how large is large enough to become serious on regional or bioregional scales. These judgement calls will always differ among experts and stakeholders with amply scope for disagreement and appeal, wherever an assessment team comes down in its own judgement. However, we do now have both an international commitment where States have set a standard for habitat impacts (UNGA resolutions 61/105 and 64/72) and more importantly, Technical Guidelines from FAO (informed by no fewer than five Expert Consultations before the Technical Consultation where the final Guidelines were negotiated) for how States and RFMOs should implement the relevant provisions in the UNGA Resolutions. Now MSC may well want its standards to be higher than the standards in the FAO Technical Guidelines, but they certainly would not want their standards to be lower than States have agreed *all* deep-sea fisheries on the high seas should meet (and that States should be encouraged to apply the Guidelines within their national jurisdictions. I would think *as a minimum* this fishery should be evaluated relative to the relevant Guidelines for assessment of potential impact on seafloor habitats (I believe paragraphs 46-49) and for measures to mitigate or manage potential risks. If it doesn't even meet the FAO Guidelines for *any* sustainable fishery on deep-sea species (<200m), it would be hard to justify certification. On the other hand, if it can be shown to be consistent with the FAO Guidelines for assessment and management of impacts on the seafloor and benthos, then the assessors have so independent benchmark for why their decisions in this evaluation are not just personal judgements. If might deflect a lot of the heat that is reasonable to expect for this fishery (or any fishery using heavy, mobile, bottom-contacting gears in areas where there is significant habitat structure on the seafloor). FCI: Point noted and passed to MSC. The score of 60 for habitat status is indeed saying that this is unacceptable in the longer term.

2.4.2 All my comments in 2.4.1 about the value of using the FAO Guidelines as an independent standard for assessing seriousness of impacts also apply to selection and application of conservation measures. For example it is fine that Norway has protected some of the highest densities of corals to bottom trawling. Everyone including the assessors agreed those closures fall short of a "strategy to ensure the fishery does not pose risk of serious harm to habitat types ". The question of course, is "how far short?". Is it enough to warrant even a 60? At what point is it enough for an 80? The industry and the ENGOs will probably never agree on the same standards for measures, as they are unlikely to agree on the same standards for risks. At least the FAO Guidelines on selecting and implementing measures give some external and credible context on which to hang one's expert judgements on these hotly contested issues. FCI: As the peer reviewer notes, this is a judgement call. The comparable Norwegian fishery was scored at 95 for this PI. Given there is less protection in the Russian zone, and reviewing the scoring guidelines, the assessors concluded that a score of 75 was more appropriate in this case. This is both precautionary – and importantly is designed to bring about positive change.

2.4.3 I can agree that the information collected by MAREANO would be sufficient to meet a minimum standard for assessing risk of impact, *if it were being used to guide spatial operations of the fleet now*, (in combination with VMS data on where the fleet is operating,

of course). It does not read like that is the case at this time however. It is only identified as a potential opportunity that should be pursued. The references and the text suggest we are some time from seeing even the existing MAREANO habitat maps (let alone those from areas where MAREANO has not yet completed mapping) used in fishery deployments. As such, I would think one would have to discount the score further (beyond just allowing for incompleteness and uncertainty in the maps) for the information merely existing, if it is not being used actively in management of the fishery being assessed. FCI: Whether and how the information is used is scored under management. The assessors point is that it is not lack of information which is preventing management, therefore low scores and resulting conditions focus on status and management rather than information. More complete and detailed maps would lead to scores in the 100 column. These are not met. Score remains unchanged.

2.5.2 I may not agree with everything said about the impacts of the fishery on the seafloor components of the ecosystem, but concerns are addressed fully in the 2.4.x criteria and this evaluation is appropriate otherwise.

2.5.3. Again, if the impacts of the fishery on the seafloor and benthos are considered to be evaluated in 2.4.x (and a bit on bycatches of some vulnerable species in 2.3.x) then all other ecosystem effects of the fishery on ecosystem relationships have been studied for these species about as completely as is realistic to expect.

3 Overall. I have almost no expert knowledge of the governance and management systems in Russia other than what I read in the narrative part of this assessment, and only a moderate knowledge of the governance and management systems in Norway. Hence I do not consider myself qualified to give a through expert review of this part of the assessment. I can comment on consistence of the scoring relative to the information provided here and other MSC certification assessments with which I am familiar. I cannot comment on how accurately and completely the information provided here reflects the actual governance situation in which the fishery operates. I am aware, as every other interested party would be, of accusations of corruption and lack of transparency in some places and times in Russian governance systems. I have no basis other than hearsay on which to just the veracity and extent of such practices, however, and I would not want (or be expected to) base a peer review on hearsay.

3.1.2 (pp 123-4) I did comment in my review of the narrative Report that I found the explanation of the roles and responsibilities of various agencies and bodies unclear (confusing in places) and apparently not really stable (relatively large changes occurring several times just in the past decade). These concerns are reflected appropriately in the justification and scoring for 3.1.2. The apparent exclusion of ENGOs from meaningful roles in governance processes would alone warrant a score below the 80 Guidepost. If the lack of clarity about roles and responsibilities is not just a lack of clarity in the explanation but a lack of full partitioning of duties, an even lower score might be considered.

3.1.3 (pg 125) I share the concerns expressed in the justification about the plethora of separate objectives, with particularly few ecological objectives, a lack of effort to reconcile even the various social and economic objectives, no explicit acknowledgement of the need for precaution, and an overall tendency to see the objectives apparently change frequently. All these concerns make even the score awarded seem somewhat optimistic that the objectives can, in fact, be pursued and achieved as a suite.

3.14 Subsidies have been a major concern with Russian fisheries, but is a highly technical area of expertise. I am not well enough informed or qualified overall to comment on this part of the assessment.

3.2.1 and 3.2.2 are accurate and well justified as best I know.

3.2.3 – I agree that the surveillance and enforcement system meets the necessary standards with regard to *landed catches* and, for at least the most part where and when fishing occurs. The degree of surveillance and enforcement of the discard ban and oversight of the *total catches* is seriously compromised by a level of independent observer coverage so low that the data would not even support doing comparative analyses of observed catches to logbook and/or landings records of catches when observers were not present, to test for the presence of an "observer effect". This is a shortcoming I consider more serious than is reflected in the present scoring – and one that is increasingly more tractable to address as new technologies are tested and come available on the market. FCI: This short coming is reflected in the scoring of principle 2. Again, for comparison, the compliance and enforcement P! is scored at 80 for this fishery as opposed to 95 for the equivalent Norwegian fishery, even though for 80% of the time the vessels are subject to identical enforcement.