WHEN TRUST MATTERS

## Announcement Comment Draft Report

# NORWAY BEAKED REDFISH FISHERY

Marine Stewardship Council fisheries assessments

| | |
|---|---|
| **Conformity Assessment Body (CAB):** | DNV Business Assurance |
| **Assessment team** | Lucia Revenga, Giuseppe Scarcella, Geir Honneland |
| **Fishery client** | Norges Fiskarlag |
| **Assessment Type** | Initial Assessment |
| **[Date]** | 25.11.2021 |

# Introduction

# 1 Contents

## • Contents

# 2 Glossary

## 2.1 Abbreviations & acronyms

| | |
|---|---|
| ACOM | (ICES) Advisory Committee |
| AFWG | (ICES) Arctic Fisheries Working Group |
| BSMP | Barents Sea Management Plan |
| CEFAS | Centre for Environment, Fisheries and Aquaculture Science |
| CPUE | Catch per unit effort |
| CRISP | Centre for Research-based Innovation in Sustainable fish capture and Pre-processing technology |
| DoF | Directorate of Fisheries |
| EEZ | Exclusive Economic Zone |
| ETP | Endangered, threatened and protected species |
| EU | European Union |
| FAM | Fisheries Assessment Methodology |
| FNI | Fridtjof Nansen Institute |
| GADGET | Globally applicable Area Disaggregated General Ecosystem Toolbox |
| GPS | Global Positioning System |
| HCR | Harvest Control Rule |
| HelCom | Baltic Marine Environment Protection (Helsinki) Commission |
| ICES | International Council for the Exploration of the Sea |
| IMR | Institute for Marine Research (Havforskninsinstituttet), Norway |
| IPI | Inseparable or practically inseparable catches |
| IUU | Illegal, unregulated and unreported fishing |
| IWC | International Whaling Commission |
| JNRCEP | Joint Norwegian–Russian Commission on Environmental Protection |
| JNRFC | Joint Norwegian-Russian Fisheries Commission |
| MAREANO | Marine AREA database for Norwegian waters / Marin AREAldatabase for NOrske kyst- og havområder |
| MFCA | Ministry of Fisheries and Coastal Affairs |
| MSC | Marine Stewardship Council |
| MTIF | Ministry of Trade, Industry and Fisheries |
| N | Norway |
| NAFO | Northwest Atlantic Fisheries Organization |
| NAMMCO | North Atlantic Marine Mammal Commission |
| NE | North East |
| NEA | North East Arctic |
| NEAFC | North East Atlantic Fisheries Commission |
| NFA | Norwegian Fishermen’s Association (Norges Fiskarlag) |
| NGO | Non – Governmental Organization |
| NINA | Norsk institutt for naturforskning / The Norwegian nature conservation agency |
| NORWECOM | NORWegian ECOlogical Model system |
| NPI | Norwegian Polar Institute |
| OCEAN-CERTAIN | EU-funded program; OCEAN-CERTAIN – “Ocean Food-web Patrol – Climate Effects: Reducing Targeted Uncertainties with an Interactive Network” |
| OSPAR | Oslo and Paris Commission for the protection and conservation of the North-East Atlantic and its Resources |
| PI | Performance Indicator |
| PISG | Performance Indicator Scoring Guidepost |
| SAM | State-space assessment model |
| SG | Scoring Guidepost |
| SMH | Sensitive marine habitat |
| TAC | Total Allowable Catch |

| | |
|---|---|
| UNEP | United Nations Environmental Programme |
| VME | Vulnerable marine ecosystem |
| VMH | Vulnerable marine habitat |
| VMS | Vessel monitoring system |
| VPA | Virtual population analysis |
| WGBYA | (ICES) Working Group on Bycatch of Protected Species |
| WGDEC | (ICES) Working Group on Deep-water Ecology |
| WGDEEP | (ICES) Working Group on the Biology and Assessment of Deep-sea Fisheries Resources |
| WGECO | Working Group on Ecosystem Effects of Fishing Activities |
| WGMME | (ICES) Working Group on Marine Mammal Ecology |
| WGSAM | Working Group on Multispecies Assessment Methods |
| WGSE | (ICES) Working Group on Seabird Ecology |
| XSA | Extended survivors' analysis |

## 2.2 Stock assessment reference points

| | |
|---|---|
| $B_0$ | The (spawning) biomass expected if there had been no fishing (assuming recruitment as estimated through stock assessment). |
| $B_{lim}$ | Spawning biomass limit reference point, sometimes used as a trigger within harvest control rules, or defined as the point below which recruitment is expected to be impaired or the stock dynamics are unknown |
| $B_{msy}$ | Spawning Biomass at which the maximum sustainable yield is expected (sometimes expressed as $SB_{msy}$) |
| $B_{targ}$ | Spawning biomass target reference point |
| $F_{lim}$ | Exploitation rate limit reference point, often taken as Fmsy based on UNFSA |
| $F_{msy}$ | Fishing mortality rate associated with the achieving maximum sustainable yield |
| $F_{targ}$ | Fishing mortality target reference point |
| MSY | Maximum Sustainable Yield |
| MSY $B_{trigger}$ | Trigger point (SSB) for stock, If SSB is below management action to reduce target fishing mortality is required |

# 3 Executive summary

*Draft determination to be completed at Public Comment Draft Report stage*

This report provides information on the initial assessment of the Norway beaked redfish fishery against Marine Stewardship Council (MSC) Fisheries Standard. The report is prepared by DNV for the client Norges Fiskarlag.

The assessment was carried out using MSC Fisheries Certification Process v2.2. For the assessment, the default assessment tree in Annex SA from the MSC Fisheries standard v2.01, without any changes, was used.

The assessment covers one UoA targeting beaked redfish with demersal and semipelagic traw, both covered under a single UoA. The beaked redfish is indigenous to the Norwegian and Barents Sea and no enhancement takes place.

The ACDR report is based on desk review of information.

*The assessment process was initiated by the announcement on the MSC web-side on the xx.xx.xxxx and the site visit was conducted on the xx.xx.xxxx in (city, country).*

*A comprehensive programme of stakeholder consultations was carried out in xx as part of this assessment, complemented by a full and thorough review of relevant literature and data sources.*

*A rigorous assessment of the MSC Principles and Criteria was undertaken by the assessment team and detailed and fully referenced scoring rationales are provided through the assessment tree scoring tables provided in chapter* ***Error! Reference source not found.****-of this report.*

The Eligibility Date for this assessment is the date of the publication of the PCDR.

## 3.1 Main strengths

**Table 1 Main strengths**

| Principle | Performance Indicator | Comment |
|---|---|---|
| Principle 1 | 1.1.1 – 1.2.3 – 1.2.4 | The beaked redfish stock status is in a relatively good shape. It has been above Bpa for many years. The data collection process is well established both in Russia and in Norway. ICES provides a robust assessment process for the stock. |
| Principle 2 | 2.1.3, 2.4.3, and 2.5.3 | There are many research institutions working in the area and much information regarding commercial stocks, benthic habitats and ecosystems involved. |
| Principle 3 | 3.1.1, 3.1.2, 3.2.2 and 3.2.3 | The fishery operates within a well-established and effective legislative and management framework, with extensive consultation mechanisms and a comprehensive enforcement system. |

## 3.2 Main weaknesses

**Table 2 Main weaknesses**

| Principle | Performance Indicator | Comment |
|---|---|---|
| Principle 1 | 1.2.1 – 1.2.2 | The harvest strategy and harvest control rules are agreed only between Norway and Russia |
| Principle 2 | 2.1.1<br>2.4.2 | If catches of golden redfish increase above 2% of total catch the fishery would face an IPI issue.<br>The demersal trawling fleet should take into consideration voluntary management measures afforded by other fisheries to the protection of VMEs. |
| Principle 3 | NA | No particular weaknesses have been identified at ACDR stage. |

## 3.3 Draft Determination

The draft principle scores are summarised in Table 7.

*The Norway beaked redfish fishery achieved a score of 80 or more for each of the three MSC Principles and did not score under 60 for any of the set MSC criteria.*
*The Norway beaked redfish fishery achieved a score of below 80 against x scoring indicators and was set x conditions and x recommendations for (continuing) certification that the client is required to address.*

*Based on the review, analysis and evaluation of available data for the fishery presented in this report the assessment team did not identify any issues that prevent the assessment/ reassessment scope extension of the xxx fishery and the assessment team recommends the certification/re- certification /scope extension of the fishery.*

# 4 Report details

## 4.1 Authorship and peer review details

*Peer reviewer information to be completed at Public Comment Draft Report stage*

**Table 3 Assessment team**

| | |
|---|---|
| **Name** | **Lucia Revenga** |
| **Role** | Team leader |
| **Qualifications:**<br>Lucia Revenga is a marine scientist, specialized in Fisheries Biology who holds degrees in Marine Sciences and in Environmental Sciences from Cadiz University (Spain). For 5 years she worked with TRAGSA for the Spanish General Marine Secretariat, conducting research on the biology and stock status of different species, such as bluefin tunas, skipjack tunas, albacores, mackerels, sardines, eels, prawns, Norway lobsters, halibuts. She has also taken part in oceanographic surveys focused on the search of vulnerable marine ecosystems. From 2011 to 2015 she worked for IFAPA (Institute for Research and Training in Fisheries) as a Fisheries biology teacher for fishermen. She also conducted research in fishery local activities with the aim of increasing community awareness of the conservation of coastal ecosystems and encouraging sustainable fishing practices. From 2015 to 2020 she worked full time as an independent consultant, covering the roles of P2 assessor and team leader for different CABs and assessments. In 2020 she joined DNV as part of DNV MSC Fishery Global Unit. She has participated in several assessments for fisheries in the Barents Sea. Her full CV is available upon request.<br><br>Her qualifications meet the competence criteria defined in Annex PC for the Team-member with expertise in the impact of fisheries on aquatic ecosystems and RBF, management systems and country knowledge:<br>• She has an appropriate university degree<br>• She has passed the MSC team member training<br>• She has passed the RBF training module<br>• She has over 3 years' experience in research in the impact of fisheries on aquatic ecosystems<br>• He has over 3 years' experience as a practising fishery manager and/or fishery/policy analyst<br>• She has no conflicts of interest in relation to the fishery under assessment.<br>Lucia's qualifications also meet the competence criteria defined in Annex PC for the Team-Leader and Chain of custody responsible:<br>• She has an appropriate university degree<br>• She has passed the MSC team leader training<br>• She has passed the MSC Traceability training module<br>• She has passed the MSC RBF training module<br>• She meets ISO 19011 training requirements<br>• She has undertaken two fishery assessments as a team member in the last five years, and<br>• She has experience in applying different types of interviewing and facilitation techniques and is able to effectively communicate with clients and various stakeholder groups.<br>• She has no conflicts of interest in relation to the fishery under assessment. | |
| **Name** | **Giuseppe Scarcella** |

| Role | Principle 1 expert |
|---|---|

**Qualifications:**

Giuseppe Scarcella is an experienced fishery scientist and population analyst and modeller, with wide knowledge and experience in the assessment of demersal stocks. He holds a first degree in Marine Biology and Oceanography (110/110) from the Unversità Politecnica delle Marche, and a Ph.D. in marine Ecology and Biology from the same university, based on a thesis "Age and growth of two rockfish in the Adriatic Sea". After his degree, he was offered a job as project scientist in several research programs about the structure and composition of fish assemblage in artificial reefs, off-shore platform and other artificial habitats in the Italian National Research Council – Institute of Marine Science of Ancona (CNR-ISMAR), now Institute for Biological Resources and Marine Biotechnologies (IRBIM). During the years of employment at CNR-ISMAR first and CNR-IRBIM later he has gained experience in benthic ecology, statistical analyses of fish assemblage evolution in artificial habitats, fisheries ecology and impacts of fishing activities, stock assessment, otholith analysis, population dynamic and fisheries management. Since 2018 Dr. Scarcella is in the permanent staff od CNR-IRBIM as researcher. During the same years, he attended courses of uni-multivariate statistics and stock assessment. He is also actively participating in the scientific advice process of FAO GFCM in the Mediterranean Sea as well as in the Euroepean context. He was member of the Scientific, Technical and Economic Committee for Fisheries for the European Commission (STECF) from 2012 to 2019 and is chair of the STECF-EWG Assessment of balance indicators for key fleet segments and review of national reports on Member States efforts to achieve balance between fleet capacity and fishing opportunities.

He is author of more than 50 scientific paper peer reviewed journals and more than 150 national, and international technical reports, most of them focused on the evolution of fish assemblages in artificial habitats, stock assessment of demersal species and evaluation of fisheries management plans. For some years now, Dr Scarcella has been working in fisheries certification applying the Marine Stewardship Council standard for sustainable fisheries, currently concentrating on Principle 1 of the Standard. Furthermore, Dr Scarcella holds the credential as Fishery team leader (MSC v2.0). Giuseppe Scarcella has passed the most updated MSC training and has no Conflict of Interest in relation to this fishery. Full CV available upon request.

His qualifications meet the competence criteria defined in Annex PC for the Team-member with expertise in Fish stock assessment and biology:

- he has an appropriate university degree
- he has passed the MSC team member training
- he has passed the RBF training module
- he has over 3 years' experience in stock assessment techniques comparable with techniques used by the fishery under assessment
- he has over 3 years' experience in the biology and population dynamics of the species with similar biology.
- he has over 3 years' experience as a practising fishery manager and/or fishery/policy analyst

| Name | **Lucia Revenga** |
|---|---|
| **Role** | Principle 2 expert |

**Qualifications:** See above.

| Name | **Geir Honneland** |
|---|---|
| **Role** | Principle 3 expert |

**Qualifications:**

Geir Honneland holds a PhD in political science from the University of Oslo and an LL.M. in the law of the sea from the Arctic University of Norway. He has studied international fisheries management (with main emphasis on enforcement and compliance issues), international environmental politics and international relations in Polar regions for more than 25 years. He has been affiliated with the Fridtjof Nansen Institute in Oslo as PhD student and research fellow (1996-2006), research director (2006-2014), director (2015-2019) and now adjunct professor. Among his fisheries-related books is Making Fishery Agreements Work (Edward Elgar, 2012; China Ocean Press, 2016). Before embarking on an academic career, he worked five years for the Norwegian Coast Guard, where he was trained and certified as a fisheries inspector. Geir has been involved in MSC assessments since 2009 and has acted as P3 expert in more than 50 full assessments and re-assessments, as well as a number of pre-assessments and surveillance audits. His experience from full assessments includes a large number of demersal, pelagic and reduction fisheries in the Northeast Atlantic, the North Pacific and Southern Ocean, including crustaceans, as well as inland, bivalve and enhanced salmon fisheries. In the Northeast Atlantic, he has covered the international management regimes in the Barents Sea, Norwegian Sea, North Sea, Skagerrak, Kattegat and the Baltic Sea, and the national management

regimes in Norway, Sweden, Denmark, Iceland, Faroe Islands, Greenland, Finland, Russia, Poland, the UK, the Netherlands and Germany, as well as the EU level.

His qualifications meet the competence criteria defined in Annex PC for the Team-member with expertise in management systems and country knowledge:

- he has an appropriate university degree
- he has passed the MSC team member training
- he has over 3 years' experience as a practising fishery manager and/or fishery/policy analyst
- he has no conflicts of interest in relation to the fishery under assessment.
- he has local knowledge of the country, language and local fishery context.

His full CV is available upon request.

### 4.1.2 Peer Reviewers

*Peer reviewer information to be completed at Public Comment Draft Report stage*

*Peer reviewers used for this report are:*

*The Peer reviewers were shortlisted by the MSC Peer Review college and listed on the MSC website. A summary CV for each is available in the Assessment downloads section of the fishery's entry on the MSC website*.

## 4.2 Version details

**Table 4 Fisheries program documents versions**

| Document | Version number |
|---|---|
| MSC Fisheries Certification Process | **Version 2.2** |
| MSC Fisheries Standard | **Version 2.01** |
| MSC General Certification Requirements | **Version 2.4.1** |
| Assessment tree MSC Fisheries Standard v 2.01- Annex SA | **Version 2.01** |
| MSC Reporting Template | **Version 1.2** |

# 5 Unit(s) of Assessment and Unit(s) of Certification and results overview

## 5.1 Unit(s) of Assessment and Unit(s) of Certification

### 5.1.1 Unit(s) of Assessment

The fishery is, to the knowledge of the assessment team, within the scope of the MSC Fisheries standard according to the following determinations:

- The target species is not an amphibian, reptile, bird or mammal.
- The fishery does not use poisons or explosives.
- The fishery is not conducted under a controversial unilateral exemption to an international agreement.
- The client or client group does not include an entity that has been successfully prosecuted for a forced or child labour violation in the last 2 years.
- The client or client group does not include an entity that has been convicted for a shark finning violation in the last 2 years.
- The fishery has mechanisms for resolving disputes and disputes do not overwhelm the fishery.
- The fishery is not enhanced or based on an introduced species.

The Unit of Assessment defines the full scope of what is being assessed and includes the Unit of Certification and any other eligible fishers.

The Unit of Assessment includes the target stock (s), the fishing method or gear type/s, vessel type/s and/or practices, and the fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including any other eligible fishers that are outside the Unit of Certification.

The Unit of Assessment for this fishery assessment is specified in below.

**Table 5 Unit of assessment (UoA)**

| UoA 1 | Description |
|---|---|
| Species | Beaked Redfish (*Sebastes mentella*) |
| Stock | Beaked redfish (*Sebastes mentella*) in subareas 1 and 2 (Northeast Arctic) |
| Fishing gear type(s) and, if relevant, vessel type(s) | Trawl (demersal and semipelagic) |
| Client group | Norges Fiskarlag (NFA) |
| Other eligible fishers | Yes. Russian and 3rd country operators are eligible fishers. |
| Geographical area | **FAO area:** 27. ICES I and II.<br>**Common name of the body of water:** Barents Sea and Norwegian Sea<br>**Local fisheries management area:** Norway Ministry of Industries, Fisheries and Innovation. Subject to the joint Norwegian/Russian Fisheries commission.<br>**Stock region:** Beaked redfish (*Sebastes mentella*) in subareas 1 and 2 (Northeast Arctic). |
| Management | Subject to the joint Norwegian/Russian Fisheries commission. Managed nationally by the Norwegian Ministry of Industries, Fisheries and Innovation and in accordance with the Directorate of Fisheries, with advice from IMR and ICES. |

### 5.1.2 Unit(s) of Certification

The Unit of certification is the unit entitled to receive the MSC certificate.
The proposed Unit of Certification includes the target stock (s), the fishing gear type(s) and, if relevant, vessel type(s) and the fishing fleets or groups of vessels or individual fishing operators pursuing that stock including entities initially intended to be covered by the certificate.

The proposed Unit of Certification is provided in the Table below.

**Table 6 Unit of certification (UoC)**

| UoC 1 | Description |
|---|---|
| Species | Beaked redfish (*Sebastes mentella*) |
| Stock | Beaked redfish (*Sebastes mentella*) in subareas 1 and 2 (Northeast Arctic) |
| Fishing gear type(s) and, if relevant, vessel type(s) | Trawl (demersal and semipelagic) |
| Client group | Norges Fiskarkag |
| Geographical area | **FAO area:** 27. ICES I and II.<br>**Common name of the body of water:** Barents Sea and Norwegian Sea<br>**Local fisheries management area:** Norway Ministry of Industries, Fisheries and Innovation. Subject to the joint Norwegian/Russian Fisheries commission.<br>**Stock region:** Beaked redfish (*Sebastes mentella*) in subareas 1 and 2 (Northeast Arctic). |
| Management | Subject to the joint Norwegian/Russian Fisheries commission. Managed nationally by the Norwegian Ministry of Industries, Fisheries and Innovation and in accordance with the Directorate of Fisheries, with advice from IMR and ICES. |

## 5.2 Assessment results overview

### 5.2.1 Determination, formal conclusion and agreement

*To be drafted at Public Comment Draft Report stage*

The CAB shall include in the report a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The CAB shall include in the report a formal statement as to the certification action taken by the CAB's official decision-maker in response to the determination recommendation.

Reference(s): FCP v2.2, 7.20.3.h and Section 7.21

*The Norway beaked redfish fishery achieved a score of 80 or more for each of the three MSC Principles and did not score under 60 for any of the set MSC criteria.*
*The fishery has x conditions against xx scoring indicators and x recommendations.*
*Based on the evaluation of the fishery presented in this report the assessment team recommends the certification of the xxxx fishery for the client xxx.*

### 5.2.2 Principle level scores

*To be drafted at Client and Peer Review Draft Report stage*

**Table 7 Principle level scores**

| Principle | UoA 1 |
|---|---|
| Principle 1 – Target species | ≥ 80 |
| Principle 2 – Ecosystem impacts | ≥ 80 |
| Principle 3 – Management system | ≥ 80 |

### 5.2.3 Summary of conditions

*To be drafted at Client and Peer Review Draft Report stage*

The CAB shall include in the report a table summarising conditions raised in this assessment. Details of the conditions shall be provided in the appendices. If no conditions are required, the CAB shall include in the report a statement confirming this.

Reference(s): FCP v2.2 Section 7.18

**Table 8 Summary of conditions**

| Condition number | Condition | Performance Indicator (PI) | Deadline | Exceptional circumstances? | Carried over from previous certificate? | Related to previous condition? |
|---|---|---|---|---|---|---|
| | | | | **Yes / No** | **Yes / No / NA** | **Yes / No / NA** |
| | | | | **Yes / No** | **Yes / No / NA** | **Yes / No / NA** |
| | | | | **Yes / No** | **Yes / No / NA** | **Yes / No / NA** |

### 5.2.4 Recommendations

*To be drafted at Client and Peer Review Draft Report stage*

If the CAB or assessment team wishes to include any recommendations to the client or notes for future assessments, these may be included in this section.

**Table 9 Summary of Recommendations**

| Recommendation number | Recommendation | Performance indicator |
|---|---|---|

# 6 Traceability and eligibility

## 6.1 Eligibility date

Products from the certified fishery will be eligible to be sold as MSC certified or bear the MSC ecolabel from the eligibility date, set as the date of publication of the Public Comment Draft Report.

The traceability and segregation systems in the fishery shall be implemented by the eligibility date.

## 6.2 Traceability within the fishery

The systems of tracking and tracing within the fishery should ensure that there are no substitution risks that can be caused by vessels using non-certified gears, fishing outside the UoA/UoC, other non-certified fisheries fishing the same stock or any other risk of substitution that may occur between point of harvest and point of sale, such as transhipment, sale via auctions, etc.

There is a sufficiently effective system of tracking, tracing and segregation in the beaked redfish fishery so as to ensure that all beaked redfish products originating from the certified fishery and sold as certified could be identified prior to or at the point of landing.

### 6.2.1 Management of fishery activities: monitoring, control and surveillance:

Licenses are issued by the Directorate of Fisheries and specify details of the vessels, permissions, etc. Norwegian vessels are required to report to the Directorate of Fisheries (DOF) with ERS in accordance with Regulations on position reporting and electronic reporting for Norwegian fishing vessels.
Monitoring, control and surveillance is a shared responsibility with close collaboration between the Directorate of Fisheries, the Coast Guard and the regional sales organizations. Coast Guard inspectors board fishing vessels and control the catch (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds.
Real time VMS monitoring of catch area is mandatory. All vessels are monitored by the Directorate of Fisheries through VMS data and every catch is identified by catch area thereby validating certified status of catch. DoF has access to real-time catch data through the electronic logbooks.

The Directorate of Fisheries also keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet. In accordance with the regulation implemented in 2015, catches are recorded using an “app” on smartphones, which also provide fishing location in a similar way to VMS on the larger vessels.

All Norwegian vessels in this fishery are therefore obliged to carry VMS on board the vessels and to log in the electronic logbook when the fishing operation begins. The Directorate of Fisheries monitors this data and can distinguish, real time, not only where the vessels are but also if the vessels are fishing or not as well as catch details, including catch locations. Norges Fiskarlag can request anonymized tracking data from the Directorate of Fisheries, if required. All vessels are also required to complete pre-filled delivery notes and set correct quantity and size distribution in accordance with requirements from Directorate of Fisheries.

### 6.2.2 Fishery activities

All methods of harvesting, in this fishery, are covered in this assessment and therefore using gears that are not part of the UoC does not occur.
Vessels included in the UoC rarely fish outside the UoC geographic area on the same trip. Even if it does occur the frequency is negligible. They may, in other parts of the year or according to their own priorities, participate in other fisheries outside the UoC geographical area.

Vessels report start of catch with catch estimates via ERS to DoF while at sea. The sales organizations have the authority (specified in the Regulations) to stop/divert fishing operations already at this stage, if not found complaint to

Regulations. The risk of mixing between certified and non-certified catch during storage on board the vessels is very low.

### 6.2.3 Risk of fishing outside the unit of certification

There is no risk of vessels fishing outside the unit of certification. This risk is negligible.

In such instance this would be vessels fishing both inside and outside of 12 nm. A system for separating catches inside or outside 12 nm is already well-established in the Norwegian reporting system. All catches are marked on landing notes and sales notes according to whether they are caught in the “ocean” (outside 12 nm) or “coast” (inside 12 nm). This allows for segregation in subsequent supply chains.

All vessels are monitored by the Directorate of Fisheries through VMS data. The client has access to tracking data on request, and organizational and peer pressure in addition to official control contributes to minimizing the possibility of fishing outside the unit of certification. Catch details including catch locations are logged real time.

### *6.2.4 Risk of substitution*

The good traceability systems implemented minimise any risk of substitution.

### 6.2.5 At-sea processing

At sea processing on-board the Norwegian vessels, from this fishery, and included in the scope of certification is mainly the production of whole chilled fresh fish, headed and gutted frozen fish, salted and dried fish, frozen blocks, frozen fillets and by-products (bellyflaps, heads, tongues, cheeks, roe, liver and trimmings). All of the on-board processing results in products which are clearly identified with batch numbers, identifying the vessel, area of catch and the species. Thus, the risk of mixing between certified and non-certified product during processing and storage on board is nearly negligible.

Beaked redfish from this fishery is also landed as unprocessed catch. All catches are subject to controls at landing.

The risk of mixing between certified and non-certified product during storage is nearly negligible as the products are well labelled.

If production of fish-oil and fishmeal on- board the vessels takes place, this would be from unspecified fish and would require separate CoC certification.

### 6.2.6 Transport

Most vessels handle other non-certified species during transport, storage, processing, landing and sale. The risk of mixing between certified and non-certified product during transport and handling activities is low as the other species are identifiable and the products are appropriately labelled.

### 6.2.7 Transhipment

There is no transhipment at sea activities involved in the Norway beaked redfish fishery.

### 6.2.8 Sale

All sales of Norway beaked redfish, for catches by vessels in the Norwegian fleet and covered by this certification, is done through the sales organizations. Direct sales from vessel to buyer is also done through the sales organization, as they get a permit and all the paperwork goes through the sales organizations. Fish is sold either through auctions organized by the sales organizations or directly from the vessel to the buyer. In both cases the same requirements for reporting apply.

The sales organizations are required to record all landings of fish in Norway. All relevant information on catch is provided to the sales organizations on a pre-delivery note. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. Physical controls of landings are carried out both by inspectors from the sales organizations and DoF.

Catch certificate is mandatory for export to EU. Norges Sildesalgslag has the responsibility for the catch certificate for all Norwegian fisheries through a separate company (Catch Certificate SA, https://www.catchcertificate.no/). The catch certificate accompanies the delivery note from the vessel. Buyers can access and extract catch certificates electronically.

MSC fishery certificate number is provided on invoices which are issued by the sales organizations. The fish changes ownership from vessel or freezer storage to processing plant or traders.

Sales organizations are responsible for invoicing and settlement to fishermen based on electronically signed delivery notes which are made available to the sales organizations after landing. Purchaser name is included in these delivery notes.

The sales organizations perform all transactions which are logged and publicly available but the sales organizations do not take ownership of the product or handle the products. They act solely as an intermediary between the vessel owners and the buyers. The client, Norges Fiskarlag (The Norwegian Fishermen's Association) was founded on 1926 and is based on memberships in local and regional fishermen's associations. The association has a total of 110 local chapters and two semi-independent group organizations with approximately 4300 members from across the country. It has 7 regional associations and 2 group organizations all of which are part of the client group. The sales organizations are owned by fishermen and boat-owners (although details of the mechanisms that form the electoral basis may vary). The sales organizations are, therefore, all a part of the “MSC client group project” and are together with NFA (and the Norwegian Seafood Council) bound by contract to perform the certifications and provide financing for direct and indirect *costs.*

The sales organizations are :

- Norges Råfisklag
- Surofi
- Vest-Norges Fiskesalslag
- Fiskehav (Rogaland Fiskesalgslag & Skagerakfisk have merged into a single organization)

### 6.2.9 Points of landing

Landing sites are mainly in Norway, with inspections by DoF and sales organization as described above.

Landing sites are the buyers/processing sites. Freezer storage facilities, that do not take ownership of the products, are common for frozen products. There is no tampering of the product in these facilities.

Landing vessels are identified for being covered by MSC certification at landing. Sampling is done at the landing ports once the fish is landed. All catches are subject to controls at landing. Vessels must complete the pre-filled delivery note and set correct quantity and size distribution in accordance with requirements from DoF.

The labels that identify the products with batch numbers, vessel Identification, catch area and species follow during storage on land before sale. The risk of mixing between certified and non-certified product during handling activities is therefore low.

After landing, the sales notes are issued immediately for fresh landings. For frozen landings a landing note is issued immediately as a temporary document and sales notes are issued later as and when the fish is sold.

For fresh landings, change of ownership takes place when the fish change ownership from vessel to processing plant, regardless of the fish being sold by the sales organizations or directly by the vessel.

For landings of frozen products to freezer storage, change of ownership takes place when a purchase at some point has been confirmed and sales notes have been issued. Up until this point, the fish remains the property of the fisher. Freezer storage facilities, as landing sites for frozen products, do not tamper with the product- they are only box in- box out facilities.

The main buyers/processing sites are producers and traders in Norway.

In rare cases product may also be landed outside of Norway, e.g. in Denmark, Scotland and Shetland. In these cases, landing information is transmitted to Norwegian Authorities who cooperate with national control bodies at points of landing to ensure correct information. Norway is contracting party to the NEAFC Port-State Control regime, which require that port state authorities ascertain with the relevant flag state that catches intended to be landed are within the total quota of the vessel in question. Each Contracting Party shall carry out inspections of at least 15% of landings or transhipments in its ports during each reporting year.

### 6.2.10 Reporting

Norwegian vessels are required to have electronic logbooks, where real-time catch data are forwarded to the Directorate of Fisheries. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of different vessels, vessel groups or other states at any given time, based on reports from the fishing fleet.

For all landings, catches are delivered to landing sites accompanied by a “sluttseddel” (sales note) and landing note which specify catch area, recorded by the fishers and verified by the landing sites. MSC certified status is documented on the “sluttseddel” based on the species and catch area. This sales note is the basis for sales invoicing.
The self-reported catch data can be checked at sales operations through the sales organizations, which have monopoly on first-hand sale of fish in Norway, and through physical checks performed by the sales organizations, the Directorate of Fisheries and the Coast Guard.
The sales organizations are required to record all landings of fish in Norway. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook.
Physical controls of landings are carried out both by inspectors from the sales organizations and the Directorate of Fisheries.

Should landings outside Norway (although this situation is rare and negligible), the following steps are also documented:

i. Prior notification for Norwegian fishing vessels referred to in Commission Regulation No 1010/2009 Article 2 (2)- refers to catch certificate number.
ii. Pre-landing declaration for Norwegian fishing vessels referred to in Commission Regulation No 1010/2009 Article 3(1)- refers to catch certificate number & catch area (NO-4242)
iii. Landing note: This document provides detailed information about catch taken and reported by a specific Norwegian fishing vessel and refers to a catch certificate number.
iv. Landings of beaked redfish outside Norway are regularly reported to DoF in accordance with the control agreements with the countries in question, landings are also reported directly to the sales organization
v. The sales organisations also assist direct landings outside Norway with NEAFC reporting. Both Norwegian and foreign control authorities are involved at these landings.

**Table 10 Identification and traceability links in documents from fishery activities**

| | | Label | Landing document | Sales document |
|---|---|---|---|---|
| 1 | Species | Yes | Yes | Yes |
| 2 | Catch date | Yes | Yes | Yes |
| 3 | Vessel name | Yes | Yes | Yes |
| 4 | Catch area | Yes | Yes | Yes |
| 5 | Production approval number | Yes | Yes | **No** |
| 6 | Gear | Yes | Yes | Yes |
| 7 | Product | Yes | Yes | Yes |
| 8 | Certified status | **No** | Yes | Yes |

**Table 11Traceability within the fishery**

| Factor | Description |
|---|---|
| Will the fishery use gears that are not part of the Unit of Certification (UoC)?<br>If Yes, please describe:<br>If this may occur on the same trip, on the same vessels, or during the same season;<br>How any risks are mitigated. | There is no gear mixing for the vessels /trips in the fishery under assessment.<br>The certificate covers the entire Norwegian fleet fishing for beaked redfish within the UoC |
| Will vessels in the UoC also fish outside the UoC geographic area?<br>If Yes, please describe:<br>If this may occur on the same trip;<br>How any risks are mitigated. | All Norwegian vessels in this fishery are obliged to carry VMS on board and to log in the electronic logbook when the fishing operation begins. This data is monitored by the Directorate of Fisheries, who can distinguish, real time, not only where the vessels are but also if the vessels are fishing or not. |
| Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.<br>Transport | Most members handle other non-certified species during all of these activities. All fishing vessels are required to keep logbooks for the recording of fishing by species, gear and area. Sampling is done at the landing ports once the fish is landed. Landing ports of the fisheries are mainly in Norway but can also be sold in Denmark, Scotland and Shetland. |

| | |
|---|---|
| Storage<br>Processing<br>Landing<br>Auction<br><br>If Yes, please describe how any risks are mitigated. | There are good co-operation systems between Norway and these countries and information on compliance and enforcement is shared among the different enforcement administrations. Robustness of these enforcement systems is expected to be high. All products on-board are clearly identified with batch numbers, identifying the vessel, area of catch and the species. These labels follow also during storage on land before sale. The risk of mixing between certified and non-certified catch during storage, transport and handling activities is low. |
| Does transhipment occur within the fishery?<br><br>If Yes, please describe:<br>If transhipment takes place at-sea, in port, or both;<br>If the transhipment vessel may handle product from outside the UoC;<br>How any risks are mitigated. | Transhipment does not take place in this fishery. This is monitored by the Directorate of Fisheries through the VMS. |
| Are there any other risks of mixing or substitution between certified and non-certified fish?<br><br>If Yes, please describe how any risks are mitigated. | None identified. |

## 6.3 Eligibility to enter further chains of custody

*To be drafted at Client and Peer Review Draft Report stage*

The scope of the MSC Fishery certification is up to the point of landing and Chain of Custody commences from the point of landing and sale.

Norway beaked redfish fishery and its products landed by Norwegian vessels, involved in this fishery, recorded by the Directorate of Fisheries and the sales organizations, and sold through or by approval from the sales organizations are eligible to enter further Chain of Custody. The list of vessels will be described in an appendix at PCR stage.

Products produced on-board the vessels and included in the scope of certification include whole chilled fresh fish, headed and gutted frozen fish, salted and dried fish, frozen blocks, frozen fillets and by-products (bellyflaps, heads, tongues, cheeks, roe, liver and trimmings).

Should production of fish-oil and fishmeal occur on board the vessels, this would require separate CoC certification.

The main market are producers and traders in Norway.

The sales organizations are:

- Norges Råfisklag
- Surofi
- Vest-Norges Fiskesalslag
- Fiskehav (Rogaland Fiskesalgslag & Skagerakfisk have merged into a single organization).

**Table 12 Eligibility to enter further chains of custody**

| | |
|---|---|
| **Conclusion and determination** | Norway beaked redfish products, fished in the certified UoC, will be eligible to enter further certified chains of custody and be sold as MSC certified or carry the MSC ecolabel. |
| **List of parties, or category of parties, eligible to use the fishery certificate and sell product as MSC certified** | The entire Norwegian fleet targeting beaked redfish in the defined geographical areas (this is, semi-pelagic trawling vessels) has been included in the unit of Certification and are eligible to use the fishery certificate and sell the product as MSC certified |

| | |
|---|---|
| **Point of intended change of ownership of product** | Point of change of ownership of product is when fish are landed from vessel to processing plant (landing site). |
| **List of eligible landing points (if relevant)** | Landing sites are mainly in Norway, with inspections by DoF and sales organizations. Products may, though very infrequently, also be landed outside of Norway, e.g. in Denmark, Scotland and Shetland.<br>Landing sites are listed in Section 8.14. |
| **Point from which subsequent Chain of Custody is required** | To be eligible to carry the MSC logo, fish must enter into separate MSC Chain of custody certification commencing sale which is point of change of ownership at landing site (processing plants). |

## 6.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

The Norway beaked redfish fishery is taken in fisheries where all catches are identified and segregated by species while on board, and later on landed in separate containers per species.

**Table 13 Identification of cause for inseparability**

| Ref. | Clause/ Requirement | IPI- Y/N | Observation |
|---|---|---|---|
| FCP v2.2 7.5.9.1 | The CAB shall only recognise stock(s) as being an IPI stock, where the inseparability arises because either: | | |
| a | The non-target catch is practicably indistinguishable during normal fishing operations (i.e., the catch is from a stock of the same species or a closely related species) | Y | Beaked redfish **i**s targeted species. Golden redfish is practicably indistinguishable during normal fishing operations |
| | OR | | |
| b | When distinguishable, it is not commercially feasible to separate due to the practical operation of the fishery that would require significant modification to existing harvesting and processing methods. | Y | Segregation of golden redfish is not commercially feasible during normal fishing operations. |
| | AND | | |
| c | The total combined proportion of catches from the IPI stock(s) do not exceed 15% by weight of the total combined catches of target and IPI stock(s) for the UoA; | Y | The average proportion of golden redfish in the beaked redfish catch is 0,3% (therefore does not exceed 15%) |
| d | The stocks are not ETP species | Y | Golden redfish is not an ETP species |
| e | The stocks are not certified separately | Y | Golden redfish is not MSC certified. |

Golden redfish is present in the catch of beaked redfish. Golden redfish is practicably indistinguishable during normal fishing operations and segregation of golden redfish is not commercially feasible during normal fishing operations. According to landing records, on average, the proportion of golden redfish is 0.3% by weight of the total catch. Golden redfish meets the requirements described in FCP v2.2 7.5.9.

While FCP v2.2 7.5.10, states that CAB shall apply Annex PA where there are IPI stocks within the scope of the assessment and publish an announcement on MSC website to inform stakeholders of the existence of IPI stocks (as required by FCP v2.2 7.5.11), guidance on FCP v2.2 7.5.9 allows for an exemption to these requirements if the proportion of IPI catches to total targe +IPI catches is less than or equal to 2%.

Specifically, "*if the proportion of IPI catches to total target + IPI catches is less than or equal to 2%, the CAB must make an assessment that the UoA does not create a significant impact on the IPI stock but* ***is not required to apply Annex PA*** *and is not required to make a further determination of status under Principle 2. Even though this is the case, effectively the IPI stock is held to the same requirements as Principle 2, in that the fishery should not be creating a significant impact on the IPI stock*".

Given this, it is acknowledged the existence of golden redfish as an IPI stock but the application of Annex PA is not required.

The impact of the beaked redfish fishery on the golden redfish stock has been evaluated under PI 2.1.1.b.

## 6.5 Risk- based methods for data-deficient fishery

**Table 14 Risk based methods for data deficient fisheries**

| Performance Indicator | Criteria | Consideration | Notes |
|---|---|---|---|
| 1.1.1 Stock status | Stock status reference points are available, derived either from analytical stock assessment or using empirical approaches. | **Yes** | Use default Performance Indicator Scoring Guideposts within default assessment tree for this PI. |
| | | No | Use Annex PF (RBF) for this PI. |
| 2.1.1 Primary species outcome<br>and<br>2.2.1 Secondary species outcome | Biologically based limits are available, derived either from analytical stock assessment or using empirical approaches. | **Yes** | Use default Performance Indicator Scoring Guideposts within default assessment tree for this PI. |
| | | No | Use Annex PF (RBF) for this PI. |
| 2.3.1 ETP species outcome | Can the impact of the fishery in assessment on ETP species be analytically determined? | **Yes** | Use default Performance Indicator Scoring Guideposts within default assessment tree for this PI. |
| | | No | Use Annex PF (RBF) for this PI. |
| 2.4.1 Habitats outcome | In line with the MSC Fisheries Standard habitats guidance (GSA3.13.1.1), are both of the following applicable?<br>1. Information on habitats encountered is available.<br>2. Information on impact of fishery on habitats encountered is available. | **Yes** | Use default Performance Indicator Scoring Guideposts within default assessment tree for this PI. |
| | | No | Use Annex PF (RBF) for this PI. |
| 2.5.1 Ecosystem outcome | Is information available to support an analysis of the impact of the fishery on the ecosystem? | **Yes** | Use default Performance Indicator Scoring Guideposts within default assessment tree for this PI. |
| | | No | Use Annex PF (RBF) for this PI. |

The fishery is not considered to be data deficient against any main scoring element. Therefore, there is no need to trigger the use of RBF for the Norway beaked redfish fishery.

# 7 Scoring

## 7.1 Principle scores

### 7.1.1 Summary of Performance Indicator level scores

**Table 15 Summary of Performance Indicator level scores**

| Principle | Component | Weight | Performance Indicator (PI) | | Weight | UoA 1 |
|---|---|---|---|---|---|---|
| **1** | Outcome | 0.333 | 1.1.1 | Stock status | 0.500 | **≥80** |
| | | | 1.1.2 | Stock rebuilding | 0.500 | **N/A** |
| | Management | 0.667 | 1.2.1 | Harvest strategy | 0.250 | **≥80** |
| | | | 1.2.2 | Harvest control rules & tools | 0.250 | **≥80** |
| | | | 1.2.3 | Information & monitoring | 0.250 | **≥80** |
| | | | 1.2.4 | Assessment of stock status | 0.250 | **≥80** |
| **2** | Primary species | 0.200 | 2.1.1 | Outcome | 0.333 | **≥80** |
| | | | 2.1.2 | Management strategy | 0.333 | **≥80** |
| | | | 2.1.3 | Information/Monitoring | 0.333 | **≥80** |
| | Secondary species | 0.200 | 2.2.1 | Outcome | 0.333 | **≥80** |
| | | | 2.2.2 | Management strategy | 0.333 | **≥80** |
| | | | 2.2.3 | Information/Monitoring | 0.333 | **≥80** |
| | ETP species | 0.200 | 2.3.1 | Outcome | 0.333 | **≥80** |
| | | | 2.3.2 | Management strategy | 0.333 | **≥80** |
| | | | 2.3.3 | Information strategy | 0.333 | **≥80** |
| | Habitats | 0.200 | 2.4.1 | Outcome | 0.333 | **≥80** |
| | | | 2.4.2 | Management strategy | 0.333 | **60-79** |
| | | | 2.4.3 | Information | 0.333 | **≥80** |
| | Ecosystem | 0.200 | 2.5.1 | Outcome | 0.333 | **≥80** |
| | | | 2.5.2 | Management | 0.333 | **≥80** |
| | | | 2.5.3 | Information | 0.333 | **≥80** |
| **3** | Governance and policy | 0.500 | 3.1.1 | Legal &/or customary framework | 0.333 | **≥80** |
| | | | 3.1.2 | Consultation, roles & responsibilities | 0.333 | **≥80** |
| | | | 3.1.3 | Long term objectives | 0.333 | **≥80** |
| | Fishery specific management system | 0.500 | 3.2.1 | Fishery specific objectives | 0.250 | **≥80** |
| | | | 3.2.2 | Decision making processes | 0.250 | **≥80** |
| | | | 3.2.3 | Compliance & enforcement | 0.250 | **≥80** |
| | | | 3.2.4 | Monitoring & management performance evaluation | 0.250 | **≥80** |

## 7.2 Principle 1

### 7.2.1 Principle 1 background

**Biology of beaked redfish *Sebastes mentella***

Beaked redfish (*Sebastes mentella* Travin, 1951) is one of four redfish species of the genus *Sebastes* found in the North Atlantic. The other three species are golden redfish (*S. marinus*), Acadian redfish (*S. fasciatus*) and Norway redfish (*S. viviparus*). *Sebastes* spp. are ovoviviparous, i.e. eggs are fertilized, develop and hatch internally and larvae extruded soon after they hatch from eggs (Hureau and Litvinenko 1986; St Pierre and de la Fontaine 1995). They are long-lived, slow-growing, late-maturing, and have in general low natural mortality. The unique life-history characteristics influence complex population structure (Cadrin et al. 2010) and make populations highly vulnerable to fishing and slow to recover when depleted (Planque et al., 2013).

It is mainly found in the open waters of the Irminger Sea and on the continental slopes and shelves of Greenland, Iceland and the Faroe Islands in the Northwest Atlantic and in the Norwegian and Barents Seas in the Northeast Atlantic (Andriashev 1954; Templeman 1959; Hureau and Litvinenko 1986; Cadrin et al. 2010). All *Sebastes* species in the North Atlantic display various kind of pelagic and demersal behaviour during their life span.

The larvae ascend to the surface layers (0–60 m) as they are transported by sea currents from the larvae extrusion areas to the nursery grounds, where the juveniles settle. During the first autumn and winter the 0-group redfish descend to near bottom habitats, although the vast majority of these young and small redfish may live semi-pelagically. When they are 5–6 years old and more, they begin to gradually migrate against the current to locations along the continental slope (Magnússon and Magnússon 1995; Drevetnyak and Nedreaas 2009). In the Northeast Atlantic, mature *S. mentella* extend their feeding out in the Norwegian Sea and return back to a demersal or semipelagic habitat along the Norwegian continental slope where they extrude their larvae in March-April. The same is seen in the Irminger Sea where mature *S. mentella* live pelagically. Beaked redfish has supported an important fishery resource since the early 1950s, but in general the fishery landings have decreased in all areas. The main fishing grounds for beaked redfish in the Northwest Atlantic were traditionally on the continental shelves and slopes of East Greenland, Iceland, and the Faroe Islands (Figure 1).

The fishery has mainly been a bottom trawl fishery (ICES 2011b). The pelagic fishery for beaked redfish in the international waters of the Irminger Sea started in 1982 and in the early 1990s two distinct pelagic fisheries developed (Sigurðsson et al. 2006). In the northeast of the Irminger Sea, within and outside Icelandic EEZ, the fishery expanded to deeper waters (500–800 m) from spring to early summer, whereas shallower fishery (150–350 m) expanded to the southwest Irminger Sea in the later months of the summer and in the autumn. Annual landings of pelagic beaked redfish of the period 1982–1993 ranged between 30 000 t and 100 000 t. When the fishery expanded into deeper waters in the northeast Irminger Sea, annual landings rose to a record high of 180 000 t in 1996. Since then, catches have declined especially in the shallower waters of the southwest Irminger Sea where very little fishing is now conducted.

The main fishery is in the northeast Irminger Sea and annual landings since 2005 have ranged between 30 000 and 70 000 t. Traditionally, the main fishing grounds in the Northeast Arctic were north of Norway towards Spitsbergen. In the Northeast Atlantic the highest landings were 293 000 t in 1976 followed by a rapid decline to 80 000 t in 1980–1981 and in 1987 only 10 500 t were caught in the Barents Sea. At this time, the fishery expanded further south along the continental slope of Norway at approximately 500 m depth. After an increase to 49 000 t in 1991, the annual landings have remained around 10 000 t mainly as bycatch in other trawl fisheries. A directed pelagic fishery for deep-water redfish in the international waters of the Norwegian Sea has developed since 2004 (ICES 2012a). The annual landings quickly rose to 30 000 t but have since then declined rapidly and in 2011, approximately 8 400 t were landed from this area. Research surveys have been conducted on pelagic beaked redfish in the Irminger and Norwegian Sea basins since 1983 and 2007 respectively (ICES 2011c, 2009a). These surveys have been conducted by individual nations or in collaboration between two or more nations. The area coverage and methodology have, however, varied and often the area coverage was limited, especially in earlier years. The surveys are mainly hydroacoustic surveys, but since 1999 pelagic trawling has also been used. Over time both the horizontal and vertical coverage have increased as earlier surveys were not considered sufficient for stock assessment purposes (ICES 2011b). In both Northwest Atlantic and the Norwegian and Barents Seas, several other surveys are conducted and relevant for beaked redfish in these areas. Most of them are bottom trawl surveys conducted on the shelves and slopes. The results from the surveys are the basis for the ICES advice on pelagic redfish in the areas. Until 2012, no analytical assessment was conducted on these stocks and their status was assessed from biomass trends derived from survey indices. In 2012, ICES conducted a workshop to evaluate and eventually revise the data collection and assessment methodologies used for these stocks (ICES 2012b). In addition to stock assessment, the results from the surveys are necessary to map the vertical and horizontal distribution of beaked redfish, to collect biological data on other fauna, and to monitor the environmental conditions in the areas.

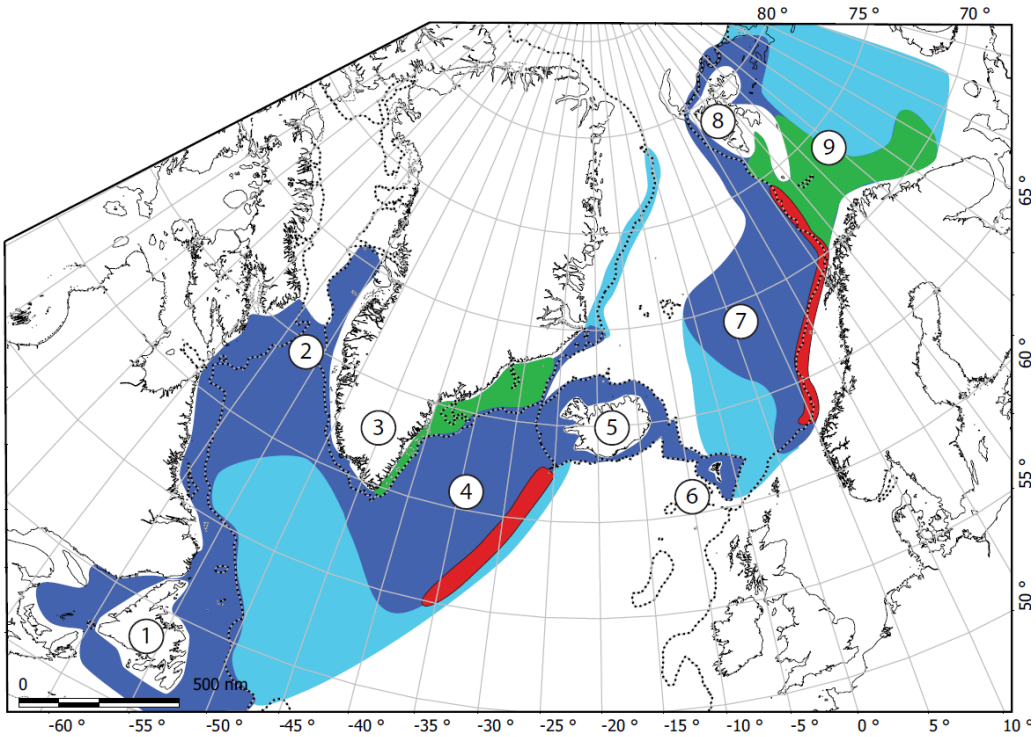



**Figure 1 - Geographic range of *Sebastes mentella*. The dark blue areas indicate the main centres of abundance. The light blue area shows the outer sector of distribution range. The red areas along the slope shows the regions of larvae release. The nursery areas of the Barents Sea and eastern Greenland are indicated in green. The dashed line indicates the 500 m depth contour. Numbers indicate geographical locations: 1: Newfoundland; 2: Davis Strait; 3: Greenland; 4: Irminger Sea; 5: Iceland; 6: Faroe Islands; 7: Norwegian Sea; 8: Svalbard; 9: Barents Sea. Adapted from Cadrin et al. (2010).**

Because *S. mentella* is found demersally and pelagically and since the depth distribution of redfish extends down to ~1000 m, the species is usually not well sampled by conventional demersal or pelagic fish assessment surveys, and rather requires dedicated sampling protocols. Most of the research survey abundance time series from the continental shelf are abundance indices estimated from bottom trawling sampling the layer of few meters above the sea floor. The use of hydroacoustic registrations allows to calculate the ratio between acoustic redfish values in the pelagic water column above 10 meters from bottom and the acoustic redfish values within the 10 m bottom layer. This ratio constitutes a proxy for the proportion of redfish population actually sampled by bottom trawling surveys. This approach was used by the North East Atlantic Fisheries Commission (NEAFC) working group collating information on the distribution of *S. mentella* in ICES sub-areas I and II (Anonymous 2009). The acoustic benthic/pelagic ratio was estimated based on nine surveys (more than 12 000 NM) in the Barents Sea and Svalbard (Spitsbergen Archipelago). In this region, the ratio estimates varied from 72% to 85% during all those surveys, with an average of 80%. A similar exercise, conducted on the Norwegian continental slope showed that about 90% of beaked redfish are located above the 10 m bottom layer.

Little is known about the mechanisms that trigger a pelagic or demersal behaviour, but it is related to size (age), search for food and mating/larvae extrusion. Among the *Sebastes* species, *S. mentella* is probably the species that change between demersal and pelagic habitats most frequently and to the greatest extent.

The age determination of *S. mentella* is generally difficult, time-consuming and highly variable (e.g., ICES 2009c). For some stocks, indirect validation by following peaks in the length distributions has been attempted (e.g., Saborido-Rey et al. 2004). Only few studies, however, have been conducted for direct validation (radiometric otolith analyses by Campana et al. 1990; Stransky et al. 2005), but these remain baseline studies due to their high methodological effort. For *S. mentella* in the Irminger Sea, longevity of at least 40 years has been confirmed. A promising validation technique that can (and should) be combined with tagging is oxytetracycline (OTC) marking of juveniles in order to follow growth increments in the otoliths from the time of marker injection (e.g. Greenland halibut: Treble et al. 2008).

As for many fish populations, the processes driving the year-to-year fluctuations in the recruitment of redfish are still poorly known. Based mainly on ichthyoplankton surveys and the observation of gravid females, two main areas of larval extrusion have been identified (Magnússon and Magnússon 1995; Rikhter 1996; Melnikov et al. 2001): close to the Reykjanes Ridge in the Irminger Sea and along the continental shelf break off Norway (from 62° N to 74° N, Figure 1). The released larvae drift to their nursery grounds on the shelf of eastern and western Greenland and into the Barents Sea and the adjacent continental slope, respectively. Genetic analyses of redfish samples from the East Greenland shelf are currently undertaken to investigate the stock structure of *S. mentella* in this important nursery area. If technically

feasible, tagging juvenile redfish on their nursery grounds would give valuable insight into the migration pattern of the juveniles, when recruiting to the adult stock(s). Another possible method for investigating the pattern and quantity of this recruitment is by following peaks in prominent length classes over the years, observed on the shelf in standard surveys like the annual German groundfish survey off West and East Greenland (Stransky 2000). A detection of these length classes (as a proxy for age classes) in certain areas or depths of adjacent waters would identify the recruitment patterns and eventually help quantifying the recruitment. There are several open questions regarding the recruitment (e.g. causes for variability, environmental factors, and natural mortality). The causes of the often observed variability are mainly unknown and the quantification of a potential recruitment based on scientific surveys in the nursery areas like the Greenland shelf are impaired by difficulties in reliably discriminating the different *Sebastes* species for small size individuals (17 cm and below). Species identification is a pre-requisite for understanding the population dynamics *of S. mentella* since different *Sebastes* species can share the same nursery grounds.

In the Norwegian and Barents Seas, the situation is somehow similar but *S. mentella* juveniles generally occur over a wider area and in larger numbers than the other two species (*S. marinus* and *S. viviparus*), so that the total number of *Sebastes* spp. juveniles is a good proxy for the abundance of juveniles of *S. mentella*. In recent years, an analytical model for year-class strength (Planque et al. 2012) and a statistical catchat- age model (ICES 2012b) were developed for *S. mentella* in the Norwegian Sea. These have permitted reconstruction of the recruitment history back to 1992. During the period 1996– 2003, recruitment in this area was extremely reduced whilst the mature stock biomass was not particularly low, which indicates that there is no obvious connection between the size of the mature stock in a given year and the level of recruitment for the associated year-class. However, year-class strength has been increasing since 2004 and is currently estimated at the highest level since the beginning of the time series (Figure 2).

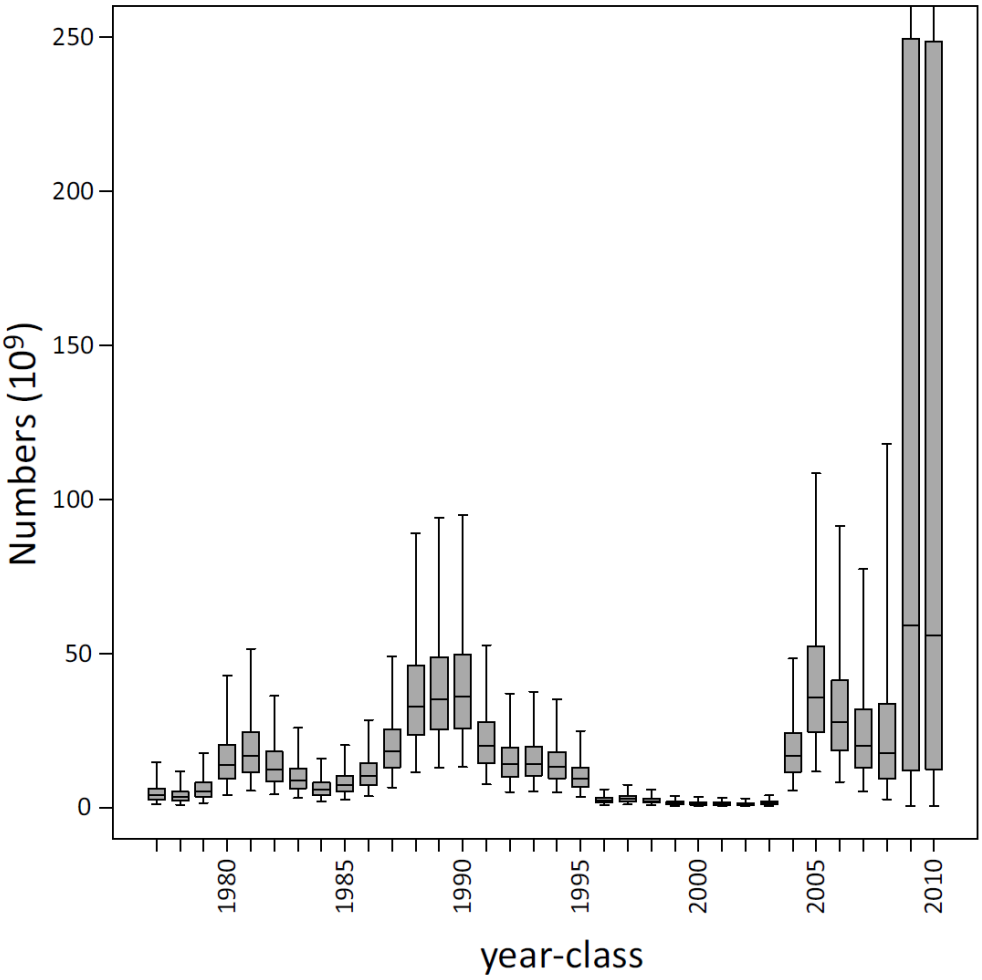



**Figure 2 - Modelled index of year-class strength of *S. mentella* in the Norwegian/Barents Sea for the period 1977–2010. The median estimate is indicated by the horizontal line in each box. Box edges outline the 25 and 75% distribution percentiles and whiskers show the 2.5% and 97.5% percentiles. In 2009 and 2010, the upper part of the distribution is off scale. Redrawn after Planque et al. (2011).**

The meta-population structure of beaked redfish is a vivid area of research. The main conclusions of the ICES workshop on Redfish Stock Structure (WKREDS, ICES 2009d) indicate that, based primarily on genetic information, four different stocks can be identified in the Irminger Sea and adjacent waters. These are separated horizontally and vertically but

partly share an important nursery area, the East Greenland shelf. Results of genetics, fatty acid analyses, morphometrics and otolith morphology (summarised in Cadrin et al. 2010) suggest that the Norwegian and Barents Sea stock, and *S. mentella* dwelling east of the Faeroes, may form one distinct stock.

The connectivity between the two large areas of the North Atlantic, the Irminger Sea and adjacent waters in the west, and the Barents and Norwegian Seas in the east, but also between smaller areas like the shelf east and west of the Faeroes remain unknown. The exact meta-population structure remains heavily debated in the scientific community and divergent views exist on the validity of proposed stock divisions, in particular in the Irminger Sea. In contrast to Cadrin et al. (2010), Makhrov et al. (2011) suggests that there is only one population of beaked redfish in the Irminger Sea area.

The four *Sebastes* species in the North Atlantic have very similar external morphological features, which make their differentiation difficult. As a result, catches are often reported for “redfish” without species specification. This is the case in the Northwest Atlantic were *S. mentella* and *S. fasciatus* are managed together as beaked redfish, and in the Northeast Atlantic where many fisheries regulations are not species specific because *S. marinus* and *S. mentella* are not always reported separately. Morphometric studies have been used to distinguish *Sebastes* species and populations on both sides of the Atlantic (Misra and Ni 1983; Power and Ni 1985; Kenchington 1986; Saborido-Rey 1994). The EU Redfish project (2000–2003, Anonymous 2004) involved collaborative sampling efforts and analyses of genetics, morphometrics, reproduction and maturation, otolith shape, otolith chemistry, and growth. The overall conclusion of the results of the morphometric analyses is that the four *Sebastes* species inhabiting the North Atlantic are morphometrically distinct, but with gradients and differences within species between areas. The external features normally used to identify species have been revealed as problematic for a real identification of the species around the Faroes and off Greenland. In the 1990s, investigations using electrophoresis revealed diagnostic criteria to separate the *Sebastes* species (e.g., Nedreaas and Nævdal 1989, 1991a, b; Nedreaas et al. 1994). Haemoglobin was shown to be a good diagnostic for *S. mentella* but S. *marinus* and S. *viviparus* show the same haemoglobin pattern. *Sebastes* specimen less than about 60 mm had not achieved the adult haemoglobin pattern hence making impossible to differentiate the young fish. The genetic structure of the enzyme malate dehydrogenase (MDH) is diagnostic for S. *viviparus*, and joint analyses of haemoglobin and MDH can achieve separation between S. *marinus* and the other two species.

Patterns of genetic variations in DNA among and within species of the genus *Sebastes* are summarized in Cadrin et al. (2010). Since the main focus in these works has been related to variation within species and population genetics, a protocol describing procedures and methods to use for diagnostic identification of species using DNA techniques is still lacking. It can though be mentioned that Johansen and Dahle (2004) investigated this by polymerase chain reaction (PCR)-based random amplification of polymorphic DNA (RAPD). They found that only one primer, OPA20, could be used to diagnostically distinguish among species.

Spatial and seasonal migration patterns of *S. mentella* in the Irminger Sea and adjacent waters and in the Norwegian and Barents Seas are still largely unidentified although it is known that adult *S. mentella* undertake large migrations between copulation grounds, larval extrusion grounds and feeding grounds (Magnússon and Magnússon 1995; Anonymous 2009). Beaked redfish in both areas have similar life cycle, i.e. males and females mature at different times, copulation occurs in autumn and larval extrusion in spring. In the Irminger Sea, males mature in August-November, at the time of copulation, but the copulation areas are unknown (Anonymous 2004). After larval development, females migrate to the open ocean where larval extrusion occurs from April to June with peaks in late April/early May (Magnússon and Magnússon 1995). Pelagic fry drift to nursery areas that are found along the coast of East and West Greenland, where they settle to the bottom (Magnússon and Magnússon 1995). As juveniles mature, they migrate into the stocks found in deeper shelf areas and in the pelagic zone into the Irminger Sea and adjacentwaters. After extrusion of larvae, adult redfish migrate northward towards the slopes of north-western Iceland and East Greenland, and to the west and southwest towards the shelf and slopes of East Greenland (Sigurðsson et al. 2006; Cadrin et al. 2010). Very little is known about the adult distribution from September to March, before the larvae extrusion starts again.

In the Norwegian and Barents Seas, larval extrusion occurs along the continental shelf break from 64° N to 74° N in March-April. Larvae drift northward along the continental slope in the surface layer towards the Barents Sea and shelf waters around Spitsbergen. Juveniles are mainly distributed in the Barents Sea and along the continental slope (Drevetnyak and Nedreaas 2009). After extrusion, adults migrate to the open Norwegian Sea where a large fraction resides during summer and autumn at depths ranging from 150 m to 800 m.

Very little is known about the migration between the Norwegian and Irminger Seas, although genetic studies suggest that the individuals found in the shallow Irminger Sea and in the open Norwegian Sea could belong to the same population. To date only limited genetic studies have been carried out on *S. mentella* in the Norwegian and Barents Sea and these suggest that only a single population inhabits these areas (Cadrin et al. 2010).

The geographical and vertical distributions of *S. mentella* in the North Atlantic are subjected to interannual variations that can affect the fishery. For example, in the first years of the pelagic fishery for *S. mentella* in the Irminger sea, the shallow (<500 m) and the deep (>500 m) stocks had a similar horizontal distribution, but the two stocks and fisheries have been widely separated since the late 1990s. The spatial distribution of *S. mentella* in the Irminger Sea seem to be related to water temperature distribution, with a preferred thermal range of 4–6 °C.

The physical oceanography in this region is variable (Hátún et al. 2009) and is dominated by the dynamics of the North Atlantic Sub-Polar Gyre (SPG), a large counter-clock rotating body of relatively cold and low-saline subarctic water in the central northern North Atlantic. The distribution of *S. mentella* is confinedwithin the SPG (Pedchenko 2005). Duringthe early 1990s the circulation of the gyre was intense but declined substantially after 1995 leading to a rapid warming and increased salinity (Hátún et al. 2009). As suggested by Pedchenko (2005), it is possible that the SPG influences the upper and lower water masses in the Irminger Sea differently, thereby explaining the different horizontal distribution of *S. mentella* in the shallow and the deep Irminger Sea.

The ICES Workshop on Redfish and Oceanographic Conditions (WKREDOCE, ICES 2012c) compiled and analysed time series from trawl surveys, acoustic surveys, commercial fisheries and oceanographic measurements to explore the relationships between beaked redfish distribution and hydrographic conditions. The main conclusions of WKREDOCE were the following: A relationship was established between seasonal and interannual movements of pelagic beaked redfish in the Irminger Sea and ocean currents and their associated physical properties (temperature and salinity). A decrease in the North Atlantic Oscillation (NAO) index strength since 2008 and the present deceleration of the Sub-Polar Gyre (SPG) suggest a subsequent northeast displacement of redfish in the coming years. No relationship was established between the overall abundance of redfish and oceanographic conditions. However, there are important limitations in the data and analyses used to draw these conclusions. In particular, no distinction was made between the two *S. mentella* stocks in the area, very few depth data were presented and the movements of the fishing fleet was assumed to reflect movements of the fish. The conclusion on interannual movements is valid for the shallow *S. mentella* stock, since most of the oceanographic changes are in the upper 4–500 m. The evidence for seasonal movements remains elusive since it is mostly based on the movement of the fishing fleet rather than on direct observations of the stock distribution.

In the Norwegian and Barents Sea, the distribution of *S. mentella* seems confined within Atlantic waters in a similar way to the confinement of the species in the SPG in the Irminger Sea. Investigations conducted in the Norwegian Sea in 2008 indicate temperature preference between –0.5 and 5.0 °C (ICES 2008), a wider thermal range than observed in the Irminger Sea.

Information on trophic relationships of *S. mentella* in the Irminger and Norwegian Seas is scarce. Observations show that deep-sea redfish in the Irminger Sea are opportunistic feeders that graze within the deep scattering layers mostly at 300–800 m depth and feed on invertebrates and small fish (Magnússon 1996). The most important food items are Copepoda, Euphausiacea, Mollusca, Decapoda and Myctophidae (Magnússon 1996; González et al. 2000; Pétursdóttir et al. 2008; ICES 2009a). Stomach content analyses are however rather difficult because a high proportion of redfish have everted stomachs when hauled to the surface. In such situation, it is problematic to evaluate feeding condition and food composition and hence it is difficult to investigate trophic interactions in the area. Research on feeding and trophic interactions requires the collection of representative stomach samples. The UTE (Underwater Tagging Equipment) could be used for this purpose, if modified to sample whole fishes inside a plastic bag that can retain stomach content. The use of fatty acid and stable isotope analyses (Pétursdóttir et al. 2008) constitute complementary approaches. According to FishBase (https://www.fishbase.in/summary/Sebastes-mentella.html), trophic level is 4.2 ±0.61 (se), based on food items. The stock is not considered an LTL species.

**History of the fishery and assessment of beaked redfish *Sebastes mentella* in subareas 1 and 2**

In the ICES 2020 report of the Arctic Fisheries Working Group (ICES 2020a) the assessment of the target stock is presented. Following the recommendation from the benchmark assessment for redfish stocks in January 2018 (WKREDFISH, ICES 2018a) the analytical assessment is conducted using a statistical catch-at-age model (SCAA, for the period 1992–2019). Following a further recommendation of the benchmark, the advice cycle for beaked redfish in subareas 1 and 2 was changed to a two-year cycle.

An international pelagic fishery for *S. mentella* in the Norwegian Sea outside EEZs has developed since 2004 (Figure 3).

This pelagic fishery is managed by the Northeast Atlantic Fisheries Commission (NEAFC). The directed demersal and pelagic fisheries were reopened in the Norwegian Economic Zone and in the Fisheries Protection Zone around Svalbard since 2014. The spatial regulation for this fishery is illustrated in Figure 4. In 2019, most of the catches of *S. mentella* from the Russian and Norwegian fisheries were taken in the Norwegian Exclusive Economic Zone or as bycatch in the Fisheries Protection Zone around Svalbard. Catches in international waters were mainly taken by EU nations.

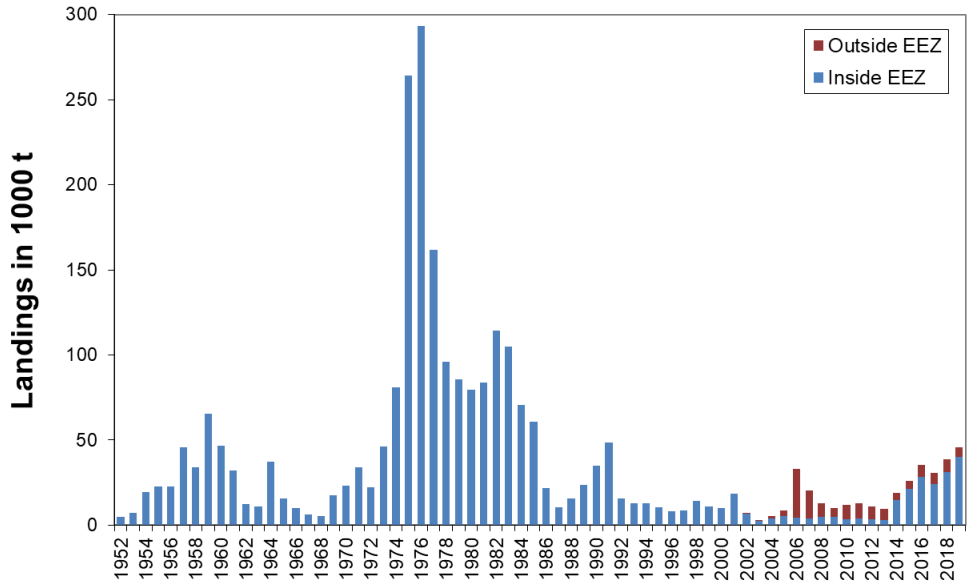



**Figure 3 - Sebastes mentella in subareas 1 and 2. Total international landings 1952–2019 (thousand tonnes). Source: ICES 2020a.**

Figure 4 shows the distribution of catch among national fishing fleets for 2018 and 2019 and the location of *S. mentella* catches in the Norwegian EEZ in 2019.

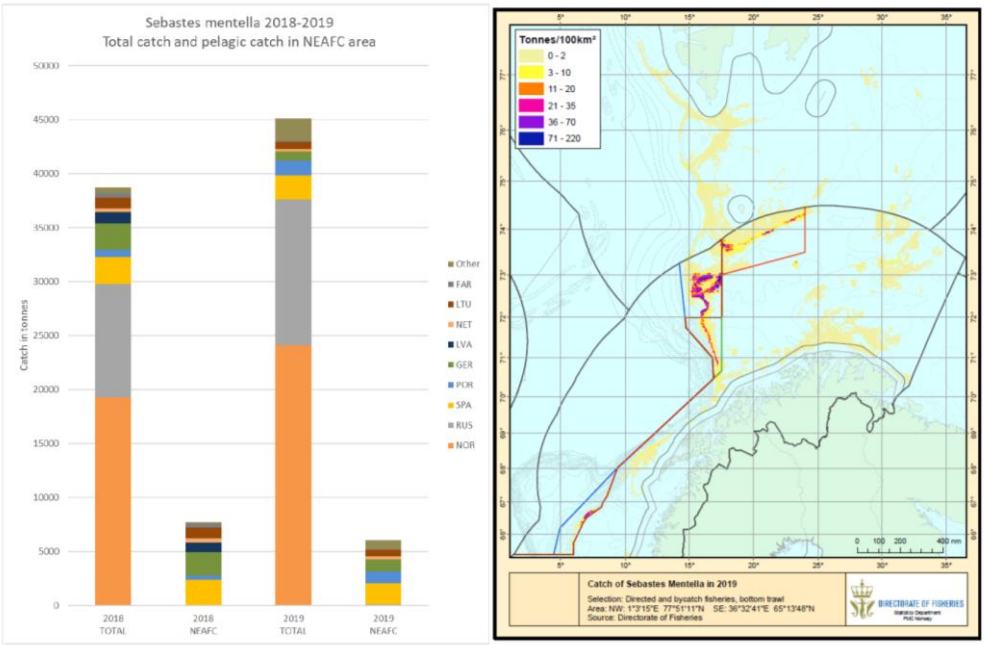



**Figure 4: Sebastes mentella in subareas 1 and 2. Left panel: Catch in tonnes reported by national fleets for the Sub-area 27.1 and 27.2 and in the NEACF regulatory area. Right panel: Geographical location of the directed Norwegian fishing within the Norwegian Exclusive Economic Zone and bycatches by Norwegian vessels in all areas. Directed fishing with bottom trawl is not permitted to the east of the red line. Directed fishing with pelagic trawl is not permitted to the east of the blue line. Directed fishing is not permitted in the Fishery Protection Zone around Svalbard. Source: ICES 2020a.**

During 2003–2013, all catches *of S. mentella*, except the pelagic fishery in the Norwegian Sea outside EEZ, were taken as by-catches in other fisheries. Some of the pelagic catches are taken as by-catches in the blue whiting and herring fisheries. From 2014 onwards most of the catch is taken as targeted catch and no longer as by-catch, following the opening of a targeted fishery in the Norwegian EEZ and Svalbard Fisheries Protection Zone. When fishing for other

species it has been allowed to have up to 20% redfish (both species together) in round weight as bycatch outside 12 nautical miles and only 10% bycatch inside 12 nautical miles in order to give a higher protection to *S. norvegicus*.

Nominal catches of *S. mentella* by country for subareas 1 and 2 combined are available in ICES 2020a. The pelagic catch of *S. mentella* in the Norwegian Sea outside EEZs reported to NEAFC and/or ICES amounted to 6,852 t in 2017, 7,739 t in 2018 and 6,060 t in 2019. The sources of information used are catches reported to ICES, NEAFC, Norwegian authorities (foreign vessels fishing in the Norwegian economic zone) or direct reporting to the AFWG. Where catches are reported as *Sebastes* sp., they are split into *S. norvegicus* and *S. mentella* by AFWG experts based on available correlation between official catches of these two species in the considered areas.

In 2014, ICES advised that the annual catch in 2015, 2016, and 2017 should be set at no more than 30,000 t and in 2017, ICES advised that the annual catch in 2018 should not exceed 32,658 t. Following the benchmark (WKREDFISH, ICES 2018a) and the subsequent evaluation of a management plan for the stock (WKREBMSE, ICES 2018b) ICES advised an annual catch of no more than 53,757 t for 2019 and 55,860 t in 2020, corresponding to a fishing mortality of F = 0.06.

Because of the novelty of the situation, related with reopening fisheries after 10 years of its ban, the total landings *of S. mentella* in subareas 1 and 2 in 2014, demersal and pelagic catches, amounted to only 18,780 t. The total landings of the demersal and pelagic fishery increased to 25,856 t in 2015, to 35,646 t in 2016, 30,934 t in 2017, 38,739 t in 2018 and 45,955 t in 2019. Of this, 6,060 t were reported from the pelagic fishery in international waters of the Norwegian Sea. The total landings in 2016 to 2018 were respectively 5,429 t, 1,201 t and 6,107 t above the TAC advised by ICES, but were 7,802 t below TAC in 2019. Norway caught the major share of the demersal catches, but Russian demersal catches increased substantially, particularly in ICES Division 2.b.

The redfish population in Subarea 4 (North Sea) is believed to belong to the Northeast Arctic stock. Since this area is outside the traditional areas handled by this Working Group, the catches are not included in the assessment. The total redfish landings (golden and beaked redfish combined) from Subarea 4 have up to 2003 been 1000–3000 t per year. Since 2005 the annual landings from this area have varied between 90 and 333 t.

ICES in 2019 has advised on the basis of precautionary considerations that the annual catch should be set at no more than 55,860 t in 2020. The 49$^{th}$ sessions of the Joint Norwegian-Russian Fisheries Commission decided to follow these advices.

In 2020 Norwegian fishing vessels can catch and land up to 36,219 t of redfish in the Norwegian economic zone (NEZ) in a limited area north of 65°20'N (see map in Figure 5), in international waters and the fisheries zone around Jan Mayen. Of this quantity, 100 t are allocated to cover by-catch in other fisheries and 34 t for research/surveillance and education purposes, while the remaining 36,085 t can be taken in a directed fishery.

Only vessels with cod and saithe trawl permits can participate in the directed fishery for redfish. Each vessel which has the right to participate is assigned a maximum quota of 1,200 t. This quota must also cover catches of redfish (both species) in other fisheries. It is prohibited to fish for redfish with bottom trawls in the pe-riod from 1 March until 10 May. Investigations were conducted in 2015–2016 to see if the protection of females during the main time of larvae release should be improved by extending the period of prohibited fishing until later in May and to see if the area south of Bear Island (Area 20) can be opened for directed fishing, either with or without sorting grid. The hitherto conclusion is that males dominated the catches (more than 70%) in the main fishing areas south and southwest of Bear Island during the investigations from late April until the directed fishery started on May, and that the area south of Bear Island should stay closed during January-February due to smaller *S. mentella* inhabiting this area at the beginning of the year.

Since 2015, Russia has had access to the NEZ when fishing their quota share. In 2020 Russia may fish 10 055 t (18%) plus 2000 t transferred from Norway to Russia. Apart from this as well as an additional 2000 t were transferred from Norway to Russia to cover bycatch of redfish (both species) in Russian fisheries targeting other species. The remaining 5586 t are divided between third countries in the NEZ and Svalbard Zone (2290 t) and the NEAFC areas (3,296 t). Catch in the NEAFC areas in 2019 amounted to 5917 t while the catch in the NEZ and Svalbard zone amounted to 40 038 t. The total catch in 2019 was by 7,802 lower than the advised TAC. It was assumed that the total catch in 2020 should not exceed the TAC of 55,860 t set by ICES.

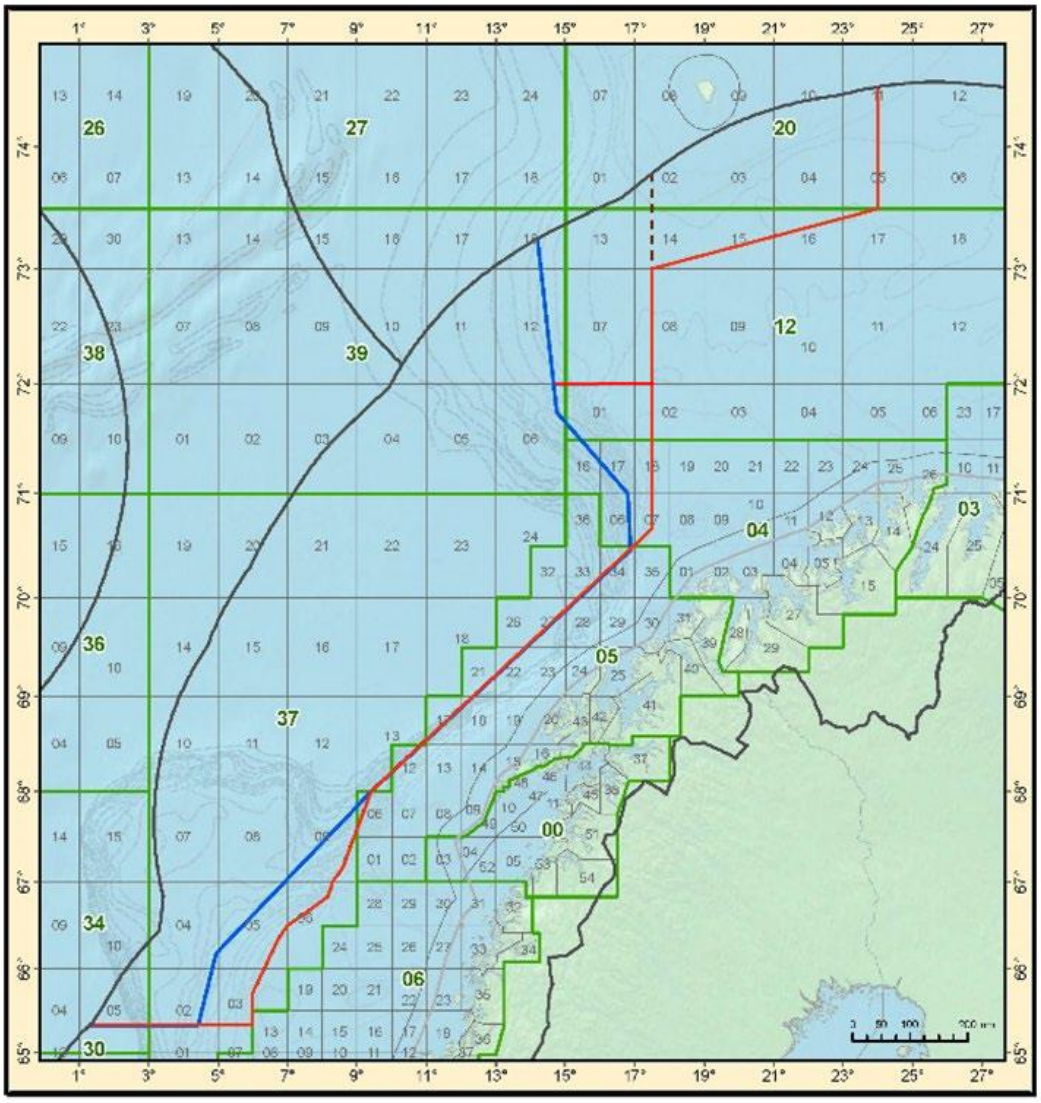



**Figure 5 - Delineation of the geographical limits for directed fishing in the Norwegian Economic Zone in 2014–2018. Directed pelagic trawling is only allowed west of the blue line. Directed demersal trawling is only allowed between the blue and the red line. The area east of the stippled line inside NEZ south of Bear Island is only open for directed demersal trawling after 10 May. The other areas for directed fishing are also open during 1 January-last February. Due to high bycatch ratios of golden redfish 72°N was suggested as southern limit for directed demersal fishing marked by the red line along that latitude to the Norwegian directorate of fisheries in November 2018. Source: ICES 2020a.**

Analytical assessment was conducted for this stock following recommendation from the benchmark assessment working group (WKREDFISH, ICES 2018a). Input datasets were updated with the most recently available data. The analytical assessment, based on a statistical catch-at-age model (SCAA), covers the period 1992—2019. The input data consists of the following:

- Total catch in tonnes;
- Catch in tonnes in the pelagic fishery Norwegian Sea outside EEZs;
- Total catch numbers-at-age 6—19+;
- Catch numbers-at-age 7—19+ in the pelagic fishery;
- Weight-at-age 2—19+ in the population;
- Maturity-at-age 2—19+ in the population;
- Russian autumn survey numbers-at-age 0—11;
- Ecosystem survey numbers-at-age 2—15;
- Winter survey numbers-at-age 2—15.
- Deep pelagic ecosystem survey proportions-at-age

There was no direct observation of catch numbers-at-age for the pelagic fishery in the Norwegian Sea outside EEZs in 2012–2018. Instead, numbers-at-age were estimated based on catch-at-age from previous or following year, and

weight-at-age and fleet selectivities. In 2013, 2016 and 2019, observations from the scientific survey in the Norwegian Sea were used to derive numbers-at-age in the pelagic fishery. This was considered appropriate given that the survey operates in the area of the fishery, with a commercial pelagic trawl and at the time of the start of the fishery.

Length distributions of the pelagic and demersal catches of *S. mentella* are available in ICES 2020a. In 2019, data were available from the Spanish and Lithuanian pelagic fleets and the Polish, Russian and Norwegian demersal fleets.

Catch-at-age in the Norwegian fishery was estimated using ECA (Estimating Catch of Age) for 2014. For 2015 and 2018, it was not possible to run ECA and the catch-at-age for the Norwegian Fishery was estimated using the older Biomass program. Not enough age readings were available to estimate catch-at-age in 2016 and 2017. For the demersal fisheries 2016, 2017 and 2019 as well as the pelagic fisheries 2017 and 2018 proportions-at-age in the catch were derived from proportions at-age in earlier years, weight-at-age and fleet selectivity.

The procedure for estimating catch-at-age for recent years in which age data are not available is somewhat problematic. This is because the last year of observation has a large impact on the estimated catch-at-age for several years. At the assessment working group in 2017 and at the benchmark assessment in January 2018, the last year of observations for the catch-at-age was 2014 and the values for the years 2015 and 2016 were extrapolated. The new data available for 2015 (demersal) and 2016 (pelagic) were substantially different from these earlier extrapolations.

Catch-at-age in the Russian demersal fishery were calculated using age reading. The estimated Age-Length-Key was then used to estimate the age distribution of the Russian demersal catches. Age-Length-Keys for *S. mentella* are uncertain because of the slow growth rate of individuals and therefore these data should be used with caution. Given that age is difficult to derive from length it is important that age readings are available for the most recent years.

In earlier assessment, weight-at-age in the stock was set equal to the weight-at-age in the catch. This turned out to be problematic because of important fluctuations in reported weight-at-age in the catch that cannot be explained biologically (i.e. these are noisy data). In 2015, it was advised to either use a fixed weight-at-age for the 19+ group, or use a modelled weight-at-age based on catch and survey records (Planque, 2015). The second option was chosen and weight-at-age in the population was modelled for each year using mixed-effect models of a von Bertalanffy growth function (in weight). In 2018 an attempt was made to model weight-at-age for each cohort (rather than each year of observation). This showed that the growth function is nearly invariant between cohorts. As a result, it was decided to use a fixed (i.e. common to all years) weight-at-age as input to the Statistical Catch-at-age model.

The proportion maturity-at-age was estimated for individual years using a mixed-effect statistical model. The modelled values of maturity-at-age for individual years are used in the analytical assessment models, except in 2008, 2011 and 2016-2019 when the fixed effects only were considered, at least for 2019 because of an insufficient number of age readings.

In previous years, natural mortality for *S. mentella* was set to 0.05 for all ages and all years. This was based on life-history correlates presented in Hoenig (1983). Thirty-nine alternative mortality estimates were explored during the benchmark workshop, based on the review work by Kenchington (2014) and several additional papers published recently (Then et al., 2014; Hamel, 2014). Overall, the mode of these natural mortality estimates is 0.058 which departs only slightly from the original estimate of 0.050. WKREDFISH 2018 (ICES 2018a) decided to continue using 0.050 as the value of M in the assessment model.

Cod's predation on juvenile (5–14 cm) redfish during 1984—2019 was used as time-series confirms the presence of redfish juveniles and may be used as an indicator of redfish abundance. A clear difference is seen between the abundance/consumption ratio in the 1980s and at present. A change in survey trawl catchability (smaller meshes) from 1993 onwards (Jakobsen et al., 1997) and/or a change in the cod's prey preference may cause this difference. As long as the trawl survey time-series has not been corrected for the change in catchability, the abundance index of juvenile redfish less than 15 cm during the 1980s might have been considerably higher, if this change in catchability had been corrected for. The decrease in the abundance of young redfish in the surveys during the 1990s is consistent with the decline in the consumption of redfish by cod.

Following a dedicated review, AFWG approved the use of the new SToX versions of the winter and ecosystem surveys for use in the *S. mentella* assessment. The group recommends that the data be monitored annually to identify if a significant portion of the *S. mentella* stock moves east of the strata system. The following survey indices were used un the assessment:

1. Russian bottom-trawl survey in the Svalbard and Barents Sea areas in October-December for 1978–2015 in fishing depths of 100—900 m (ICES acronym: RU-BTr-Q4).
2. Russian-Norwegian Barents Sea 'Ecosystem survey' (bottom-trawl survey, August-September) from 1986—2016 in fishing depths of 100—500 m. Data disaggregated by age for the period 1992—2016 (ICES acronym: since 2003 part of Eco-NoRu-Q3 (BTr))
3. Winter Barents Seabed-trawl survey (February) from 1986—2014 (jointly with Russia since 2000, except 2006 and 2007) in fishing depths of 100—500 m. Data disaggregated by age for the period 1992—2011 and 2013 (ICES acronym: BS-NoRu-Q1 (BTr)).

4. The Norwegian survey initially designed for redfish and Greenland halibut is now part of the ecosystem survey and covers the Norwegian Economic Zone (NEZ) and Svalbard incl. north and east of Spitsbergen during August 1996—2012 from less than 100 m to 800 m depth. This survey includes survey no. 2 above, and has been a joint survey with Russia since 2003, and since then called the Ecosystem survey. (ICES acronym: Eco-NoRu-Q3 (Btr)).
5. The international deep pelagic ecosystem survey in the Norwegian Sea (WGIDEEPS, ICES 2016, no ICES-acronym) monitors deep pelagic ecosystems, with a particular focus on beaked redfish (S. mentella). The latest survey was conducted in the open Norwegian Sea from 11 August until 28 August 2019, following similar surveys in 2008, 2009, 2013 and 2016. The survey is scheduled every third year. Estimated numbers-at-age from this survey were presented at the benchmark assessment in 2018 and used in the SCAA model. Data for 2016 was updated in 2019, using additional age readings and numbers-at-age for the 2019 survey were presented during AFWG 2020 and also used in the assessment. The details of the data preparation, using StoX, are available from WD7 of AFWG 2018 (Planque et al., 2018). The data used as input to the analytical assessment consists of proportions-at-age from age 2 to 75 y.
6. The international 0-group survey in the Svalbard and Barents Sea areas in August-September 1980–2019, now part of the Ecosystem survey (ICES acronym: Eco-NoRu-Q3).
7. A slope survey “Egga-sør survey” was carried out by IMR from 07 March to 07 April 2020, following similar surveys ran in 2009, 2012, 2014,2016 and 2018. An update for the 2020 survey was not available for AFWG 2020. Egga-Sør and Egga-Nord surveys operate on a biennial basis. The length and age distributions of beaked redfish from these surveys show consistent ageing in the population and gradual incoming of new cohorts after the recruitment failure period (Planque, 2016).

The ICES group performed the analytical assessment using the statistical catch-at-age (SCAA) model reviewed at the benchmark in January 2018 (WKREDFISH, ICES 2018a). The model was configured as the benchmark baseline model which includes 53 parameters to be estimated and the model converged correctly.

The temporal patterns in recruitment-at-age 2 confirm the previously reported recruitment failure for the year-classes 1996 to 2003 and indicate a return to high levels of recruitment. The estimates of year-class strength for recent years are uncertain due to limited age data from the Winter and ecosystem surveys. Modelled spawning-stock biomass (SSB) has increased from 1992 to 2007. In the late 2000s the total-stock biomass (TSB) consisted of a larger proportion of mature fish than in the 1990s. This is reversing as individuals from new successful year classes, but still immature, are growing. TSB has increased from 1.0 to approximately 1.4 million tonnes in the last 10 years. The concurrent decline in SSB from 2007 to 2014 can be attributed to the weak year classes (1996—2003) entering the mature stock. This trend has levelled off and SSB increases again. SSB at the start of 2020 is estimated at 917,578 t (Figure 6).

The patterns of fleet selectivity-at-age indicate that most of the fish captured by the demersal fleet in 2019 are of age 9 years and older, while the pelagic fleet mostly captures fish of age 14 and older. While model results at the benchmark workshop showed a gradual shift in the demersal selectivity towards older ages in recent years, this is no longer observed after the 2015 catch-at-age data were incorporated in the model. The demersal fleet selectivity appears shifted towards later ages only in 2014. In 2019 F19+ is estimated at 0.045, with 0.036 for the demersal and 0.008 for the pelagic fleets, respectively.

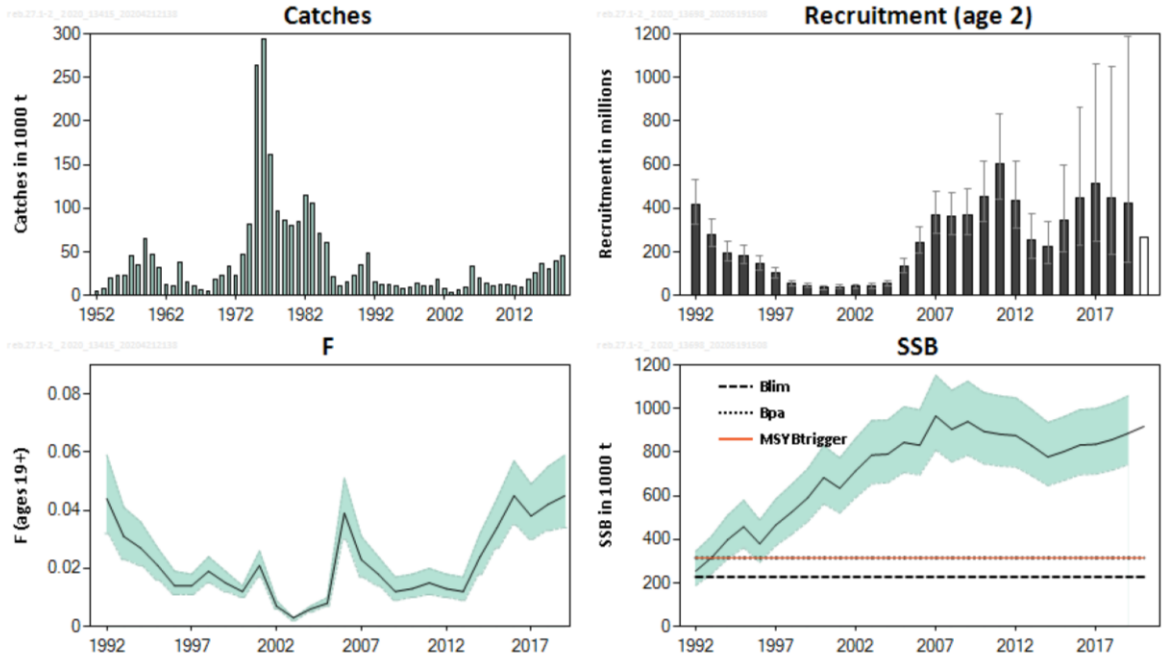



**Figure 6 - Beaked redfish in subareas 1 and 2. Summary of the stock assessment. The assumed recruitment value is unshaded. Shaded areas (F, SSB) and error bars (R) indicate 95% confidence intervals. Source ICES 2020b.**

Winter and ecosystem surveys selectivity at age are very similar and show reduced selectivity for age 8 years and older, which is consistent with the known geographical distribution of different life stages of *S. mentella*. Conversely, the Russian survey shows a reduced selectivity for age 7 years and younger.

Residual patterns in catch and survey indices were investigated in ICES AFWG 2020 (ICES 2020a). There is generally no visible trend in the residuals for the Russian groundfish survey neither by age nor by year. Trends in residuals are visible in recent years for winter and ecosystem surveys and will need to be investigated further. Residual patterns for the demersal fleet indicate a similar fit of the model compared AFWG 2018 (ICES 2018c), when a time varying selectivity-at-age for this fleet was introduced.

The historical retrospective patterns for the years 2007 to 2016 are presented in Figure 7. All model parameters were estimated in each individual run. The most recent model run (last year of data 2019) is consistent with previous runs. As in 2018 the SSB time-series is smoother than before, due to fixed weight-at-age for every year. The new estimates for the winter and Ecosystem surveys led to an increase in estimated SSB, up to 19% in the early years and later on around 7% to 9%. Retrospective bias (Mohn's rho) over the last 5 assessments was -38% for recruitment, 1% for F(19+) and -1% for SSB. Note that for F(19+) the average rho was calculated with 4 peels, since F(12-18) was used earlier. The benchmark run stands out and this is due to the unavailability of recent catch-at-age data during the benchmark assessment. The estimate of SSB in the early years is revised upward and this results from the use of new number-at-age indices from the WGIDEEPS survey.

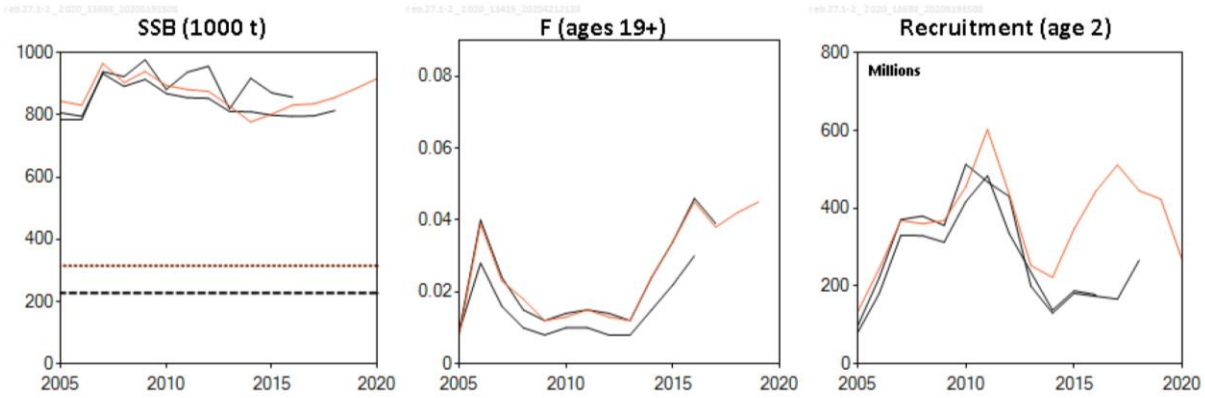



**Figure 7 - Beaked redfish in subareas 1 and 2. Historical assessment results. Prior to 2018, Fbar was calculated over the ages 12–18. Recruitment was revised upwards by the inclusion of an updated Barents Sea ecosystem survey index. Forecast recruitment is based on regression between survey indices and recruitment time-series**

**for the intermediate year, and the average of the last ten cohorts for the subsequent forecast years. Source ICES 2020b.**

$F_{MSY}$ at age 19+ is approximated using $F_{0.1}$ and estimated at 0.084 (WKREBMSE report 2018b). The estimated fishing mortality in 2019 is: F19+ = 0.045. If the fishing mortality is maintained, this is expected to lead to a catch of 48,305 t in 2020, well below the advised TAC of 55,860 t. This would lead to an SSB of 948 178 t in early 2021, catches of 49 703 t in 2021 and SSB of 978 137 t in 2022. Raising F19+ to FMSY (F19+ = 0.084) in 2021—2023 would lead to average catches of 91,378 t during that period and a SSB of 943,950 t by 2023 (SSB at the start of 2019 is estimated at 855,553 t). These projections assume that the selectivity patterns of the demersal and pelagic fleets are iden-tical with those estimated for 2019. It is also assumed that the ratio of fishing mortality between these two fleets remains unchanged.

Historical fluctuations in the recruitment-at-age 2 are consistent with the 0-group survey index, although the 0-group survey index is not used as an input to the SCAA. The population age structure derived from the model outputs for the old individuals (beyond 19+) is consistent with the age structure reported from the slopes surveys although these are not used (yet) as input to the model.

Recent recruitment levels estimated with SCAA are highly uncertain since they rely on only few years of observations and since the age readings from the winter survey were not available for years 2014-2019. The use of the autoregressive model for recruitment (random effects in the SCAA) which was introduced in this assessment allows for a projection of the recruitment in recent years, despite the current lack of age data.

In conclusion, the history of the stock as described by the SCAA model for the period 1992–2019 is summarized in Figure 6 and Figure 8. The key elements are as follows:

- upward trend in Total-stock biomass from 1992 to 2006 followed by stabilization until 2011 and new upward trend until the present,
- upward trend in spawning-stock biomass from 1992 to 2007 followed by stabilization (or slight decline) until 2014,
- recruitment failure for year classes 1996—2003 (2y old fish in 1998—2005),
- good (although uncertain) recruitment for year classes born after 2005. Age data for recruits (at age 2y) after 2014 is limited,
- annual fishing mortality for the 19+ group fluctuated throughout the assessment period.

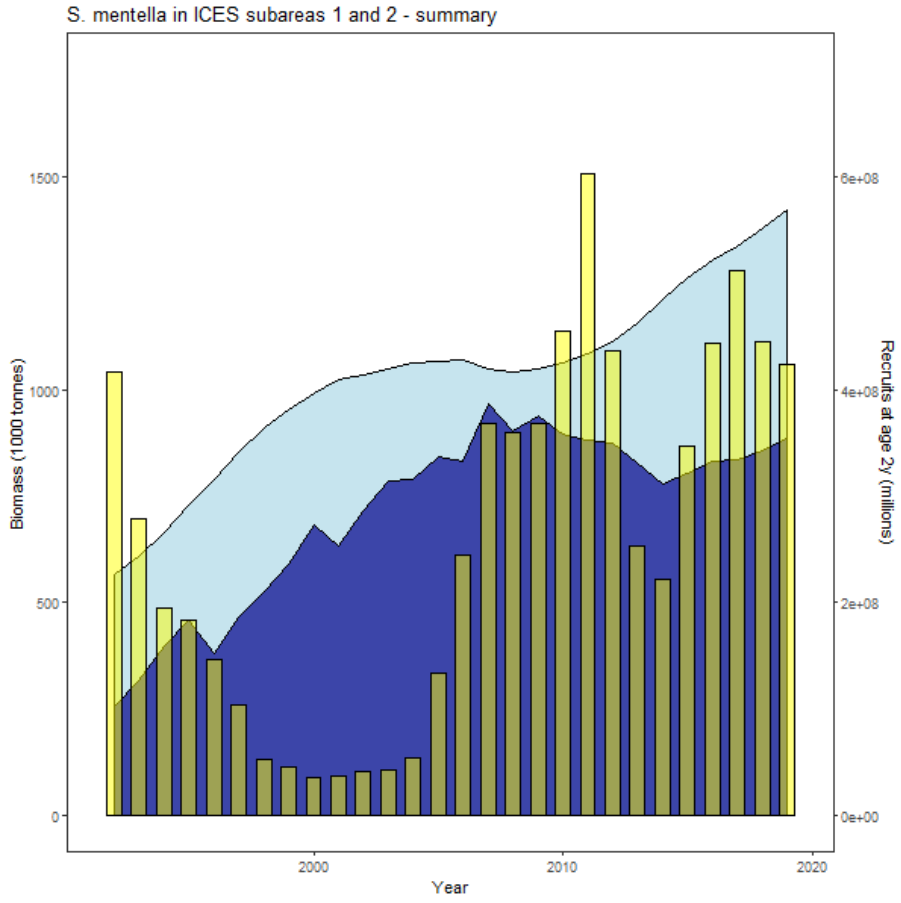



**Figure 8 - Sebastes mentella in subareas 1 and 2. Results from the statistical catch-at-age model showing the evolution of total biomass (in tonnes light blue left axis) spawning-stock-biomass (in tonnes dark blue left axis)**

**and recruitment-at-age 2 (in numbers yellow right axis) for the period 1992–2019 for S. mentella in subareas 1 and 2. Source: ICES, 2020a.**

Currently, the survey series used in the SCAA do not appropriately cover the geographical distribution of the adult population. Data from the pelagic survey in the Norwegian Sea has been reviewed in the last benchmark and is now included in the assessment model. The SCAA model relies on the availability of reliable age data in surveys and in the catch. Although additional age reading since the last assessment has improved reliability, it requires a continuous effort to keep these data at an appropriate level.

The proposed reference points estimated during the workshop on the management plan for *S. mentella* in (ICES 2018b) were Bpa = 315 kt, Blim = 227 kt and FMSY19+ = F0.1 = 0.08. ICES advised that when the precautionary approach is applied, catches in 2021 should be no more than 66,158 tonnes, and catches in 2022 should be no more than 67,210 tonnes.

The history of the advice with catches and agreed TACs is presented in Table 16

**Table 16 - Beaked redfish in subareas 1 and 2. ICES advice, agreed TACs, and catches. All weights are in tonnes. Source: ICES, 2020a.**

| Year | ICES advice | Predicted catch corresponding to advice | Agreed TAC | ICES catches |
|---|---|---|---|---|
| 1987 | Precautionary TAC | 70000* | 85000 | 35000 |
| 1988 | F = $F_{0.1}$; TAC | 11000 | - | 41000 |
| 1989 | *Status quo* F; TAC | 12000 | - | 47000 |
| 1990 | *Status quo* F; TAC | 18000 | - | 63000 |
| 1991 | F at $F_{med}$; TAC | 12000 | - | 68000 |
| 1992 | If required, precautionary TAC | 22000 | - | 32000 |
| 1993 | If required, precautionary TAC | 18000 | 18000 | 12814 |
| 1994 | If required, precautionary TAC | - | - | 12721 |
| 1995 | Lowest possible F | - | - | 10284 |
| 1996 | Catch at lowest possible level | - | - | 8075 |
| 1997 | Catch at lowest possible level | - | - | 8598 |
| 1998 | No directed fishery, reduce bycatch | - | - | 14045 |
| 1999 | No directed fishery, reduce bycatch | - | - | 11209 |
| 2000 | No directed fishery, bycatch at lowest possible level | - | - | 10075 |
| 2001 | No directed fishery, bycatch at lowest possible level | - | - | 18418 |
| 2002 | No directed fishery, bycatch at lowest possible level | - | - | 6993 |
| 2003 | No directed fishery, bycatch at lowest possible level | - | - | 2520 |
| 2004 | No directed trawl fishery and low bycatch limits | - | - | 5493** |
| 2005 | No directed trawl fishery and low bycatch limits | - | - | 8465** |
| 2006 | No directed trawl fishery and low bycatch limits | - | - | 33261** |
| 2007 | No directed trawl fishery and low bycatch limits | - | 15500^ | 20219** |
| 2008 | Protection of juveniles, no directed trawl fishery and low bycatch limits | - | 14500^ | 13095** |
| 2009 | Protection of juveniles, no directed trawl fishery and low bycatch limits | - | 10500^ | 10246** |
| 2010 | Protection of juveniles, no directed trawl fishery and low bycatch limits | - | 8600^ | 11924** |
| 2011 | Protection of juveniles, no directed trawl fishery and low bycatch limits | - | 7900^ | 12962** |
| 2012 | Protection of juveniles, no directed fishery and low bycatch limits | - | 7500^ | 11059** |
| 2013 | $F_{0.1}$ | < 47000 | 19500^ | 9474** |
| 2014 | *Status quo* catch | < 24000 | 36800^^ | 18780** |
| 2015 | Precautionary approach | < 30000 | 30000# | 25836 |
| 2016 | Precautionary approach | < 30000 | 30000# | 35429 |
| 2017 | Precautionary approach | < 30000 | 30000# | 31201 |
| 2018 | Precautionary approach | < 32658 | 32658# | 38739 |
| 2019 | Precautionary approach | < 53757 | 53757# | 45955 |
| 2020 | Precautionary approach | < 55860 | 55860# | |
| 2021 | Precautionary approach | < 66158 | | |
| 2022 | Precautionary approach | < 67210 | | |

* Includes both *Sebastes mentella* and *S. norvegicus*.

** Includes the pelagic catches in the Norwegian Sea outside the EEZ.

^ TAC set by the North-East Atlantic Fisheries Commission (NEAFC) for an Olympic fishery in international waters.

^^ Sum of TAC set by NEAFC in international waters and by Norway in the Norwegian Economic Zone.
# TAC set by jointly by Norway and Russia.

**Management of beaked redfish (*Sebastes mentella)* fisheries in subareas 1 and 2**

No management plan exists for this stock. From 1995 to 2012, the ICES advice had been no directed catch or lowest possible level. From 2013 onwards, the basis of the advice has been somewhat ad hoc and has varied (F0.1 in 2013, status quo catch in 2014, precautionary approach in 2015–2020).

Fisheries for beaked redfish are conducted in both national and international waters of the Barents Sea under different management authorities using different management schemes. In international waters, a pelagic fishery for beaked redfish is managed by the North East Atlantic Fisheries Commission (NEAFC). In recent years, an Olympic fishery has been conducted with a set TAC that is not derived from a harvest control rule. In national waters of the Barents Sea, a demersal fishery based on bycatch is conducted with specific bycatch regulations. Management decisions taken at national and international levels are coordinated to ensure that the total catch in ICES Subareas 1 and 2 does not exceed the recommended TAC.

The NEAFC is the regional fisheries management organization mandated to manage most fisheries in the Oceanic Northeast Atlantic ecoregion. These include fisheries targeting redfish (*S. mentella*). These fisheries are conducted both inside EEZs and in the ABNJ (Areas Beyond National Jurisdiction), where they are regulated by a mixture of national, EU, and NEAFC measures. NEAFC has frozen the fishing footprint by designating existing fishing areas within which bottom fishing is permitted. Outside these areas bottom fishing is prohibited, and any new fishery wanting to be developed must do so under an exploratory fishing protocol. In addition, extensive areas within the fishing areas have been closed to protect vulnerable marine ecosystems (VMEs). Individual parties to NEAFC have implemented additional measures for their own fleets fishing in international waters, e.g. the recent changes in EU fishing opportunities for deep-sea species. NEAFC measures are legally binding, and activity by contracting parties or third parties not complying with the measures is regarded as illegal and may lead to sanctions, such as the blacklisting of vessels. All fishing vessels in the NEAFC area are monitored by electronic vessel monitoring systems (VMS). NEAFC receives scientific advice on stocks as redfish (*S. mentella*) by ICES. The Long Distance Fleet Advisory Council (LDAC) also provides advice via the European Commission.

A pelagic fishery for *S. mentella* has developed in the Norwegian Sea outside EEZs since 2004. In the Barents Sea, where fisheries are managed by the Joint Norwegian-Russian Fisheries Commission (JNRFC), there had been no directed fishery for this stock from the 1990s until 2013. A new directed demersal and pelagic fishery was opened in the Norwegian Economic Zone in 2014. The 44$^{th}$ Session of JNRFC decided to split the total TAC among countries as follows: Norway: 72%, Russia: 18%, Third countries: 10% (as bycatch in the fishery protection zone at Svalbard (Spitsbergen): 4.1%, and international waters of the Norwegian Sea (NEAFC-area): 5.9%). This split was reconducted at the 47$^{th}$ session of JNRFC in 2017, but there is no agreement between JNRFC and NEAFC concerning this split.

The Joint Russian-Norwegian Fisheries Commission decided to avoid sharply increased quotas over the next years and to pursue a more precautionary approach. This is significant since implementation of a new analytical method may give rise to shortcomings. Because beaked redfish is a long-lived species, there should be no loss of long-term revenue by waiting for evidence of improved stock conditions before increasing the TAC. As with the management of many other long-lived species, and in keeping with responsible and precautionary strategies, TAC-increases should be made gradually, and not following a single year of perceived improvement.

Norway and Russia asked ICES in 2018 to evaluate the following set of harvest control rules for *S. mentella* in ICES areas 1 and 2. All combinations (total 3x3=9) of the following elements were tested by ICES (ICES 2018b):

- Fishing mortality (F19+) of 0.06, 0.08 and 0.10
- Trigger points of 450, 600 and 800 kt.

In addition, for a trigger point of 450 kt and F19+=0.08, a rule with the following additional clause was tested: “Reduction of F by 50% or no reduction of F if the average strength at age 2 for the year classes which are 3-12 years old in the first year for which the TAC advice is given, is below 100 million individuals”. In all cases F should be reduced linearly towards F=0 at SSB=0 if SSB in the first year for which TAC advice is given, is below the trigger point. If none of the rules are found to be precautionary, rules with additional values of F and trigger point should be investigated in order to find rules which are precautionary.

ICES concluded that, for a long-lived, slow growing, late maturing stock any management action will take longer than five years before changes in the biomass are likely to be detected. Therefore, ten years seem to be a more sensible time span to assess the impact of a harvest control rule. The life-history characteristics of this stock also make it vulnerable to overfishing, and once overfished, the recovery might take decades. ICES therefore recommends applying a rather conservative management approach.

Based on the HCRs specified in the request, the simulations made ICES recommended a harvest control rule with Btrigger = 315 kt (based on the Bpa value) and F19+ = 0.06 or 0.08, with a cap on TAC of 50 000 t.

After the next surveys on mature *S. mentella* in the Norwegian Sea, which are planned for 2019 and 2022, there should be more info on absolute stock size and it should be possible to include this survey in the assessment model, also it will be known whether the good year classes after 2003 have recruited to the mature stock. Thus, the HCR should be re-evaluated in 2023. ICES also recommended a re-evaluation of the HCR be part of the research around any future period of poor recruitment. ICES recommended that at the next benchmark a thorough evaluation be made as to the appropriate ICES category (1 or 2) for this stock. On the basis of these precautionary considerations, ICES advised that annual catch as reported Table 16, and that measures currently in place to protect juveniles should be maintained.

According to the protocol for the 50th session Joint Russian-Norwegian Fisheries Commission (see https://www.jointfish.com/content/download/512/6950/file/50-norsk.pdf), the parties confirmed the TAC distribution mentioned before. Norway and Russia can fish on their national quotas in each other's economic zones as well as in the fisheries protection zone off Svalbard and in international waters in the Norwegian Sea (NEAFC area). Russia has the right to fish its national share of 18% in Norway's economic zone.

On the basis of the advice from ICES, the parties set a TAC for *S. mentella* of 66,158 tonnes for 2021. The distribution of quota will apply in 2021 and will be renewed automatically unless one of the parties requests renegotiation of shares.

The parties agreed also that it is important to continue the current regulatory measures for *S. norvegicus* until the population is again up to an acceptable reproductive level.

The parties discussed various management rules for *S. mentella* but agreed not to adopt a management rule for this stock until the 51st session of the Joint Norwegian-Russian Fisheries Commission. Technical regulatory measures in place are:

- Minimum size for redfish is 30 cm. Mixing of redfish below the minimum size should not exceed 15% in the number of individuals of the total catch in each catch.
- When fishing with bottom trawls on other species, it is permitted to have a by-catch of redfish of up to 20% of the total weight in each individual catch and of the country catch.
- When fishing with pelagic trawls for other species, it is permitted to have a by-catch of redfish on up to 1% of the total weight in each individual catch and of the country catch. When fishing for capelin, the by-catch of redfish shall not, however, exceed 5% of the catch by weight in each single catch and off country catch.

The parties agreed also that closure of fields for shrimp fishing shall be carried out on the basis of data on the mixing of fry of blue halibut, cod, haddock and redfish (S*. mentella* and *S. norvegicus*). At the 47th session, the parties agreed to ask ICES to evaluate the effect on redfish stocks (*S. mentella* and *S. norvegicus*) of various interference criteria for redfish in the shrimp fishery.

According to the records of fisheries consultations between the European Union and Norway for 2021, Norwegian delegation informed the EU delegation that the allocation of redfish for 2021 entirely relates to *S. mentella*. Moreover, the Norwegian delegation underlined that this amount refers to total allowable catch and includes both by-catch and catches taken in a directed fishery for redfish. In addition, the Norwegian delegation reminded the European delegation that Norway and the Russian Federation are the two only coastal States to this redfish stock, and that Norway and the Russian Federation for years have implemented strong conservation measures, including a direct ban on direct fishery until 2014. This precautionary regime resulted in an increase of the stock, allowing a small part of the stock to migrate into international waters for a few months during the year. However, the European Union continues to undermine the conservation efforts of the Coastal States, by ignoring the best available scientific evidence and giving itself unsustainably high unilateral quotas for redfish in international waters in ICES 1 and 2.

The Norwegian Delegation stated that despite several attempts by Norway to find a common understanding, both within the framework of NEAFC and through bilateral initiatives, the European Union has showed no interest in finding an agreement, and have even expressed preference for the present situation. The European Union's establishment of inflated quotas in international waters is a violation of the obligation under international law to cooperate and establish compatible measures to those of the Coastal States.

The EU Delegation noted that there are markedly divergent views on the management of this stock, also stressed the the absence of management measures that have been agreed under NEAFC. Furthermore, the EU regrets that the two NEAFC contracting parties that have signed a bilateral arrangement for the management of this stock outside the scope of the relevant regional fisheries management organisation, have not agreed to cooperate with the EU, contrary to the requirements of Article 63(2) of UNCLOS and the UN Fish Stocks Agreement.

In the absence of such cooperation and of such NEAFC measures, the EU has therefore regulated its fishery in international waters. The EU Delegation confirms that such regulation cannot be considered a unilateral quota and it has been set well below the scientific advice to take into account the activities of all other parties in the international waters. The EU Delegation reiterated its availability to address this issue bilaterally with Norway in the near future.

In the meantime, and in the absence of NEAFC measures, the Union has regulated the fisheries in ICES Sub-Areas 1 and 2 by setting an overall catch limit of 1500 tons (see https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0703&from=EN).

### 7.2.2 Catch profiles

Cath profile of S. mentella in subareas 1 and 2 is presented in Figure 3

### 7.2.3 Total Allowable Catch (TAC) and catch data

**Table 17 Total Allowable Catch (TAC) and catch data**

| | | | | |
|---|---|---|---|---|
| Total TAC | Year | **2020** | Amount | **55,860 tons** |
| Norway TAC | Year | **2020** | Amount | **36,085 tons** |
| UoA share of Norway TAC | Year | **2020** | Amount | **100%** |
| UoA share of total TAC | Year | **2020** | Amount | **64,59%** |
| Total green weight catch by UoC | Year (most recent) | **2020** | Amount | **33,302 tons** |
| Total green weight catch by UoC | Year (second most recent) | **2019** | Amount | **23,431 tons** |

### 7.2.4 Principle 1 Performance Indicator scores and rationales

## PI 1.1.1 – Stock status

| PI 1.1.1 | | The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Stock status relative to recruitment impairment | | | |
| | Guide post | It is **likely** that the stock is above the point where recruitment would be impaired (PRI). | It is **highly likely** that the stock is above the PRI. | There is a **high degree of certainty** that the stock is above the PRI. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

According to the analyses available in ICES report of the Workshop on the evaluation of harvest control rules for *Sebastes mentella* in ICES areas 1 and 2 (WKREBMSE, ICES 2018b), there is not much evidence of relationship between recruitment and spawners. However, the value of Blim is estimated as the lowest value of biomass observed in the available timeseries (SSB in 1992) as 227 kt. The ICES reference point Blim can be treated as the PRI (see: https://mscportal.force.com/interpret/s/article/Scoring-stock-status-against-Bmsy-for-ICES-stocks-PI-1-1-1-1527262010506). This value can be considred a good proxy of PRI, taking into account that in the following years high recruitments have been observed. The 5% lower confidence intervall of SSB estimated in 2019 is 741,433, which is much higher than Blim (ICES 2020a, b), therefore here is a high degree of certainty that the stock is above the PRI and SG 60, 80 and 100 are met.

| | | | | |
|---|---|---|---|---|
| **b** | Stock status in relation to achievement of Maximum Sustainable Yield (MSY) | | | |
| | Guide post | | The stock is at or fluctuating around a level consistent with MSY. | There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years. |
| | Met? | | **Yes** | **Yes** |
| Rationale | | | | |

An MSY biomass reference point is not available for this stock. However, according with the analyses carried out in the framework of the Workshop on the evaluation of harvest control rules for *Sebastes mentella* in ICES areas 1 and 2 (WKREBMSE, ICES 2018b), the MSY Btrigger is estimated at 315 kt.

According to the MSC interpretation log (https://mscportal.force.com/interpret/s/article/Scoring-stock-status-against-Bmsy-for-ICES-stocks-PI-1-1-1-1527262010506):

> *ICES defines MSY Btrigger (hereafter Btrigger), which should not be interpreted by CABs as a target reference point equal in intent and outcome to BMSY. Rather MSY Btrigger is considered the lower bound of spawning–stock biomass fluctuation around BMSY. It is a biomass reference point that triggers a cautious response (ICES 2016).*
>
> *The guidance states that in ICES assessments, fisheries with B> Btrigger may be regarded as fluctuating around MSY. However, a stock with B>Btrigger is not necessarily at or fluctuating around BMSY. Irrespective of status with respect to Btrigger, CABs must ensure that there is evidence that the stock is 'fluctuating around' BMSY in contrast to recovering towards BMSY.*
>
> *CABs should consider proxy indicators and reference points (SA2.2.3) where BMSY is not defined by ICES. Fishing mortality rate is usually defined and thus should be used in accordance with SA2.2.4 which states that teams shall demonstrate that F has been low enough for long enough to ensure that corresponding biomass levels have been met (SA2.2.4). In ICES stocks, BMSY is assumed to be achieved through consistent maintenance of fishing mortality at or below FMSY. Consistent with requirements in PI 1.1.2a (Rebuilding PI) MSC recommends that to achieve an assumed status of BMSY, F should have been at or below FMSY for at*

*least 1 Generation Time (GT) from a starting point close to Bpa or Btrigger, and 2 generation times from a starting point close to Blim (Carruthers and Agnew 2016), GT is assumed to be given by the proxy GT = AM50 + 1/M, where AM50 is the age at 50% maturity, and M is natural mortality.*

*An 80 score may also be met where stock size is very substantially higher than Bpa, for instance greater than 2 x Bpa (Btrigger) (Froese et al, 2014), irrespective of the above F proxies.*

In the present case the 5% lower confidence intervall of SSB estimated in 2019 is 741,433, which is higher than 2 x Bpa (630 kt). In addition, F was below the F0.1 (FMSY proxy) value for the entire time series (ices 2020a, b). Therefore, there is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years and SG 80 and 100 are met.

## References

ICES. 2018b. Workshop on the evaluation of harvest control rules for Sebastes mentella in ICES areas 1 and 2 (WKREBMSE). June –August 2018, by correspondence. ICES CM 2018/ACOM:52.

ICES. 2020a. Arctic Fisheries Working Group (AFWG). ICES Scientific Reports. 2:52. http://doi.org/10.17895/ices.pub.6050

ICES. 2020b. Beaked redfish (*Sebastes mentella*) in subareas 1 and 2 (Northeast Arctic). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, reb.27.1-2. https://doi.org/10.17895/ices.advice.5826.

## Stock status relative to reference points

| | Type of reference point | Value of reference point | Current stock status relative to reference point |
|---|---|---|---|
| Reference point used in scoring stock relative to PRI (SIa) | *PRI = Blim = $B_{LOSS.}$* | *227* | *886 (SSB in 2019)/227 = 3.9* |
| Reference point used in scoring stock relative to MSY (SIb) | *BMSY = 2 x MSY Btrigger = 2 x Bpa* | *315* | *886/630 = 1.4* |

*Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage*

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 1.1.2 – Stock rebuilding: This PI is N/A since the stock is not depleted.

| PI 1.1.2 | | Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Rebuilding timeframes | | | |
| | Guide post | A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years. | | The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock. |
| | Met? | **NA** | | **NA** |
| Rationale | | | | |

The stock is not depleted.

| | | | | |
|---|---|---|---|---|
| b | Rebuilding evaluation | | | |
| | Guide post | Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe. | There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**. | There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |

The stock is not depleted.

References

-

*Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage*

| | |
|---|---|
| Draft scoring range | N/A |
| Information gap indicator | N/A |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 1.2.1 – Harvest strategy

| PI 1.2.1 | | There is a robust and precautionary harvest strategy in place | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Harvest strategy design | | | |
| | Guide post | The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80. | The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80. | The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

A harvest strategy is defined as the combination of monitoring, stock assessment, harvest control rules and management actions. Monitoring and stock assessment are carried out by ICES (see ICES 2020a), as the review of the HCRs requested by Norway/Russia (see ICES 2018b). ICES has advised on the basis of precautionary considerations that the annual catches in 2021 should be no more than 66,158 tonnes, and catches in 2022 should be no more than 67,210 tonnes. The 47th/50th sessions of the Joint Norwegian-Russian Fisheries Commission decided to follow this advice in setting annual TACs.

Taking into account that the management measures (especially TAC) are following the estimates of ICES assessment and that stock status is improving it is possible to conclude the the HS is responsive the state of the stock and the elements of the harvest strategy work together towards achieving MSY levels. Therefore, SG 60 and 80 are met.

However, the absence of international agreements with EU or other countries rather than Russia in the framework of NEAFC and the use of a less conservative proxy of BMSY (Bpa) as trigger point of management actions, would not suggest that the HS is designed to achieve stock management objectives reflected in PI 1.1.1 SG80. Therefore, SG 100 is not met.

| | | | | |
|---|---|---|---|---|
| **b** | Harvest strategy evaluation | | | |
| | Guide post | The harvest strategy is **likely** to work based on prior experience or plausible argument. | The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives. | The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

As discussed under 7.2.1, ICES in 2018 (ICES 2018b), evaluated the HCRs proposed by Norway and Russia and according to the analyses the SSB development if HCR was introduced in 1992, would keep the stock at high levels (see Figure 9), assuming a constant recruitment. This evaluation is not a full test of the HS but is a further evidence, together with the increase of biomass of the stock, that the HS in place is achieving its objectives (ICES 2020a, b). Therefore, SG 60 and 80 are met.

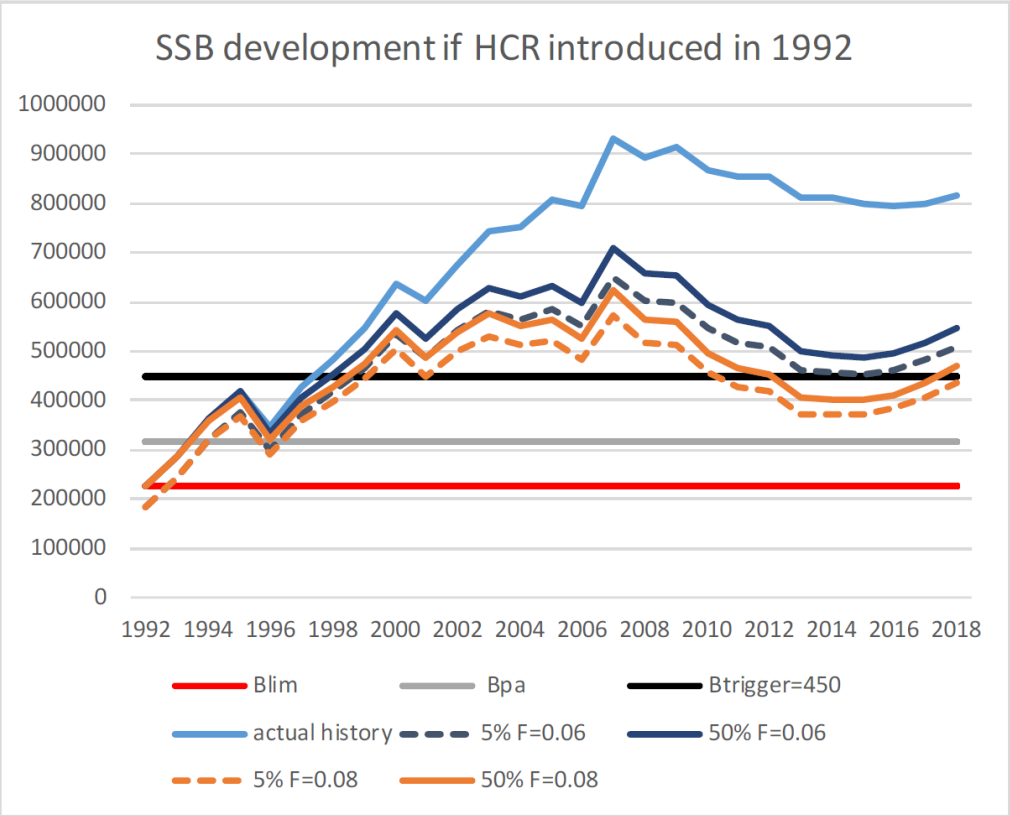



**Figure 9 - SSB development if HCR introduced in 1992, stock dynamics including recruitment un-changed. Source: ICES 2018b**

However, a full evaluation of HS performance under a full Management Stategy Evaluation process, which should consider the risk of TAC overshooting, taking into account the lack of international agreement under NEAFC, is not available. Therefore, SG 100 is not met.

| | | | | |
|---|---|---|---|---|
| **c** | Harvest strategy monitoring | | | |
| | Guide post | Monitoring is in place that is expected to determine whether the harvest strategy is working. | | |
| | Met? | **Yes** | | |
| Rationale | | | | |

Monitoring of the HS is in place and is conducted by ICES as well as in the framework of JNRFC with data collection, stock assessment and evaluation of management measures as summarized in ICES 2020a. Therefore, SG 60 is met.

| | | | | |
|---|---|---|---|---|
| **d** | Harvest strategy review | | | |
| | Guide post | | | The harvest strategy is periodically reviewed and improved as necessary. |
| | Met? | | | **Yes** |
| Rationale | | | | |

The HS has been reviewed both in the framework of ICES (ICES 2018b) and JNRFC (see: https://www.jointfish.com/content/download/512/6950/file/50-norsk.pdf). Therefore, SG 100 is met.

| | Shark finning | | | |
|---|---|---|---|---|
| e | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |

The stock is not a shark.

| | Review of alternative measures | | | |
|---|---|---|---|---|
| f | Guide post | There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |

According with the information available in ICES 2020a (report of Arctic Fisheries Working Group), discard of this stock is negligible and the present PI is not score.

However, during the site visit further information on UoA-related mortality of unwanted catch of the target stock will be requested.

## References

ICES. 2018b. Workshop on the evaluation of harvest control rules for Sebastes mentella in ICES areas 1 and 2 (WKREBMSE). June –August 2018, by correspondence. ICES CM 2018/ACOM:52.

ICES. 2020a. Arctic Fisheries Working Group (AFWG). ICES Scientific Reports. 2:52. http://doi.org/10.17895/ices.pub.6050

ICES. 2020b. Beaked redfish (Sebastes mentella) in subareas 1 and 2 (Northeast Arctic). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, reb.27.1-2. https://doi.org/10.17895/ices.advice.5826.

*Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage*

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought**<br>*More info about UoAs related mortality of unwanted catch of the target stock.* |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 1.2.2 – Harvest control rules and tools

| PI 1.2.2 | | There are well defined and effective harvest control rules (HCRs) in place | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | HCRs design and application | | | |
| | Guide post | **Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached. | **Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs. | The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

HCRs are based on setting TACs taking into account the ICES advice. The TAC is set in the framework of Norway and Russia agreement (see: https://www.jointfish.com/content/download/512/6950/file/50-norsk.pdf). With TACs based on scientific advice, and using an MSY Btrigger. Also specific measures to protect juvenile and regulate the exploitation of the stock as by-catch of other fisheries are in place both in the framework of JNRFC and NEAFC. Therefore, well defined HCRs. Also the fact that a direct fishery was not allowed when the status of the stock was low is an evidence that the exploitation was reduced when PRI was approached and now a precautionary approach is in place, which is keeping the stock above MSYBtrigger. The evidence to supports this is also F being below possible precautionary limits for a long period. Therefore, SG 60 and 80 are met.

However, the lack of international agreement on TAC setting and the advice based on precautionary approach rather than MSY would not determine that the HCRs are expected to keep the stock at level consistent with MSY. Thus, SG 100 is not met.

| | | | | |
|---|---|---|---|---|
| **b** | HCRs robustness to uncertainty | | | |
| | Guide post | | The HCRs are likely to be robust to the main uncertainties. | The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties. |
| | Met? | | **Yes** | **No** |
| Rationale | | | | |

The HCRs are mainly based on the stock assessment outcome carried out by ICES (see ICES 2020a, b). Taking into consideration that ICES uses a no error free model to provide the advice (SCAA) it is possible to conclude that the HCR is robust the main uncertainties as in catch and stock abundance. Therefore, SG 80 is met.

However, taking into account the doubts HCRs implementation due to the lack of international agreement and the doubts about the stock configuration and connectivity, it is not possible to conclude that the HCRs take into account a wide range of uncertainties Therefore, SG100 is not met.

| | | | | |
|---|---|---|---|---|
| **c** | HCRs evaluation | | | |
| | Guide post | There is **some evidence** that tools used **or available** to implement HCRs are | **Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation | **Evidence clearly shows** that the tools in use are effective in achieving the |

| | | | | |
|---|---|---|---|---|
| | | appropriate and effective in controlling exploitation. | levels required under the HCRs. | exploitation levels required under the HCRs. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The tools in use for implementing the HCRs are primarily the TAC, which is adjusted in relation to a precautionary approach based on the reference points previously commented. Moreover, other tools as minimum landing size and additional measures aimed at the protection of juveniles and exploitation by not directed fisheries are implemented and monitored. The evidence that discards are not a problem (see ICES 2020a) and TAC is set in agreement with the ICES advice since 2015, catches have been below TAC in 2015 and 2019 and the fishing mortality is below the FMSY proxy indicate that the tools are appropriate and effective in achieving the exploitation levels required under the HCRs. Therefore, SG 60 and 80 are met.

However, there has been overshoot of the TAC above the target level in the period 2016-2018, due also to the lack of international agreement on TAC setting. Therefore, SG 100 is not met.

References

ICES. 2018b. Workshop on the evaluation of harvest control rules for Sebastes mentella in ICES areas 1 and 2 (WKREBMSE). June –August 2018, by correspondence. ICES CM 2018/ACOM:52.

ICES. 2020a. Arctic Fisheries Working Group (AFWG). ICES Scientific Reports. 2:52. http://doi.org/10.17895/ices.pub.6050

ICES. 2020b. Beaked redfish (Sebastes mentella) in subareas 1 and 2 (Northeast Arctic). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, reb.27.1-2. https://doi.org/10.17895/ices.advice.5826.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 1.2.3 – Information and monitoring

| PI 1.2.3 | | Relevant information is collected to support the harvest strategy | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Range of information | | | |
| | Guide post | **Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. | **Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy. | A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

There is a comprehensive range of information available for the assessment of the stock (see ICES, 2020a, ICES 2018b). Such information is sufficient to support the HCRs taking into account that both fishery dependent and independent data are used in the stock assessment approach employed by ICES. Therefore, SG80 is met

The amount of information is the result of a more than 50 years of research and of a major effort to understand the environmental impacts on the stock (see the review from Planque et al. 2013). Therefore, SG100 is met

| | | | | |
|---|---|---|---|---|
| **b** | Monitoring | | | |
| | Guide post | Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule. | Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule. | **All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

There are a detailed fisheries statistics programmes that cover all removals by commercial fisheries, there is sampling of the landings, there are data from the Norwegian and Russian fleets, and there are several research surveys, which provide good estimates of stock abundance. These data are sufficient to support the HCRs which is based on the advice produced by ICES using such data (ICES 2020a, b). Therefore, SG60 and 80 are met.

In general, there is a good understanding of the uncertainties; the robustness of the assessment is tested at benchmark, most recent in 2018 (ICES 2018a, c) and the robustness of the management is considered as part of the evaluation of the JNRFC agreement. However, the inherent uncertainties in the information related to the stock configuration and the lack of complete coverage of the population by the research survey would not allow to score SG 100 (ICES 2020a).

More information will be requested during the site visit about the monitoring of UoA removals.

| | | | | |
|---|---|---|---|---|
| | Comprehensiveness of information | | | |
| c | Guide post | | There is good information on all other fishery removals from the stock. | |
| | Met? | | **Yes** | |
| Rationale | | | | |

The fisheries statistics programmes covers all fishing in Norwegian waters as well as in EU and Russia waters (see ICES 2020a, 2018a, c). These programmes includes landing statistics, logbooks and VMS surveillance. Therefore, SG80 is met.

## References

ICES. 2018a. Report of the Benchmark Workshop on Redfish Stocks (WKREDFISH). 29 January –2 February 2018, Copenhagen, Denmark. ICES CM 2018/ACOM:34, 174 pp.

ICES. 2018c. Report of the Arctic Fisheries Working Group (AFWG), 18–24 April 2018, JRC, Ispra, Italy. ICES CM 2018/ACOM:06, 857 pp.

ICES, 2020a. Arctic Fisheries Working Group (AFWG). ICES Scientific Reports. 2:52. http://doi.org/10.17895/ices.pub.6050

ICES, 2020b. Beaked redfish (Sebastes mentella) in subareas 1 and 2 (Northeast Arctic). In Report of the ICES Advisory Committee, 2020. ICES Advice 2020, reb.27.1-2. https://doi.org/10.17895/ices.advice.5826.

Planque B., Kristinsson E., Astakhov, A., Bernreuther, M., Bethke, E., Drevetnyak, K., Nedreaas, K., Reinert, J., Rolskiy, A., Sigurðsson, T., Stransky, C. 2013. Monitoring beaked redfish (*Sebastes mentella*) in the North Atlantic, current challenges and future prospects. Aquat. Living Resour. 26 (4) 293-306

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought**<br>*More info about the monitoring of UoA removals* |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 1.2.4 – Assessment of stock status

| PI 1.2.4 | There is an adequate assessment of the stock status | | |
|---|---|---|---|
| Scoring Issue | SG 60 | SG 80 | SG 100 |
| **a** Appropriateness of assessment to stock under consideration | | | |
| Guide post | | The assessment is appropriate for the stock and for the harvest control rule. | The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA. |
| Met? | | **Yes** | **Yes** |
| Rationale | | | |

The analytical assessment is conducted using a statistical catch-at-age model (SCAA) for the period 1992–2019. The stock assessment was reviewed at ICES benchmark (ICES 2018a) and is considered to be based on 'best scientific practice'. The HCRs were also reviewed at WKREBMSE ICES (2018b).

The stock assessment includes the features relevant to the biology of the species (as growth, maturity, natural mortality, etc.) and an integration of a stochastic process model for recruitment-at-age 2, for the annual component of fishing mortalities, and to account for annual changes in fleet selectivities-at-age. In addition, a right trapezoid population matrix, coding of older ages into flexible predefined age-blocks and integrating of data from pelagic surveys in the Norwegian Sea were implemented (ICES 2018a). The purpose of these new features was to reduce the number of parameters to estimate, include new data on the older age fraction of the population and account for possible temporal changes in selectivity linked to changes in the national and international fisheries and their regulations (also relevant to the UoA). Such evidences indicate that the stock assessment process takes into account the major features relevant to the biology of the species and the nature of the UoA. Therefore, SG80 and 100 are met.

| | | | | |
|---|---|---|---|---|
| **b** | Assessment approach | | | |
| | Guide post | The assessment estimates stock status relative to generic reference points appropriate to the species category. | The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated. | |
| | Met? | **Yes** | **Yes** | |
| Rationale | | | | |

The assessment estimates stock status relative to reference points as Blim and Bpa (see ICES 2016). The reference points were analysed and tested in the framework of ICES benchmark (ICES 2018a) and reviewed at WKREBMSE ICES (2018b). Both groups evidenced that reference points are appropriate to the stock. Therefore, SG 60 and 80 are met.

| | | | | |
|---|---|---|---|---|
| **c** | Uncertainty in the assessment | | | |
| | Guide post | The assessment **identifies major sources** of uncertainty. | The assessment **takes uncertainty into account**. | The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

The assessment is based on the SCAA methodology (ICES 2018b, 2020a). This methodology is based on an identification of the major uncertainties – observation variability – and these uncertainties are taken into account by the approach used. Moreover, during the benchmark assessment (ICES 2018a) stochastic long-term simulations were

performed and the following components were considered stochastic: initial stock size, annual stock assessments, recruitment function (independent of SSB). Making these components stochastic were considered, to be sufficient to describe the overall uncertainty in the biological model, uncertainties in weight, maturation, mortality and fishing pattern were thought to be of minor importance in comparison. Therefore, SG 60 and SG 80 is met.

The SCAA methodology provides uncertainty estimates of its parameters with confidence limits, also in the framework of WKREBMSE (ICES 2018b), risk levels of SSB falling below Blim are evaluated taking into account different F and TAC variability (50-year period). Therefore, SG100 is met.

| | Evaluation of assessment | | | |
|---|---|---|---|---|
| **d** | Guide post | | | The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. |
| | Met? | | | **Yes** |
| Rationale | | | | |

The assessment has been reviewed at ICES benchmark (ICES 2018a) and the diagnostics of the model show that the assessment is robust both (see ICES 2018a, 2020a). Alternative approaches using GADGET and production models have been considered both in 2018 benchmark (ICES 2018a) as well as in the previous benchmarks (ICES 2012b). Therefore, SG100 is met.

| | Peer review of assessment | | | |
|---|---|---|---|---|
| **e** | Guide post | | The assessment of stock status is subject to peer review. | The assessment has been **internally and externally** peer reviewed. |
| | Met? | | **Yes** | **Yes** |
| Rationale | | | | |

The ICES system includes peer reviewing at various stages. The working group (AFWG) provides a first review of the assessment, the ICES advice drafting group (ADG) also reviews the outcomes of the assessment. The benchmark system is a full review of the methodologies and the methods themselves are also reviewed. Therefore, SG80 is met.

The ICES benchmark system involve external reviewers, who were involved both during the workshop on the evaluation of harvest control rules for *Sebastes mentella* in ICES areas 1 and 2 (ICES 2018b) and during the benchmark workshop on redfish stocks (ICES, 2018a). Therefore, SG100 is met.

## References

ICES, 2012b, Report of the benchmark workshop on redfish (WKRED). ICES CM 2012/ACOM: 48, 289 p.

ICES. 2016. Advice basis. In Report of the ICES Advisory Committee, 2016. ICES Advice 2016, Book 1, Section 1.2.

ICES. 2018a. Report of the Benchmark Workshop on Redfish Stocks (WKREDFISH). 29 January –2 February 2018, Copenhagen, Denmark. ICES CM 2018/ACOM:34, 174 pp.

ICES. 2018b. Workshop on the evaluation of harvest control rules for Sebastes mentella in ICES areas 1 and 2 (WKREBMSE). June –August 2018, by correspondence. ICES CM 2018/ACOM:52.

ICES. 2018c. Report of the Arctic Fisheries Working Group (AFWG), 18–24 April 2018, JRC, Ispra, Italy. ICES CM 2018/ACOM:06, 857 pp.

ICES, 2020a. Arctic Fisheries Working Group (AFWG). ICES Scientific Reports. 2:52. http://doi.org/10.17895/ices.pub.6050.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## 7.3 Principle 2

### 7.3.1 Principle 2 background

This section focuses on the ecosystem the beaked redfish fishery depends on and the environmental impacts of the beaked redfish fishery activities. In Principle 2, the MSC standard and criteria evaluates the impact of the fishery on a range of ecosystem components, namely: Primary Species, Secondary Species, Endangered Threatened and Protected species, Habitat and Ecosystem.

MSC FCR v.2.2 states that:

***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.*

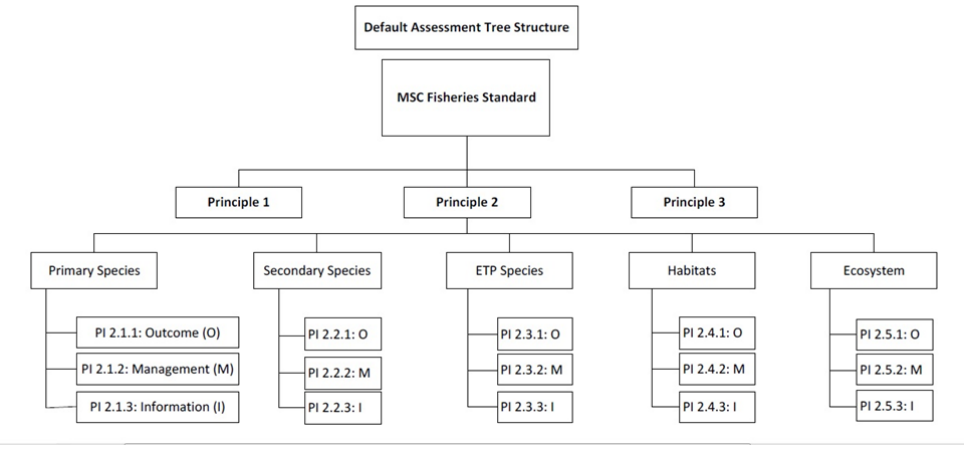



**Figure 10. Diagram of the components included under Principle 2 of the MSC standards and criteria (*Source:* https://www.msc.org)**

To define primary, secondary species and ETP species evaluated under P2, a decision tree from the MSC FCP v2.2 is used (Figure 11 below).

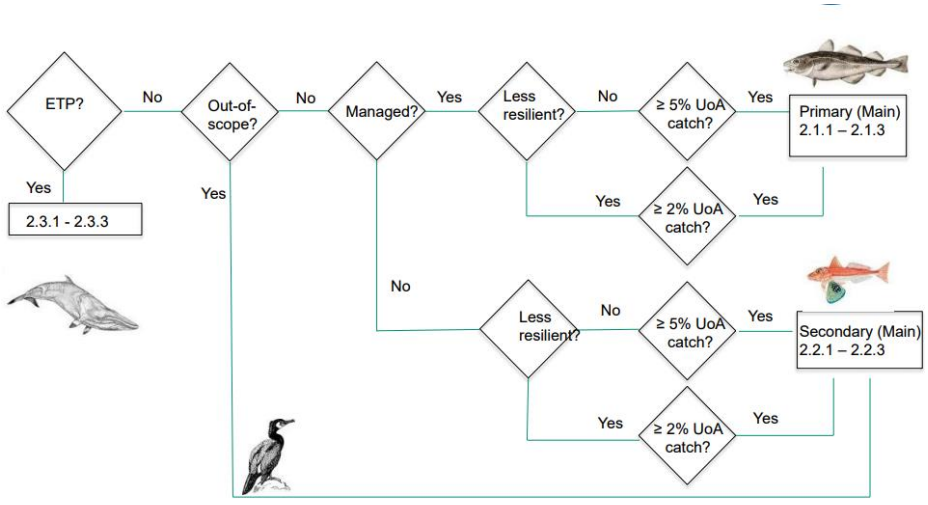



**Figure 11. P2 Decision tree (*Source:* https://www.msc.org)**

Therefore, other than ETP species, any non-target species caught in the fishery is classified depending on a combination of several factors. Each non-target species will thus fall within one of the following categories: Primary main, Primary minor, Secondary main, Secondary minor.

- *Primary main* species are all those fulfilling these requisites: the species has management tools and measures in place (to control exploitation and maintain a stock according to maximum sustainable yield -MSY levels, or target reference points), is resilient and represent at least 5% of the total catch. Or the species is non-resilient but represents more than 2% of the total catch.
- *Primary minor* species are managed and resilient, but fall below 5% of the total catch, or else are managed and non-resilient, but do not reach 2% of the catch.
- *Secondary species* are thus defined as the part of the catch that is (i) not covered by P1, (ii) are not considered primary species and (iii) might be out of the MSC scope but are not assigned as ETP species. Their sub-classification follows the same pattern as with the primary species.

Information on potential resilience of individual species can be obtained from the fishbase website (www.fishbase.de) which includes specific information on a species; size, maturity, fecundity, growth rates, and trophic level.

Under non-target species that are not ETP, the MSC considers two components: Primary and Secondary Species. Table 18 gives the definition of these two components.

**Table 18 Definition of Primary and Secondary Species according to MSC FCP v2.2**.

| Primary Species | Secondary Species |
|---|---|
| • In scope species, e.g. fish and shellfish;<br>• Managed with tools controlling exploitation;<br>• Reference points are in place;<br>• Analytical or empirical derived stock assessment in place. | • Fish and shellfish, and out of scope species (birds, reptiles, amphibians and mammals) that are not ETP species;<br>• Not managed. Reference points are not in place;<br>• No analytical or empirical derived stock assessment in place. |

Catch composition tables serve to identify different scoring elements in the fishery.

Table 19 below gives catch composition of the fishery for years 2016-2020, showing NEA cod and saithe as a main primary species and haddock, Greenland halibut, golden redfish, tusk, and ling as minor primary species. There are no main secondary species. Minor secondary species include Atlantic halibut, Northern wolfish, spotted wolfish, pollack, hake and lesser silver smelt.

**Table 19 Catch composition for UoA 1, for years 2016-2020. Source: Directorate of Fisheries**

| Catch composition | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | | Average 2016-2020 | % Average |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Beaked redfish | 17747,0 | 83,5 | 16063,0 | 91,4 | 18277,2 | 83,8 | 23431,8 | 85,2 | 33302,6 | 81,4 | 21764,3 | 84,3 |
| **NEA cod** | 1062,0 | **5,2** | 696,5 | 4,0 | 1292,0 | **5,9** | 2542,6 | **9,2** | 3489,9 | **8,5** | 1816,6 | **7,0** |
| **Saithe** | 1137,2 | **5,6** | 279,6 | 1,6 | 1069,3 | **4,9** | 713,9 | 2,6 | 1746,8 | 4,3 | 989,4 | 3,8 |
| Haddock | 684,1 | 3,4 | 182,2 | 1,0 | 611,4 | 2,8 | 238,7 | 0,9 | 1694,0 | 4,3 | 682,1 | 2,6 |
| Greenland halibut | 515,2 | 2,5 | 319,5 | 1,8 | 459,8 | 2,1 | 384,0 | 1,4 | 436,0 | 4,1 | 422,9 | 1,6 |
| Golden redfish | 68,6 | 0,3 | 20,6 | 0,1 | 49,5 | 0,2 | 149,3 | 0,5 | 133,6 | 0,3 | 84,3 | 0,3 |
| Spotted wolfish | 30,3 | 0,1 | 13,1 | 0,1 | 21,3 | 0,1 | 25,1 | 0,1 | 62,2 | 0,2 | 30,4 | 0,1 |
| Atlantic wolfish | 1,0 | 0,0 | 1,7 | 0,0 | 13,9 | 0,1 | 6,0 | 0,0 | 24,5 | 0,1 | 9,4 | 0,0 |
| Ling | 5,5 | 0,0 | 0,6 | 0,0 | 1,2 | 0,0 | 1,7 | 0,0 | 4,1 | 0,0 | 2,6 | 0,0 |
| Atlantic halibut | 2,5 | 0,0 | 0,0 | 0,0 | 1,4 | 0,0 | 1,0 | 0,0 | 1,9 | 0,0 | 1,4 | 0,0 |
| Lesser silver smelt | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 2,2 | 0,0 | 0,0 | 0,0 | 0,4 | 0,0 |
| Tusk | 1,0 | 0,0 | 0,0 | 0,0 | 0,7 | 0,0 | 0,9 | 0,0 | 0,0 | 0,0 | 0,5 | 0,0 |
| Other skates and rays | 0,7 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,1 | 0,0 |
| Hake | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,8 | 0,0 | 0,2 | 0,0 |
| Pollack | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,6 | 0,0 | 0,0 | 0,0 | 0,1 | 0,0 |
| Unspecified fish | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 0,0 | 2,8 | 0,0 | 0,6 | 0,0 |
| **TOTAL** | **21.255** | **105** | **17.577** | **100** | **21.798** | **100** | **27.498** | **100** | **40.896** | **100** | **25.805** | **100** |

**Primary species**

**NEA cod**

The beaked redfish fishery takes place in defined fishing grounds as defined in Figure 5. Beaked redfish fishery does not take place inside 12 nm and therefore coastal cod is not present in the catch.

According to ICES 2021 advice for NEA cod, fishing pressure on the stock is at FMSY between Fpa and Flim and spawning-stock size is above MSY Btrigger, Bpa, and Blim.

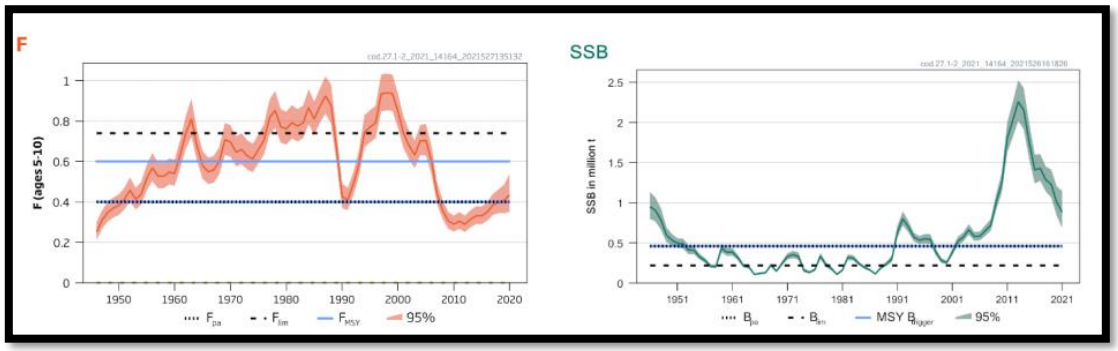



**Figure 12 Cod in subareas 1 and 2 (Northeast Arctic). Fishing mortality and Spawning stock biomass, and related reference points.**

**Table 20 Cod in subareas 1 and 2. Catch distribution by fleet in 2020 as estimated by ICES.**

| Catch (2020) | Landings | | Discards |
|---|---|---|---|
| 692 903 tonnes | 74% demersal trawls | 26 % other gear types | Unknown, but discarding is considered to be negligible |
| | 692 903 tonnes | | |

ICES advises that when the Joint Norwegian–Russian Fisheries Commission (JRNFC) management plan is applied, catches of NEA cod in subareas 1 and 2 for 2022 should be no more than 708 480 tonnes.

Implemented management plan for NEA cod is as follows:

- The TAC is calculated as the average catch predicted for the coming three years, using the target level of exploitation (Ftr).
- The target level of exploitation is calculated according to the spawning-stock biomass (SSB) in the first year of the forecast as follows:
  - if SSB < Bpa, then Ftr = SSB/Bpa × FMSY;
  - if Bpa ≤ SSB ≤ 2×Bpa, then Ftr = FMSY;
  - if 2 × Bpa < SSB < 3 × Bpa, then Ftr = FMSY × (1 + 0.5 × (SSB – 2 × Bpa)/Bpa);
  - if SSB ≥ 3 × Bpa, then Ftr = 1.5 × FMSY; where FMSY = 0.40 and Bpa = 460 000 tonnes.
- If the SSB in the present year, the previous year, and each of the three years of prediction is above Bpa, the TAC should not be changed by more than ±20% compared with the previous year's TAC. In this case, however, Ftr should not be below 0.30.
- In 2014, JNRFC decided that from 2015 onwards, Norway and Russia can transfer to or borrow from the following year up to 10% of their country's quota. ICES evaluated this harvest control rule in 2016 (ICES, 2016a) and 2021 (ICES, 2021a) and concluded that it is precautionary.

**Saithe**

According to ICES 2021 advice on saithe in subareas I and II, fishing pressure on the stock is below FMGT and spawning-stock size is above MSY Btrigger, Bpa, and Blim. ICES advises that when the Norwegian management plan is applied, catches in 2022 should be no more than 197 212 tonnes.

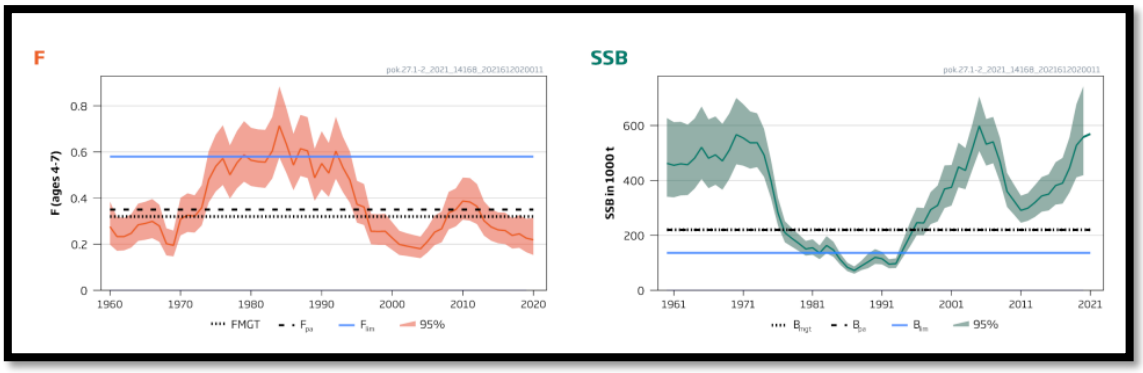



**Figure 13 Saithe in subareas 1 and 2. Historical development of the stock from the summary of stock assessment (weights in thousand tonnes). Source: ICES 2021 advice for saithe.**

The saithe stock is managed under the Norwegian management plan. The harvest control rule (HCR), as revised in 2013 and communicated to ICES by the Norwegian Ministry of Fisheries and Coastal Affairs, contains the following elements:

- Estimate the average TAC level for the coming three years based on FMP = 0.32. The TAC for the next year will be set to this level as a starting value for the three-year period.
- The year after, the TAC calculation for the next three years is repeated based on updated information about the stock development. However, the TAC should not be changed by more than +/− 15% compared with the previous year's TAC.
- If the spawning-stock biomass (SSB) at the beginning of the year for which the quota is set (first year of prediction) is below Bpa, the procedure for establishing the TAC should be based on a fishing mortality that is linearly reduced from FMP at SSB = Bpa to zero at SSB equal to zero. At SSB levels below Bpa in any of the operational years (current year and three years of prediction), there should be no limitations on the year-to-year variations in TAC.

The HCR for saithe was last evaluated by ICES in 2011 (ICES, 2011), with FMP = 0.35. The evaluation concluded that the HCR is precautionary. The FMP was lowered to the current value of 0.32 by Norwegian authorities in 2013. The interbenchmark for this stock in 2014 did not result in significantly different estimates of stock dynamics, and the former HCR evaluation is still considered valid.

Minor primary species in the catch include haddock, Greenland halibut, golden redfish, tusk and ling. Special attention is paid to golden redfish due to its poor stock status.

**Golden redfish**
Golden redfish sums up to a 0.3 % of the total catch. According to ICES 2020 advice for golden redfish there should be zero catch in each of the years 2021 and 2022.

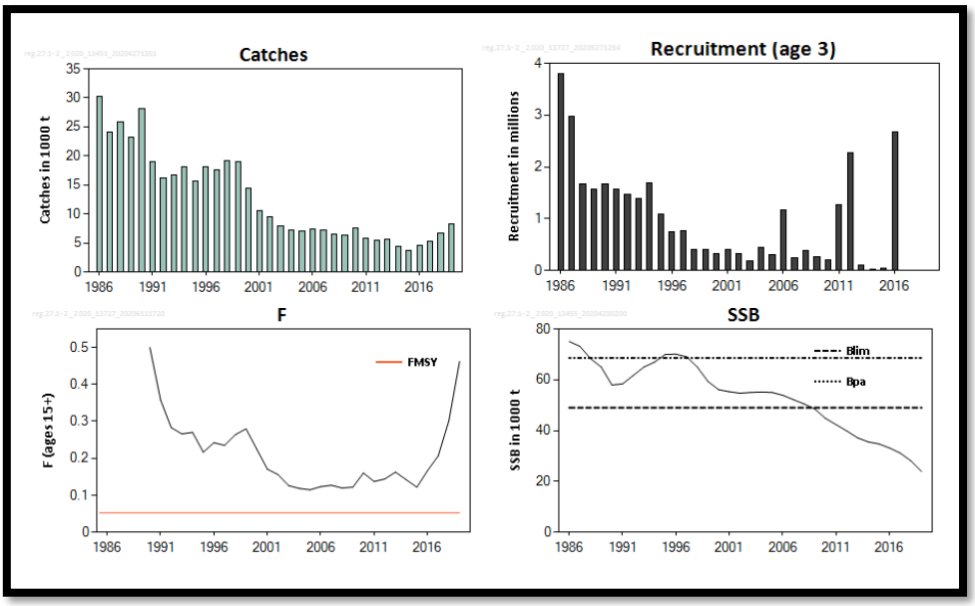



**Figure 14 Golden redfish in subareas 1 and 2. Summary of the stock assessment (weights in thousand tonnes). Recruitment (until 2016 only), fishing mortality, and SSB are shown.**

**Table 21 Golden redfish in subareas 1 and 2. State of the stock and the fishery relative to reference points.**

| | | Fishing pressure | | | | Stock size | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2017 | 2018 | 2019 | | 2017 | 2018 | 2019 | |
| Maximum sustainable yield | $F_{MSY}$ | ✗ | ✗ | ✗ | Above | MSY $B_{trigger}$ | ? | ? | ? Undefined |
| Precautionary approach | $F_{pa}$,$F_{lim}$ | ? | ? | ? | Undefined | $B_{pa}$,$B_{lim}$ | ✗ | ✗ | ✗ Reduced reproductive capac |
| Management plan | $F_{MGT}$ | – | – | – | Not applicable | $B_{MGT}$ | – | – | – Not applicable |

According to ICES 2021 advice on NEA cod, fisheries targeting NEA cod take as bycatch a considerable part of the total golden redfish (*Sebastes norvegicus*) catch, and this bycatch is still above any sustainable catch level. Measures to minimize bycatch levels are essential.

Management measures applying to the golden redfish stock are as follows:

- Prior to 1 January 2003 there were no regulations particularly for the S. norvegicus fishery, and the regulations aimed at S. mentella had only marginal effects on the S. norvegicus stock. After this date, all directed trawl fishery for redfish (both S. norvegicus and S. mentella) outside the permanently closed areas were forbidden in the Norwegian Economic Zone north of 62°N and in the Svalbard area.
- When fishing for other species it was legal to have up to 15% redfish (both species together) in round weight as bycatch per haul and on board at any time. Until 14 April 2004 there were no regulations of the other gears/fleets fishing for S. norvegicus. After this date, a minimum legal catch size of 32 cm has been set for all fisheries, with the allowance to have up to 10% undersized (i.e. less than 32 cm) specimens of S. norvegicus (in numbers) per haul. In addition, a time-limited moratorium (up to 8 months) was enforced in the conventional fisheries (gillnet, longline, handline, Danish seine) except for handline vessels less than 11 metres. From 2016, when trawling outside 12 nm, vessels can have up to 20% by weight of redfish in each catch and upon landing. When trawling inside 12 nm, it is permitted to have up to 10% bycatch.
- Since 2015 it has been prohibited to fish for redfish with conventional gears north of 62°N. The ban does not, however, apply to vessels less than 15 metres fishing with handline during 1 June - 31 August. When fishing with conventional gears for other species, it is permitted to have up to 10% by weight of redfish. Vessels less than 21 metres can still have up to 30% by weight of redfish in the period 1 August to 31 December.
- Bycatch of redfish is calculated in live weight per week.

**Secondary species**

Main secondary species are those species in the catch which comprise more than 5% of the catch (or more than 2% for less resilient species) and with no associated management measures as well as out of scope species which are not categorised as ETP species. According to catch composition tables facilitated by the client for years 2016-2020, there are no main secondary fish species in the UoA. As regards out of scope secondary species, catch composition table show no interactions with these species. Information from IMR high seas reference fleet also show that these interactions are highly unlikely. More information on the population status, research and expected interactions with out-of-scope species is given below (in the ETP section).

As regards minor secondary species, these are unmanaged fish species present in the catch, and include Atlantic halibut, Northern wolfish, spotted wolfish, pollack, hake and lesser silver smelt. There are no reference points for these stocks and they should be evaluated by using the RBF framework.

*Most of the following background information on ETP species, habitats and ecosystem has been taken from the MSC Public Certification Report on Norway NEA offshore cod fishery, by Chaudhury et al, 2021.*

## ***ETP species***

*According to MSC FS v2.01, SA 3.1.5, the team shall assign ETP (endangered, threatened or protected) species as follows:*

- *Species that are recognised by national ETP legislation (such as Norwegian Regulation J-250-2013 protecting basking sharks, spurdogs, porbeagle and silky sharks. It shall be highlighted here that Norway has a Norwegian red list of endangered species which demands the protection of certain species in the Norwegian territory, but which has no specific regulation nor enforcement measures related. Therefore, species enlisted are not necessarily considered as ETP species for the MSC assessment).*
- *Species listed in the binding international agreements given below:*
    - *Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.*
    - *Binding agreements concluded under the Convention on Migratory Species (CMS), including: ii. Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP);*
    - *Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA);*
    - *Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS);*
    - *Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS);*
    - *Wadden Sea Seals Agreement;*
    - *Any other binding agreements that list relevant ETP species concluded under this Convention*
- *Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).*

*Norway has signed several international agreements and conventions on species protection and management of relevance to the Norway beaked redfish fishery:*

- *The Convention on Biological Diversity (CBD);*
- *The Convention on International Trade in Endangered Species of Wild Animals (CITES)*
- *The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention / CMS).*
- *The Agreement on North Atlantic Marine Mammal Commission (NAMMCO).*
- *The OSPAR Agreement, Annex V ("on the protection and conservation of the ecosystems and Biological Diversity in the maritime area"), listing threatened and declining species in the Barents Sea.*
- *Report No. 8 (2005-2006) for species management in the Barents Sea – Lofoten area.*

*Given these guidelines, ETP species to consider are listed in Table 22* ***Error! Reference source not found.****below, which lists ETP species in relation to the Norway beaked redfish fishery in the Barents and Norwegian Seas. Information on the status of those species in the Norwegian red list of species and in the Russian red book of the Murmansk region is given as an indication of the species status and consideration by the affected jurisdictions but does not define the MSC consideration of ETP species.*

***Table 22: ETP species in the Barents Sea and Norwegian coastal waters (LC: Least Concern; NT: Near Threatened). Species in bold are specifically protected by Norwegian Regulation J-250-2013. Source: DNV-GL.***

| *SCIENTIFIC NAME* | *COMMON NAME* | *2015 Norwegian red list* | *Russian red book of the Murmansk region* | | | |
|---|---|---|---|---|---|---|
| | | | | *OSPAR* | *IUCN red list* | *CITES Appendix I* |
| *INVERTEBRATES* | | | | | | |
| *Arctica islandica* | *Ocean quahog* | *N/A* | *N/A* | ***Yes*** | *N/A* | *No* |
| *Nucella lapillus* | *Dog whelk* | *LC* | *N/A* | ***Yes*** | *N/A* | *No* |
| *SEABIRDS* | | | | | | |
| *Fratercula arctica* | *Atlantic puffin* | *Vulnerable* | *N/A* | *N/A* | ***Vulnerable*** | *No* |
| *Pagophila eburnea* | *Ivory gull* | *Vulnerable* | *N/A* | ***Yes*** | *NT* | *No* |
| *Polysticta stelleri* | *Steller's eider* | *Vulnerable* | *Yes* | ***Yes*** | ***Vulnerable*** | *No* |
| *Rissa tridactyla* | *Black-legged kittiwake* | *Endangered* | *N/A* | ***Yes*** | *LC* | *No* |
| *Somateria mollissima* | *Common eider* | *N/A* | *Yes* | *No* | ***Vulnerable*** | *No* |
| *Uria lomvia* | *Thick-billed murre (or Brünnich's guillemot)* | *Critically Endangered* | *N/A* | ***Yes*** | *LC* | *No* |
| *FISH* | | | | | | |
| *Acipenser sturio* | *Sturgeon* | *N/A* | *N/A* | ***Yes*** | ***Critically Endangered*** | ***Yes*** |
| *Alosa alosa* | *Allis shad* | *N/A* | *N/A* | ***Yes*** | *LC* | *No* |
| *Anguilla anguilla* | *European eel* | *Vulnerable* | *N/A* | ***Yes*** | ***Critically Endangered*** | *No* |
| *Carcharhinus falciformis* | ***Silky shark*** | *N/A* | *N/A* | *No* | *NT* | *No* |
| *Cetorhinus maximus* | ***Basking shark*** | *Endangered* | *N/A* | ***Yes*** | ***Vulnerable*** | *No* |
| *Coregonus lavaretus* | *Lavaret* | *LC* | *N/A* | ***Yes*** | ***Vulnerable*** | *No* |
| *Dipturus batis* | *Common skate* | *Critically Endangered* | *N/A* | ***Yes*** | ***Critically Endangered*** | *No* |
| *Lamna nasus* | ***Porbeagle*** | *Vulnerable* | *N/A* | ***Yes*** | ***Vulnerable*** | *No* |
| *Petromyzon marinus* | *Sea lamprey* | *NT* | *N/A* | ***Yes*** | *LC* | *No* |
| *Raja clavata* | *Thornback ray* | *LC* | *N/A* | ***Yes*** | *NT* | *No* |
| *Salmo salar* | *Salmon* | *LC* | *N/A* | ***Yes*** | *LC* | *No* |
| *Squalus acanthias* | ***Spurdog*** | *Endangered* | *N/A* | ***Yes*** | ***Vulnerable*** | *No* |
| *MARINE MAMMALS* | | | | | | |
| *Balaena mysticetus* | *Bowhead whale* | *Critically Endangered* | *N/A* | ***Yes*** | *LC* | ***Yes*** |
| *Balaenoptera acutorostrata* | *Minke whale* | *LC* | *N/A* | *N/A* | *LC* | ***Yes*** |
| *Balaenoptera borealis* | *Sei whale* | *N/A* | *N/A* | *N/A* | ***Endangered*** | ***Yes*** |
| *Balaenoptera musculus* | *Blue whale* | *Vulnerable* | *N/A* | ***Yes*** | ***Endangered*** | ***Yes*** |

| SCIENTIFIC NAME | COMMON NAME | 2015 Norwegian red list | Russian red book of the Murmansk region | | | |
|---|---|---|---|---|---|---|
| | | | | OSPAR | IUCN red list | CITES Appendix I |
| *Balaenoptera physalus* | *Fin whale* | *LC* | *N/A* | *N/A* | ***Endangered*** | ***Yes*** |
| *Cystophora cristata* | *Hooded seal* | *Endangered* | *N/A* | *N/A* | ***Vulnerable*** | *No* |
| *Eubalaena glacialis* | *Northern right whale* | *Regionally extinct* | *N/A* | ***Yes*** | ***Endangered*** | ***Yes*** |
| *Eschrichtius robustus* | *Gray whale* | *LC* | *N/A* | *N/A* | *LC* | ***Yes*** |
| *Hyperoodon ampullatus* | *Northern bottlenose whale* | *LC* | *N/A* | *N/A* | *DD* | ***Yes*** |
| *Megaptera novaeangliae* | *Humpback whale* | *LC* | *N/A* | *N/A* | *LC* | ***Yes*** |
| *Odobenus rosmarus* | *Walrus* | *Vulnerable* | *N/A* | *N/A* | ***Vulnerable*** | *No* |
| *Phocoena phocoena* | *Harbour porpoise* | *LC* | *N/A* | ***Yes (OSPAR regions 2 and 3)*** | *LC* | *No* |
| *Physeter macrocephalus* | *Sperm whale* | *N/A* | *N/A* | *N/A* | ***Vulnerable*** | ***Yes*** |

*Among the fishes, all large elasmobranchs (sharks and rays) are listed at one level of concern or another by the IUCN. Despite the legal requirement not to discard commercial species, most fishing vessels will return large sharks to the sea if they are still alive but some, e.g. basking shark (Cetorhinus maximus) and porbeagle (Lamna nasus), can become enmeshed in gillnets and would be landed.*

*The Norwegian reference fleet collected data on interactions with all different species from years 2015-2018. This data shows that there are interactions with the different fishing gears with elasmobranchs, although not necessarily with protected species. The following table lists elasmobranchs interacted by the reference fleet in waters North 62º both in High seas and in coastal waters.*

***Table 23: Elasmobranchs species interacted by the different vessels in the reference fleet in years 2015-2018. Species considered as ETP species are highlighted in bold. Species are listed according to relative frequency of interactions.***

| Gear type | Fishing area: High seas North 62º | Fishing area: Coastal waters North 62º |
|---|---|---|
| *Bottom trawls* | *Starry skate*<br>*Round skate*<br>*Spinytail skate* | *N/A* |
| *Hooks and lines* | *Starry skate*<br>*Blackmouth dogfish*<br>*Arctic skate*<br>*Velvet belly*<br>*Blue skate*<br>***Spurdog*** | *Velvet belly*<br>*Blackmouth dogfish*<br>***Skates**** *and rays*<br>*Starry skate*<br>***Spurdog*** |
| *Gillnets* | *Blackmouth dogfish*<br>*Starry skate*<br>*Spurdog*<br>*Round skate* | *Blackmouth dogfish*<br>*Starry skate*<br>***Spurdog***<br>*Velvel belly*<br>***Thornback ray*** |
| *Demersal seine* | *Starry skate*<br>***Skates**** *and rays*<br>***Spurdog*** | ***Thornback ray***<br>*Spotted ray* |

** Given the uncertainty in relation to if recorded "Skates" refers to "Common skate" the assessment team has considered all skates recorded as common skates, ETP species.*

*The vessels in the reference fleet (north of 62º North) have not reported any interaction with seabirds or marine mammals. The UoA has not reported such interactions too, nor interactions with protected elasmobranchs.*

*The abundance and distribution of seabirds and marine mammals are monitored as part of the annual IMR–PINRO ecosystem survey (Mauritzen & Klepikovsky, 2013). Both institutions collect information on the presence of ETP species*

*in the Barents Sea through the combined research projects on board research vessels. Besides, PINRO has 5 scientific observers covering Russian vessels in the Barents Sea (with approximately 5% coverage) collecting information on ETP and benthic species in the catch, and IMR collects information through the reference fleet.*

*The Barents Sea has one of the largest concentrations of seabirds in the world (Norderhaug et al., 1977; Anker-Nilssen et al., 2000); its 20 million seabirds harvest annually approximately 1.2 million tonnes of biomass from the area (Barrett et al., 2002). Nearly 40 species are thought to breed regularly in northern regions of the Norwegian Sea and the Barents Sea but just two species (both considered as ETP species) – puffin (Fratercula arctica) and kittiwake (Rissa tridactyla) – account for more than 90% of all breeding seabirds in the region (Christiansen, 2010). The high density of seabirds is a consequence of high primary production and large stocks of pelagic fish species such as capelin, herring and polar cod. In the north and east, the marginal ice-zone is an important feeding habitat where seabirds forage on migrating capelin, polar cod and zooplankton (Mehlum & Gabrielsen, 993, Mehlum et al., 1996). The seabird communities in south and west depend on juvenile gadoids, juvenile herring, sandeels (Ammodytes sp.) and capelin (e.g. Anker-Nilssen, 1992, Barrett & Krasnov, 1996, Barrett et al., 1997, Fauchald & Erikstad, 2002).*

*There is always concern with respect to interactions of static-gear fisheries and seabirds (Fangel et al.2011). The 2009 joint IMR–NINA survey estimated that less than 3000 seabirds (all species combined) were taken in the cod gillnet fishery with comparable numbers in the cod longline fishery (Fangel et al., 2014). While undesirable, these numbers are small relative to the size of the seabird populations in the NEA Arctic. These findings are consistent with the ICES working group on seabird ecology (WGSE, 2014) which has not identified NE Arctic fisheries as specific cause for concern. Furthermore, surveys with a remote electronic monitoring system of gillnet and longline fishing (in the Baltic) found that in >1000 hours of recording during hauling operations, only 136 seabirds were captured (both gears combined) and no marine mammals (WGBYA, 2014). By observation and inference, therefore, these reports would tend to confirm the industry's contention that the capture of seabirds, by any method of fishing, is extremely rare.*

*ICES JWGBIRD 2018 report summarizes the vulnerability of marine bird species and families to bycatch of different gear types, including all gears under assessment. Information on this report is broad and does refer to North East Atlantic however serves as an indicator to Norwegian waters too. According to this report, gillnets and/or hook gears (hand- and longlines) are reported to be the deadliest fishing gears for seabirds. Besides, Bærum et al. (2018) showed that coastal fisheries might represent a more general threat to a wider range of seabird species, as opposed to longline fisheries (e.g. Fangel et al. 2017). It is acknowledged that important gaps remain in the understanding of seabird bycatch (ICES JWGBIRD 2018).*

*The ICES Working Group on Bycatch of Protected Species (WGBYC) identified a number of data sources related to bycatch numbers and fishing effort, but these are often incomplete with regards to seabird bycatch. Specifically related to Norway, "the Norwegian Reference Fleet (NRF), a group of Norwegian fishing vessels contracted by the Institute of Marine Research (IMR), provides detailed information on their fishing activity, to improve stock assessments and fisheries management (https://www.hi.no/hi/tokt/referanseflaten-1 ). The self-reported data collected by the NRF include bycatch of marine mammals and seabirds. This has resulted in a 10-year long time series of seabird bycatch data related to the fishery data from a large fleet of small-scale vessels fishing with gillnets along the Norwegian coast, and enabled estimation of the total bycatch of seabirds in the Norwegian small-vessel gillnet fishery (Bærum et al. 2018).* ***The NRF has proven an effective way of collecting seabird bycatch data****, yet caution is required when interpreting self-reported fisheries information".*

*Detailed information on research and results by the Norwegian reference fleet, including information on species interacted, areas of research, and vessels in the reference fleet can be found at https://www.hi.no/hi/nettrapporter/rapport-fra-havforskningen-en-2020-8 .*

*Information on the distribution and abundance of marine mammals in the Barents Sea is gathered under the auspices of the North Atlantic Marine Mammal Commission (NAMMCO). Twelve species of large cetaceans, five species of dolphins and seven pinniped species have been recorded in the Barents Sea region, plus polar bears (Ursus maritimus). Most of the whales are long-distance migrants but only three species are permanent high Arctic residents – white (beluga) whale (Delphinapterus leucas), narwhal (Monodon monceros) and bowhead whale (Balaena mysticetus). Historically, all of the large whales were hunted but even after 80 years of protection, only scattered individuals of bowhead whale survive near the ice edge. Today, the minke whale (Balaenoptera acutorostrata) is the only whale species being hunted in the region, and only in limited numbers (Stiansen et al., 2009). Demersal fish species, particularly cod (Stiansen et al., 2009) contribute a significant percentage of the minke whale annual diet but, clearly, it is not an obligate predator of gadoids.*

***Table 24: Estimated annual fish consumption (thousand tonnes) by minke whale (1992–1995) and harp seal (1990–1996). 1. The prey species is included in the "other-fish" group. 2. Only Themisto spp. Source: Stiansen et al., 2009***

| Prey | Minke whale consumption | Harp seal consumption | |
|---|---|---|---|
| | | Low capelin stock | High capelin stock |
| Capelin | 142 | 23 | 812 |
| Herring | 633 | 394 | 213 |
| Cod | 256 | 298 | 101 |
| Haddock | 128 | 47 | [1] |
| Krill | 602 | 550 | 605 |
| Hyperiid amphipods | 0 | 304 | 313[2] |
| Shrimp | 0 | [1] | [1] |
| Polar cod | [1] | 880 | 608 |
| Other fish | 55 | 622 | 406 |
| Other crustaceans | 0 | 356 | 312 |
| Total | 1817 | 3491 | 3371 |

*Marine mammal abundance is estimated through counting surveys by NAMMCO. The NAMMCO NASS 2015 surveys (**Error! Reference source not found.** see Figure 15 below) covered the Northern part of the North Atlantic. These surveys include areal sightings and vessel observations.*

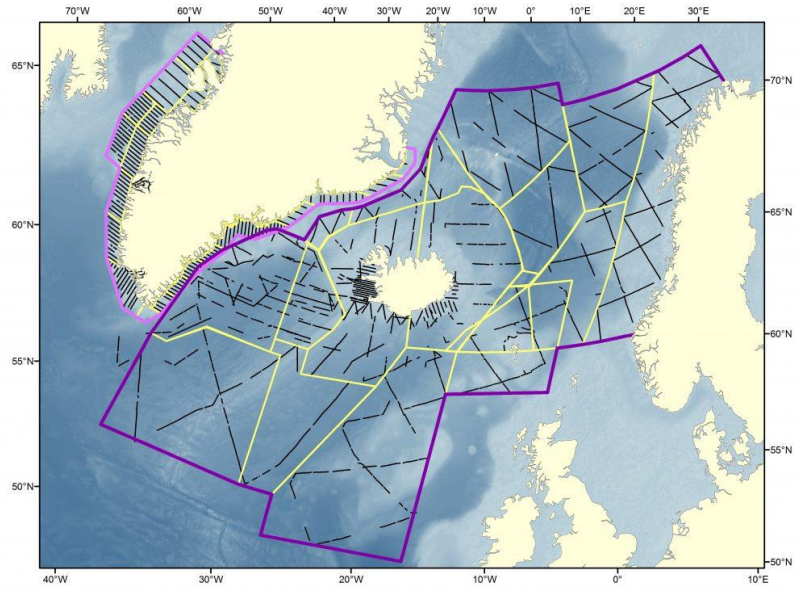



***Figure 15 : Transects that were surveyed during NASS2015. Source: NAMMCO website.***

*The frequency of direct, physical interaction between demersal fishing vessels and large whales is likely to be trivial [dolphins and certainly porpoises (Phocoena phocoena), tend to be more abundant inshore] but there can be direct trophic competition. Trophic competition for pelagic prey species (e.g. herring, capelin) probably occurs on a greater scale between target gadoid species and whales. The demersal fisheries, however, tend to reduce gadoid stock size and hence predation pressure on the pelagic species thereby favouring the cetacean predators rather than increasing trophic pressure. These species interactions are all part of the mosaic of multi-species ecosystem research and modelling undertaken by numerous institutions in the NE Atlantic (e.g. Marine Research Institute, Iceland: Stefansson et al., 1997; CEFAS, UK: Blanchard et al., 2002) and as part of the Barents Sea Management Plan (BSMP, 2006; Stiansen et al., 2009; Arneberg, 2013).*

*The 2014 NAMMCO report expresses concern about the number of harbour porpoise (Phocoena phocoena, ETP species in OSPAR regions II and III, see [https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats](https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats)) taken in the inshore cod (and monkfish) gillnet fishery in Norwegian coastal waters. The numbers of casualties resulting from interactions by those fisheries were at the time estimated to be around 6000–7000 individuals per year (C.V. 30%). In 2017 IMR reported that previous numbers were overestimated and that the current*

*level of by-catch of harbour porpoise in the total Norwegian gill-net cod and monk fishery are around 3,000 individuals annually (Bjørge et al., 2016). The 2016 SCANS-III survey found that the harbour porpoise population was about 467,000 individuals, and in the Northern Norwegian areas (North of 62 N), the estimate was around 25,000 (Hammond et al., 2017). Catch statistics for the different UoAs for years 2017-2019 show no interactions with marine mammals.*

*The Research Council of Norway acts as an observer of the CRISP consortium. The purpose of CRISP (Centre for Research-based Innovation in Sustainable fish capture and Processing technology) is to establish a platform for cooperation where scientists, fishermen, fishing gear manufacturers, and electronic instrument producers will work together to solve these challenges. CRISP is formed by institutions such as the Institute of Marine Research, the University of Bergen, the University of Tromsø, Norges Sildesalgslag and Norges Råfisklag, among others. One of the pillars of this consortium is to work on the development of low-impact and selective fishing gears (http://crisp.imr.no/en/projects/crisp/about-crisp/project-overview). To reduce the impact of gillnets on marine mammals there is research undergoing on the use of deterrent pingers to reduce the undesirable catch of harbour porpoises and other marine mammals. To date, deterrent pingers have been tested in the Vestfjord fishery as a mean to minimise adverse fishery interactions but their utility is still discussed, as harbour porpoise bycatch seems to be reduced with the use of pingers but there seems to be an increase in the bycatch or harbour seals, which may be attracted to the pingers. Further investigation is needed (Bjørge and Moan, 2019).*

*In any case, NFA, IMR and the Fisheries Directorate are pressing to implement the use of pingers on a voluntary basis. Besides, a hearing for J-regulations for mandatory use of pingers in Vestfjorden was published in June 2020 (https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Hoeringer/Forslag-til-tiltak-for-aa-redusere-bifangst-av-sjoepattedyr). Close date for comments was 8th September 2020 (https://www.fiskeridir.no/Yrkesfiske/Nyheter/2020/0620/Hoering-om-tiltak-for-aa-redusere-bifangst-av-sjoepattedyr).*

***Habitats***

*The fishery takes place in the Norwegian and Barents Sea, using semi-pelagic and demersal trawling fishing gear. As mentioned in the background section of Principle 1, 90% of beaked redfish is found at heights in the water column above 10 m from the seafloor. Given the semi-pelagic nature of the fishing gear and that the stock is mostly located above the seafloor interactions with the seafloor are generally not expected for the semipelagic fishing gear, unless cases of gear loss or bad manoeuvre when deploying the gear.* Figure 4 *and* Figure 5 *in Section 7.2.1 show effort distribution by the UoA. Note that demersal trawling can only be used between the red and blue lines marked in* Figure 4 *and* Figure 5*, inside Norwegian EEZ.*

*The Barents Sea area is about 1 600 000 km2 (Carmack et al. 2006). This estimation includes the surface of the different islands in the area (i.e. Svalbard, Franz Joseph Land and the Novaya Zemlya archipelagos and other small islands), which account for more than 81 200 km2 (Terziev 1990).*

*First investigations on Barents Sea benthic species were made more than 200 years ago (Jakobsen T., Ozhigin V., 2011). Since then, both PINRO and IMR have undertaken research in the area through different means. Both institutions have a history of collaboration programs over the years. Since 2003, both institutions participate in an annual Joint Russian-Norwegian ecosystem survey using five research vessels and bottom trawlers. These surveys serve to gather information regarding the abundance of different fish species but also information on hydrographic conditions, endangered species or planktonic or benthic species. Information on the area can be found in the figures and maps below.*

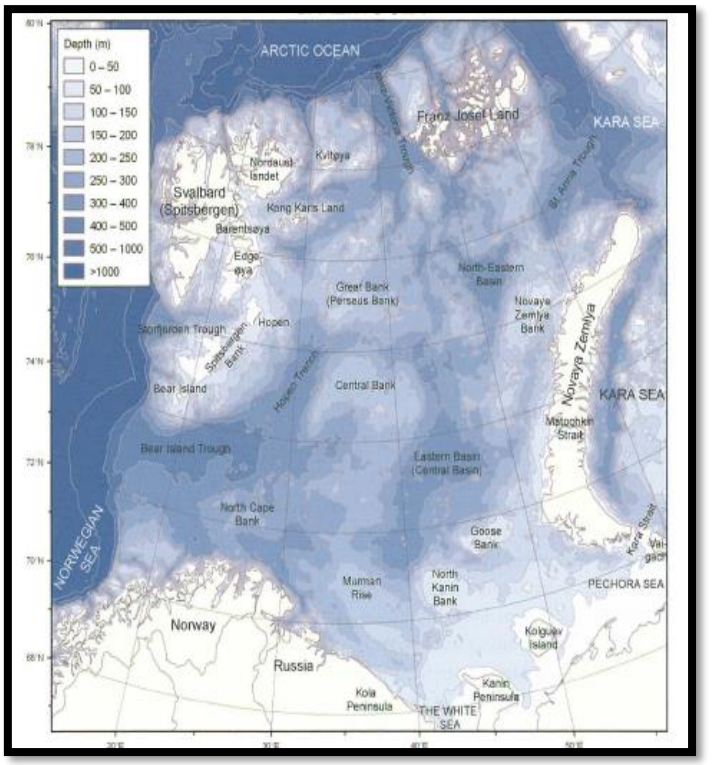



*Figure 16: Barents Sea bottom topography and regional names. Source: Jakobsen T., Ozhigin V., 2011*

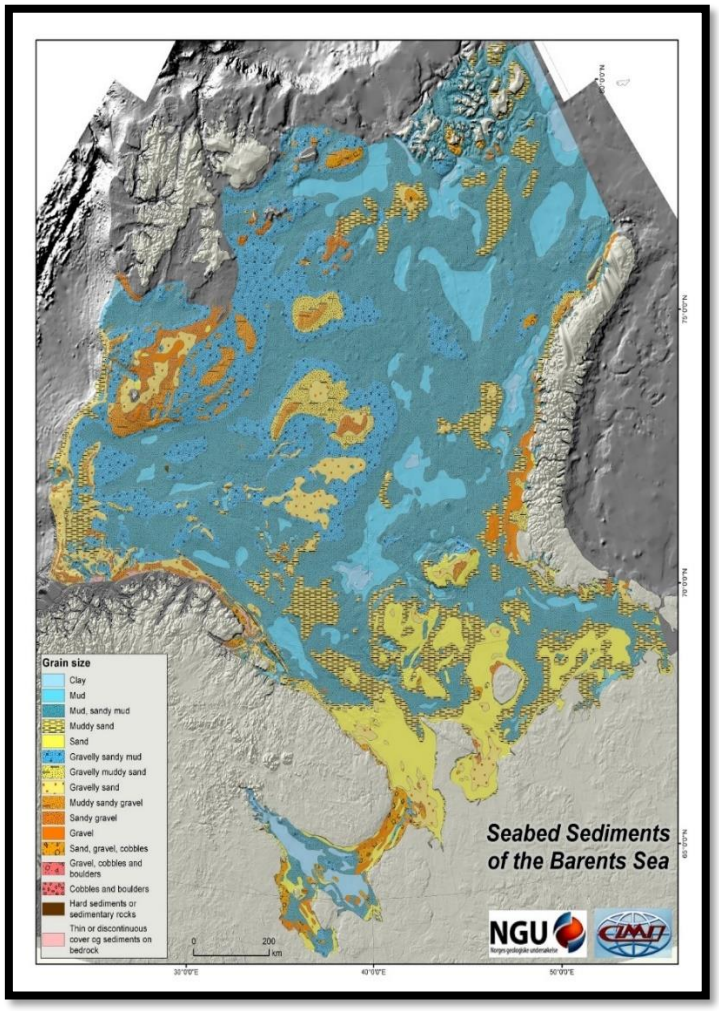


*Figure 17: Seabed sediments of the Barents Sea. The area is dominated by soft sediments such as sandy mud or also by muddy sands, with occasional patches of gravels. There are no hard sediments in the area. Source: Lepland Aivo, Rybalko Aleksandr & Lepland Aave 2014: Seabed Sediments of the Barents Sea. Scale 1:3 000 000. Geological Survey of Norway (Trondheim) and SEVMORGEO (St. Petersburg).*

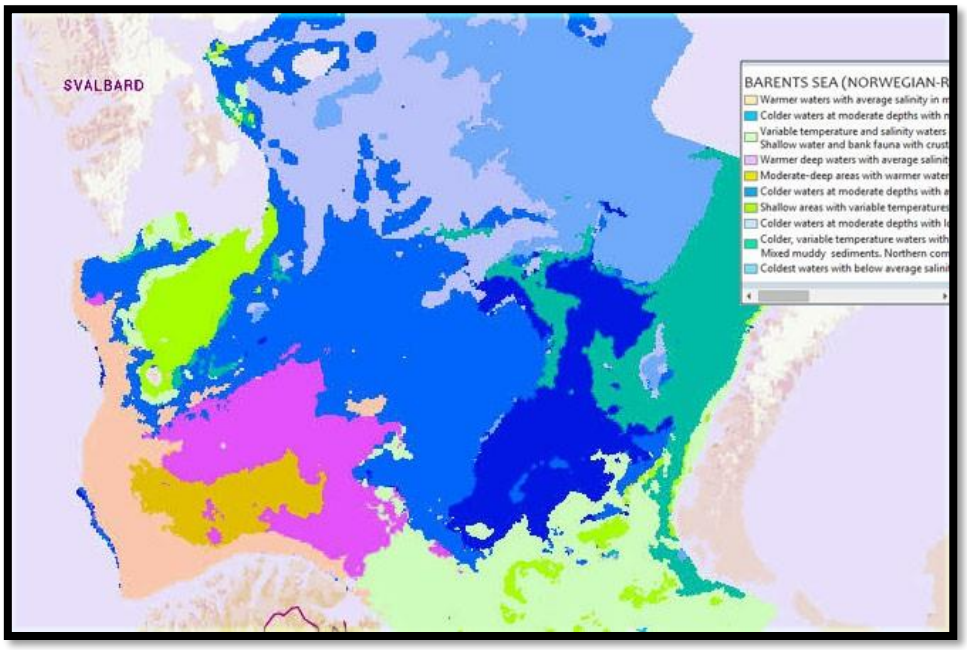



*Figure 18: Biotopes of the Barents Sea. Blue areas represent cold water from the polar front while pink areas represent warmer waters from the Atlantic influx. (Source: www.ngu.no. Dolan, M.F.J., Jørgensen, L.L., Lien, V.S., Ljubin, P., Lepland, A. 2015: Biotopes of the Barents Sea. Scale 1:3 000 000. Geological Survey of Norway (Trondheim), Institute of the Marine Research (Bergen) and Polar Research Institute of Marine Fisheries and Oceanography (Murmansk)).*

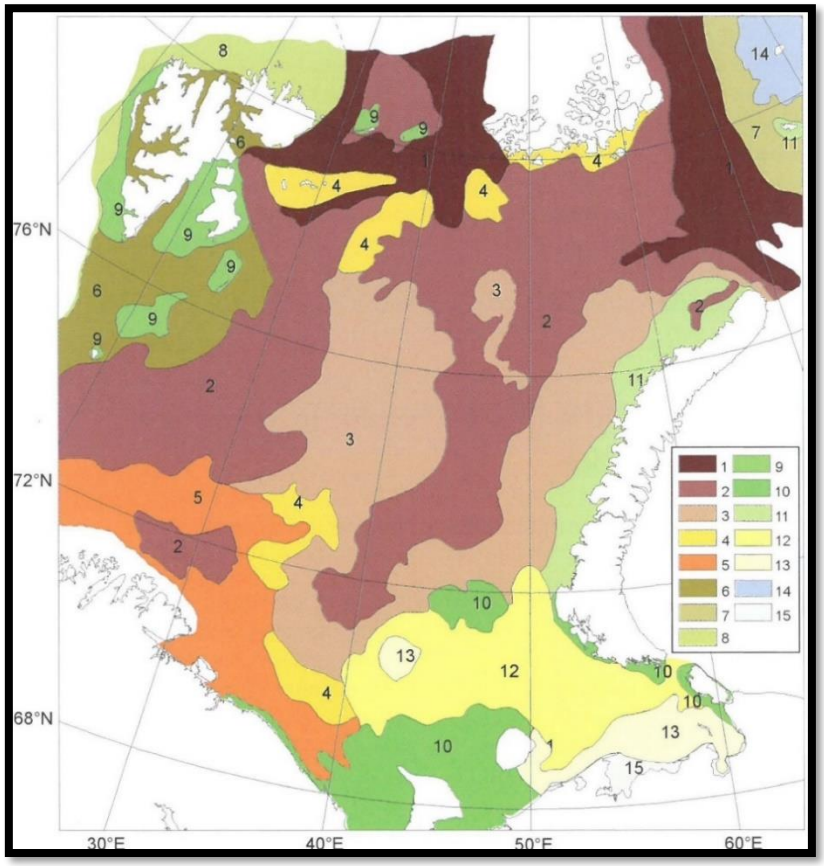


***Figure 19: Distribution of benthic communities in the Barents Sea. Numbers from 1 to 15 represent communities dominated by different species. (Source: Jakobsen T., Ozhigin V., 2011)***
*1 - Ophiopleura borealis + Hormosina globulifera;*
*2 - Polychaeta + Sipunculoidea (Gofjingia spp.);*
*3 - Trochostoma spp.;*
*4 – Elliptica elliptica + Astarte crenata;*
*5 - Brisaster fragilis;*
*6 - soft-bottom community adjacent to Svalbard (Spitsbergen);*
*7 - community of St. Anna Trough slopes;*
*8 - Strongylocentrotus spp. + Ophiopholis aculeata;*
*9 - shallow-water coastal community of sessile filter-feeders adjacent to Svalbard;*
*10 - shallow-water coastal community of sessile filter-feeders on Lithothamnion spp.;*
*11 - shallow-water coastal community adjacent to western coast of Novaya Zemlya and Vise Island;*
*12 -Astarte borealis;*
*13 - Clinocardium ciliatum + Macoma calcarea + Serripes groenlandicus;*
*14- community of bivalves adjacent to Ushakov Island;*
*15 - Macoma balthica.*

*In 2013, over approximately 35 000 km2 of the Barents Sea were affected by bottom trawling by Norwegian vessels in the area, corresponding to circa 1.6% of the ecoregion's spatial extent. The proportion of swept seafloor increased by ca. 1% from 2009 until 2013. As seen below, bottom trawl activity concentrates close to the coastline and in the central Barents Sea. In the International waters of the Loop-hole there is overlap between snow crab pots and bottom trawlers which may bring conflict between fleets. Location of mid-water trawls is shown in red and is in accordance with previously shown in* Figure 4*.*

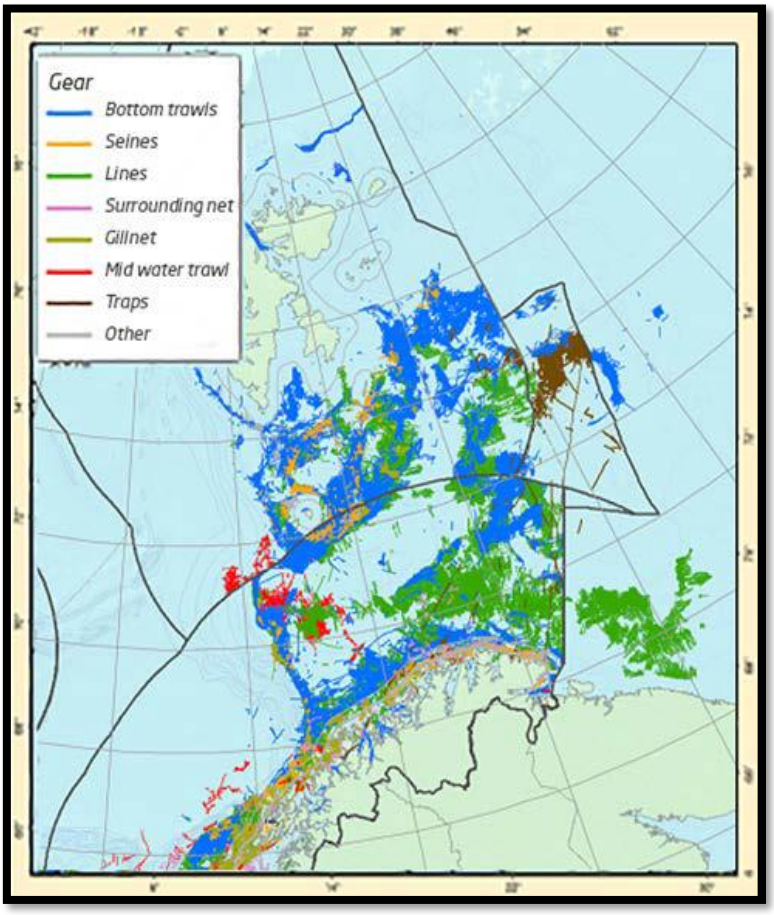



***Figure 20: Location of Norwegian fishing activity in all waters, and non-Norwegian fishing activity within the Norwegian EEZ as reported (VMS) to Norwegian authorities. (Source: Jakobsen T., Ozhigin V., 2011)***

*According to ICES advice, there are certain habitats in the Barents Sea (and in the Northeast Atlantic) at a threatened or declining situation. For MSC certification purposes, these will be considered as Vulnerable marine ecosystems. These habitats include:*

- *Coral gardens*
- *Cymodocea meadows*

- *Deep-sea sponge aggregations*
- *Intertidal mudflats*
- *Lophelia pertusa reefs*
- *Modiolus modiolus beds*
- *Ostrea edulis beds*
- *Seamounts*
- *Zostera beds.*

*NEAFC Recommendation 09/2015 lists which species should be considered as VME indicators when encountered in large fields. These species are listed based on traits related to functional significance, fragility, and the life-history traits of components that show slow recovery to disturbance.*
*NEAFC VME habitat types include the following taxa:*

*1 - Cold water coral reef:*
- *Lophelia pertusa reef*
- *Solenosmilia variabilis reef*

*2 - Coral garden:*
- *Hard-bottom coral garden*
  - *Hard-bottom gorgonian and black coral gardens: Anthothelidae, Chrysogorgiidae, Isididae, Keratoisidinae, Plexauridae, Acanthogorgiidae, Coralliidae, Paragorgiidae, Primnoidae, Schizopathidae.*
  - *Colonial scleractinians on rocky outcrops: Lophelia pertusa, Solenosmilia variabilis.*
  - *Non-reefal scleractinian aggregations: Enallopsammia rostrate, Madrepora oculata*
- *Soft bottom coral gardens*
  - *Soft-bottom gorgonian and black Chrysogorgiidae coral gardens*
  - *Cup-coral fields Caryophylliidae, Flabellidae*
  - *Cauliflower coral fields Nephtheidae*

*3 - Deep sea sponge aggregations*
- *Other sponge aggregations: Geodiidae, Ancorinidae, Pachastrellidae.*
- *Hard-bottom sponge gardens: Axinellidae. Mycalidae*
- *Glass sponge communities Rossellidae, Pheronematidae*

*4 - Seapen fields: Anthoptilidae, Pennatulidae, Funiculinidae, Halipteridae, Kophobelemnidae, Protoptilidae, Umbellulidae, and Vigulariidae*
*5 - Tube dwelling anemone patches: Cerianthidae*
*6 - Mud and sand emergent fauna: Bourgetcrinidae, Antedontidae, Hyocrinidae, Xenophyophora, Syringamminidae.*
*7 - Bryozoan patches*

*The MAREANO program is a comprehensive research program which aims to map Norwegian EEZ seafloor. The program was first launched in 2005 and since then has increased the area covered year by year. Much information about vulnerable habitat types can be found on its website, however, so far, the program has focused on mapping the seabed along the coast of Norwegian mainland (see Figure 21). Mapping of the seafloor in the Barents Sea began some years ago, but the area covered is still small. The identification of certain vulnerable habitats such as coral reefs in the mainland coastline has led to the designation of new marine protected areas in the zone.*

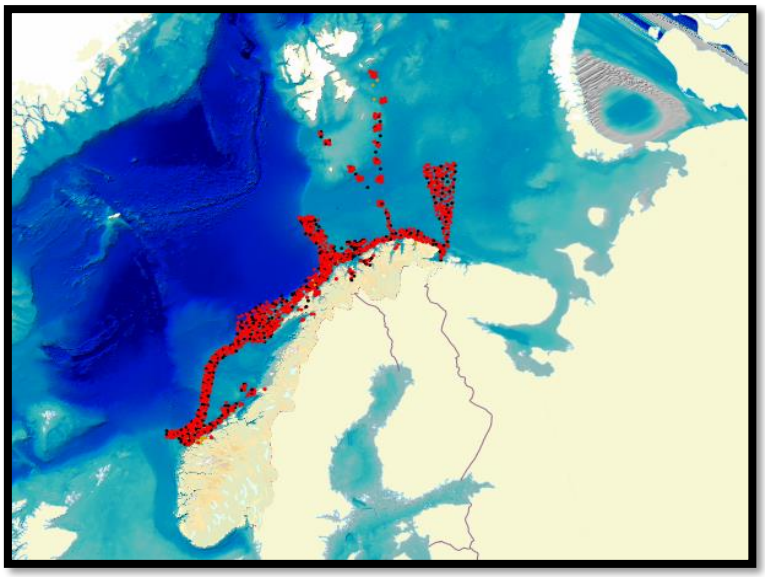


*Figure 21: Area covered by the MAREANO program. Red dots show MAREANO stations. (Source: www.mareano.no)*

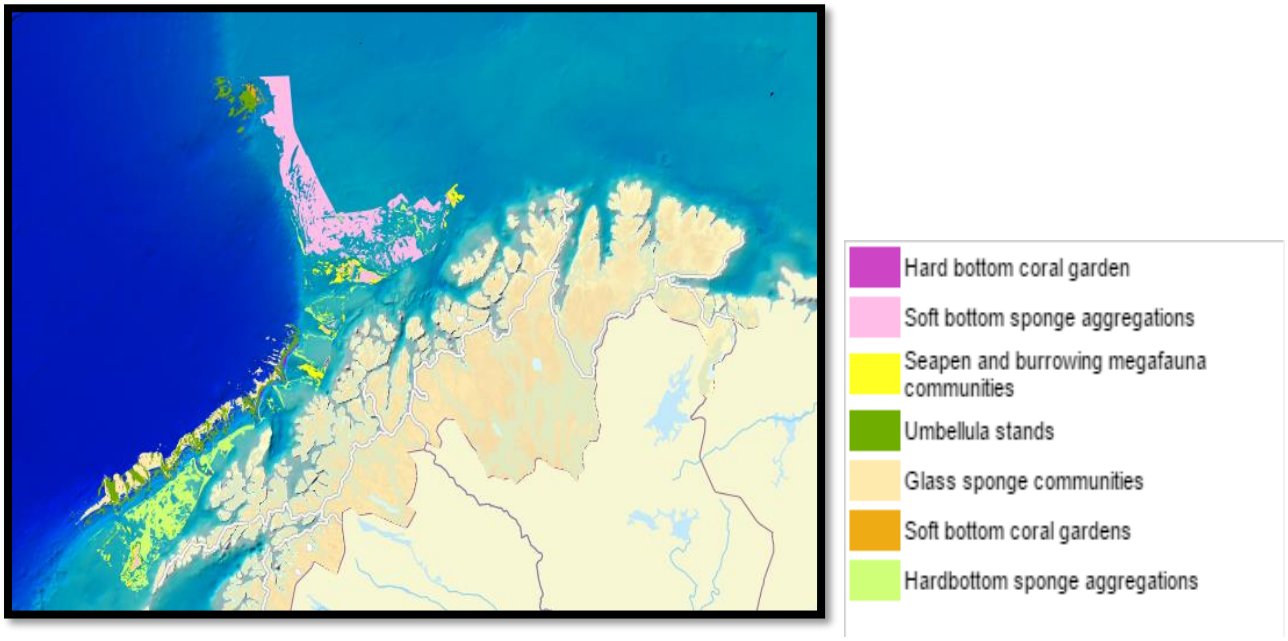



*Figure 22. Vulnerable biotopes as identified by the MAREANO program. Source www.mareano.no*

*Benthic species in the Barents Sea have however been studied by other research institutions such as IMR. Jørgensen et al. (2015) studied data collected in 2011 by bottom trawlers to assess the vulnerability of benthic species to trawling, based on the risk of being caught or damaged by a bottom trawl. This work identified 347 different benthic species in the Barents Sea. Of those, 23 were classified by the research group as "high-risk" species, due to their "large weight and upraised" taxa and the ease of being caught by a bottom trawl. Jørgensen et al. (2015) research focuses on the distribution of these "high-risk" species, some of which are also considered as species indicators of VME by OSPAR and/or NEAFC.*

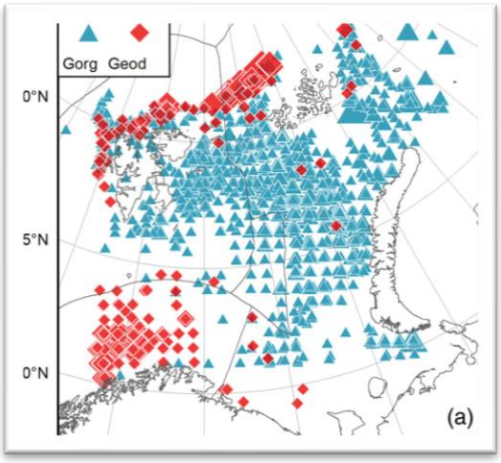
*Table 25: Benthic species present in the Barents Sea with a high risk of catchability, as identified by Jørgensen et al. (2015).*

| | | |
|---|---|---|
| *Arthropods* | *Red king crab* | *Paralithodes camtschaticus* |
| | *Snow crab* | *Chionoecetes opilio* |
| | *Sea spider* | *Colossendeis spp.* |
| *Cnidarian* | *Sea pen* | *Umbellula encrinus* |

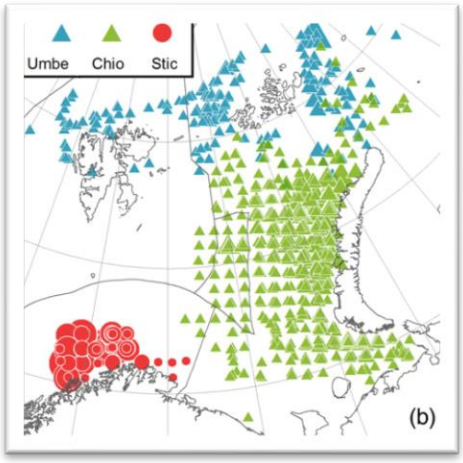
| | | | |
|---|---|---|---|
| | *Nephtheidae corals* | *soft* | *Gersemia spp.*<br>*Drifa glomerata* |
| *Echinoderms* | *Basket stars* | | *Gorgonocephalus arcticus*<br>*Gorgonocephalus eucnemis*<br>*Gorgonocephalus lamarcki* |
| | *Sea cucumbers* | | *Cucumaria frondosa*<br>*Parastichopus tremulus* |
| | *Sea lilies* | | *Heliometra glacialis*<br>*Poliometra prolix* |
| *Molluscs* | *Cephalopods* | | *Bathypolypus arcticus*<br>*Benthoctopus spp.*<br>*Rossia moelleri*<br>*Rossia palpebrosa* |
| | *Sea whelk* | | *Neptunea ventricosa* |
| *Porifera* | *Surface-dwelling sponges* | | *Geodia barrette*<br>*Geodia macandrewii* |
| | *Other sponges* | | *Phakellia spp.*<br>*Haliclona spp.*<br>*Suberites spp.* |

*This study showed that Geodia sponges were dominant in the southwestern Barents Sea, basket stars (Gorgonocephalus) in the northern Barents Sea, sea pen (Umbellula encrinus) on the shelf facing the Arctic Ocean, and sea cucumber (Cucumaria frondosa) in shallow southern areas. Sea pens are associated with the shelf margin in the Arctic and lower slope in Norways EEZ. Of the species mentioned in Table 25 above, Porifera are considered by OSPAR as threatened and declining in the Barents Sea. NEAFC, in Recommendation 09:2015, considers both cnidarian and porifera species as representative of VME.*

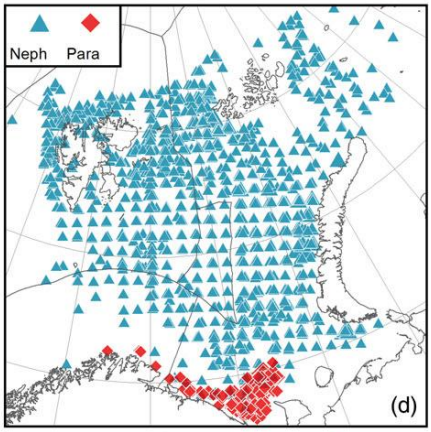
*The following figures show the distribution of cnidarians and porifera as recorded by Jørgensen et al. (2015).*



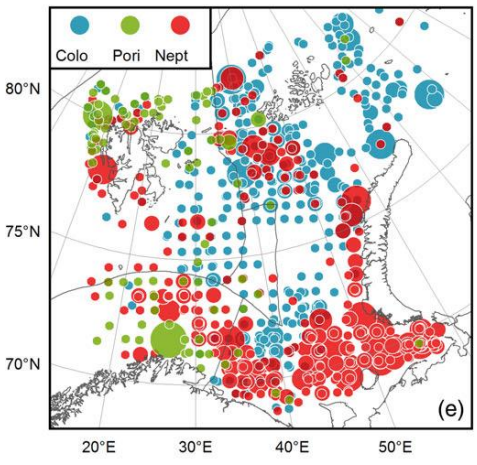

*A: Geodia species are marked in red*




*B: Seapen species are marked in blue*




*D: Soft coral species are marked in blue*




*E: Porifera are marked in green.*

***Figure 23: Distribution (wet weight biomass after 15 min trawling) of benthic species in the Barents Sea. Of those, sponges, seapens and corals are considered as indicator species for vulnerable habitats by NEAFC. Source: Jørgensen et al. (2015)***
*(a) Basket star: Gorgonocephalus spp. (Gorg) and sponges: Geodia spp. (Geod); VME Species are marked in red.*
*(b) Seapens: Umbellula encrinus (Umbe), Snow crab: Chionocetes opilio (Chio), and sea cucumber: Parasticopus spp. (Stic); VME species are marked in blue.*
*(d) Soft coral: Nephtheidae (Neph) and red king crab: Paralithodes camtschaticus (Para); VME species are marked in blue.*
*(e) Sea spider: Colossendeis spp. (Colo), stalked Porifera (Pori: including C. gigantean, S. borealis, Cladohriza spp., Asbestopluma spp.), and Sea whelk: Neptunea spp. (Nept: including N. communis, N. despecta, N. ventricosa, and N. denselirata); VME species are marked in green.*

*Jakobsen and Ozhigin (2011) agree that large aggregations of sponges (e.g. Geodia spp.) can be found along the continental slope from Tromsøflaket and north along the west coast of West Spitsbergen, north of Svalbard (Spitsbergen) and east to Franz Josef Land. Porifera also appears to dominate the communities in terms of biomass north of the Finnmark coast, including the Bear Island Channel, while cnidarians (mainly sea anemones and soft corals) and molluscs are more common the Eastern part of the Barents Sea.*
*Vulnerable bottom habitats in the Barents Sea north of 76°N and around Svalbard have been studied by IMR (Jørgensen, 2017) and described based on an evaluation of:*

- *the complexity of the benthos community (number of species, biomass, number of individuals),*
- *the sensitivity of the benthos community for climate warming (mean temperature preference and temperature tolerance),*
- *how exposed the benthos community are toward being hit/caught by a bottom trawl (height, body weight and mobility of species), and the geographical distribution of possible vulnerable species/species group.*

*The areas which are considered as vulnerable are:*

- *The deep regions on the continental slope around Svalbard*
- *The Yermack Plateau with the slopes*
- *The areas east of Svalbard including*
    - *The area between Nordøstlandet and Kvitøya*
    - *The area around Kong Karls Land*

*Along the delimitation line between Norway and Russian on the Central Bank.*

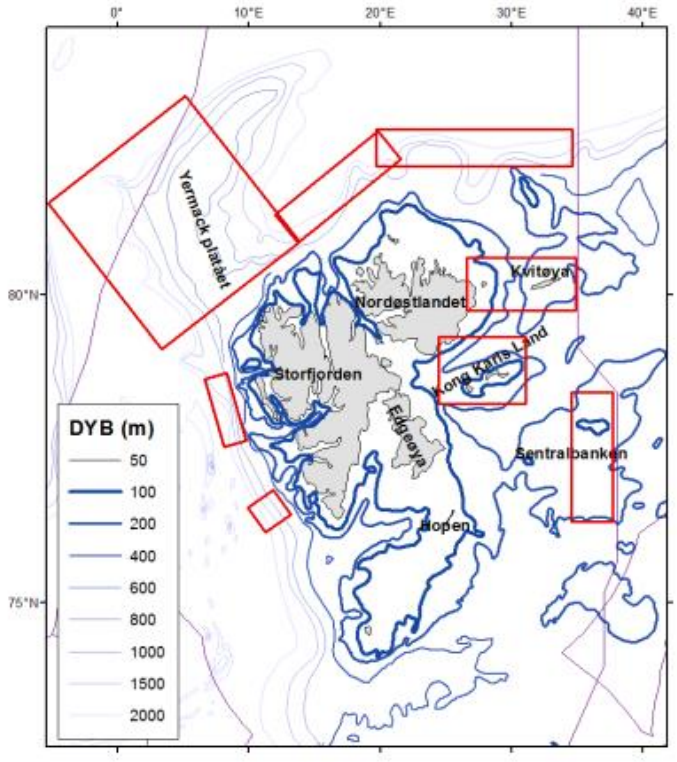


***Figure 24: Vulnerable areas (in red) north of 76°N. The vulnerability is based on the complexity of the benthos-community, sensitivity toward increasing temperature and bottom trawling and the geographical distribution of vulnerable species/species-groups. Source: Jørgensen, L.L. (2017).***

*Denisenko et al (2013) concluded that the Lophelia pertusa coral reefs are mostly located in the south western part of the Barents Sea (Norway EEZ). The distribution of the species is affected by water temperature and hydrological conditions (which do not occur in the Russian EEZ). They agree that largest sponge aggregations are located in the southwest part of the shelf around Banks of Tromso, and that the biomass of sponges is insignificant in the central and Eastern part of the Barents Sea (Denisenko et al, 2013). Fossa et al. (2002) estimated that L. pertusa covered 1500–2000 km2 of seabed in the Norwegian EEZ and that 30–50% of the total reef area had been damaged by demersal fishing. Whether this damage is recent and ongoing or is primarily historical is a moot point at present as such damage will remain virtually undisturbed in these deep stable environments, as indicated by the presence of settled 'marine snow' in some tracks (Hankinson & Ulvestad, 2013). Inevitably, fishing remains a threat to L. pertusa reefs throughout the OSPAR area (Hall-Spencer & Stehfest,2008).*

*Soft corals are widely distributed in the Barents Sea. While most of these species (Gersemia fruticosa, G. rubiformis, Drifa glomerata and Duva florida) need a hard substratum to grow on, Gersemia fruticosa can also lodge on soft sediment. While soft corals are common in all waters in the Barents Sea and are generally taken as bycatch of bottom trawlers, they do not form mass settlements in the open waters of the Barents Sea.*

*Deepwater sponge communities (known to fishermen as ostur) are also widespread, but not always densely populated throughout the Barents Sea (Fig 1.4a; Christiansen, 2010;61 WGDEC, 2014). The ostur communities act as keystone habitat for a wide range of associated species. Klitgaard (1995) found 242 species of epi and in-fauna, of which 115 species were obligate sponge associates. Spicule mats associated with the sponge communities also support increased biomass of macrofauna (Bett and Rice, 1992). The western Barents Sea is well known for mass occurrences of sponges from numerous scientific and fishermen's sources (Klitgaard & Tendal, 2004); between 150 and 350 m depth, sponges of up to 1 m diameter and contributing up to 95–98 % of the local benthic total biomass samples and up to 5–6 kg m–2 were found to occur on sandy and sandy–silty seabed with good water movement. The distribution (presence, or absence), of sponges in the Russian sector has yet to be established in detail comparable with that in the MAREANO area. Such data as have been presented to date suggest that the occurrence sponge communities in the Russian zone of the Barents Sea are few and sparsely distributed (OSPAR, 2008, 2009; Lubin et al., 2013). The greatest abundance of sponge species in the Barents Sea are to be found along the western and northern margins, adjacent to the icefield (Lubin et al., 2013).*

*During MAREANO mapping (and comparable ROV-camera surveys; Hankinson & Ulvestad, 2013) closely spaced trawl-door ruts and traces of trawling have been seen in about 90% of video recordings. In some places with a large number of trawl tracks, large quantities of sediments were observed on the surface of sponges, and unattached sponges had collected in the trawl ruts. Self-evidently, direct trawl-gear impact will damage and break sponge colonies but aquarium experiments show that damage can be healed relatively fast (Hoffmann et al. 2003)65 and sponges have been found to regrow quite rapidly within the Barents Sea (Hankinson & Ulvestad, 2013). Nevertheless, the size structure within sponge populations indicates slow reproduction and recruitment, and high age of the large specimens. No exact aging has so far been done but comparable size structure investigations in Antarctica point to decades if not centuries (Dayton 1979;66 Gatti 2002).67 Consequently, it is assumed that it will take a long time for a sponge dominated area to recover even after partial destruction.*

*The distribution of seapens has been studied by the MAREANO program. Figure 25 below shows the relative abundance as observed during field surveys (2006-2017). Umbelulla incrinus forms dense aggregations on soft sediments in the northeastern part of the Barents Sea near Saint Anne's trench. Again, according to Denisenko et al (2013), benthic biomass in this southern region is considerably lower than in the northern region, however this does not affect food supply for fish species.*

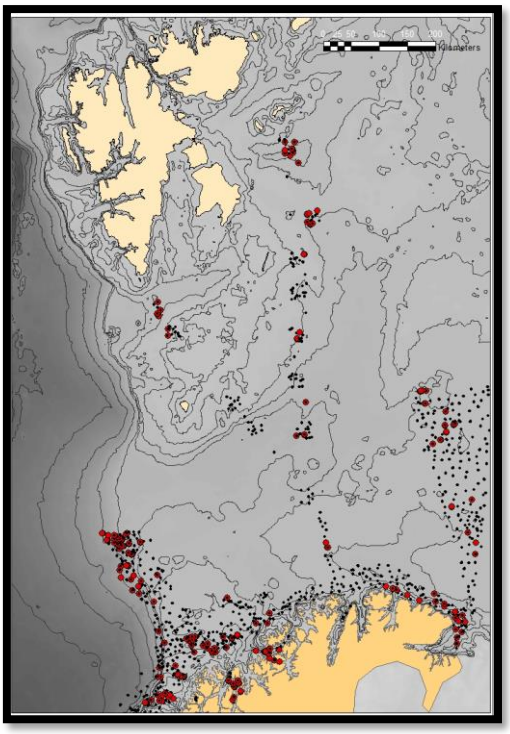


***Figure 25: Relative abundance of sea pens (red dots) observed by MAREANO during field surveys from 2006 until 2017. Black dots indicate locations where the seabed has been surveyed and no seapen has been observed. (Source: www. MAREANO.no)***

*Sessile animals such as sea pens which project above the sediment surface are clearly likely to be damaged or uprooted by the passage of a trawl. As suspension-feeders, sea pens may require a certain degree of water movement, and more favourable conditions for growth may exist where local hydrography is modified by irregularities in the sea floor. In Loch Fyne, Virgularia was scarce on the deeper muds irrespective of whether or not these were trawled (Howson & Davies, 1991). At shallower depths where the species was more abundant, densities were similar at untrawled (3 - 4 individuals m-2) and trawled (2 - 7 m-2) sites. Howson & Davies concluded that there was no clear evidence that trawling had affected Virgularia densities in Loch Fyne. The resilience of Virgularia to trawling is supported by the findings of Tuck et al. (1998), who found no changes in density in a sea loch following experimental trawling carried out repeatedly over an 18-month period http://www.ukmarinesac.org.uk/communities/seapens/sp5_1_1.htm#a3 )*

*There are a number of management measures which are already implemented in the Barents Sea in order to protect habitats:*

- *Avoidance of coral reefs and sponges by the fishing industry, as towed-gear vessels avoid coral because of the damage it can do to the gear and sponges crush the fish and makes the catch commercially worthless. There is also the risk of trawls bursting with concomitant loss of fishing time for repairs or (high-cost) replacement. Vessels engaged in the current fishery have the technology (high precision GPS navigation and ground-discrimination echo sounders which can distinguish between mud and sand or hard rock, coral and sponges) that enables them to skirt around and avoid known VME areas.*
- *Mandatory use of satellite monitoring (VMS – vessel monitoring system) which serves to verify that large vessels do not enter Marine Protected Areas (MPAs), as confirmed by the Norwegian Directorate of Fisheries.*
- *Trawling is forbidden within the majority of the 12- nautical mile limit from Norwegian baselines (in some instances, this limit is set at 6 nautical miles).*
- *Fishing below 1000 m within the Norwegian EEZ is banned in order to protect deep-water sensitive habitats and species.*
- *Norwegian regulation J-61-2019 regulating bottom gears to protect vulnerable marine ecosystems. (https://fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/J-meldinger/Kommende-J-meldinger/J-61-2019)This regulation applies to all the Norwegian EEZ including waters in the Barents Sea;and establishes that when a trawl vessel catches more than 30 kgs of coral or 400 kg of sponges in a single haul, the vessel shall stop fishing and move position at least 2 nautical miles in order to avoid such catches. The incident must be reported to the Directorate of Fisheries. According to this regulation, when fishing in a "new fishing area" in the Norwegian EEZ*

*or the Svalbard FPZ, vessels must have a special permit from the Directorate of Fisheries. These are only approved by the Directorate if the vessel has submitted for approval:*
  - *A detailed protocol for trial fishing which includes a fishing plan for fishing gear, fish stocks, by-catches, time and areas.*
  - *A plan to avoid damage to sensitive marine ecosystems.*
  - *A plan for journal entry and reporting.*
  - *And a plan for collecting data on vulnerable habitats.*
- *Regulation J-61-2019 also establishes the limits of 10 closed areas (MPAs) in order to protect VMEs. See Figure 26 below. Similar measures on the protection of corals and sponges is recommended in NEAFC waters, where Recommendation 19/2014 establishes threshold limits for bycatch of corals and sponges.*
- *NEAFC commission meets annually and decides, when necessary, on the establishment of area closures, as done in other NEAFC waters. To date, NEAFC has not identified any need for area closure in the Loophole area (http://www.fao.org/fishery/topic/16204/en).*
- *While not specifically designed for the protection of benthic habitats, Russian Regulation 414 (2014), articles 16 and 17, describes the position of 5 area closures in the Russian EEZ in order to protect juvenile fish.*

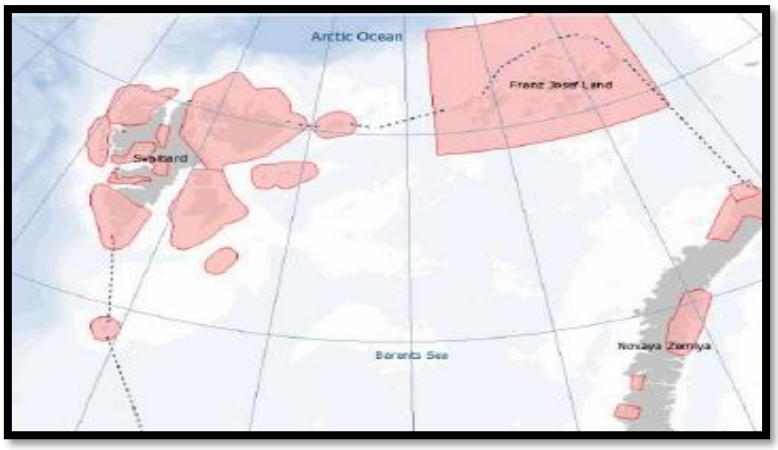



***Figure 26: Marine Protected Areas in the Barents Sea. Source: www.barentsportal.com***

*The Norwegian Biodiversity Information Centre has designed a Red list of vulnerable ecosystems and habitats in Norway. This list includes 16 marine areas which are categorised from Data Deficient to Critically Endangered. Table 26 lists the vulnerable habitats as described by the Norwegian Biodiversity Information Centre.*

***Table 26: List of vulnerable and endangered marine habitats and ecosystems as categorised by the Norwegian Red List of vulnerable ecosystems and habitats. Source: https://www.artsdatabanken.no/rodlistefornaturtyper***

| Area | Type of area | Classification |
|---|---|---|
| *Pigtail coral forest bottom* | *Marine deep water* | *Endangered* |
| *Bamboo coral forest bottom* | *Marine deep water* | *Endangered* |
| *Cold water basins* | *Marine shallow waters, Svalbard* | *Endangered* |
| *Arctic lagoon* | *Marine shallow waters, Svalbard* | *Data Deficient* |
| *Polar sea Ice* | *Marine shallow waters, Svalbard* | *Critically Endangered* |
| *Isskurt sublitoral bottom* | *Marine shallow waters, Svalbard* | *Vulnerable* |
| *Isskurt litoral bottom* | *Marine shallow waters, Svalbard* | *Vulnerable* |
| *Brakk hard bottom springs* | *Marine shallow waters, Svalbard* | *Data Deficient* |
| *Rulg bottom* | *Marine shallow waters, Svalbard* | *Data Deficient* |
| *Brakk sand and gravel floor* | *Marine shallow waters, Svalbard* | *Vulnerable* |
| *Shallow sandy bottom* | *Marine shallow waters, Svalbard* | *Data Deficient* |
| *Northern sugarcane forest* | *Marine deep water* | *Endangered* |
| *Southern sugarcane forest* | *Marine deep water* | *Endangered* |
| *Northern fingertip bottom* | *Marine deep water* | *Vulnerable* |
| *Exposed mussel bottom* | *Marine deep water* | *Vulnerable* |
| *Rugl bottom* | *Marine deep water* | *Data Deficient* |

*According to Kaiser et al. (2006), bottom trawling does not irreversibly affect soft bottoms such as sandy and muddy grounds. However, there is still a clear and negative relation between fisheries-intensity and density of mega benthos (Jakobsen T., Ozhigin V., 2011).*

*Large epifauna species such as echinoderms, sponges, gorgonian corals, soft corals, large snails and bivalves are examples of groups of animals found in trawl bycatches. Sponges, seapens, ophiurids and sessile polychaetes remaining in the seafloor show a clear negative relationship between their biomass and trawling intensity in the area. Specifically, sea pens have the ability to bend under pressure and some can retract into their burrow in response to hydrodynamic pressure clues. Those that cannot bend may be cut down by bottom-contact ground gear, including Danish seine footropes as the net closes but probably not by a rock-hopper foot rope that is 25–30 cm clear of the seabed (i.e. the axis of 21–24 inch wheels). Even if they are not cut down, they can still be damaged by passage of the gear. Other species such as Asteroidea spp. show a positive response to trawling.*
*WWF Russia, developed, in 2013, a map of the minimum recovery time for habitats in the Barents Sea. The map was made based on the assumption that the duration of community recovery is determined by the average life expectancy of the most long-lived species in the community. On this basis, a community cannot be considered fully recovered prior to the time that the longest-living member completes its entire life cycle. According to the map, recovery after bottom trawling would take place within 5 years in most parts of the Barents Sea, but recovery would be up to 10 years or more in the areas where VMEs tend to occur.*

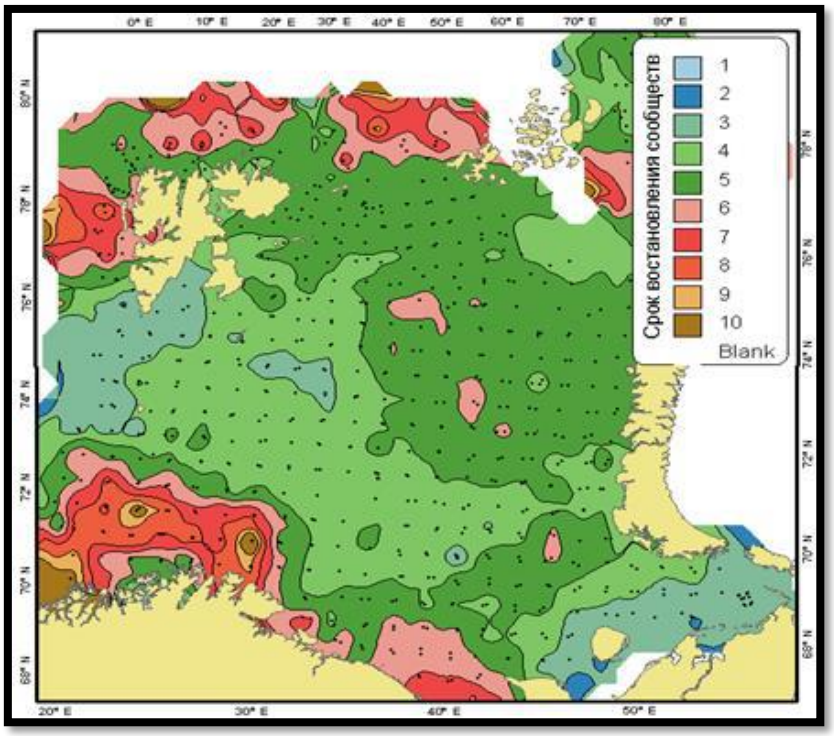



***Figure 27: Map of the minimum recovery time (years) in the Barents Sea. Different colours show the community recovery time in years. (Source: Lubin 2013 (from Denisenko S.G. and Zgurovsky, K.A. 2013. Impact of trawl fishery on benthic ecosystems of the Barents Sea and opportunities to reduce negative consequences. Murmansk. WWF. 2013. 55pp.)***

*Other authors have also tried to estimate the recovery time for different species after trawling (Buhl-Mortensen et al., 2015). Benthic infauna communities might take at least 18 months to recover (Tuck et al. 1998). Macrobenthic invertebrates (molluscs, crustaceans, annelids and echinoderms) may take 1-3 years to recover (Desprez, 2000). Large sessile fauna takes from years to decades to recover. Indirect evidence (Pitcher 2000, and Sainsbury et al. 1997) suggests that large sponges probably take more than 15 years to recover.*
*However, some regions have already been trawled for more than a century, which has led to a loss of biodiversity in the modified areas where vulnerable species are less abundant.*
*Trawling impacts have also been accompanied by natural spatial and temporal variations in water temperature and ocean currents. Full recovery of vulnerable species in those habitats is not expected to take place in a short time frame but avoiding future damage in unexplored areas should be easier to control. In any case, trawl-modified habitats continue to offer nutrients for ecosystem needs, regardless showing lower biodiversity.*

*The interaction of fishing gears with seabed habitats and species varies considerably with specific details of the gear and location (e.g. not all trawls will have the same effect on a given habitat, not least because the rig of the ground gear – doors, sweeps and footrope – may not be suitable for a particular substratum; Lokkeborg, 2005). In recent years there have been a plethora of specific studies and examples have been reviewed by Hall (1999) and Kaiser & de Groot (2000).*

*Specifically, semi-pelagic trawling gears such as the one under assessment are not expected to have any significant impact on the seafloor.*

***Ecosystem***

*The Barents Sea is one of the shelf seas surrounding the Polar basin. It covers an area of approximately 1 600 000 km2 (Carmack et al. 2006), has an average depth of ca. 230 m, and a maximum depth of about 500 m at the western end of Bear Island Trough (ICES 2016 AFWG Report). It connects with the deeper Norwegian Sea to the west, the Arctic Ocean to the north, and the Kara Sea to the east (Figure 28 below). It is delimited by mainland Russia and Norway in the South, Svalbard Islands in the East, Novaya Zemlya Islands to the West, and the Franz Josef Land Islands to the North. Atlantic waters enter the central Barents Sea through the western troughs between the Svalbard archipelago and the Norwegian coastline.*

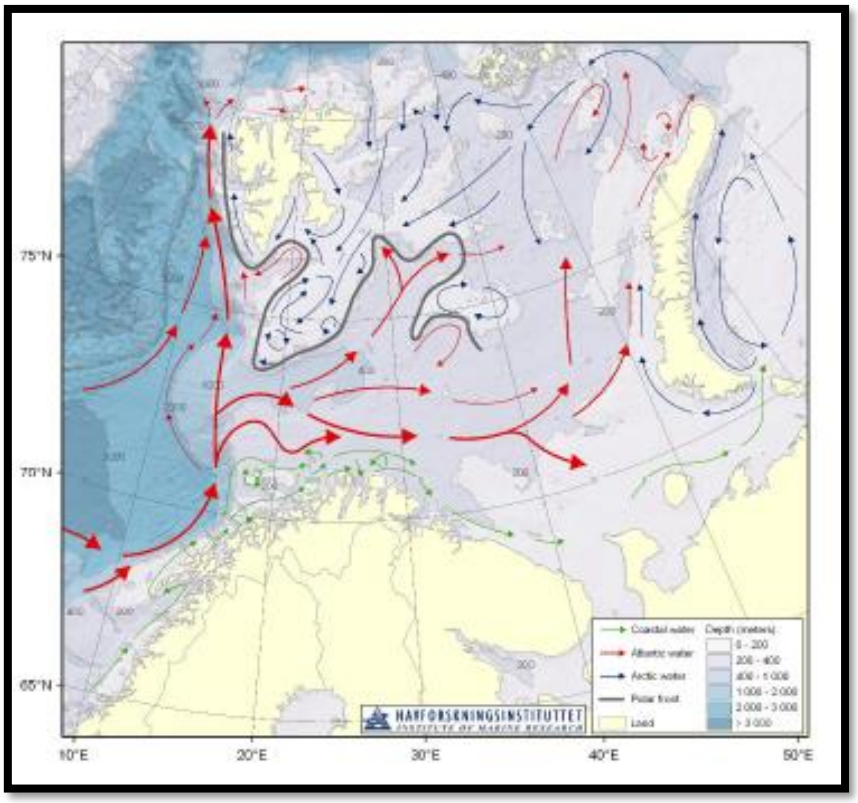



*Figure 28: Water circulation in the Barents Sea. (Source: ICES AFWG REPORT 2016)*

*Ocean circulation in the Barents Sea is influenced by the region's topography and is characterized by inflow of relatively warm Atlantic water, and coastal freshwater from the west. Atlantic waters later divide into two branches, one going East and one going North. In the northern region, colder Arctic waters flow from northeast to southwest. Atlantic and Arctic water masses are separated by the Polar Front, which is characterized by strong gradients in both temperature and salinity. In the western Barents Sea the front position is stable, while in the eastern Barents Sea the front position varies seasonally and inter-annually. Variations in large-scale atmospheric circulation leads to changes in upper ocean circulation, ice extent and hydrographic properties of the water column. Ice cover also has a strong seasonal and inter-annual variation, ranging from almost ice-free conditions to covering more than half the sea. In the last 40 years, there has been a general decreasing trend in ice coverage in the Barents Sea. Distribution of phytoplankton, zooplankton and fish species have moved North as these waters get warmer. Other responses of the Barents Sea to climate change and ocean acidification are still to be observed.*
*The last decade was the warmest on record, with the highest temperatures in 2007 and 2012. In 2015 the surface temperature was on average 1.2°C higher than the long-term mean for the period 1931–2010 almost all over the Barents Sea Figure 29 below). Water masses get stratified during the springtime, and after that primary production increases leading to a spring bloom (ICES 2016 AFWG Report).*

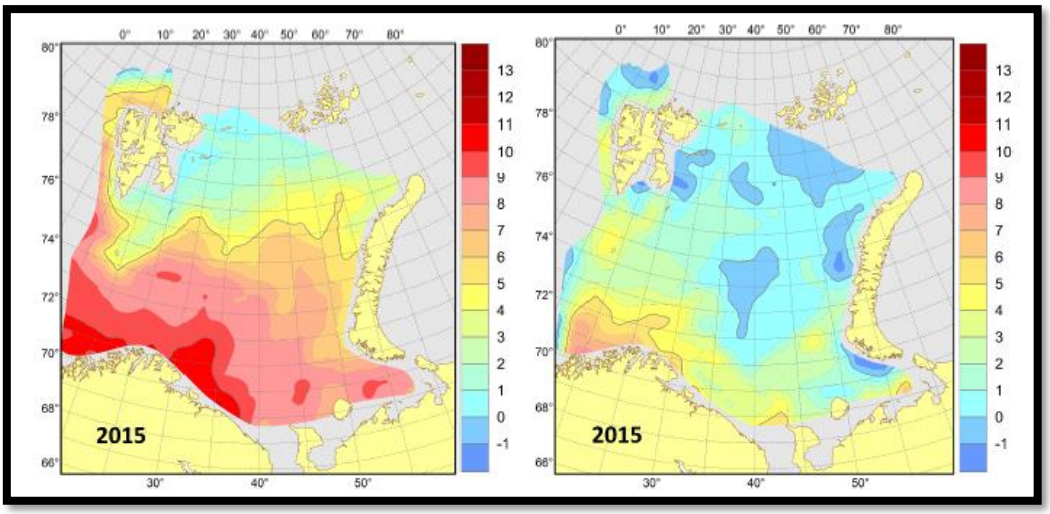



*Figure 29: Surface (left) and bottom (right) water temperature (ºC) in the Barents Sea in August-October 2015. (Source: ICES AFWG REPORT 2016)*

*The Barents Sea region is influenced by different human activities such as fishing, transportation of goods, oil and gas, tourism and aquaculture. Hunting of marine mammals was a common activity which remains at lower rates.*
*As regards fishing activities, vessels from different nationalities target different species using different gears. The largest commercially exploited fish stocks (cod, capelin and haddock) are now harvested at fishing mortalities close to those in the management plan and have full reproductive capacity. Some of the smaller stocks (golden redfish Sebastes marinus and coastal cod in Norway) are overfished. Other species subject to targeted fisheries include Greenland halibut, Atlantic halibut, beaked redfish, deep-water shrimps, red king crabs, and snow crabs (both crab species are well established in the region, despite being invasive species).*
*Marine research institutions such as IMR and PINRO undertake different scientific surveys to monitor both physical and chemical parameters as well as sample the status of the stock of different species. Table 27 below summarizes the different scientific surveys regularly taken by these institutions.*

*Table 27: Overview of conducted monitoring surveys by IMR and PINRO in the Barents Sea, with observed parameters and species. Climate and phytoplankton parameters are: T-temperature, S-Salinity, N-nutrients, Chla-chlorophyll.*

| Survey | Institution | Period | Climate | Phyto-plankton | Zooplankton | Juvenile fish | Target fish stocks | Mammals | Benthos |
|---|---|---|---|---|---|---|---|---|---|
| Winter survey | Joint | Feb- Mar | T, S | N, chla | Intermittent | All commercial species and some additional | Cod, Haddock | - | - |
| Lofoten survey | IMR | Mar- Apr | T, S | - | - | - | Cod, haddock, saithe | - | - |
| Ecosystem survey | Joint IMR - PINRO | Aug- Oct | T, S | N, chla | Yes | All commercial species and some additional | All commercial species and some additional | Yes | Yes |
| Norwegian coastal surveys | IMR | Oct- Nov | T, S | N, chla | Yes | Herring, sprat, demersal species | Saithe, coastal cod | - | - |
| Russian Autumn-winter trawl-acoustic survey | PINRO | Oct- Dec | T, S | - | Yes | Demersal species | Demersial species | - | - |

| Survey | Institution | Period | Climate | Phyto-plankton | Zooplankton | Juvenile fish | Target fish stocks | Mammals | Benthos |
|---|---|---|---|---|---|---|---|---|---|
| Norwegian Greenland halibut survey | IMR | Aug, biennial | - | - | - | - | Greenland halibut, redfish | - | - |
| Russian young herring survey | PINRO | May | T, S | - | Yes | | Herring | - | - |

*Interspecies trophic relations are also studied through different multispecies and ecosystem models, which identify the most important inter-species/ functional group links and sensitivity of the ecosystem to changes and serves to give scientific based management advice to the different fleets. Table 28 below gives a summary of different multispecies and ecosystem models for the Barents Sea.*

*According to Plagányi (2007), there are different approaches to modelling the ecosystem:*

- *Whole ecosystem models: models that attempt to take into account all trophic levels in the ecosystem.*
- *Minimum Realistic Models (MRM): takes into account a limited number of species which are most likely to have important interactions with a target species of interest.*
- *Dynamic System Models (Biophysical): represent both bottom-up (physical) and top-down (biological) forces interacting in an ecosystem.*
- *Extensions of single-species assessment models (ESAM): They expand current single-species assessment models taking only a few additional inter-specific interactions into account.*

**Table 28: Classification of the multispecies/ecosystem models for the Barents Sea. (Source: ICES AFWG REPORT 2016)**

| MODEL | NAME | STATUS (for the Barents Sea) |
|---|---|---|
| Whole ecosystem models (End to End models) | | |
| EwE and ECOSPACE | Ecopath with Ecosim | Potentially useful |
| ATLANTIS | ATLANTIS | Operational |
| Minimum realistic models (Multispecies models) | | |
| Bifrost | Boreal integrated fish resource optimization and simulation tool. | Operational |
| STOCOBAR | Stock of cod in the Barents Sea | Operational |
| GADGET | Globally applicable Area Disaggregated General Ecosystem Toolbox | Operational |
| DSF | Dynamic Stochastic Food web | In development |
| BORMICON | Boreal Migration and consumption model | Precursor to GADGET |
| MULTISPEC | Multi-species model for the Barents Sea: Simplified version is AGGMULT which is also connected to a ECONMULT - a model describing the economies of the fishing fleet. | Retired |
| MSVPA and MSFOR (and derivates) | Multi-species Virtual Population Analysis; Multi-species Forecasting Model. | Potentially useful |
| IBM | Individual-Based Models | Operational |
| Dynamic system models | | |
| NORWECOM.E2E | Formulation is moving towards whole ecosystem model | In development |
| SYMBIOSES | SYMBIOSES | First version functional, under further development. |
| Extension of single species assessment models | | |
| ESAM | Extended Single-Species Models e.g. Livingston and Methot 1998; Hollowed et al., 2000; Tjelmeland and Lindstrøm 2005. | Limited application |
| SEASTAR | Stock Estimation with Adjustable Survey observation model and TAg-Return data | Limited application |
| EcoCod | Ecosystem and Cod | In development |

*These models and assessments provide enough information to indicate that the Barents Sea ecosystem is relatively healthy (affected however by global warming and other human pressures). Declines in the populations of certain species*

*such as marine mammals or birds are attributed to other factors such as rising sea temperature or redistribution of prey species.*
*Monitoring of the marine environment and all aspects of its living resources are ongoing research programmes by IMR in support of Norwegian seas management plans, and further afield under the auspices of JNRFC (Prokhorova, 2013; Wienerroither et al., 2013). These programmes include monitoring the effects of trawling on sensitive marine habitats and developing further protection measures where appropriate.*

*Since 2012 there are two trawlers in the reference fleet. Crew members in these vessels record all interactions, including those with released individuals. Data from 2012 – 2015 include a total of 30 recorded interactions (which would mean 3 interactions per vessel per year) with the following bycatch species: Velvet belly lanternshark (Etmopterus spinax, IUCN Least Concern), Blackmouth catshark (Galeus melastomus, IUCN Least Concern), Sailray (Rajella lintea, IUCN Least Concern), Rabbit fish (Chimaera monstrosa, IUCN Near Threatened), Longnosed skate (Dipturus oxyrhincus, IUCN Near Threatened), Starry ray (Amblyraja radiata, IUCN Vulnerable) and one individual of Great black-backed gull (Larus marinus, IUCN Least Concern). Data collected by the reference fleet in years 2015-2018 show similar interactions by trawling vessels. As reflected in the data recorded by the reference fleet, these interactions are sporadic. Besides, the procedure of releasing them back to the sea and the general high survival rate should serve not to hinder the stock status of these species.*
*The fishery also takes place in the Norwegian Sea. The Norwegian Sea is bounded by a line drawn from the Norwegian Coast at about 62° N to Shetland–Faroes–east Iceland–Jan Mayen–southern Spitsbergen–Vesteralen (on the Norwegian coast). The Norwegian Sea has an area of c.1 million km2 and an average depth of c. 2000 m divided into two separate basins (the Lofoten Basin to the south and the Norwegian Basin in the north) of 3000 m to 4000 m depth. Along the Norwegian coast there is a relatively narrow continental shelf, between 40 and 200 km wide with a relatively level seabed.*
*The circulation in the Norwegian Sea is strongly affected by the topography. A low salinity Norwegian Coastal Current enters the area from the North Sea and flows north to the Barents Sea. North Atlantic inflow takes place mainly through the Faroe–Shetland Channel with some flow over the Iceland–Faroe Ridge. The major part of the warm, high salinity Atlantic Water continues northward as the offshore Norwegian Atlantic Current, parts of which branch into the North Sea and also to the more central parts of the Norwegian Sea. At the western boundary of the Barents Sea, the Norwegian Atlantic Current further bifurcates into the North Cape Current, which carries herring eggs and larvae from the Norwegian Sea spawning areas into the Barents Sea nursery areas, flowing eastwards into the Barents Sea and the West Spitsbergen Current flowing northwards into the Fram Strait between Spitzbergen and Greenland.*

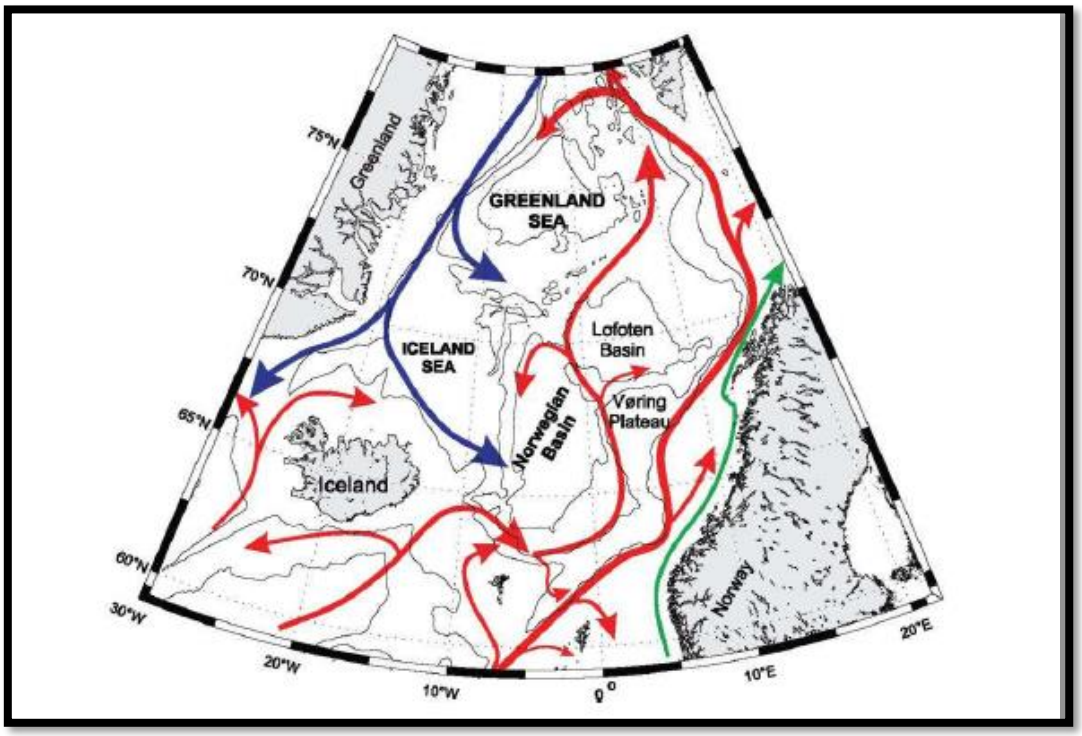



***Figure 30: The main circulation pattern in the Norwegian Sea. Red lines indicate warm currents, blue lines indicate cold currents and green lines show low salinity coastal water.***

*The ecosystem in the Norwegian Sea has a relatively low biodiversity, but the food chain is productive and some species occur in very high numbers (http://www.imr.no/filarkiv/havets_ressurser_og_miljo_2009/2.1_introduksjon-*

*okosystem_Norskehavet.pdf/nb-no ). The great basins are dominated by deep-sea fauna while there are deep-sea coral reefs which act as keystone habitats for a diverse associated community of invertebrate and fish species. There is intense primary production during the spring bloom, which supports a high zooplankton biomass but recent biomass is the lowest since the measurements started in 1997 (http://www.imr.no/filarkiv/havets_ressurser_og_miljo_2009/2.3_primaer_sekundaerproduksjon.pdf/nb-no).*

*Plankton organisms uncommon to the Norwegian Sea are entering the area at an increasing rate. The warm–temperate copepod Calanus helgolandicus appears to be displacing the normal Norwegian Sea copepod C. finmarchicus, and at times is the dominant species along the south-western coast of Norway. This change might have a detrimental effect on spring-spawning fish stocks if the fish larvae experience a reduction in their favoured food supply, i.e. larvae of C. finmarchicus.*

*The spring phytoplankton bloom starts in the Norwegian Sea, where it is dominated by the diatom Chaetoceros socialis followed by flagellates, particularly Phaeocyctis pouchetii, and then spreads north and east into the Barents Sea with the retreating ice. In early spring, the water is mixed from top to bottom, but the main bloom does not occur until the water becomes stratified by density (temperature–salinity) differences. Diatoms are the dominant phytoplankton group in the Barents Sea, particularly early in the spring bloom when the concentration of diatoms can reach several million cells per litre.*

*The zooplankton communities of the Norwegian–Barents Seas are dominated by copepods and euphausids. The calanoid copepod Calanus finmarchicus is the main copepod in the Atlantic water while C. hyperboreus and C. glacialis are the dominant species in Arctic water masses. Krill (euphausids) also play a significant role, particularly Meganychthiphanes norvegica, Thysanoessa inermis and Thysanoessa longicaudata. Other important zooplankton include the hyperids Themisto libellula and Themisto abyssorum. Krill species are believed to be omnivorous, filterfeeding on phytoplankton during the spring bloom but feeding on small zooplankton (possibly including cod and haddock eggs and larvae) at other times of the year. Ctenophore and scyphozoan jellyfishes are also abundant, widespread predators of planktonic-stage and post-larval fish. The plankton community shows interannual variability in productivity, with concomitant implications for fish productivity.*

**Table 29 Scoring elements**

| Component | Scoring elements | Designation | Data-deficient |
|---|---|---|---|
| Targeted (P1) | Beaked redfish | N/A | No |
| Primary | NEA cod | Main | No |
| Primary | Saithe | Main | No |
| Primary | Haddock | Minor | No |
| Primary | Greenland halibut | Minor | No |
| Primary | Golden redfish | Minor | No |
| Primary | Tusk | Minor | No |
| Primary | Ling | Minor | No |
| Secondary | Hake | Minor | No |
| Secondary | Atlantic halibut | Minor | Yes |
| Secondary | Northern wolfish | Minor | Yes |

| Component | Scoring elements | Designation | Data-deficient |
|---|---|---|---|
| Secondary | Spotted wolfish | Minor | Yes |
| Secondary | Pollack | Minor | Yes |
| Secondary | Lesser silver smelt | Minor | Yes |

### 7.3.2 Principle 2 Performance Indicator scores and rationales

## PI 2.1.1 – Primary species outcome

| PI 2.1.1 | | The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Main primary species stock status | | | |
| | Guide post | Main primary species are **likely** to be above the PRI.<br><br>OR<br><br>If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding. | Main primary species are **highly likely** to be above the PRI.<br><br>OR<br><br>If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding. | There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

Main primary species are NEA offshore cod and saithe.
According to ICES 2021 advice on Cod (Gadus morhua) in subareas 1 and 2 (Northeast Arctic), fishing pressure on the stock is at FMSY between Fpa and Flim and spawning-stock size is above MSY Btrigger, Bpa, and Blim. Given this, there is a high degree of certainty that the stock is above the PRI and fluctuating around a level consistent with MSY. The requirements at SG60, SG80 and SG100 are met for NEA cod.
According to ICES 2021 advce for saithe in subareas 1 and 2 (Northeast Arctic), fishing pressure on the stock is below FMGT and spawning-stock size is above MSY Btrigger, Bpa, and Blim. Given this, there is a high degree of certainty that the stock is above the PRI and fluctuating around a level consistent with MSY. The requirements at SG60, SG80 and SG100 are met for saithe.

| | SG60 | SG80 | SG100 |
|---|---|---|---|
| NEA cod | Y | Y | Y |
| Saithe | Y | Y | Y |

| | | | | |
|---|---|---|---|---|
| **b** | Minor primary species stock status | | | |
| | Guide post | | | Minor primary species are highly likely to be above the PRI.<br><br>OR<br><br>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species. |
| | Met? | | | **No** |

## Rationale

Minor primary species are haddock, Greenland halibut, golden redfish, tusk, and ling.

Golden redfish: Golden redfish is present in the catch composition of the UoA in a very low proportion (0.3% on average). According to ICES 2021 advice on golden redfish, ICES is not able to identify catch levels that will, with high probability, give an increase in stock size above Blim. Therefore, the advice is for zero catch for years 2021 and 2022. This applies to both commercial and recreational fishing. Golden redfish stock is not likely to be above the PRI. However, there are measures in place implemented by the whole Norwegian fleet which seek the rebuilding of the stock. These measures, which have been in place for several years now, are expected to ensure that the UoA do not hinder recovery and rebuilding of the stock. While these measures can be considered as a strategy, so far the strategy is not considered to be demonstrably effective as the measures have been implemented for several years now but there is no evidence of recovery yet. **SG100 is not met by golden redfish**.

Haddock in subareas I and II: According to ICES 2021 advice, the spawning-stock biomass (SSB) has been above MSY Btrigger since 1989. Due to the strong recruitment-at-age 3 in 2007–2009 (2004–2006 year classes) the stock reached an all-time high level in 2013. SSB is now decreasing but remains well above MSY Btrigger. Fishing mortality (F) has increased since 2013 and was above FMSY in 2017 and 2018. ICES assesses that fishing pressure on the stock is above FMSY but below Fpa and Flim and that the spawning-stock size is above MSY Btrigger and Bpa. ICES advises that when the Joint Russian–Norwegian Fisheries Commission management plan is applied, catches in in 2022 should be no more than 180 003 tonnes. **Haddock meets the requirements at SG100**.

Tusk: According to ICES 2021 advice, ICES cannot assess the stock and exploitation status relative to MSY and precautionary approach (PA) reference points because the reference points are undefined. ICES advises that when the precautionary approach is applied, catches should be no more than 8076 tonnes in each of the years 2022 and 2023. It is noticeable that the 2021 advice is based on a standardized CPUE series from the Norwegian longline fleet which covers the main areas of the stock. The SPiCT model used as an indicator of stock status and exploitation in the previous advice was evaluated during a benchmark in 2021 and was no longer considered appropriate. Although there is no information on reference points for the stock (and therefore it is not possible to determine if the stock is above or below PRI), ICES 2021 advice estimates catches by the trawling fleet to be below 1%. Given the low level of catches by this gear type the team considers that the UoA does not hinder the recovery and rebuilding of the stock. **The requirements at SG100 are met for tusk.**

Ling: According to ICES 2021 advice on ling in subareas 1 and 2, a standardized catch per unit effort (cpue) based on data from the Norwegian longline fleet shows an increasing trend from 2004 to present. Landings have been relatively stable, but with a sharp increase in 2018. No reference points for stock size have been defined for this stock. ICES assesses that fishing pressure on the stock is below FMSY proxy. **SG100 is met by ling**.

Greenland halibut in subareas 1 and 2 (Northeast Arctic): According to ICES advice for 2021, fishing pressure on the stock is above HRpa and fishable biomass is above Bpa. **SG100 is met by Greenland halibut.**

| Species | SG100 |
|---|---|
| Golden redfish | No |
| Haddock | Yes |
| Tusk | Yes |
| Ling | Yes |
| Greenland halibut | Yes |

## References

https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/cod.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/reg.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/pok.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/had.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/usk.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/lin.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/ghl.27.1-2.pdf

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| Draft scoring range | **≥80** |
|---|---|

| | |
|---|---|
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.1.2 – Primary species management strategy

| PI 2.1.2 | | There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place | | | |
| | Guide post | There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI. | There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI. | There is a **strategy** in place for the UoA for managing main and minor primary species. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

Main primary species are NEA offshore cod and saithe. Minor primary species are haddock, golden redfish, tusk, ling and Greenland halibut.

The Norwegian Marine Resources Act is an established strategy which should address all main impacts of the fishery on the ecosystem. Besides, the Joint Russian–Norwegian Fisheries Convention and the Norwegian management plans for the Barents Sea and Norwegian Sea set the guidelines to manage the different commercial stocks present in these areas.

The generic strategy for the conservation and sustainable exploitation of fish stocks is supported by ongoing research into the distribution and abundance of all fishes in the NE Arctic. IMR CRISP programme contributes with research into potential improvements in target identification and gear selectivity.

Generic management regulations that apply to the beaked redfish fishery are:

- Discard ban
- minimum catch size
- minimum mesh size
- maximum bycatch of undersized fish
- closure of areas having high densities of undersized fish and in addition some seasonal and other area restrictions.
- The use of sorting grid is mandatory for all trawl fisheries.
- ban on targeted fishing for vulnerable species such as golden redfish.
- Regulation on the releasement of Atlantic halibut <80 cm which must be returned to sea alive to contribute to the rebuilding of the stock.
- Cod, haddock and saithe are subject to quota
- There are specific management measures directed to the rebuilding of golden redfish and coastal cod which are described below.

The TAC for Norwegian cod is a combined TAC for both the stock of NEA cod and the stock of coastal cod. There are no separated quotas for the coastal cod, and the catches of coastal cod are therefore not effectively restricted by quotas. Most regulatory measures for NEA cod also apply for coastal cod; such as minimum catch size, minimum mesh size, maximum bycatch of undersized fish, closure of areas having high densities of undersized fish and in addition some seasonal and other area restrictions. The use of sorting grid is mandatory for all trawl fisheries. Since the NEA beaked redfish fishery takes place in waters outside 12 nm, coastal cod is not present in the catch of the UoA.

Saithe stock is also managed under the Norwegian management plan. The harvest control rule (HCR), as revised in 2013 and communicated to ICES by the Norwegian Ministry of Fisheries and Coastal Affairs, estimatee the average TAC level for the coming three years based on Fishing mortality at Management Plan = 0.32. The TAC for the next year will be set to this level as a starting value for the three-year period. The HCR for saithe was last evaluated by ICES in 2011. The evaluation concluded that the HCR is precautionary. The interbenchmark for this stock in 2014 did not result in significantly different estimates of stock dynamics, and the former HCR evaluation is still considered valid in 2021.

There are other measures directed to certain minor species, such as golden redfish. Specifically, ICES 2018 advice states that catches should be zero for 2019 and 2020. The species is redlisted in the Norwegian red list of protected species (with no associated specific management measures or regulations) and catches should be kept to minimum. For the 5340 tonnes landed in 2017 in ICES subareas I and II, 64% were landed by the trawl fleet, 18 % were landed by the gillnet fleet, 15 % by the longline fleet and 3% by other gear types. There are specific management measures which were implemented with the intention of reverting the poor situation of this stock. Such measures are area closures and bycatch limitations, and a move-on rule for the prawn trawl fishery in the Barents Sea:

- In 2004 the redfish fishery became banned from 1st to 31st of May. Maximum bycatch allowed was reduced to 20% and a minimum landing size was established at 32 cm.
- In 2005 the prohibition to target redfish was extended from 20th April till 19th June.
- In 2006 fishing season was again modified, and prohibitions remained during the months of April and September. A minimum mesh size of 120 mm was introduced.
- In 2007 fishing was banned from 1st March till 30th June, and also during September. However, the hand-line fleet smaller than 11 m was excluded from these regulations.
- In 2012 fishing closures run from 20th December till 30th June, and also during September. However, all hand-line vessels were excepted from the regulatory measures for future years.
- In 2015 the fishing closures remained the same but additional restrictions were added such that redfish catch should be less than 50% of the catch per week.
- In 2016 fishing closures were modified from previous years and was now banned from 1st January to 31st July. Catch of redfish was restricted as it shouldn't be more than 30% of the total catch per week.

According to previous data from IMR, total catch by the Norwegian fleet was reduced from 6233 tonnes in 2004 down to 1969 in 2016 (68 %), where the landings from trawlers was reduced by 82%, while the landings from coastal fleet was reduced by 55 %. In spite of the reduction, as mentioned above, the stock has so far shown no signs of recovery.

The different measures implemented under the auspices of the Norwegian Marine Resources Act, act globally as a strategy for managing all main and minor primary species. The requirements at SG60, SG80 and SG100 are met by main and minor species.

| Scoring element | SG60 | SG80 | SG100 |
|---|---|---|---|
| NEA cod | Yes | Yes | Yes |
| Saithe | Yes | Yes | Yes |
| Minor primary species | N/A | N/A | Yes |

| | | | | |
|---|---|---|---|---|
| **b** | Management strategy evaluation | | | |
| | Guide post | The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species). | There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved. | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

Enforcement by the Coast Guard, together with records on landings, research on the status of the different stocks and the scientific advice given for the different stocks serve to give some objective basis for confidence that the measures will work for most species.
ICES stock assessments allow to estimate the size and status of all the impacted primary species. NEA cod and saithe stocks are well above the PRI. Its good status serves as testing that the strategy is working effectively for these stocks. NEA cod and saithe meet the requirements at SG60, SG80 and SG100.
However, this is not the situation for certain minor species such as golden redfish, as management measures have been implemented for a long period and there are no signs of recovery of the stock. SG100 is not met for certain minor species such as golden redfish.

| Scoring element | SG60 | SG80 | SG100 |
|---|---|---|---|
| NEA Cod | Yes | Yes | Yes |

| | | | |
|---|---|---|---|
| Saithe | Yes | Yes | Yes |
| Minor primary species (golden redfish) | N/A | N/A | No |

As a result, the requirements at SG100 are not met for this SI.

| | | | | |
|---|---|---|---|---|
| **c** | Management strategy implementation | | | |
| | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its overall objective as set out in scoring issue (a).** |
| | Met? | | **Yes** | **No** |

Rationale

There is clear evidence that the strategy is successfully implemented, as confirmed by previous conversations with the Norwegian Ministry of Fisheries. There are control measures covering fleet effort, gear types and sizes, landings, quotas and permanent and temporary area closures. All main scoring elements (NEA cod and saithe) meet the requirements at SG80. The UoA meets the requirements at SG80.

While the good stock status of NEA cod could serve as clear evidence that the objective of not hindering affected stocks is been met for this species, certain stocks, such as golden redfish show no sign of recovery despite the management efforts applied to the stock. Since golden redfish is also present in the catch, the requirements at SG100 are not considered to be met.

| | | | | |
|---|---|---|---|---|
| **d** | Shark finning | | | |
| | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | **NA** | **NA** | **NA** |

Rationale

There are no shark primary species in the catch. In any case, shark finning is not an issue in Norwegian waters. This SI is not applicable.

| | | | | |
|---|---|---|---|---|
| **e** | Review of alternative measures | | | |
| | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

The Norwegian Directorate of Fisheries performs an annual risk review in which different aspects are taken into consideration, including the examination of the number and type of infringements by Norwegian vessels, the species (and quantities) affected and the alternative measures to minimize such damages in the future. The risk review includes a review of catch data and its relation to allocated TACs.
The risk review is taken as part of the Directorate of Fisheries annual activity, with annual meetings in June and November, and review of results would result in new management measures to minimize unwanted catch and infringements by the fleet (if any). SG60, SG80 and SG100 are met by the UoA.

References

DNV MSC PCR Norway haddock offshore fishery, 2021.
ICES 2021 advice for NEA cod.
ICES 2021 advice for saithe.
ICES 2020 advice for golden redfish.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought, such as confirmation by the Ministry of Fisheries and the Directorate of Fisheries on the level of implementation by the fleet of management measures.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.1.3 – Primary species information

| PI 2.1.3 | | Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Information adequacy for assessment of impact on main primary species | | | |
| | Guide post | Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status.<br><br>**OR**<br><br>**If RBF is used to score PI 2.1.1 for the UoA:** Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species. | Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status.<br><br>**OR**<br><br>**If RBF is used to score PI 2.1.1 for the UoA:** Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species. | Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

On a general approach, the landing obligation, which was implemented for all species in 2009, serves to provide quantitative information on the impacts of the fishery in all affected species. Removals by other countries in the area are also known by the relevant management institutions.
Specifically, ICES provides scientific advice for NEA cod and saithe. This information, together with removals by the UoA and by all fishing fleets in the area serve to assess with a high degree of certainty the impact of the UoA on NEA cod and saithe with respect to status. The requirements at SG60, SG80 and SG100 are met by NEA cod and saithe and therefore by the UoA.

| | | | | |
|---|---|---|---|---|
| **b** | Information adequacy for assessment of impact on minor primary species | | | |
| | Guide post | | | Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status. |
| | Met? | | | **Yes** |
| Rationale | | | | |

As mentioned above, the landing obligation, which was implemented for all species in 2009, serves to provide quantitative information on the impacts of the fishery in all affected species. Removals by other countries in the area are also known by the relevant management institutions. Enforcement to the different management measures is carried out by the Norwegian Coast Guard. There is research undertaken by IMR which includes annual coastal surveys and ecosystem surveys, both in the Norwegian Sea and in the Barents Sea.
The impact of the UoA with respect to stock status of the different minor primary species can be easily evaluated by consulting ICES catch advice. SG100 is met by the UoA and all scoring elements.

| | | | | |
|---|---|---|---|---|
| **c** | Information adequacy for management strategy | | | |
| | Guide post | Information is adequate to support **measures** to manage **main** primary species. | Information is adequate to support a **partial strategy** to manage **main** primary species. | Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree** |

| | | | | |
|---|---|---|---|---|
| | | | | **of certainty** whether the strategy is achieving its objective. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

Landing statistics since the implementation of the Norwegian landing obligation can provide trends of the landings of the different primary species in the catch composition and the areas where these species are more abundant. On general terms, the evaluation of the effectiveness of the different management measures can be done by comparing landing statistics before and after the implementation of the different management measures and by consultation of ICES advice on the different species.

The status of the different stocks present in the catch composition is studied by research institutions such as ICES, IMR and also by PINRO (for those stocks in the Barents Sea waters). Special attention is paid to golden redfish due to its poor stock status. SG60, SG80 and SG100 are met by the UoA.

References

https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/cod.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2020/2020/reg.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/pok.27.1-2.pdf
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https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/usk.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/lin.27.1-2.pdf
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2021/2021/ghl.27.1-2.pdf

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.2.1 – Secondary species outcome

| PI 2.2.1 | | The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| | Main secondary species stock status | | | |
| **a** | Guide post | Main secondary species are **likely** to be above biologically based limits.<br><br>OR<br><br>If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding. | Main secondary species are **highly likely** to be above biologically based limits.<br><br>OR<br><br>If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding.<br>AND<br>Where catches of a main secondary species outside of biological limits are **considerable**, there is either **evidence of recovery** or a, **demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species**, to ensure that they collectively do not hinder recovery and rebuilding. | There is a **high degree of certainty** that main secondary species are above biologically based limits. |
| | Met? | **Yes / No** | **Yes / No** | **Yes / No** |
| Rationale | | | | |

According to information recorded on electronic logbooks (which also record interaction on fatal interactions with out of scope species) for the UoA for years 2016-2020 as facilitated by the client, there are no main secondary species to take into consideration for the UoA. This information needs to be confirmed by the Directorate of fisheries. Should that be the situation, the SI would score as N/A.

| | | | | |
|---|---|---|---|---|
| | Minor secondary species stock status | | | |
| **b** | Guide post | | | Minor secondary species are highly likely to be above biologically based limits.<br><br>OR<br><br>If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species |
| | Met? | | | **No** |
| Rationale | | | | |

Minor secondary fish species in the catch of the different UoAs are Atlantic halibut, pollack, hake, silver smelt, spotted wolfish and northern wolfish.

There are no reference points available for these stocks, neither derived from analytical stock assessment nor using empirical approaches. Thus, all Minor Secondary scoring elements are Data Deficient species according to MSC FCP v2.1 Section 7.7.3.2 and a RBF shall be triggered for assessing this SI. However, FCP v2.1 PF4.1.4 allows the team to avoid conducting RBF on Minor species when evaluating PI2.1.1 or 2.2.1. The assessment team has decided to take this approach and not assess these species.
Therefore, in accordance with PF4.1.4 the final PI score shall be adjusted downward according to clause PF5.3.2 (which states that “final PI score shall be no greater than 80”). SG100 is not met by any minor secondary species.

## References

The CAB shall list any references here, including hyperlinks to publicly-available documents.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought. Specifically confirmation by the Directorate of fisheries that out of scope species are not present in the catch.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.2.2 – Secondary species management strategy

| PI 2.2.2 | | There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place | | | |
| | Guide post | There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery. | There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery. | There is a **strategy** in place for the UoA for managing main and minor secondary species. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

There are no main secondary fish species to consider.

The strategy is set out in the Norwegian Marine Resources Act, in the protocol for the JRNFC and in the Barents Sea and Norwegian Sea management plans, which explicitly require an ecosystem approach to marine environmental management. The act also requires that all commercial fish species are retained, recorded and landed and that vessels equipped with e-logbooks must record interactions with seabirds and marine mammals. (Paper logbooks are still required in the Russian zone). Electronic logbooks should serve to record fatal interactions with seabirds and marine mammals should these happen.
There is no requirement to record non-fatal interactions with out-of-scope species, which would serve to better quantify the effects that the UoA has on the different possible out of scope main secondary species.

Marine mammal and seabird stock monitoring and abundance estimates are made by IMR and NINA and records of all biota are made during annual IMR– PINRO trawl surveys undertaken under the auspices of JRNFC. As for seabirds, there are permanent and seasonal closures of inshore waters in the vicinity of key seabird nesting sites. As regards sharks and rays, the study on their status is part of both IMR and ICES research activities, who provides advice on the stock status of some of these species.

Fishermen always avoid interactions of non-targeted species in order to save time and money. Entanglements with trawlers could result either in casualty or in releasement, depending on the level of entanglement. All trawlers are equipped with sorting grids for exclusion of bycatch and minimise the mortality of non-targeted species. Specifically, a review of the impact of Norwegian offshore demersal trawl fisheries on marine mammals was undertaken by ICES Study Group for Bycatch of Protected Species (SGBYC 2009) and concluded that larger offshore demersal trawl vessels “are regarded as having a relatively low risk for bycatches of marine mammals”.

The different measures implemented are considered as a partial strategy by the UoA for managing interactions with possible main secondary species. SG60 and SG80 are met by the UoA.

Despite the fact that interactions with out-of-scope species are not expected, and that there are no main secondary fish species to consider in this assessment, the team is not aware of any “strategy” designed to manage interactions with main and minor secondary species. SG100 is not met by the UoA.

| | | | | |
|---|---|---|---|---|
| **b** | Management strategy evaluation | | | |
| | Guide post | The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or | There is **some objective basis for confidence** that the measures/partial strategy will work, based on some | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly |

| | | | | |
|---|---|---|---|---|
| | | comparison with similar UoAs/species). | information directly about the UoA and/or species involved. | about the UoA and/or species involved. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

As described in SIa, the strategy is set out in the Norwegian Marine Resources Act, in the protocol for the JRNFC and in the Barents Sea and Norwegian Sea management plans, which explicitly require an ecosystem approach to marine environmental management. Actual level of implementation of the different management measures in place is discussed under SIc.
Coastal states' agencies (IMR, NINA, PINRO) monitor the status of fish, seabird and marine mammal populations and pay close regard to the potential for adverse interactions of these populations with fisheries. Where specific problems are identified, they are modelled and subject to quantitative analysis although more generally emphasis is given to broader ecosystem modelling. IMR conducts on-site research which serves to provide estimations on the effectiveness of mitigation measures.
The general low level of interactions with secondary species (resulting in no main secondary species to consider) gives some objective basis for confidence that the partial strategy implemented will work. The requirements at SG60 and SG80 are met.
Uncertainties related to the stock status of some minor species prevent the UoA from meeting the requirements at SG100. The requirements at SG100 are not met by the UoA.

| | | | | |
|---|---|---|---|---|
| **c** | Management strategy implementation | | | |
| | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).** |
| | Met? | | **Yes** | **No** |
| Rationale | | | | |

ICES, IMR and NINA conduct research and monitoring of the populations of marine mammal and seabirds. Their results are afterwards reviewed by OSPAR and NAMMCO.
Norwegian specific management measures such as landing obligation of all species, area closures, bycatch limitations, move on rules, return to sea of alive elasmobranchs, use of sorting grids to avoid catch of unwanted species, comprehensive research by IMR and a robust enforcement system serve as a clear evidence that the strategy is being implemented successfully. There is a strong enforcement system covering fleet effort, gear types and mesh sizes, landings and permanent and temporary area closures. **Requirements at SG80 are met.**

While the monitoring of interactions by the fishery and the monitoring of elasmobranchians, marine mammal and seabird populations by ICES, IMR and NINA would serve to detect any increase in the risk posed by these populations due to the Norway beaked redfish fishery, the lack of information on the biologically based limits for all secondary species prevent the UoA from meeting the requirements at SG100, since it is not possible to asseverate that the partial strategy is achieving its overall objective in relation to minor secondary species, **SG100 is not met.**

| | | | | |
|---|---|---|---|---|
| **d** | Shark finning | | | |
| | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |

There are no sharks in the catch. This SI is N/A.

| | |
|---|---|
| **e** | Review of alternative measures to minimise mortality of unwanted catch |

| | | | | |
|---|---|---|---|---|
| | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

The Norwegian Directorate of Fisheries performs an annual risk review in which different aspects are taken into consideration, including the examination of the number and type of infringements by Norwegian vessels, the species (and quantities) affected and the alternative measures to minimize such damages in the future. The risk review includes a review of fatal interactions with out-of-scope species, but non-fatal interactions can't be taken into consideration due to the lack of records.
The risk review is taken as part of the Directorate of Fisheries annual activity, with meetings in June and November, and review of results would result in new measures to minimize unwanted catch (including out of scope main secondary species if any) and infringements by the fleet (if any). SG60, SG80 and SG100 are met by the UoA.

References

DNV MSC PCR Norway offshore haddock report, 2021.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought. Confirmation is needed from the Directorate of Fisheries and the Minisitry of Fisheries in relation to the performance of regular risk reviews and on the level of implementation of associated management measures.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.2.3 – Secondary species information

| PI 2.2.3 | | Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Information adequacy for assessment of impacts on main secondary species | | | |
| | Guide post | Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status.<br><br>OR<br><br>**If RBF is used to score PI 2.2.1 for the UoA:**<br><br>Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species. | Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status.<br><br>OR<br><br>**If RBF is used to score PI 2.2.1 for the UoA:**<br><br>Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species. | Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

There are no main secondary fish species to consider.
Quantitative information from catches and landings is available, including VMS and standardised logbooks, combined with regular at sea inspections. This provides an accurate time-series of catches. According to catch composition data there are no main secondary species to consider. There is information available on the status of stocks and populations of certain secondary species gathered by research institutions and programs (such as IMR, ICES, NAMMCO, NINA, JRNFC) which provide some qualitative information on the possible out of scope secondary species present in the area and their population status. This qualitative and quantitative information is generally available and is adequate to assess the impact of the UoA on main secondary species (if any) with respect to status. The requirements at SG60 and SG80 are met by the UoA.
However, available quantitative information on the occurrence of non-fatal interactions with out-of-scope species is not considered adequate to assess with a high degree of certainty the full impact that the UoA may have on possible out-of scope main secondary species. The requirements at SG100 are not met.

| | | | | |
|---|---|---|---|---|
| **b** | Information adequacy for assessment of impacts on minor secondary species | | | |
| | Guide post | | | Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. |
| | Met? | | | **No** |
| Rationale | | | | |

Minor secondary species are Atlantic halibut, Northern wolfish, spotted wolfish, hake, silver smelt and pollack.

While quantitative information is available on the amounts of these species taken by the UoA, stock status of is not always known. **Therefore, the requirements at SG100 are not met.**

| | | | | |
|---|---|---|---|---|
| | Information adequacy for management strategy | | | |
| **c** | Guide post | Information is adequate to support **measures** to manage **main** secondary species. | Information is adequate to support a **partial strategy** to manage **main** secondary species. | Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

Information on catches and interactions with main secondary species is gathered by the Directorate of Fisheries and also by research institutions such as IMR. This information, collected on a continued basis, is considered adequate both to support measures or a partial strategy to manage main secondary species. SG60 and SG80 are met by the UoA.

Information gathered by research institutions should also serve to assess the impact that the UoA may have with respect to the status of the potential main secondary species. As regards minor secondary species the team considers that available information is not adequate to support a strategy to manage all secondary species and to evaluate with a high degree of certainty whether the strategy is achieving its objective, as stock status and reference limits are not known for some of them. SG100 is not met.

References

Landing records
DNV MSC PCR Norway haddock offshore fishery, 2021.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought such as confirmation by IMR on research projects and by the Directorate of Fisheries on potential interactinos with out of scope species.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.3.1 – ETP species outcome

| PI 2.3.1 | | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Effects of the UoA on population/stock within national or international limits, where applicable | | | |
| | Guide post | Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

According to landing records there are no ETP species interacting the Norway beaked redfish fishery.

For 2016 there are some unidentified skates and rays in the catch (0.7 tons), which accounts for 0,01% of the total catch in that year. No other skates or rays were reported in years 2017-2020. Those unidentified skates and rays may or may not be ETP species.

There are different regulations protecting ETP species in Norwegian waters, including Norwegian Regulation J-250-2013, protecting basking sharks, spurdogs, porbeagles and silky sharks, which prohibits direct fishing for these species and enforces releasement when species are still alive. Apart from the 0 TAC, this regulation does not set specific limits for these encounters.

Considering the detailed reporting of landings, and the procedure to release living elasmobranchians when encountered, it can be said that the effect of the fishery on potential ETP species such as elasmobranchians, marine mammals or birds are known and there is a high degree of certainty that these effects are within set limits. **SG60, SG80 and SG100 are met.**

| | | | | |
|---|---|---|---|---|
| **b** | Direct effects | | | |
| | Guide post | Known direct effects of the UoA are likely to not **hinder recovery** of ETP species. | Direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species. | There is a **high degree of confidence** that there are no **significant detrimental direct effects** of the UoA on ETP species. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

Landing obligation, implemented in 1987, would require vessels to land any dead animal, regardless it being ETP species or not. The electronic logbook system requires that not only commercial fishes are recorded but also ETP species, principally seabirds and marine mammals. A particular logbook ‘page’ cannot be closed until the ETP boxes are completed, even if it is with a zero. Skippers are also required to avoid all known coral reefs and report all catches of coral >30 kg and sponges >400 kg and move on ≥2 miles.

According to landing records there are no interactions between the Norway beaked redfish fishery and ETP species. Some other unidentified skates and rays (of which some would be considered as secondary species, but others would be considered as ETP species) were reported in small quantities (0.7 tons) in 2016 and have not been reported afterwards. Given this low level of interactions and the high post releasement rate of these species (as described by Mandelman and Farrington (2007), direct effects are likely not to hinder the recovery of elasmobranchians ETP species. Interactions with seabirds and marine mammals are also not expected nor reported for years 2016-2020. **The requirements at SG60 are met.**

Given the implemented recording of interactions with ETP species, and the low level of interactions, the team considers that direct effects of the UoA are highly likely not to hinder the recovery of ETP species. **The requirements at SG80 are met.**

The good level of recording together with the minimal interactions provide a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. **SG100 is met**.

| | | | | |
|---|---|---|---|---|
| | Indirect effects | | | |
| **c** | Guide post | | Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts. | There is a **high degree of confidence** that there are no **significant detrimental indirect effects** of the UoA on ETP species. |
| | Met? | | **Yes** | **No** |
| Rationale | | | | |

Indirect effects on ETP populations would be those caused as results of interactions with the fishing gear or vessel (such as injuries, acoustic disturbances, ghost fishing in case of gear loss or environmental degradation such as pollution) or those related to the reduction of prey availability for prey species, competition for forage, destruction of egg cases or geolocation difficulties.
As regards lost fishing gears, fleets make every effort to avoid gear loss and to retrieve it.
Indirect effects such as prey removal are normally considered in the management plans by increasing the natural mortality in the assessment to account for the needs of higher trophic levels. Previous personal comments by the Institute of Marine Research in Bergen reported that marine mammals are normally taken into account on catch advice, but they could not asseverate the same for bird species. In any case, the beaked redfish stock in subareas 1 and 2 is on a healthy situation.
Given this, indirect effects have been considered for all UoAs under assessment and are thought to be highly likely to not create unacceptable impacts to ETP species. **SG80 is met by the UoA.**

Given the uncertainties related to certain indirect effects (such as acoustic disturbances) and the difficulty to provide a high degree of confidence that there aren't significant detrimental effects of the fishery on ETP species **prevent the requirements of SG100 to be met.**

References

Landing records.
DNV PCR Norway haddock offshore fishery, 2021.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **More information sought. Confirmation by IMR and DoF of potential interactions of the beaked redfish fishery and ETP species.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.3.2 – ETP species management strategy

| PI 2.3.2 | | The UoA has in place precautionary management strategies designed to:<br>- meet national and international requirements;<br>- ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place (national and international requirements) | | | |
| | Guide post | There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |

While there is a strategy in place to manage the UoA's impact on ETP species, there are no specific requirements for their protection set out in applicable national ETP legislation nor in international agreements. See SIb.

| | | | | |
|---|---|---|---|---|
| **b** | Management strategy in place (alternative) | | | |
| | Guide post | There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The strategy is set out in the Norwegian Marine Resources Act, in the protocol for the JRNFC and in the Barents Sea and Norwegian Sea management plans, which explicitly require an ecosystem approach to marine environmental management. The act also requires that all commercial fish species are retained, recorded and landed and that vessels equipped with e-logbooks must record interactions with seabirds and marine mammals. (Paper logbooks are still required if in the Russian zone.) Electronic logbooks should serve to record fatal interactions with any ETP species should these happen. Records from catch statistics for years 2016-2020 show no interactions. In 2016 there were some interafctions with unidentified skates or rays, but not with seabirds nor marine mammals. There is no requirement to record non-fatal interactions, which would serve to better quantify the effects that different UoAs have on the different ETP populations.

Marine mammal and seabird stock monitoring and abundance estimates are made by IMR and NINA and records of all biota are made during annual IMR– PINRO trawl surveys undertaken under the auspices of JRNFC. The status of the different sharks and ray species is part of both IMR and ICES research activities, who provides advice on the stock status of some of these species. As for seabirds, there are permanent and seasonal closures of inshore waters in the vicinity of key seabird nesting sites.

Fishermen always avoid interactions of ETP species with the fishing gear, as these may result in damages to the net that would require expensive reparations:

- All demersal trawlers are equipped with sorting grids for exclusion of bycatch and minimise the mortality of non-targeted species. Specifically, a review of the impact of Norwegian offshore demersal trawl fisheries on marine mammals was undertaken by ICES Study Group for Bycatch of Protected Species (SGBYC 2009) and concluded that larger offshore demersal trawl vessels “are regarded as having a relatively low risk for bycatches of marine mammals”.

The team considers that the different regulations and measures in place are considered as a strategy which is expected to ensure that the different UoAs do not hinder the recovery of ETP species. **SG60 and SG80 are met by the UoA.**

However, the team considers that this strategy is not comprehensive it still lacks from mitigation devices in other fishing gears and and from the mandatory record for all interactions and measures to avoid non-fatal interactions. **SG100 is not met by the UoA.**

| | Management strategy evaluation | | | |
|---|---|---|---|---|
| **c** | Guide post | The measures are **considered likely** to work, based on **plausible argument** (e.g. general experience, theory or comparison with similar fisheries/species). | There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved. | The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

Norwegian Regulation J-250-2013 applies to all gear types and obliges to the releasement of spurdogs, porbeagles, silky sharks and basking sharks if entangled. Research undertaken by Madelman and Farrington (2007) shows that shark species have a high survival rate if released soon.
Coastal states’ agencies (IMR, NINA, PINRO) monitor the status of fish, seabird and marine mammal populations and pay close regard to the potential for adverse interactions of these populations with fisheries. The rationale at PI 2.3.1.SIb describes that specific interactions with seabirds and marine mammals are not considered to be a cause of concern for research agencies.
Where (and if) specific problems are identified, they are modelled and subject to quantitative analysis although more generally emphasis is given to broader ecosystem modelling. IMR conducts on-site research which serves to provide estimations on the effectiveness of mitigation measures. Information from catch statistics show that interactions with ETP species are low. This is supported by research agencies such as NAMMCO and NINA (see PI 2.3.1.b).
The minimal (nil) interactions of the Norway beaked redfish fishery with ETP species serve as an objective basis for confidence that the measures implemented work effectively in preventing any hindering to ETP species. **The requirements at SG60 and SG80 are met.**

The lack of a comprehensive strategy directed to minimise these impacts and of a quantitative analysis of interactions **prevent the UoA from meeting the requirements at SG100.**

| | Management strategy implementation | | | |
|---|---|---|---|---|
| **d** | Guide post | | There is some **evidence** that the measures/strategy is being implemented successfully. | There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).** |
| | Met? | | **Yes** | **No** |
| Rationale | | | | |

ICES, IMR and NINA conduct research and monitoring of the populations of marine mammal and seabirds. Their results are afterward reviewed by OSPAR and NAMMCO.

Norwegian specific management measures such as landing obligation of all species, area closures, bycatch limitations, move on rules, return to sea of alive elasmobranchs, use of sorting grids to avoid catch of juvenile fish, research by IMR and a robust enforcement system serve as a clear evidence that the strategy is being implemented successfully. **SG80 is met**.

While the monitoring of interactions with the fishery and the monitoring of elasmobranchs, marine mammal and seabird populations by ICES, IMR and NINA, would serve to detect any increase in the risk posed by these populations due to the Norway beaked redfish fishery, the uncertainties in relation to the identification of possible ETP species (such as unidentified skates and rays) prevent the UoA from meeting the requirements at SG100, since it is difficult to quantitatively determine the level of impact by the UoA on these species (although it is expected to be very low). **SG100 is not met by the UoA.**

| | Review of alternative measures to minimise mortality of ETP species | | | |
|---|---|---|---|---|
| **e** | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

The Norwegian Directorate of Fisheries performs an annual risk review in which different aspects are taken into consideration, including the examination of the number and type of infringements by Norwegian vessels, the species (and quantities) affected and the alternative measures to minimize such damages in the future. The risk review includes a review of fatal interactions with ETP species, but non-fatal interactions can't be taken into consideration due to the lack of records.

The risk review is taken as part of the Directorate of Fisheries annual activity, with meetings held in June and November, and review of results would result in new measures to minimize unwanted catch (including ETP species) and infringements by the fleet (if any). **SG60, SG80 and SG100 are met by the UoA.**

References

Landing records.
Mandelman, J.W., and M.A. Farrington. 2007. The estimated short-term discard mortality of a trawled elasmobranch, the spiny dogfish (Squalus acanthias).
DNV PCR Norway NEA haddock offshore fishery, 2021.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.3.3 – ETP species information

| PI 2.3.3 | | Relevant information is collected to support the management of UoA impacts on ETP species, including:<br>- Information for the development of the management strategy;<br>- Information to assess the effectiveness of the management strategy; and<br>- Information to determine the outcome status of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Information adequacy for assessment of impacts | | | |
| | Guide post | Qualitative information is **adequate to estimate** the UoA related mortality on ETP species.<br><br>**OR**<br><br>**If RBF is used to score PI 2.3.1 for the UoA:** Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species. | Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.<br><br>**OR**<br><br>**If RBF is used to score PI 2.3.1 for the UoA:** Some quantitative information is **adequate to assess productivity and susceptibility attributes** for ETP species. | Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

A good overview of the ETP species' spatial and temporal distribution is obtained from the joint IMR–PINRO and IMR surveys of the Barents Sea and Norwegian Sea ecosystems, Polar Institute research, NINA bird surveys and ICES working groups, who gather information on sharks, marine mammals and seabird distributions, populations and life-history characteristics.
Research on ETP species in the area is undertaken by different groups, such as ICES Working Group on Elasmobrachian Fishes (WGEF), ICES Working Group on Protected Species (SGBYC), and ICES Working Group on marine mammal ecology (WGMME) which identify issues relating to marine mammal ETP species or. Other groups, such as NAMMCO (the North Atlantic Marine Mammal Commission) and IWC also monitor marine mammal ETP species in the Barents Sea.
There have been marine mammal surveys going on in the NE Arctic for a long time which inform us of abundance estimates. Mark–recapture experiments, breeding surveys and more recently transect surveys either by ship for large cetaceans, or spotter planes for small one, have been used to get this information. The ICES states that any quotas for harvesting marine mammal species commercially must be based on estimates that are less than 5-years old, and therefore has advised that these surveys are necessary. Obviously, the species that are most threatened or most valuable commercially receive more monitoring than the rest of species. Annual vessel monitoring surveys undertaken by IMR target minke whales and other large baleen whales and provide abundance estimates every 6 years. According to NINA, the principal threat to seabird populations is the inshore static gear fishery, with other methods of fishing having little significant interaction. According to IMR, estimates of seabird static gear interaction show that bird mortality is low in relation to total fishing effort and the population sizes.
Landing obligation, implemented in 1987, should serve to detect any increase in landings of ETP species. IMR also collects information on interactions of the fishing fleets with ETP species. This qualitative and quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **The requirements at SG60 and SG80 are met.**

So far injuries or other non-fatal impacts are not being measured so information falls short to cover the possible non-fatal injuries made to ETP populations. **SG100 is not met.** It is recommended that all vessels record all ETP interactions in an electronic database.

| | | | | |
|---|---|---|---|---|
| | Information adequacy for management strategy | | | |
| **b** | Guide post | Information is adequate to support **measures** to manage the impacts on ETP species. | Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species. | Information is adequate to support a **comprehensive strategy** to manage impacts, minimise mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives. |
| | Met? | **Yes** | **Yes** | **No** |

Rationale

The broad range of surveys undertaken by IMR, PINRO, NINA and the Norwegian Polar Institute provide adequate information to monitor the trends that support the strategies represented by the protocols of the JNRFC, NAMMCO and OSPAR and the Norwegian and Barents Seas management plans. According to the team, the amount of data provided by landing records, fishery's log-books, research done by ICES working groups and the current monitoring programs are enough to measure trends and support a full strategy to manage the possible fatal impacts that the fishery may have on ETP species. **SG60 and SG80 are met.**

However, such strategy can't be considered as comprehensive as it falls short to evaluate impacts and injuries that the fishery may have on ETP species. **SG100 is not met.**

## References

The CAB shall list any references here, including hyperlinks to publicly-available documents.


- http://www.seapop.no/en/about/
- Anker-Nilssen, T., Barrett, R.T., Bustnes, J.O., Bårdsen, B.-J., Christensen-Dalsgaard, S., Dehnhard, N., Descamps, S., Erikstad, K.K., Fauchald, P., Hanssen, S.A., Langset, M., Lorentsen, S.-H., Moe, B., Reiertsen, T.K., Strøm, H., Systad, G.H.2019.Sjøfugl i Norge 2018. Resultater fra SEAPOP-programmet. SEAPOP: 28 pp. (Seabirds in Norway, 2018. Results from the SEAPOP programme). http://www.seapop.no/opencms/export/sites/SEAPOP/no/filer/pdf/arsbrosjyrer/seapop-arsbrosjyre-2018-web.pdf
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- ICES 2018 Working Group on Bycatch of Protected Species. http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2018/WGBYC/wgbyc_2018.pdf
- ICES 2019 Working Group on Marine Mammals Ecology. http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EPDSG/2019/WGMME/wgmme_2019.pdf
- NSMP. 2010. Integrated Management of the Marine Environment of the Norwegian Sea. Report No. 37 (2008–2009) to the Storting. Ministry of the Environment, Oslo. https://www.regjeringen.no/en/dokumenter/meld.-st.-10-20102011/id635591/
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- PCR NEA haddock offshore fishery, 2021. DNV.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.4.1 – Habitats outcome

| PI 2.4.1 | | The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Commonly encountered habitat status | | | |
| | Guide post | The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. | The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The UoA uses trawling fishing gear. Most of the catch is taken by semipelagic fishing gear but some other by demersal trawling gear. The areas where the fishing activity takes place is restricted to those shown in Figure 4 and Figure 5. Specifically, activity of demersal trawling is spatially restricted. Most commonly encountered habitats by the UoA in the fishing grounds are sandy and muddy-sandy bottoms (see *Figure 21*, *Figure 22*, *Figure 23* and *Figure 24*). These bottoms fall under the "Fine" substratum category, which has a "flat" associated geomorphology and "large erect" biota. There are no hard sediments in the area.

The degree to which the effect of a fishing 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 fishing operations ceasing. Irreversibility may imply regime change, loss or 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. MSC guidance suggests that serious (or irreversible) harm refers to change that fundamentally alters the capacity of the component to maintain its function (e.g. reducing ecosystem services; loss of resilience; regime shift; gross changes in composition of dependent species) or to recover from the impact (within timescales of natural ecological processes – normally one or two decades).

As regards the demersal fishing activity by the UoA, it takes place in the Norwegian EEZ not far from Bear Island, in a well-established trawl corridor meaning that fishing activity is concentrated there. This area represents far less than 20% of the total Barents Sea and Norwegian Sea area and in habitats which are already degraded.

Trawling affects benthic habitats through relocation of shallow burrowing infaunal species to the surface of the seafloor, and by resuspension of surface sediment. Kaiser et al. (2006) concluded that trawling produces a significant, negative, short-term effect on soft habitats, but no detrimental effects were seen in the long term once the fishing stops. The recovery time as described in *Figure 27*, which shows that commonly encountered areas by the fishery should recover in 5 to 10 years' time once the fishery stops. Besides, trawl modified habitats continue to cover ecosystem needs, regardless of showing a lower biodiversity rate.

The team concludes that the UoA is highly unlikely to (further) reduce structure and function of the commonly encountered habitats (soft bottoms of fine substratum with flat associated geomorphology and large erect biota) to a point where there would be serious or irreversible harm. **SG60 and SG80 are met.**

As regards SG100, the assessment team could not find any evidence to support SG100 for the UoA. **SG100 is not met.**

| Scoring element | SG60 | SG80 | SG100 |
|---|---|---|---|
| Fine substratum (with flat associated geomorphology and large erect biota). | Trawl (demersal and semipelagic) - Yes | Trawl (demersal and semipelagic) - Yes | Trawl (demersal and semipelagic) - No |

| | | | | |
|---|---|---|---|---|
| **b** | VME habitat status | | | |
| | Guide post | The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. | The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

Throughout the NE Arctic, benthic species that are potentially vulnerable to trawling remain well represented in both IMR–PINRO and MAREANO 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, substratum type and sedimentary environment.

Different species described by NEAFC and OSPAR as indicator species of VME ecosystems have been identified in the fishing grounds. Both Jørgensen *et al* (2015) and Jakobsen and Ozhigin (2011) have located the spatial distribution of corals, sponges, seapens, and soft corals. These species have been designated by NEAFC as indicators of VMEs in the Barents Sea (although OSPAR does not consider seapens to be a declining habitat in OSPAR Region 1, see https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats).

The assessment team has considered the following scoring elements (VME habitats), following ICES and NEAFC advice and Jorgesen et al (2015) identification of benthic species present in the area:

- Cold water hard coral reefs: *Lophelia pertusa* reef and *Solenosmilia variabilis* reef.
- Coral garden: Hard bottom coral garden and soft bottom coral garden.
- Deep sea sponge aggregations: Hard bottom sponge gardens and glass sponge communities
- Seapen fields.

In considering the potential impact of the fishery, the assessment team took into account the distribution of fishing activity in relation to known distribution of the VME habitats, the bio-regional distribution of habitat types, the irregular reproduction and slow growth rates of the vulnerable species with the consequent slow recovery rates, the nature of the fishing gear used, and the behaviour of fishermen in avoiding habitats which might damage the fishing gear.

There are certain management measures and regulations protecting VME in the fishing grounds. These include:

- Comprehensive research on the distribution of VME gained through the Mareano program.
- Avoidance of coral reefs and sponges by the fishing industry, as towed-gear vessels avoid coral because of the damage it can do to the gear and sponges crush the fish and makes the catch commercially worthless. There is also the risk of trawls bursting with concomitant loss of fishing time for repairs or (high cost) replacement. Vessels engaged in the current fishery have the technology (high precision GPS navigation and ground-discrimination echo sounders which can distinguish between mud and sand or hard rock, coral and sponges) that enables them to skirt around and avoid known VME areas.
- Mandatory use of satellite monitoring (VMS – vessel monitoring system) which serves to verify that large vessels do not enter Marine Protected Areas (MPAs). The assessment team will need to confirm this with Norwegian Directorate of Fisheries at the site visit.
- Trawling is forbidden within the majority of the 12 nautical mile limit from Norwegian baselines (in some instances, this limit is set at 6 nautical miles). Much of the cold-water coral reefs are located within this limit.
- Fishing below 1000 m within the Norwegian EEZ is banned in order to protect deep-water sensitive habitats and species.
- Norwegian regulation J-61-2019 regulating bottom gears to protect vulnerable marine ecosystems (https://fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/J-meldinger/Kommende-J-meldinger/J-61-2019)
- Norwegian Regulation J-40-2016 – which applies to all the Norwegian EEZ including waters in the Barents Sea; article 2 establishes that when a trawl vessel catches more than 30 kgs of coral or 400 kg of sponges in a single haul, the vessel shall stop fishing and move position at least 2 nautical miles in order to avoid such catches. The incident must be reported to the Directorate of Fisheries.

  Regulation J-40-2016 requires that when fishing in a “new fishing area” in the Norwegian EEZ or the Svalbard FPZ, vessels must have a special permit from the Directorate of Fisheries. These are only approved by the Directorate if the vessel has submitted for approval:

  - A detailed protocol for trial fishing which includes a fishing plan for fishing gear, fish stocks, by-catches, time and areas.
  - A plan to avoid damage to sensitive marine ecosystems.
  - A plan for journal entry and reporting.
  - And a plan for collecting data on vulnerable habitats.
- Norwegian Regulation J-215-2015 states that when fishing in “New fishing areas” all living corals and sponges are to be reported by the fishing vessels. This goes into effect from 1 kg corals and 1 kg sponge bycatch Norwegian Regulation J-215-2015.
- Norwegian Regulation J-58-2015 states that it is illegal for any fishing vessel to fish on known coral reefs” (included those mapped by the Mareano program and which are not managed as MPAs)
- Similar measures on the protection of corals and sponges is recommended in NEAFC waters, where Recommendation 19/2014 establishes threshold limits for bycatch of corals and sponges. (It is highlighted however that fishing activity does not take place in NEAFC waters).
- NEAFC commission meets annually and decides, when necessary, on the establishment of area closures, as done in other NEAFC waters. To date, NEAFC has not identified any need for area closure in the Loophole area (http://www.fao.org/fishery/topic/16204/en).
- Norwegian Regulation J-187-2008, prohibits trawling near coral reefs, and establishes MPAs to protect coral species. It is noted that these are all located in Norwegian coastal waters.
- Norwegian Regulation J-151-2014 establishing closed areas to protect benthic habitats (mostly coral) in Norwegian and Svalbard EEZs.
- Other VME habitats, present in the area, such as seapen fields, have just very recently (May 2017) been protected in the Barents Sea by the creation of a closed area directed to protect these VME.

In past audits the Directorate of Fisheries was generally satisfied as regards compliance of these measures. At the site visit it will be verified if this is the situation for the beaked redfish fishery.

As mentioned above, VME scoring elements to consider are cold water coral reefs, coral gardens, deep sea sponge aggregations and seapen fields.

Coral water coral reefs, coral gardens and sponges: The distribution of these VME habitats has been investigated by different research institutions (IMR, PINRO, and individual researchers) and mapped by the Mareano program. Results of the Mareano program are updated in the vessel’s bridge technology. Given the different management measures that apply to the protection of corals (through the identification of these areas and the use of VMS to position the vessels, the prohibition of bottom trawling in waters closer than the 12 nm limit from the coast, the establishment of MPA and the mandatory move on rule) and sponges (again through the identification of these areas and the use of VMS to position the vessels, and through the mandatory move on rule) the team considers that it is unlikely that the UoA would reduce the structure and function of these VME habitats to a point where there would be serious or irreversible harm, as interactions are generally avoided.

It should be considered that some areas of the Barents Sea are regularly fished, while other areas will never be targeted and fished. This limits the impact of the different gears to particular lanes, while creating benthic unfished patches or islands of greater diversity amongst even the more heavily fished areas. Such islands support recovery of benthic community in fished areas through neighbouring emigration and by acting as source locations for new recruits to other areas. This is important because such benthic ecology/habitats are key to the life history processes (breeding, nursery and feeding areas) for a wide range of species, including commercially important fish and shellfish. Also varying levels of recoverability is expected post-fishing. Large sessile fauna may require years or decades to recover. Indirect evidence (Pitcher 2000, and Sainsbury et al. 1997) suggests that large sponges probably take more than 15 years to recover. Kaiser et.al. (2006), suggest 5-10years recovery time.

Hard bottom areas associated with VMEs and other habitat forming species are likely to take much longer from trawling impact. Coral aggregations or structures are thousands of years old, and some sponges live for hundreds of years. According to Lubin (2013) and Denisenko and Zgurovsky (2013) full recovery of VMEs - age structures and species composition - is likely to take decades. However, there are examples of relatively rapid recovery of certain sponge communities. These may not be identical to the original habitat in terms of age, size structure and species composition, however their functionality, diversity and healthy habitats deliver a wide and comparable range of ecosystem services. Also, though there is evidence of reduced physical heterogeneity and of changes in the abundance of some taxa, there is no evidence of loss or change in the number of taxa. For the ecoregion, it suggested that recovery in most parts of the Barents Sea would take place within 5 years, but recovery would be up to 10 years or more in the areas where VMEs tend to occur (such as epibenthos, and sponge aggregations on the edge of the continental slope). In other benthic environments similar to the Barents Sea, recovery is observed in similar time periods (3 to 9 years) from monitoring, pre and post mobile bottom fishing gear and closed areas (Collie et al., 2001).

As regards seapens (which are not considered to be a declining habitat in OSPAR region 1, where most of the bottom trawl fishing activity takes place), following the highlight of this topic in previous MSC assessments in Norwegian waters, a MPA has been designated in the fisheries protection zone around Svalbard. In any case, and according to Denisenko et al (2015), most seapens in the Barents Sea are distributed further north that where the fishery takes place.

Regarding coral reefs, soft coral gardens, sponges and seapens scoring elements, the established management measures and the historical footprint of the fishery (which follow the same paths over the time), make it unlikely for the UoA to reduce structure and function of the VME habitats to a point where there would be irreversible harm. **SG60 is met.**

However, it is recognised that demersal trawlers (which are partially part of the UoA) have an impact on VMEs when encountered. MSC FS v2.01 SA 3.13.3.2 describes how VMEs shall be defined and includes potential VMEs to cover situations when a gobernance body uses a precautionary approach. MSC interpretation on Identification of VMEs (see https://mscportal.force.com/interpret/s/article/identification-of-VMEs-SA3-13-3-1527262008557) states that in the absence of formal recognition and protection "The CAB shall consider those VMEs and potential VMEs (as defined by the FAO Guidelines; see GSA3.13.3.2) that have been accepted, defined or identified as such by a local, regional, national, or international management authority/governance body". In harmonised approach with other fisheries in the Barents and Norwegian Seas, the assessment team will only consider VMEs as designated by management authorities, and not potential VMEs in the area under assessment.

Also, MSC FS v2.01 SA3.13.4.1 describes that in the case of VMEs the team shall interpret "serious or irreversible harm" as reductions in habitat structure and function below 80% of the unimpacted level.

Given the semipelagic nature of most fishing activity by the UoA, the restricted and regulated path where demersal fishing is allowed, and the extensive management measures to protect VMEs in Norwegian EEZ, the assessment team considers that it is highly unlikely that the UoA would reduce structure and function of VMEs to a point where there would be serious or irreversible harm, i.e. are highly unlikely (<30th %ile) to cause reductions in vulnerable biotopes to below 80% of their current status (status at the time of identification as VMEs). **The requirements at SG80 are met for the UoA.**

The requirements at SG100 are not met at present as there is no evidence that UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. Overlapped maps of VMS tracks and VMEs distribution could help in increasing this score. **SG100 is not met.**

| Scoring element | SG60 | SG80 | SG100 |
|---|---|---|---|
| Cold water coral reefs | Y | Y | N |
| Coral gardens | Y | Y | N |
| Deep sea sponge aggregations | Y | Y | N |
| Seapens fields | Y | Y | N |

| | | | | |
|---|---|---|---|---|
| | Minor habitat status | | | |
| **c** | Guide post | | | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm. |
| | Met? | | | **No** |
| Rationale | | | | |

Minor habitats are coarse sediments and rocky areas.
Bottom trawlers are generally designed to ride over seabed irregularities but still have the capacity to affect habitat structure and function through surface abrasion and boulder turning. The team could not find evidence to support SG100 for the demersal trawlers which are part of the UoA. SG100 is not met.

| Scoring element | SG60 | SG80 | SG100 |
|---|---|---|---|
| Coarse sediments | N/A | N/A | N |
| Rocky areas | N/A | N/A | N |

## References


- Kaiser et al, 2006.
- Collie, J.S., Hall, S.J., Kaiser, M.J., and Poiner, I.R. (2001). A quantitative analysis of shing impacts on shelf-sea benthos. Journal of Animal Ecology, 69, 785-798.
- https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats
- Jørgensen *et al* (2015)
- Jakobsen and Ozhigin (2011)
- Denisenko et al (2015)
- Norwegian Regulation J-215-2015
- Norwegian Regulation J-58-2015
- Norwegian Regulation J-40-2016
- https://www.fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/J-meldinger/Gjeldende-J-meldinger/J-61-2019
- NEAFC Recommendation 19/2014
- Norwegian Regulation J-187-2008
- Norwegian Regulation J-151-2014
- Industry Group Agreement to Cod fishery in the northern part of North-East Atlantic


***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Further information needed in relation to the compliance of the UoA with relevant management measures.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.4.2 – Habitats management strategy

| PI 2.4.2 | | There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place | | | |
| | Guide post | There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance. | There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. | There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

As described in PI 2.4.1.SI b, there is a broad range of management measures which apply to Norwegian vessels when fishing in the Barents or in the Norwegian Seas, including Barents and Norwegian Seas management plans. Management measures include:

- Comprehensive research on the distribution of VME gained through the Mareano program, which maps depth, topography, sediment composition, contaminants, biotopes and habitats in Norwegian and Svalbard waters, serves as a valuable tool to manage habitat types in Norwegian and Svalbard waters, and has helped to establish no fishing zones in Norwegian waters, which have been designed mainly to protect cold corals which are mostly located near the shore line, with the exception of two protected areas in more open waters.
- Mandatory use of satellite monitoring (VMS – vessel monitoring system) which serves to verify that large vessels do not enter Marine Protected Areas (MPAs). This will be reviewed at site visit in meeting with the Norwegian Directorate of Fisheries.
- Fishing below 1000 m within the Norwegian EEZ is banned in order to protect deep-water sensitive habitats and species.
- Norwegian Regulation J-58-2017 creating a protected area in the Trænadjupet Slide, offshore Norway.
- Norwegian Regulation J-151-2014 establishing closed areas to protect benthic habitats (mostly coral) in Norwegian and Svalbard EEZs.
- Other VME habitats, present in the area, such as seapen fields, have been recently (2017) protected in the Barents Sea by the creation of a closed area directed to protect these VME.
- Avoidance of coral reefs and sponges by the fishing industry, as towed-gear vessels avoid coral because of the damage it can do to the gear and sponges crush the fish and makes the catch commercially worthless. There is also the risk of trawls bursting with concomitant loss of fishing time for repairs or (high cost) replacement. Vessels engaged in the current fishery have the technology (high precision GPS navigation and ground-discrimination echo sounders which can distinguish between mud and sand or hard rock, coral and sponges) that enables them to skirt around and avoid known VME areas. Besides, trawling vessels generally fish only in predetermined trawling corridors thus concentrating fishing activity in historical fishing grounds already degraded.
- Trawling is forbidden within the majority of the 12 nautical mile limit from Norwegian baselines (in some instances, this limit is set at 6 nautical miles). Much of the cold-water coral reefs are located within this limit.
- Norwegian regulation J-61-2019 regulating bottom gears to protect vulnerable marine ecosystems (https://fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/J-meldinger/Kommende-J-meldinger/J-61-2019)
- Norwegian Regulation J-40-2016 – which applies to all the Norwegian EEZ including waters in the Barents Sea; article 2 establishes that when a trawl vessel catches more than 30 kgs of coral or 400 kg of sponges in a single haul, the vessel shall stop fishing and move position at least 2 nautical miles in order to avoid such catches. The incident must be reported to the Directorate of Fisheries.

  Regulation J-40-2016 requires that when fishing in a “new fishing area” in the Norwegian EEZ or the Svalbard FPZ, vessels must have a special permit from the Directorate of Fisheries. These are only approved by the Directorate if the vessel has submitted for approval:

  - A detailed protocol for trial fishing which includes a fishing plan for fishing gear, fish stocks, by-catches, time and areas.

- A plan to avoid damage to sensitive marine ecosystems.
- A plan for journal entry and reporting.
- And a plan for collecting data on vulnerable habitats.

- Similar measures on the protection of corals and sponges is recommended in NEAFC waters, where Recommendation 19/2014 establishes threshold limits for bycatch of corals and sponges.
- NEAFC commission meets annually and decides, when necessary, on the establishment of area closures, as done in other NEAFC waters. To date, NEAFC has not identified any need for area closure in the Loophole area (http://www.fao.org/fishery/topic/16204/en).
- Norwegian Regulation J-187-2008, prohibits trawling near coral reefs, and establishes MPAs to protect coral species. It is noted that these are all located in Norwegian coastal waters.

Enforcement of these measures is carried out by the Norwegian Coast Guard. In previous years the Directorate of Fisheries has been generally content with the accomplishment of these measures by the Norwegian fleet industry but this needs to be confirm at the site visit.

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The comprehensive set of measures to manage habitat impacts by the different fishing gears (mostly focused on the performance of trawling vessels, which have the higher impact on bottom types) serve to justify that there are measures in place to manage habitat impacts and that these measures conform a partial strategy. **SG80 is met.**

As SG80 for scoring issue a is met, SG60 is not scored following Derogation for PI 2.4.2 for scoring issue a (see https://mscportal.force.com/interpret/s/article/Move-On-Rules-derogation-November-2020) These measures are considered as a comprehensive strategy to manage habitat impacts by Norwegian vessels in Norwegian and Svalvard waters. SG100 is met.

| | Management strategy evaluation | | | |
|---|---|---|---|---|
| **b** | Guide post | The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats). | There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved. | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The environmental status of the Barents and Norwegian Seas (including common and VME habitats) is monitored by different research programs, including the MAREANO monitoring program, the joint IMR-PINRO ecosystem surveys in the Barents Sea and research by IMR on the status of benthic habitats in Norwegian waters.
Information gathered on these research programs together with information gathered by VMS, serve to support scientific advice for conservation measures when deemed necessary, e.g. the coral-reef MPAs and general prohibition on ground-contact fishing is similar areas. The science supporting management measures serve to provide an objective basis for confidence that this strategy to manage benthic habitats will work. **SG60 and SG80 are met.**
The requirements at SG100 are not meet since to the team considers that the strategy won't be fully tested until all fishing grounds subject to demersal trawling by the UoA are fully mapped and research is undertaken to see the response of vulnerable habitats to management measures. **SG100 is not met.**

| | Management strategy implementation | | | |
|---|---|---|---|---|
| **c** | Guide post | | There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully. | There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a). |
| | Met? | | **Yes** | **No** |
| Rationale | | | | |

The MAREANO program began mapping the Norwegian Sea seafloor in 2005 and continues to increase its coverage of the Norwegian and Svalbard EEZs seafloor annually. The Marine Resources Act was established in 2008. Regulation J- 187-2008, which prohibits trawling near coral reefs, was implemented in 2008, while Regulation J-40-2016 (now J-61-2019), which protects corals and sponges through the implementation of a move on rule, was first implemented in 2016. Since 2016 different areas have been closed to the fishing activity in order to protect vulnerable habitats (mostly corals but also seapens).
All vessels above 15 m carry VMS which serve to monitor their position and accomplishment of regulation measures as regards Marine Protected Areas. The Norwegian Coast Guard enforces these regulations, and the Directorate of Fisheries who monitors VMS data and catch logbooks for compliance has been in the past generally content as regards Norwegian fisheries compliance with management measures. This statement, as well as UoA avoidance if MPAs will need to be verified at the site visit.
Given the different management measures implemented, the enforcement in place, and the expected low ratio of infringements, the team considers that it is feasible that there is clear quantitative evidence that the management strategy to ensure that the fishery does not cause serious or irreversible harm to habitat types is successfully implemented. This will need to be verified at the site visit. **SG60 and SG80 are expected to be met**.
Fishing methodology impacts the seafloor and there is no evidence of the recovery of vulnerable habitats following area closures. **SG100 is not met.**

| | | | | |
|---|---|---|---|---|
| **d** | Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs | | | |
| | Guide post | There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs. | There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. | There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. |
| | Met? | **Yes** | **No** | **No** |
| Rationale | | | | |

Quantitative evidence (based on the number of inspections and the number of infractions) from the Norwegian fisheries authority and Coast guard in previous audits confirms all permitted fishing vessels (MSC and non-MSC) are complying with fisheries management regulations with regards to sharing VMS data, catch data and avoiding closed areas, and MPA, where any non-compliance would result in infringements as well as loss of fishing permit. This statement needs to be confirmed at the site visit. If the statement continues to be true the team will consider that there is clear quantitative evidence that the UoA complies with the different mandatory management requirements affecting the fishery, including those designed to protect VMEs. **SG60 is expected to be met.**

There might be room for uncertainty in relation to the compliance with protection measures afforded to VMEs by other MSC UoAs/ non MSC fisheries, however, given that the UoA is managed internally by Norges Fiskarlag as well as other Norwegian MSC certified fisheries, it is expected that same management measures in relation to protection of VMEs in the fishing grounds apply to them all.
However, there are other voluntary protection measures afforded by other MSC UoAs outside Norges Fiskarlag in the area. These include:

- Development and implementation of lighter gear (several Russian fisheries e.g. Arkhangelsk, FIUN etc.)
- Several Russian fisheries are developing and hoping to implement lighter bottom trawl gears.
- Implementation of NEAFC Recommendation as regards the establishment of a move on rule of 5 nm when encountering 7 kg of seapens.
- Recording by the crew of interactions with living corals and living sponges (AGARBA, FIUN)
- The MSC AGARBA cod fishery has an internal Code of Conduct and internal move on rule so that vessels shall move 2 nm when encountering 200 kg sponges or 20 kg corals.
- Agreement by Russian Barents Sea MSC fisheries to voluntarily protect a number of areas in the Barents Sea from demersal fishing (came into force on 1st August 2020). Two of these areas fall within Russian EEZ and one within Norwegian EEZ.

The Norwegian beaked redfish fishery has not provided evidence of complying with these voluntary measures. **The requirements at SG80 and SG100 are not met.** It must been highlighted however that while the UOC covers semipelagic and demersal trawlers, the vast majority of the fishery uses semipelagic trawlers.

## References

- Norwegian Regulation J-215-2015
- Norwegian Regulation J-58-2015
- Norwegian Regulation J-40-2016
- NEAFC Recommendation 19/2014
- Norwegian Regulation J-187-2008
- Norwegian Regulation J-151-2014
- Norwegian regulation J-61-2019

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **60-79** |
| Information gap indicator | **More information sought in relation to the UoA compliance with mandatory and voluntary management measures.** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | **1** |

## PI 2.4.3 – Habitats information

| PI 2.4.3 | | Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Information quality | | | |
| | Guide post | The types and distribution of the main habitats are **broadly understood**.<br><br>**OR**<br><br>**If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the types and distribution of the main habitats. | The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.<br><br>**OR**<br><br>**If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats. | The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

As described in the background section, there is sufficient information on the nature, distribution and vulnerability of the main habitats in the UoA. Moreover, the general distribution of vulnerable habitats such as cold-water coral reefs, coral gardens, deep sea sponge aggregations and seapen fields are also identified. Information on depths, sediments, distribution of biotopes, and presence of certain indicator species of VME has been gathered over the years by different institutions, such as IMR and PINRO through their Joint annual ecosystem survey, or by the Mareano program (which maps depth, topography, sediment composition, contaminants, VME biotopes, biotopes in general with species diversity and richness, and habitats in Norwegian and Svalbard EEZ). The MAREANO-programme was launched in 2005 by multibeam echo-sounder mapping of a 984 km2 area at Tromsoflaket. This is a progressive programme, in 2013, the sum depth measurements, for all years: were about 131 000 km2, and by 2014, an area of 157 585 km2 has been sampled. While Norwegian coastal waters have been widely mapped, the Mareano program still falls short in providing specific information on the central Barents Sea, but which is slowly increasing its coverage year by year, but the Norwegian Sea has a better coverage.
Besides, there are different publications on the distribution on benthic species, as those by Jakobsen and Ozhigin (2011), Jørgensen *et al*. (2015), Lubin (2013) or by ICES working groups (WGIBAR 2018) which serve to increase the knowledge of habitats in the area.

Research undertaken serves to provide sufficient knowledge on the nature, vulnerability and distribution of main habitats (this is, commonly encountered habitats and VME) in the different areas under assessment are known at a level of detail relevant to the scale and intensity of the UoA. **SG60 and SG80 are met.**

While the occurrence of vulnerable habitats has been identified, it is difficult to state that ALL habitats are known over their range. **SG100 is not met.**

| | | | | |
|---|---|---|---|---|
| **b** | Information adequacy for assessment of impacts | | | |
| | Guide post | Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.<br><br>OR | Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear. | The physical impacts of the gear on all habitats have been quantified fully. |

| | | | | |
|---|---|---|---|---|
| | | **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats. | OR<br><br>**If CSA is used to score PI 2.4.1 for the UoA:** Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats. | |
| | Met? | **Yes** | **Yes** | **No** |

Rationale

VMS tracks provide reliable information on the spatial and temporal location and extent of fishing gear types. These tracks, together with available information on the distributions of main habitat types and the knowledge of the impacts that the different gears may have on habitat types serve to identify the main impacts that the different UoAs have on main habitats and that there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.
As regards demersal trawling activity by the UoA, it is known that this activity generates disturbance on any type of sediments. Effects such as bottom damage, seabed relief, sediment sorting and species survival, abundance and recovery have been studied in different research programs. According to Kaiser et al (2006), Gordon et al (2002) and Meenakumari et al (2008), soft grounds such as muddy and sandy bottoms are expected to recover quickly, and in a timeframe smaller than 5 years once the disturbance is stopped. Lubin (2013) estimated this time to range from 4 to 7 years in the affected habitats. It is acknowledged that the composition of the benthic communities may shift favouring more resilient species, but the overall structure and function of the habitats remains. Effects or hard substrate have also been studied and are considered more harmful. **SG60 and SG80 are met**.
While there is reasonable data on recovery rates of major habitats, understanding of recovery rates of associated species, and especially vulnerable species is still poorly understood, and although effects of the demersal trawling fishing activity has been studied in different research papers, its effects in the affected fishing grounds have not been quantified fully, regardless of the small area where these take place. **SG100 is not met**.

| | | | | |
|---|---|---|---|---|
| | Monitoring | | | |
| **c** | Guide post | | Adequate information continues to be collected to detect any increase in risk to the main habitats. | Changes in all habitat distributions over time are measured. |
| | Met? | | **Yes** | **No** |

Rationale

Information on habitats continues to be collected through the ongoing MAREANO Program, joint IMR-PINRO ecosystem surveys and the OSPAR Commission (www.ospar.org ). The combination of VMS maps and habitat maps serve to determine the risk that a fishery may have for the habitat of a certain area. **SG80 is met.**

However, further mapping is needed in order to gather information on yet un-mapped areas in order to be able to measure change in all habitat distributions over time. Besides, habitat maps on the same area that date back time enough would be necessary in order to measure any change or trend. **SG100 is not met.**

References

Jakobsen and Ozhigin (2011)
Jørgensen et al. (2015)
ICES working group (WGIBAR 2018)
VMS maps.
MAREANO Program
IMR-PINRO Joint fisheries commission.
OSPAR Commission (www.ospar.org )

Grekov and Pavlenko (2011)
Kaiser et al (2006),
Gordon et al (2002)
Meenakumari et al (2008)
Lubin (2013)

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.5.1 – Ecosystem outcome

| PI 2.5.1 | | The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Ecosystem status | | | |
| | Guide post | The UoA 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 UoA 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 UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The background section summarises the ecosystem models, specific to the Barents Sea, described in the 2018 ICES AFWG Report. The AFWG has reported on the trophic relationships among the different species in the ecosystem, such as Ecopath type studies by Blanchard *et al* 2002; EcoCod (which seeks to estimate cod MSY taking into account a range of ecosystem factors), Gadget (multispecies interactions between cod, herring, capelin, minke whale, krill) in the Barents Sea; Biofrost (multispecies model for Barents Sea – addressing primarily cod / capelin dynamics); STOCOBAR (Stock of cod in the Barents Sea) and various ecosystem modelling studies by e.g. Planque and Lindstom at IMR. Similar ecosystem models exist for the Norwegian Sea (Hjollo et al, 2012; Utne et al, 2012). Broader ecosystem models include NORWECOM.E2E, which includes plankton and fish. PINRO and IMR have developed together hydrodynamic models that complement these mainly biologically based models.

Three ICES working groups (AFWG, WGDEC and WGIBAR) provide a comprehensive annual review of ecosystem status in the NE Arctic. This information is supplemented by on-going data collected by IMR and PINRO under the Joint Norwegian-Russian Commission and its environmental status reports for the Barents Sea (which issues annual Barents Sea ecosystem status report, trends, highlights expected future situation) and work undertaken as part of implementing the Norwegian Integrated Management Plan for the Barents Sea- Lofoten area. The different models and assessments provide enough information to support that both the Norwegian and the Barents Sea ecosystems are relatively healthy (affected however by global warming and other human pressures).

Key ecosystem elements considered to be most crucial to giving the Barents Seas ecosystem its characteristic nature, structure, dynamics and functions are well documented (WGIBAR 2018). There is evidence that many of the key elements of the ecosystem are in good shape, and there is a good understanding of the factors affecting the negative change in other ecosystem elements, such as some seabirds species with declining population trends (northern fulmar, black-legged kittiwake, razorbill, Atlantic puffin and common guillemot) as 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 bycatch in different fisheries (particularly long line and gill net fisheries).
As for marine mammals, some of which prey on cod, haddock, saithe, etc but which are not obligate predators of any one of them, the clearest evidence that the fishery for cod and haddock is highly unlikely to disrupt the key elements underlying ecosystem structure and function is provided by the long-term historic overview. Despite the extreme variation in abundance of several of the major fish stocks over the past 50 – 70 years (which includes current stock and haddock stocks being c. twice all previous recorded levels) there has never been any substantiated indication of any significant adverse effect on ecosystem structure or function (as might be indicated by a universal collapse of bird or mammal populations or plague blooms of jellyfish).

The Marine Resources Act makes it an explicit requirement that an ecosystem approach is taken to all aspects of marine resource management. Norway maintains extensive ecosystem monitoring and management programmes that review the role of fisheries and target species' trophic role. A key element of this is the annual assessment, management advice and landing for the beaked redfish fishery. The fishery's share of TAC is based on ICES advice, which takes into account the potential needs of other species in the ecosystem, such as other fish species or marine mammals. However, the feed needs of other predators such as seabirds are not yet taken into account.

Of relevance to the beaked redfish fishery, the stock is at an all-time high (above Bmsy since 1994) and is harvested at sustainable levels. The current beaked redfish fishery is not being considered as disrupting ecosystem main functions.

Declines in the populations of other species such as marine mammals or birds in the Barents Sea are attributed to other factors such as rising sea temperature or redistribution of prey species.
The team considers that the beaked redfish fishery in the NEA 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. **SG60 and SG80 are met.**

Uncertainties in relation to the impact that global warming has on the different elements of the ecosystem including distribution and abundance of fish and out-of-scope species prevent the UoA from meeting the requirements at SG100, since this impact is still not well understood in relation to fisheries. **SG100 is not met.**

## References

ICES 2018 AFWG Report
Blanchard *et al* 2002;
Planque and Lindstom at IMR
Hjollo et al, 2012
Utne et al, 2012
NORWECOM.E2E
ICES 2018 WGIBAR
ICES advice for cod, haddock.
Marine Resources Act.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.5.2 – Ecosystem management strategy

| PI 2.5.2 | | There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place | | | |
| | Guide post | There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA on key elements of the ecosystem. | There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. | There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

The Norwegian EEZ and the Barents Sea are subject to management measures which seek profit from the fishery as well as the protection of the fishing resources. This is done by the establishment of fishing regulations, mesh limitations and technical measures, closed areas, bycatch limitations, enforcement effort, landing obligation, and continue monitoring of many species present in the ecosystem.
The Norwegian Marine Resources Act has an explicit requirement to take an ecosystem approach to resource management and exploitation. The act provides the statutory basis for the suite of regional seas management plans (for the North Sea and Skagerrak, the Norwegian Sea, and the Barents Sea), each of them aimed at monitoring and safeguarding the status of the marine environment and the resources it supports. Major revisions of these management plans are planned every 4 years.
An integral part of the fishing strategy in the Barents Sea is the JNRFC commitment to safeguarding the exploited stocks. Fundamental to the strategy is the annual planning and execution of a series of research cruises both by individual states and under the auspices of the JNRFC, to monitor and assess the status of resources, ecosystems and environment. The strategy bases its measures on data gathered through different research institutions (including IMR and PINRO), ICES advice on fish stocks, ICES Advisory Committee on Ecosystems (ACE), habitat mapping programs (MAREANO Programme) and OSPAR Commission research (www.ospar.org).
There are different management measures used in the beaked redfish fishery which ensure that the fishery does not pose a risk of serious or irreversible harm to ecosystem structure and function. These measures include: TAC for the targeted species but also for several of the P2 primary species (e.g. cod, haddock, saithe); minimum landing size, sorting grids in the bottom trawl fishery to minimize the catch of juvenile fish; minimum mesh size (130mm); maximum bycatch of undersized fish, move-on rules to protect juvenile fish (cod, saithe, Greenland halibut and redfish); area closures to protect spawning grounds; MPAs to protect vulnerable benthic habitats and species and move on-rule to protect corals and sponges.
The different measures in place take into account the potential impact of the fishery. **SG60 is met.**

Given the coordination with Russian management authorities gained through the JNRFC and the Norwegian management plans for the Barents and Norwegian Sea these measures can be considered as a partial strategy already implemented. **SG80 is met.**

Norway has defined management plans for the Barents Sea and the Norwegian sea ecoregions. These management plans contain management measures designed to ensure that the fishing activity does not pose a risk of serious or irreversible harm to the ecosystem structure and function. **SG100 is met.**

| | | | | |
|---|---|---|---|---|
| **b** | Management strategy evaluation | | | |
| | Guide post | The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems). | There is **some objective basis for confidence** that the measures/ partial strategy will work, based on some information directly about the | **Testing** supports **high confidence** that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved. |

| | | | | |
|---|---|---|---|---|
| | | | UoA and/or the ecosystem involved. | |
| | Met? | **Yes** | **Yes** | **No** |

Rationale

The beaked redfish stock is at biomass levels above MSY Btrigger. The integrated ecosystem approach-based management plan and strategies for the Barents Sea and Lofoten areas, as well as for the Norwegian Sea, which take into account direct information about the ecosystems involved through ICES advice, scientific advice from IMR, PINRO and the scientific community and which uses historical and current information collected under the framework of the Joint-Norwegian-Russian Fisheries Commission, are reviewed every 4 years which allows for modifications to the management plans where further effectiveness is required.
Given the broad knowledge on the Barents Sea and Norwegian Sea ecosystems, the continued monitoring by different research institutions, the generally healthy status of both ecosystems and of the heathy situation of beaked redfish stock, there is some objective basis for confidence that the measures and partial strategy implemented will work (and are working already). **SG60 and SG80 are met.**

Although the main pressures of the Barents Sea and the Norwegian Sea are evaluated and reported by ICES (EOBSE 2016 and EONSE 2018) there is no testing as regards the management plan effectiveness. Besides, the plan falls short to manage certain fish stocks such as golden redfish. **SG100 is not met.**

| | | | | |
|---|---|---|---|---|
| | Management strategy implementation | | | |
| **C** | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is **clear evidence** that the partial strategy/strategy is being **implemented successfully and is achieving its objective as set out in scoring issue (a).** |
| | Met? | | **Yes** | **No** |

Rationale

There is evidence of area closures (compliance will be verified at site visit), compliance with management measures (evidence will be gathered at site visit), evidence of scientific 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. This conform an evidence that the partial strategy is implemented successfully. **SG80 is met.**

This evidence is not available for all the fishing grounds, as some fishing areas remain unmapped by the Mareano program. **SG100 is not met.**

References

ICES Ecosystem Overview for the Barents Sea Ecoregion, 2016.
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/Barents_Sea_Ecoregion-Ecosystem_overview.pdf
ICES Ecosystem Overview for the Norwegian Sea Ecoregion, 2018.
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/NorwegianSea_EcosystemOverview.pdf
Integrated Management Plan for the Marine Environment of the Barents Sea–Lofoten Area, Meld. St. 10 (2010–2011).
https://www.regjeringen.no/en/dokumenter/meld.-st.-10-20102011/id635591/
Integrated Management of the Marine Environment of the Norwegian Sea — Report No. 37 (2008 – 2009).
https://www.regjeringen.no/en/dokumenter/report-no.-37-to-the-storting-2008-2009/id560159/
ICES 2020 advice for beaked redfish in regions I and II.
ICES 2020 advice for golden redfish in regions I and II.
Mareano program. www.mareano.no

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |

| | |
|---|---|
| Information gap indicator | **More information sought (specifically information of compliance by the UoA with the different management measures that apply).** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 2.5.3 – Ecosystem information

| PI 2.5.3 | | There is adequate knowledge of the impacts of the UoA on the ecosystem | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Information quality | | | |
| | Guide post | Information is adequate to **identify** the key elements of the ecosystem. | Information is adequate to **broadly understand** the key elements of the ecosystem. | |
| | Met? | **Yes** | **Yes** | |
| Rationale | | | | |

As described in PI 2.5.1, key elements of the ecosystem, such as primary and secondary productivity, and predator-prey relationships, have been studied through different ecosystem models both in the Norwegian and the Barents Seas. The trophic relationships of beaked redfish on the North East Atlantic have been studied through ecosystem models for the Norwegian Sea (Hjollo et al, 2012; Utne et al, 2012) and the Barents Sea.

The Norwegian Institute for Nature Research (NINA) monitors birds populations while the IMR Institute studies the Norwegian Sea ecosystem through the Norwecom.E2E project. Barents Sea ecosystem is studied under the auspices of the JNRFC. Information from these studies is adequate to broadly understand the key elements of these ecosystems. **SG60 and SG80 are met.**

| | | | | |
|---|---|---|---|---|
| **b** | Investigation of UoA impacts | | | |
| | Guide post | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information but **have not been investigated** in detail. | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**. | Main interactions between the UoA and these ecosystem elements can be inferred from existing information and **have been investigated in detail**. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

International research effort over the past 25 years has led to an increased knowledge and understanding of interactions between fisheries and ecosystems. This understanding is backed-up by different ecosystem models designed for the fishing grounds.
There is a good level of information on the ecosystem, and also a broad knowledge of the impacts that the fishery has on the different ecosystem elements, including information on the level of interactions with bycatch, ETP species, and main habitat types. Such information is collected via VMS, landing and inspection records. Furthermore, different institutions such as IMR, PINRO and WWF follow up the status of the different elements of the Norwegian and Barents Seas ecosystems.
The main impacts and interactions of the fishery on key ecosystem elements can be inferred from existing information, and several have been investigated in detail**. SG60, 80 and 100 are met.**

| | | | | |
|---|---|---|---|---|
| **c** | Understanding of component functions | | | |
| | Guide post | | The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**. | The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**. |
| | Met? | | **Yes** | **Yes** |

Rationale

Information obtained by different means ((relevant scientific research by IMR/PINRO together with ecosystem modelling over the years, and fishery specific data such as VMS data, catch composition data, and non-commercial species sightings data, as well as coast guard inspection data) is sufficient to gather a good understanding of the main functions of key ecosystem components, such as target species – beaked redfish – primary, secondary, ETP species, habitats (productive nursery areas) and ecosystem. **SG80 is met.**

The distribution of fishing effort and landings are recorded accurately and shared with national authorities for real-time quota/fishing removal management. There is a well-established landing obligation. Impact on seabed habitat is managed by scientific surveys of closed areas, and before –after surveys of open areas. The impacts of the different UoAs on the different species and habitats are identified and the main functions of these components in the ecosystem have been investigated and are understood. **SG100 is met.**

| | Information relevance | | | |
|---|---|---|---|---|
| **d** | Guide post | | Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. | Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred. |
| | Met? | | **Yes** | **Yes** |

Rationale

The long-established and long-term research programmes have built a database that ensures that the main functions of the components in the ecosystem are known. Different ecosystem models (mentioned under PI 2.5.1) provide a broad knowledge of the impacts that the fishery has on the targeted species and dependent predators. These simulation models have been developed using data collected over many years, including stomach content analysis 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, there 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. **SG80 and SG100 are met.**

| | Monitoring | | | |
|---|---|---|---|---|
| **e** | Guide post | | Adequate data continue to be collected to detect any increase in risk level. | Information is adequate to support the development of strategies to manage ecosystem impacts. |
| | Met? | | **Yes** | **Yes** |

Rationale

There is a comprehensive monitoring of the area by IMR (in the Norwegian and Barents Seas) and also by PINRO (in the Barents Sea), conducted through different annual research trips intended to evaluate the status of different fishing stocks, ETP species and habitats. Other institutions monitor other populations such as seabirds and mammals. There also are different ecosystem models in the area which serve to foresee expected future changes in the status of the ecosystem. Risks associated with changing populations or relations between fisheries and various elements of the ecosystem should be detected. **SG80 is met.**

Although there are some gaps in understanding, there is more than enough information available to support precautionary strategies to manage marine ecosystem impacts. The long-established and long-term research programmes and their associated databases (and not only those of coastal states but other nations with an historic scientific interest in the NE Arctic) are undoubtedly sufficient to support the development of strategies to manage ecosystem interactions. The regional seas management plans for the Norwegian and the Barents Sea are de facto examples of such management strategies. **SG100 is met.**

## References

ICES 2018 AFWG Report
NORWECOM.E2E
ICES 2018 WGIBAR
ICES advice for cod, haddock.
Marine Resources Act.
ICES Ecosystem Overview for the Barents Sea Ecoregion, 2016.
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2016/2016/Barents_Sea_Ecoregion-Ecosystem_overview.pdf
ICES Ecosystem Overview for the Norwegian Sea Ecoregion, 2018.
https://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/NorwegianSea_EcosystemOverview.pdf
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Integrated Management of the Marine Environment of the Norwegian Sea — Report No. 37 (2008 – 2009).
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ICES 2018 advice for cod in regions I and II.
ICES 2018 advice for haddock in regions I and II.
Mareano program. www.mareano.no
http://www.jointfish.com/index.php/eng.html

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## 7.4 Principle 3

### 7.4.1 Principle 3 background

a. Jurisdiction

The fishery takes place solely in waters under Norwegian jurisdiction, and all catch is landed in Norway. The UoA stock is managed exclusively by Norway. Only the Norwegian fisheries management system needs to be assessed.

b. Legislative basis and management set-up

In Norway, fisheries management is governed by the 2008 Marine Resources Act. The Act applies to all catch and use of marine resources and their genetic material (§ 3) and covers issues such as bioprospecting (Chapter 2), catch levels and quotas (Chapter 3), catch and use of marine resources (Chapter 4), arrangements on the fishing fields, liability for damage and local regulations (Chapter 5) and monitoring, enforcement, sanctions and criminal liability (Chapters 6–12).

The Marine Resources Act is a framework law, which in the main authorizes the Government to issue specific regulations within designated fields. The most important rules are found in the Regulation on the Execution of Marine Fisheries, which is updated annually. The Regulation contains rules for mesh size, selection and limitations on the use of specific catch gear (Chapters II–V), seasonal restrictions (Chapter VI), bycatch (Chapters VII–VIII), minimal fish size (Chapter IX), discard ban (Chapter X), restrictions on the use of trawl in specific areas (Chapters XI–XII), protection of coral reefs (Chapter XIII), documentation on hold volumes (Chapter XIV), marking of vessels and gear (Chapters XV–XVI), loss of gear (Chapter XVII) and fish welfare (Chapter XVIII). Other important legal instruments are the 1999 Act on the Right to Participate in Fisheries, the 2015 Act on First-Hand Sales of Wild Catch of Marine Resources, the 2018 Regulation on Participation in Fisheries, the 2018 Regulation on Licencing and the 2018 Regulation on Landing and Sales Notes. All Regulations are subject to running modifications and additions through so-called J-orders, which are distributed to the fishing fleet electronically. This includes dedicated and regularly updated annual regulations for the fishery of each specific species, including separate regulations for redfish.

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

c. Objectives

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

The Norwegian system for fisheries management includes various mechanisms that generally respect and observe the rights of the coastal population along the country's northern, western and southern coast. For the most important species, significantly and proportionately larger quota shares are allotted to coastal fisheries than to the ocean going fleet (see, for instance, the Regulation on Participation in Fisheries for an overview), with particular attention to the traditional fisheries of the coastal Sami population in the northernmost part of the country. The Sami Parliament, which is a consultative body for the indigenous Sami population on Norwegian territory, is consulted on all management measures, including the distribution of the national quota, related to species of particular historic importance to the Sami. The Government has formally committed to this through the 2005 Royal Decree on Consultations with the Sami Parliament.

d. Stakeholders and consultation processes

The most important organizations involved in Norwegian fisheries management are government bodies such as the Ministry of Trade, Industry and Fisheries, the Directorate of Fisheries and the Coast Guard, sales organizations such as the Norwegian Fishermen's Sales Organization, fishermen's organizations such as the Norwegian Fishermen's Association and environmental NGOs such as WWF, Greenpeace and the Norwegian Society for the Conservation of Nature. The Sami Parliament represents the interests of the coastal Sami population.

Norway has a long tradition of including non-governmental organisations in fisheries management, with continuous consultation and close cooperation between governmental agencies and user-group organisations, in particular the Norwegian Fishermen's Association, but also the more specialized organisations such as the fishermen's sales organisations. As these organisations have regional branches, whose representatives are actively involved in policymaking, ensuring that local knowledge is also taken into consideration in the management process. So-called Regulatory Meetings are organized twice a year are open to all; user-group organisations and NGOs attend on a regular basis. In addition, there is day-to-day contact by telephone and email between authorities, user groups and other interested parties. Distribution of the national quota between different gear and fishing fleets has in practice been delegated to the Norwegian Association of Fishermen, which includes all fishermen from the smallest coastal vessels to ocean-going trawlers. Technical regulation measures are to a large extent decided upon in direct consultations 'over the table' between authorities and user groups at the Regulatory Meetings. The Sami Parliament is formally consulted in the management of fisheries that are of historical importance to the Sami population.

e. Enforcement and sanctions

The Marine Resources Act contains provisions in Chapter 6 on fishermen's duties to contribute to an effective control (see, e.g., § 36 and § 39 on catch log and sales notes requirements, respectively); in Chapter 7 on authorities' responsibilities for control and enforcement (including, in § 48, the sales organizations' control obligations); in Chapter 8 measures to combat illegal, unreported and unregulated (IUU) fisheries (including § 50 on the ban to land IUU catch); and in Chapter 9 on illegally caught fish.

The Marine Resources Act places the overall responsibility for monitoring, control and surveillance in Norwegian fisheries with the Directorate of Fisheries (§ 44). The 1997 Coast Guard Act provides the Coast Guard with the authority to conduct inspections in waters under Norwegian jurisdiction, within the fields covered by the Marine Resources Act and secondary legislation given with statutory authority in that Act (§ 9). According to the 2015 Act on First-Hand Sales of Wild Catch of Marine Resources, the six sales organizations, which have monopoly on first-hand sale of fish in Norway, are required to record all landings of fish in Norway and keep track of how much remains of a vessel's quota at any given time, on the basis of the landings data (§§ 17-21). Hence, monitoring, control and surveillance in Norwegian fisheries is taken care of through shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the sales organizations, here: the Norwegian Fishermen's Sales Organization (Norges Råfisklag), located in Tromsø. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of individual vessels, different vessel groups and other states at any given time, based on reports from the fishing fleet. Norwegian vessels are required to have electronic logbooks, or more specifically Electronic Reporting Systems (ERS). This implies that real-time data are forwarded to the Directorate of Fisheries, with the possibility to make corrections of data submitted each day within 12 hours into the next day. Norway has agreements in place with a number of other countries about exchange of ERS data, including the EU.

The self-reported catch data can be checked at sales operations through the sales organizations and through physical checks by the Directorate of Fisheries and the Coast Guard. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. The value of any catch delivered above a vessel's quota is retained by the sales organization and used for control purposes. The sales organizations have their own inspectors who carry out physical controls of landings. They check, among other things, weighing equipment, quantity and size distribution of the catch, the quality of the fish and documentation. The Directorate has seven regional offices along the coast, staffed with inspectors that carry out independent physical control of the fish at the point of landing, including total volume, species and fish size. All landings have to be reported six hours in advance in order to give the inspectors the possibility to check the landed catch. The landed volumes are compared to the volumes reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. The Norwegian Food Safety Authority checks all landings by foreign vessels in Norwegian ports, while the Directorate of Fisheries conducts physical inspections of at least 15 % of these landings.

The Norwegian Coast Guard operates 15 vessels, of which five patrol the coastal area and the rest the wider EEZ – four of the latter have a helicopter on board. These Coast Guard vessels are the largest in the entire Royal Norwegian Navy. They perform spot checks at sea (in the EEZ and the Protection Zone around Svalbard), including from helicopters during fishing activities and inspections at check points that foreign vessels have to pass when entering or leaving the

EEZ and in connection with transhipments in Norwegian waters, which have to be reported in advance. Coast Guard inspectors board fishing vessels and control the catch from last haul (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculate the volume of the fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. Helicopters are used for impromptu inspections, e.g. to reveal discards. The Norwegian Coast Guard carried out 1139 inspections in waters under Norwegian jurisdiction in 2019. 52 inspections (4.6 %) resulted in a fine or prosecution. In 2020, 1155 inspections were carried out, of which 49 (4.2 %) resulted in fine or prosecution.

Statutory authority for the use of sanctions in the event of infringements of fisheries regulations is given in Chapters 11 and 12 of the Marine Resources Act. Intentional or negligent violations are punished with fines or prison up to one year (§§ 60–63), while infringements committed with gross intent or negligence may be punished with prison up to six years. In the judgment of the seriousness of the infringement, the economic gain of the violation, among other things, is to be taken into consideration (§ 64). Alternatively, catch, gear, vessels or other properties can be confiscated (§ 65). The Act on First-Hand Sales of Wild Catch of Marine Resources also provides a legal foundation for sanctions, including penal liability (§ 22; same as for the Marine Resources Act) and confiscation (§ 23), and the Coast Guard Act for penal liability (§ 36; up to six months prison or two years for infringements committed under aggravating circumstances).

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

f. Review of the management system

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

### 7.4.2 Principle 3 Performance Indicator scores and rationales

## PI 3.1.1 – Legal and/or customary framework

| PI 3.1.1 | | The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>- Is capable of delivering sustainability in the UoA(s);<br>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>- Incorporates an appropriate dispute resolution framework | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Compatibility of laws or standards with effective management | | | |
| | Guide post | There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2 | There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2. | There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

In Norway, fisheries management is governed by the 2008 Marine Resources Act. The Act applies to all catch and use of marine resources and their genetic material (§ 3) and covers issues such as bioprospecting (Chapter 2), catch levels and quotas (Chapter 3), catch and use of marine resources (Chapter 4), arrangements on the fishing fields, liability for damage and local regulations (Chapter 5) and monitoring, enforcement, sanctions and criminal liability (Chapters 6–12) (see PI 3.2.3 below).

The Marine Resources Act is a framework law, which in the main authorizes the Government to issue specific regulations within designated fields. The most important rules are found in the Regulation on the Execution of Marine Fisheries, which is updated annually. The Regulation contains rules for mesh size, selection and limitations on the use of specific catch gear (Chapters II–V), seasonal restrictions (Chapter VI), bycatch (Chapters VII–VIII), minimal fish size (Chapter IX), discard ban (Chapter X), restrictions on the use of trawl in specific areas (Chapters XI–XII), protection of coral reefs (Chapter XIII), documentation on hold volumes (Chapter XIV), marking of vessels and gear (Chapters XV–XVI), loss of gear (Chapter XVII) and fish welfare (Chapter XVIII). Other important legal instruments are the 1999 Act on the Right to Participate in Fisheries, the 2015 Act on First-Hand Sales of Wild Catch of Marine Resources, the 2018 Regulation on Participation in Fisheries, the 2018 Regulation on Licencing and the 2018 Regulation on Landing and Sales Notes. All Regulations are subject to running modifications and additions through so-called J-orders, which are distributed to the fishing fleet electronically. This includes dedicated and regularly updated annual regulations for the fishery of each specific species, including separate regulations for redfish.

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

Hence, there is an effective national legal system in place to deliver management outcomes consistent with MSC Principles 1 and 2. **SG60 and SG80 are met.**

It also contains binding procedures insofar as it is based on formal law. **SG100 is met.**

| | |
|---|---|
| **b** | Resolution of disputes |

| | | | | |
|---|---|---|---|---|
| | Guide post | The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system. | The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA. | 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**. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

At the national level in Norway, there is an effective, transparent dispute resolution system in place, as fishers can take their case to court if they do not accept the rationale behind an infringement accusation by enforcement authorities, or the fees levied against them. Verdicts at the lower court levels can be appealed to higher levels. **SG 60 is met.**

The system is transparent insofar as court cases are open to the public and verdicts published in Norway. The Norwegian court system is generally considered to be effective in dealing with most issues and is appropriate to the context of the UoA. **SG 80 is met.**

There are instances where management authorities have lost cases against fishermen and accepted the verdict, which is a clear demonstration that the system has been tested and proven to be effective. **SG 100 is met.**

| | | | | |
|---|---|---|---|---|
| | Respect for rights | | | |
| **c** | Guide post | The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. | The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. | The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. |
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

The Norwegian system for fisheries management includes various mechanisms that generally respect and observe the rights of the coastal population along the country's northern, western and southern coast. For the most important species, significantly and proportionately larger quota shares are allotted to coastal fisheries than to the ocean going fleet (see, for instance, the Regulation on Participation in Fisheries for an overview), with particular attention to the traditional fisheries of the coastal Sami population in the northernmost part of the country. The Sami Parliament, which is a consultative body for the indigenous Sami population on Norwegian territory, is consulted on all management measures, including the distribution of the national quota, related to species of particular historic importance to the Sami. The Government has formally committed to this through the 2005 Royal Decree on Consultations with the Sami Parliament.

Hence, 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. **SG 60 is met.**

The system has a mechanism to observe such rights, so **SG 80 is also met.**

Since it is founded in law, the mechanism formally commits to these rights, and **SG 100 is met.**

References

Deltakerloven, LOV-1999-03-26-15, 1999 (Act on the Right to Participate in Fisheries).

J-3-2021: Deltakerforskriften (‘Regulation on Participation in Fisheries’), Directorate of Fisheries, Norway, 6 January 2021.

J-31-2021: Forskrift om utøvelse av fisket i sjøen (‘Regulation on the Execution of Marine Fisheries’), Directorate of Fisheries, Norway, 2 February 2021.

Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 (‘Marine Resources Act’), Parliament of Norway (Stortinget), 2008.

Lov om førstehandsomsetning av viltlevande marine ressursar (fiskesalslagslova), LOV-2015-06-19-65, 2015 (Act on First-Hand Sales of Wild Catch of Marine Resources).

Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten (‘Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten’), Ministry of Climate and Environment, Norway, 2011.

Meld. St. 35 (2016–2017) Oppdatering av forvaltningsplanen for Norskehavet, 2017 (Update of the [Integrated] Management Plan for the Norwegian Sea).

Prosedyrer for konsultasjoner med Sametinget, Kgl. res. 04/186 (‘Royal Decree on Procedures for Consultations with the Sami Parliament’), Government of Norway, 2005.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.1.2 – Consultation, roles and responsibilities

| PI 3.1.2 | | The management system has effective consultation processes that are open to interested and affected parties<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Roles and responsibilities | | | |
| | Guide post | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The most important organizations involved in Norwegian fisheries management are government bodies such as the Ministry of Trade, Industry and Fisheries, the Directorate of Fisheries and the Coast Guard, sales organizations such as the Norwegian Fishermen's Sales Organization, fishermen's organizations such as the Norwegian Fishermen's Association and environmental NGOs such as WWF, Greenpeace and the Norwegian Society for the Conservation of Nature. The Sami Parliament is consulted in the management of fisheries that are of historical importance to the Sami people.

Organizations and individuals involved in the management process have been identified, and according to the submitted client checklist, their functions, roles and responsibilities are generally understood. **SG 60 is met.**

The functions, roles and responsibilities are explicitly defined in legislation and long-standing practice and well understood for key areas of responsibility and interaction. **SG 80 is met.**

It remains to be seen at interviews during the site visit whether these are well understood for *all* areas. At this point, **SG100 is not met.**

| | | | | |
|---|---|---|---|---|
| **b** | Consultation processes | | | |
| | Guide post | The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

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

Regulatory Meetings are organized twice a year are open to all; user-group organisations and NGOs attend on a regular basis. In addition, there is day-to-day contact by telephone and email between authorities, user groups and other interested parties. Distribution of the national quota between different gear and fishing fleets has in practice been delegated to the Norwegian Association of Fishermen, which includes all fishermen from the smallest coastal vessels to ocean-going trawlers. Technical regulation measures are to a large extent decided upon in direct consultations 'over the table' between authorities and user groups at the Regulatory Meetings. As mentioned under SI 3.1.1c above, the Sami Parliament is formally consulted in the management of fisheries that are of historical importance to the Sami population.

Hence, the management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system. **SG 60 is met.**

The processes regularly seek and accept relevant information, and the management system demonstrates consideration of the information obtained. **SG 80 is met.**

It is at this stage not clear whether the authorities provide adequate explanations of how stakeholders' input is used or not used. **SG 100 is not met.**

| | Participation | | | |
|---|---|---|---|---|
| **c** | Guide post | | The consultation process **provides opportunity** for all interested and affected parties to be involved. | The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement. |
| | Met? | | **Yes** | **Yes** |
| Rationale | | | | |

As follows from SI 3.1.2b above, the consultation processes provide opportunity for all interested and affected parties to be involved at both national and international level. Meetings are publicly announced, and authorities encourage all interested parties, including NGOs and the media, to attend. The various hearing opportunities available online also contribute to encouraging and facilitating public involvement.

Hence, the consultation process provides opportunity for all interested and affected parties to be involved. **SG 80 is met.**

The authorities not only provide opportunity, but actively encourage all parties both within and outside the fisheries sector to get involved and facilitate their effective engagement. **SG 100 is met.**

## References

Deltakerloven, LOV-1999-03-26-15, 1999 (Act on the Right to Participate in Fisheries).

J-3-2021: Deltakerforskriften ('Regulation on Participation in Fisheries'), Directorate of Fisheries, Norway, 6 January 2021.

Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 ('Marine Resources Act'), Parliament of Norway (Stortinget), 2008.

Prosedyrer for konsultasjoner med Sametinget, Kgr. res. 04/186 ('Royal Decree on Procedures for Consultations with the Sami Parliament'), Government of Norway, 2005.

Referat fra reguleringsmøtet 6. og 7. november 2019 ('Minutes from the Regulatory Meeting 6 and 7 November 2019'), Directorate of Fisheries, Norway, 2019.

Reguleringsmøte 2020 (online) ('Regulatory Meeting 2020 (online)), available at https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2/Hoeringer-av-reguleringer-for-2021-reguleringsmoetet.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.1.3 – Long term objectives

| PI 3.1.3 | | The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Objectives | | | |
| | Guide post | Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy. | **Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are **explicit** within management policy. | **Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are **explicit** within **and required by** management policy. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

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

Hence, clear long-term objectives that guide decision-making, consistent with MSC Principles and Criteria and the precautionary approach, are explicit within management policy. **SG 60 and SG 80 are met.**

These objectives are required by binding legislation which has to be followed at lower management levels. **SG 100 is met.**

### References

Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 (‘Marine Resources Act’), Parliament of Norway (Stortinget), 2008.

Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten (‘Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten’), Ministry of Climate and Environment, Norway, 2011.

Meld. St. 35 (2016–2017) Oppdatering av forvaltningsplanen for Norskehavet, 2017 (Update of the [Integrated] Management Plan for the Norwegian Sea).

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.2.1 – Fishery-specific objectives

| PI 3.2.1 | | The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2 | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Objectives | | | |
| | Guide post | **Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific 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-specific 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-specific management system. |
| | Met? | **Yes** | **Yes** | **Partial** |

Rationale

Objectives which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2 are in place in the integrated management plans for the Barents and Norwegian Seas, the Marine Resources Act and supporting legislation at national level in Norway. **SG 60 is met.**

This includes objectives to maintain fish stocks at sustainable levels (here: both target stocks and other retained species) and protect other parts of the ecosystem, such as habitats. These objectives are short- and long-term and measurable, in the sense that performance against them can be measured through the enforcement bodies' recording and inspection routines (see PI 3.2.3). **SG 80 is met.**

P1 objectives are well defines, but P2 objectives are less so, warranting **a partial score at SG 100**.

References

J-31-2021: Forskrift om utøvelse av fisket i sjøen ('Regulation on the Execution of Marine Fisheries'), Directorate of Fisheries, Norway, 2 February 2021.

Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37 ('Marine Resources Act'), Parliament of Norway (Stortinget), 2008.

Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten ('Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten'), Ministry of Climate and Environment, Norway, 2011.

Meld. St. 35 (2016–2017) Oppdatering av forvaltningsplanen for Norskehavet, 2017 (Update of the [Integrated] Management Plan for the Norwegian Sea).

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.2.2 – Decision-making processes

| PI 3.2.2 | | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Decision-making processes | | | |
| | Guide post | There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives. | There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. | |
| | Met? | **Yes** | **Yes** | |
| Rationale | | | | |

The Ministry of Trade, Industry and Fisheries decides on policy and regulatory schemes, while the Directorate of Fisheries acts as a technical body with a main responsibility for secondary legislation. The Directorate and the Coast Guard perform compliance control, on shore and at sea respectively. The decision-making processes include the allocation of national quotas to different fleet groups according to an elaborate distributional scheme based on vessel groups defined by gear and length of the vessels. Further, technical regulations are defined by the Directorate of Fisheries, after consultations with user groups and other stakeholders. (The enforcement system is further described under PI 3.2.3 below.)

Hence, there are decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives. This applies to the UoA fishery as it does to Norwegian fisheries in general; see PIs 3.1.1 and 3.1.2 above. **SG 60 is met.**

These processes are established – evolved over several decades and now codified in the 2004 Federal Fisheries Act and secondary legislation – so **SG 80 is also met.**

| | | | | |
|---|---|---|---|---|
| b | Responsiveness of decision-making processes | | | |
| | Guide post | Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions. | Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. | Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. |
| | Met? | **Yes** | **Yes** | **No** |
| Rationale | | | | |

The well-established decision-making procedures in the Norwegian system for fisheries management respond to serious issues identified in research, monitoring, evaluation or by groups with an interest in the fishery through the arenas for regular consultations between governmental agencies and the public. This happens first and foremost at the Regulatory Meetings, further through ad hoc consultation with the industry and other stakeholders (see PI 3.1.2 above). In addition, there is close contact between authorities and scientific research institutions, primarily between the Directorate of Fisheries and the Institute of Marine Research. **SG 60 is met**.

Not only serious issues are responded to, as demonstrated by the voluminous minutes from the Regulatory Meetings. **SG 80 is met.**

It is a principal challenge to claim that *all* issues are responded to, but at ACDR stage the assessment team prefers a precautionary scoring. **SG 100 is not met.**

| | | | | |
|---|---|---|---|---|
| | Use of precautionary approach | | | |
| **c** | Guide post | | Decision-making processes use the precautionary approach and are based on best available information. | |
| | Met? | | **Yes** | |
| Rationale | | | | |

Decision-making processes are based on scientific recommendations from ICES and the Institute for Marine Research. The Norwegian Marine Resources Act, which applies to the capture of all marine species, requires fisheries management to be based on the precautionary approach (see PI 3.1.3 above). **SG 80 is met.**

| | | | | |
|---|---|---|---|---|
| | Accountability and transparency of management system and decision-making process | | | |
| **d** | Guide post | Some information on the fishery's performance and management action is generally available on request to stakeholders. | **Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. | Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

The Ministry of Trade, Industry and Fisheries submits annual reports to the Parliament on behalf of the entire system for fisheries management (see PI 3.2.4 below). Other involved agencies, such as the Institute of Marine Research, the Directorate of Fisheries and the Coast Guard, produce annual reports that are available to the public on request. **SG 60 is met.**

In these reports, as well as in the minutes from the Regulatory Meetings, actions taken or not taken by the relevant authority are accounted for, including those proposed based on information from research, monitoring, evaluation and review activity. **SG 80 is met.**

All the information above is available for downloading on the website of the relevant institution. In the opinion of the assessment team, this counts as formal reporting appropriate to the context of the fishery, as much as letters to stakeholders would have done. The information also comprehensive; cf., e.g., the detailed minutes from the Regulatory Meetings. **SG 100 is met.**

| | | | | |
|---|---|---|---|---|
| | Approach to disputes | | | |
| **e** | Guide post | Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery. | The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges. | The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. |

| | | | | |
|---|---|---|---|---|
| | Met? | **Yes** | **Yes** | **Yes** |

Rationale

The Norwegian system for fisheries management is not subject to continuing court challenges or indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery. **SG 60 is met.**

When occasionally taken to court by fishing companies, the management authority complies with the judicial decision in a timely manner. If management authorities lose court cases, they will accept the verdict. **SG 80 is met.**

The management authority works proactively to avoid legal disputes. This is done partly through the tight cooperation with user groups at the regulatory level (see PI 3.1.2 above), ensuring as high legitimacy as possible for regulations and other management decisions. Regulatory and enforcement authorities offer advice to the fleet on how to avoid infringements, on request but often on their own initiative (see PI 3.2.3 below). For example, Coast Guard inspectors work in a dedicated manner to communicate with fishers on the fishing grounds, keeping them updated on changes in regulations and explaining the rationale of the rules in an attempt to increase their legitimacy. The enforcement agencies have the authority to issue administrative penalties for minor infringements (serious enough to be met by a reaction above a written warning), thus referring only the more serious cases to prosecution by the police and possible transfer to the court system. Since the management system acts proactively to avoid legal disputes and rapidly implements judicial decisions, **SG 100 is met.**

References

J-3-2021: Deltakerforskriften (‘Regulation on Participation in Fisheries’), Directorate of Fisheries, Norway, 6 January 2021.

J-31-2021: Forskrift om utøvelse av fisket i sjøen (‘Regulation on the Execution of Marine Fisheries’), Directorate of Fisheries, Norway, 2 February 2021.

Lov om forvaltning av viltlevande marine ressursar (havressurslova), LOV-2008-06-06-37, 2008 (‘Marine Resources Act’), Parliament of Norway (Stortinget).

Meld. St. 10 (2010–2011) Oppdatering av forvaltningsplanen for det marine miljø i Barentshavet og havområdene utenfor Lofoten (‘Update of the [Integrated] Management Plan for the Marine Environment in the Barents Sea and the Marine Area outside Lofoten’), Ministry of Climate and Environment, Norway, 2011.

Referat fra reguleringsmøtet 6. og 7. november 2019 (‘Minutes from the Regulatory Meeting 6 and 7 November 2019’), Directorate of Fisheries, Norway, 2019.

Reguleringsmøte 2020 (online) (‘Regulatory Meeting 2020 (online)), available at https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2/Hoeringer-av-reguleringer-for-2021-reguleringsmoetet.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.2.3 – Compliance and enforcement

| PI 3.2.3 | | Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | MCS implementation | | | |
| | Guide post | Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective. | A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. | A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

The 2008 Marine Resources Act contains provisions in Chapter 6 on fishermen's duties to contribute to an effective control (see, e.g., § 36 and § 39 on catch log and sales notes requirements, respectively); in Chapter 7 on authorities' responsibilities for control and enforcement (including, in § 48, the sales organizations' control obligations); in Chapter 8 measures to combat illegal, unreported and unregulated (IUU) fisheries (including § 50 on the ban to land IUU catch); and in Chapter 9 on illegally caught fish.

The Marine Resources Act places the overall responsibility for monitoring, control and surveillance in Norwegian fisheries with the Directorate of Fisheries (§ 44). The 1997 Coast Guard Act provides the Coast Guard with the authority to conduct inspections in waters under Norwegian jurisdiction, within the fields covered by the Marine Resources Act and secondary legislation given with statutory authority in that Act (§ 9). According to the 2015 Act on First-Hand Sales of Wild Catch of Marine Resources, the six sales organizations, which have monopoly on first-hand sale of fish in Norway, are required to record all landings of fish in Norway and keep track of how much remains of a vessel's quota at any given time, on the basis of the landings data (§§ 17-21). Hence, monitoring, control and surveillance in Norwegian fisheries is taken care of through shared responsibility and close collaboration between the Directorate of Fisheries, the Coast Guard and the sales organizations, here: the Norwegian Fishermen's Sales Organization (Norges Råfisklag), located in Tromsø. The Directorate of Fisheries keeps track of how much fish is taken of the quotas of individual vessels, different vessel groups and other states at any given time, based on reports from the fishing fleet. Norwegian vessels are required to have electronic logbooks, or more specifically Electronic Reporting Systems (ERS). This implies that real-time data are forwarded to the Directorate of Fisheries, with the possibility to make corrections of data submitted each day within 12 hours into the next day. Norway has agreements in place with a number of other countries about exchange of ERS data, including the EU.

The self-reported catch data can be checked at sales operations through the sales organizations and through physical checks by the Directorate of Fisheries and the Coast Guard. This information is compared to the figures provided by the vessels to the Directorate of Fisheries through the electronic logbook. The value of any catch delivered above a vessel's quota is retained by the sales organization and used for control purposes. The sales organizations have their own inspectors who carry out physical controls of landings. They check, among other things, weighing equipment, quantity and size distribution of the catch, the quality of the fish and documentation. The Directorate has seven regional offices along the coast, staffed with inspectors that carry out independent physical control of the fish at the point of landing, including total volume, species and fish size. All landings have to be reported six hours in advance in order to give the inspectors the possibility to check the landed catch. The landed volumes are compared to the volumes reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. The Norwegian Food Safety Authority checks all landings by foreign vessels in Norwegian ports, while the Directorate of Fisheries conducts physical inspections of at least 15 % of these landings.

The Norwegian Coast Guard operates 15 vessels, of which five patrol the coastal area and the rest the wider EEZ – four of the latter have a helicopter on board. These Coast Guard vessels are the largest in the entire Royal Norwegian Navy. They perform spot checks at sea (in the EEZ and the Protection Zone around Svalbard), including from helicopters

during fishing activities and inspections at check points that foreign vessels have to pass when entering or leaving the EEZ and in connection with transshipments in Norwegian waters, which have to be reported in advance. Coast Guard inspectors board fishing vessels and control the catch from last haul (e.g. catch composition and fish size) and fishing gear (e.g. mesh size) on deck and the volume of fish in the holds. Using the established conversion factors for the relevant fish product, the inspectors calculate the volume of the fish in round weight and compare this with the catches reported to the Directorate through the logbooks. Both landing and at-sea control is conducted using a risk-based framework aimed at utilizing resources to optimize compliance at any given moment. Helicopters are used for impromptu inspections, e.g. to reveal discards. The Coast Guard carried out 1139 inspections in 2019 and 1155 in 2020 (see SI 3.2.3c below on infringement rates).

Thus, control and surveillance mechanisms exist and are implemented in the fishery, and there is a reasonable expectation that they are effective. **SG 60 is met.**

These measures qualify as a system and have demonstrated an ability to enforce relevant management measures, strategies and rules; see SI 3.2.3c below on compliance. **SG 80 is met.**

The system is comprehensive, cf. the extensive inspection activities on land and at sea and has demonstrated a consistent ability to enforce regulations; see SI 3.2.3c below on compliance. **SG 100 is met.**

| | Sanctions | | | |
|---|---|---|---|---|
| **b** | Guide post | Sanctions to deal with non-compliance exist and there is some evidence that they are applied. | Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence. | Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

Statutory authority for the use of sanctions in the event of infringements of fisheries regulations is given in Chapters 11 and 12 of the Marine Resources Act. Intentional or negligent violations are punished with fines or prison up to one year (§§ 60–63), while infringements committed with gross intent or negligence may be punished with prison up to six years. In the judgment of the seriousness of the infringement, the economic gain of the violation, among other things, is to be taken into consideration (§ 64). Alternatively, catch, gear, vessels or other properties can be confiscated (§ 65). The Act on First-Hand Sales of Wild Catch of Marine Resources also provides a legal foundation for sanctions, including penal liability (§ 22; same as for the Marine Resources Act) and confiscation (§ 23), and the Coast Guard Act for penal liability (§ 36; up to six months prison or two years for infringements committed under aggravating circumstances).

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

Hence, sanctions to deal with non-compliance exist and there is evidence that they are applied. **SG 60 is met.**

Sanctions are consistently applied and thought to provide effective deterrence; see SI 3.2.3 c) below on compliance. **SG 80 is met.**

In addition to official inspection and infringement data, independent social science studies as well as assessments by the Office of the Auditor General document that sanctions provide effective deterrence. **SG 100 is met.**

| | Compliance | | | |
|---|---|---|---|---|
| **c** | Guide post | Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery. | **Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. | There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery. |

| | | | | |
|---|---|---|---|---|
| | Met? | **Yes** | **Yes** | **No** |

Rationale

The Norwegian Coast Guard carried out 1139 inspections in waters under Norwegian jurisdiction in 2019. 52 inspections (4.6 %) resulted in a fine or prosecution. In 2020, 1155 inspections were carried out, of which 49 (4.2 %) resulted in fine or prosecution.

Hence, fishers are generally thought to comply with the requirements of the management system, including, when required, providing information of importance to the effective management of the fishery. **SG 60 is met.**

Information from Norwegian enforcement authorities provides some evidence that fishers comply. **SG 80 is met.**

Even though independent social science studies as well as assessments by the Office of the Auditor General document a generally high level of compliance in Norwegian fisheries, more detailed information on inspections and compliance in the UoA is needed to conclude that there is a high degree of confidence that fishers comply. **SG 100 is not met.**

| | | | | |
|---|---|---|---|---|
| | Systematic non-compliance | | | |
| **d** | Guide post | | There is no evidence of systematic non-compliance. | |
| | Met? | | **Yes** | |

Rationale

Based on information from Norwegian enforcement authorities (see SI 3.2.3c above), fishers generally comply with regulations. The assessment team has not been provided with any other evidence of systematic non-compliance in the fishery either. **SG 80 is met.**

References

Gezelius, S.S. (2003/2012), Regulation and Compliance in the Atlantic Fisheries: State/Society Relations in the Management of Natural Resources, Dordrecht: Springer.

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Hønneland, G. (2013), Making Fishery Agreements Work: Post-Agreement Bargaining in the Barents Sea, Cheltenham: Edward Elgar.

Kystvaktens årsrapport 2020 (‘The Coast Guard’s Annual Report 2020’), Norwegian Coast Guard, 2021.

Lov om forvaltning av viltlevande marine ressursar (havressurslova) (‘Act relating to the Management of Wild Living Marine Resources (Marine Resources Act)’), LOV-2008-06-06-37, Stortinget (Norwegian Parliament), 2008.

Lov om førstehandsomsetning av viltlevande marine ressursar (fiskesalslagslova), LOV-2015-06-19-65, 2015 (Act on First-Hand Sales of Wild Catch of Marine Resources).

Lov om kystvakten (kystvaktloven), LOV-2015-06-19-65, 1997 (Coast Guard Act).

Press release from the Norwegian Coast Guard about activities in 2019, referred in several Norwegian media outlets, e.g. the newspaper Vesterålen on 4th January 2020 (https://www.blv.no/nyheter/travelt-2019-for-kystvakta/).

Press release from the Norwegian Coast Guard about activities in 2020, referred in several Norwegian media outlets, e.g. the newspaper Fiskeribladet on 1st February 2021 (https://www.fiskeribladet.no/nyheter/kystvakten-ga-138-advarsler-for-brudd-pa-regelverk-og-anmeldte-49-forhold-i-fjor/2-1-955006).

Report from the Parallel Review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals (‘Document No. 3:2 (2007–2008) from the Norwegian Auditor General’), Office of the Auditor General of Norway, 2008.

Riksrevisjonens oppfølging av parallellrevisjonen medDen russiske føderasjons riksrevisjon om forvaltningen av fiskeressursene i Barentshavet og Norskehavet, Dokument 3:8 (2010–2011) (‘The Office of the Auditor General’s Follow-up of the Parallel Audit with the Office of the Auditor General of the Russian Federation relating to the Management of Fish Resources in the Barents Sea and Norwegian Sea, Document 3:8 (2010–2011)’), Office of the Auditor General of Norway, 2011.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

## PI 3.2.4 – Monitoring and management performance evaluation

| PI 3.2.4 | | There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives<br>There is effective and timely review of the fishery-specific management system | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Evaluation coverage | | | |
| | Guide post | There are mechanisms in place to evaluate **some** parts of the fishery-specific management system. | There are mechanisms in place to evaluate **key** parts of the fishery-specific management system. | There are mechanisms in place to evaluate **all** parts of the fishery-specific management system. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

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

Hence, the fishery has in place mechanisms to evaluate some parts of the management system, so **SG 60 is met**.

Several of these components can be considered as key parts of the management system, so **SG 80 is met** as well.

It is a principal challenge to claim that absolutely *all* parts of a fisheries management system are subject to review, but it seems reasonable to expect some sort of a holistic evaluation of the system as such. The Office of the Auditor General regularly carries out holistic reviews of different sectors of the Norwegian bureaucracy (so-called 'management audits', as opposed to the more traditional financial audits). Such comprehensive reviews have been carried out for the Barents Sea (2007 and 2011) and the North Sea and Skagerrak (2017). **SG 100 is met.**

| | | | | |
|---|---|---|---|---|
| **b** | Internal and/or external review | | | |
| | Guide post | The fishery-specific management system is subject to **occasional internal** review. | The fishery-specific management system is subject to **regular internal** and **occasional external** review. | The fishery-specific management system is subject to **regular internal and external** review. |
| | Met? | **Yes** | **Yes** | **Yes** |
| Rationale | | | | |

This SI, as opposed to SI 3.2.4a above, does not ask about the extent of reviews (covering some/key/all parts of the management system), but rather about their frequency and whether they are internal or external to the management system. (If that were not the case, scoring SI 3.2.4b would have made no sense in cases where this SI does not reach SG 100, i.e. if not *all* parts of the management system are subject to review.) Hence, various forms of evaluation can be considered under the present SI even if they do not comprise the entire management system. However, some level of interrelationship between these PIs must be assumed. For instance, external reviews of only peripheral components of fisheries management (such as financial audits of management bodies) cannot automatically lead to a positive score on the external review indicator (whether 'occasional' for SG 80 or 'regular' for SG 100).

The fishery-specific management system is subject to various forms of internal self-evaluation within the Norwegian bodies of governance (see SI 3.2.4a above). **SG 60 is met.**

These take place on a regular basis, and the system is also subject to external review. For instance, Norway's fishery agreements with other states are reviewed by Parliament following the submission of status reports by the Ministry of Trade Industry and Fisheries. GSA4.10.1, an external review can be a review carried out by another governmental body than the fisheries management agency, so reviews by the legislative of the performance of the executive branch of government are considered external. **SG 80 is met.**

Since these external reviews are performed on an annual basis and hence regular, **SG 100 is met.**

## References

Forvaltning og kontroll av fiskeressursene i Barentshavet: en parallelrevisjon mellom norsk og russisk Riksrevision, Office of the Auditor General, Oslo, 2007 (Management and Control of the Fish Resources in the Barents Sea: A Parallel Audit between the Norwegian and Russian Auditors General).

Meld. St. 13 (2019–2020) Noregs fiskeriavtalar for 2020 og fisket etter avtalane i 2018 og 2019 ('White Paper on Norway's [International] Fisheries Agreements for 2020 and Fishing in Accordance with the Agreements in 2018 and 2019'), Ministry of Industry, Trade and Fisheries, Norway, 2020.

Report from the Parallel Review of the Barents Sea Fisheries by the Norwegian and Russian Auditor Generals (Document No. 3:2 (2007–2008) from the Norwegian Auditor General), Office of the Auditor General of Norway, 2008.

Riksrevisjonens oppfølging av parallellrevisjonen medDen russiske føderasjons riksrevisjon om forvaltningen av fiskeressursene i Barentshavet og Norskehavet, Dokument 3:8 (2010–2011) ('The Office of the Auditor General's Follow-up of the Parallel Audit with the Office of the Auditor General of the Russian Federation relating to the Management of Fish Resources in the Barents Sea and Norwegian Sea, Document 3:8 (2010–2011)'), Office of the Auditor General of Norway, 2011.

Riksrevisjonens undersøkelse av fiskeriforvaltningen i Nordsjøen og Skagerrak, Dokument 3:9 (2016–2017) (The Office of the Auditor General's Investigation of the Fisheries Management in the North Sea and Skagerrak), Office of the Auditor General of Norway, 2017.

***Draft scoring range and information gap indicator added at Announcement Comment Draft Report stage***

| | |
|---|---|
| Draft scoring range | **≥80** |
| Information gap indicator | **Information sufficient to score PI** |

*Overall Performance Indicator scores added from Client and Peer Review Draft Report stage*

| | |
|---|---|
| Overall Performance Indicator score | |
| Condition number (if relevant) | |

# 8 Appendices

## 8.1 Assessment information

### 8.1.1 Small-scale fisheries

**Table 30 Small scale fisheries**

| Unit of Assessment (UoA) | Percentage of vessels with length <15m | Percentage of fishing activity completed within 12 nautical miles of shore |
|---|---|---|
| 1 | 0% | 0% |

## 8.2 Evaluation processes and techniques

### 8.2.1 Site visits

The CAB shall include in the report:

- An itinerary of site visit activities with dates.
- A description of site visit activities, including any locations that were inspected.
- Names of individuals contacted.

Reference(s): FCP v2.2 Section 7.16

The ACDR was prepared as a desk -study based on public available information and input from the Client (Norges Fiskarlag). Site visits were scheduled to be held on December 2021.

*The CPRDR/PCDR is prepared based on a site visit (city, country) on (date). Stakeholders were informed 30/60 days before the site visit and given the opportunity to provide information in advance. Information from the client and stakeholders was reviewed by the assessment team before the on-site meetings. In some cases, information was not available at the on-site meeting but was supplied within the cut-off date requirements in FCP v.2.2.* ***Error! Reference source not found.****below provides details on who was met, and the topics discussed.*

### 8.2.2 Stakeholder participation

The CAB shall include in the report:

- Details of people interviewed: local residents, representatives of stakeholder organisations including contacts with any regional MSC representatives.
- A description of stakeholder engagement strategy and opportunities available.

Reference(s): FCP v2.2 Section 7.16

There was no stakeholder participation for the ACDR.

*Sixty days prior to the site visit, all stakeholders were informed of the visit and the opportunity to provide advance information to the auditors or to meet with the team during the site visit. DNV received no request for participation at the site visit, and no written submissions regarding the (fishery name) fishery.*

*The participants present at the different stakeholder meetings in (city, country) on the (date) are given in the table above.*

### 8.2.3 Evaluation techniques

At Announcement Comment Draft report stage, if the use of the RBF is triggered for this assessment, the CAB shall include in the report:

- The plan for RBF activities that the team will undertake at the site visit.
- The justification for using the RBF, which can be copied from previous RBF announcements, and stakeholder comments on its use.
- The RBF stakeholder consultation strategy to ensure effective participation from a range of stakeholders including any participatory tools used.
- The full list of activities and components to be discussed or evaluated in the assessment.

At Client Draft Report stage, if the RBF was used for this assessment, the CAB shall include in the report:

- A summary of the information obtained from the stakeholder meetings including the range of opinions.
- The full list of activities and components that have been discussed or evaluated in the assessment, regardless of the final risk-based outcome.

The stakeholder input should be reported in the stakeholder input appendix and incorporated in the rationales directly in the scoring tables.

Reference(s): FCP v2.2 Section 7.16, FCP v2.2 Annex PF Section PF2.1

The ACDR was based on a desk-top study with information from the client on request, and the client document checklist.

*Information on the assessment process was made publicly available through www.msc.org at given stages of the assessment. DNV published the assessment announcement along with the Announcement Comment Draft report on (date). These were published on the MSC website and followed by stakeholder notifications by direct emails.*

*In addition, all relevant stakeholders identified at the beginning of the (original) assessment were reached through direct e-mails and given a possibility to monitor the assessment process and provide feedback to the assessment team. Relevant main stakeholders were interviewed on (date) as outlined in sections 8.2.1 and 8.2.2 above.*

*Information gathered is presented in this report and in the enclosed scoring tables. As no stakeholder comments were submitted during the stakeholder consultancy period prior to the site visit in (city, country), information gathered during the site visits formed the main basis of the stakeholder consultancy for this assessment.*
*The interviews were based on audit agenda sent to all involved stakeholders.*
*(At these meetings, it was confirmed that the fishery has developed as in previous years and that there were no changes in the management, control and enforcement of the fishery.)*

The default assessment tree from the MSC Fisheries standard v 2.01 Annex SA was used for the scoring of the assessment.

*Information was reviewed by the assessment team at the scoring meetings held on (date), in (city, country). The team finalised scoring through TEAMS meetings on the (date) as well as by email communication.*

*After all relevant information was compiled and analysed, the assessment team scored the Unit of Assessment against the Performance Indicator Scoring Guideposts (PISGs) in the final tree. The team discussed evidence together, weighed up the balance of evidence and used their judgement to agree on a final score following MSC FCP v2.2 process and based on consensus. Each scoring issue was scored and then averaged to principle scores. Individual Performance indicators were scored. Scores for individual PIs were assigned in increments of five points. Any divisions of less than five points were justified in the relevant scoring table. Scores for each of the three Principles were reported to the nearest one decimal.*

*Some scoring issues do not have a scoring guidepost at each of the 60, 80 and 100 levels. The scoring issues and scoring guideposts are cumulative; this means that a PI is scored first at the SG60 levels. If not all of the SG scoring issues meet the 60 requirements, the fishery fails, and no further scoring occurs.*
*If all of the SG60 scoring issues are met, the fishery meets the 60 level, and the scoring moves to SG80 scoring issues. If no scoring issues meet the requirements at the SG80 level, the fishery receives a score of 60. As the fishery meets increasing numbers of SG80 scoring issues, the score increases above 60 in proportion to the number of scoring issues met; PI scoring occurs at 5-point intervals. If the fishery meets half the scoring issues at the 80 level, the PI would score 70; if it meets a quarter, then it would score 65; and it would score 75 by meeting three-quarters of the scoring issues. If the fishery meets all of the SG80 scoring issues, the scoring moves to the SG100 level. Scoring at the SG100 level follows the same pattern as for SG80.*

*MSC do not require the SG100s to be assessed (or rationales provided) when all of the scoring issues within the SG80 level are not met, as per FCP v2.2 § 7.17.7.4, except in cases where obtaining a combined scoring element PI score require it (7.10.7). However, if the assessment team judge that it would be useful to assess the SG100s they may do so – ref. interpretation log https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218*
*The assessment has followed the interpretation log and scored all SG100s.*

*The final scores are based on group consensus within the assessment team. During the scoring process the assessment team discussed the information available for evaluating PIs with the intention to develop a broad opinion of performance of the fishery against each PI thus assuring that the assessment team was aware of the issues for each PI. Subsequently, the assessment team member responsible for each principle discussed the relevant scoring tables and provided provisional scores. The assessment team members reviewed the rationales and scores, and recommended modifications as necessary, including possible changes in scores. PI scores were entered into MSC's Fishery Assessment Scoring Worksheet (Table xx) to arrive at Principle-level scores.*

*The assessment team recommends the reassessment certification as the weighted average score is 80 or more for all the three Principles and all individual scoring issues are met at the SG60 level.*

*Conditions are set where the fishery fails to achieve a score of 80 to any Performance Indicators. Conditions with milestones are set to result in improved performance to at least the 80 level within a period set by the assessment team. The client is required to provide a client action plan to be accepted by the assessment team and may use MSC Client Action Plan template v1.0. The client action plan shall detail:*
*- how conditions and milestones will be addressed*
*- who will address the conditions*
*- the specified time- period within which the conditions and milestones will be addressed*
*- how the action(s) is expected to improve the performance of the UoA*
*- how the CAB will assess outcomes and milestones in each subsequent surveillance or assessment*
*- how progress to meeting conditions will be shown to CABs.*

*Principle scores result from averaging the scores within each component, and then from averaging the component scores within each Principle. If a Principle averages less than 80, the fishery fails.*

*Based on the evaluation of the fishery presented in this report the assessment team recommends the certification of the (fishery name), with xx conditions and xx recommendations, for the client xxx.*

## 8.3 Peer Review reports

*To be drafted at Public Comment Draft Report stage*

The CAB shall include in the report unattributed reports of the Peer Reviewers in full using the relevant templates. The CAB shall include in the report explicit responses of the team that include:

- Identification of specifically what (if any) changes to scoring, rationales, or conditions have been made; and,
- A substantiated justification for not making changes where Peer Reviewers suggest changes, but the team disagrees.

Reference(s): FCP v2.2 Section 7.14

### 8.3.1 Peer Reviewer A:

### 8.3.2 Peer Reviewer B:

## 8.4 Stakeholder input

*To be drafted at Client and Peer Review Draft Report stage*

The CAB shall use the 'MSC Template for Stakeholder Input into Fishery Assessments' to include all written stakeholder input during the stakeholder input opportunities (Announcement Comment Draft Report, site visit and Public Comment Draft Report). Using the 'MSC Template for Stakeholder Input into Fishery Assessments', the team shall respond to all written stakeholder input identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

The 'MSC Template for Stakeholder Input into Fishery Assessments' shall also be used to provide a summary of verbal submissions received during the site visit likely to cause a material difference to the outcome of the assessment. Using the 'MSC Template for Stakeholder Input into Fishery Assessments' the team shall respond to the summary of verbal submissions identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'.

Reference(s): FCP v2.2 Sections 7.15, 7.20.5 and 7.22.3

## 8.5 Conditions – delete if not applicable

### 8.5.1 Conditions – delete if not applicable

*To be drafted at Client and Peer Review Draft Report stage*

The CAB shall document in the report all conditions in separate tables.

Reference(s): FCP v2.2 Section 7.18, 7.30.5 and 7.30.6

**Table 31 Condition 1**

| | |
|---|---|
| Performance Indicator | |
| Score | *State score for Performance Indicator.* |
| Justification | *Cross reference to page number containing scoring template table or copy justification text here.* |
| Condition | *State condition.* |
| Condition deadline | *State deadline for the condition.*<br>- *activity (initial assessment/reassessment/scope extension/Surveillance 1/2/3/4*<br>- *date (month and year without day is acceptable) (Start date is publication of PCR)* |
| Exceptional circumstances ☐ | *Check the box if exceptional circumstances apply and condition deadline is longer than the period of certification (FCP v2.2 7.18.1.6). Provide a justification.* |
| Milestones | *State milestones and resulting scores where applicable.* |
| Verification with other entities | *Include details of any verification required to meet requirements in FCP v2.2 7.19.8.* |
| *Complete the following rows for reassessments.* | |
| Carried over condition ☐ | *Check the box if the condition is being carried over from a previous certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).*<br><br>*Include a justification that progress against the condition and milestones is adequate (FCP v2.2 7.30.5.2). The CAB shall base its justification on information from the reassessment site visit.* |
| Related condition ☐ | *Check the box if the condition relates to a previous condition that was closed during a previous certification period but where a new condition on the same Performance Indicator or Scoring Issue is set.*<br><br>*Include a justification – why is a related condition being raised? (FCP v2.2 7.30.6 & G7.30.6).* |
| Condition rewritten ☐ | *Check the box if the condition has been rewritten. Include a justification (FCP v2.2 7.30.5.3).* |

## 8.6 Client Action Plan

*To be drafted at Public Comment Draft Report stage*

The CAB shall include in the report the Client Action Plan from the fishery client to address conditions.

Reference(s): FCP v2.2 Section 7.19

## 8.7 Surveillance

*To be drafted at Client and Peer Review Draft Report stage*

The CAB shall include in the report the program for surveillance, timing of surveillance audits and a supporting justification.

Reference(s): FCP v2.2 Section 7.28

**Table 32 Fishery surveillance program**

| Surveillance level | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| e.g. Level 5 | e.g. On-site surveillance audit | e.g. On-site surveillance audit | e.g. On-site surveillance audit | e.g. On-site surveillance audit & re-certification site visit |
| | | | | |

**Table 33 Timing of surveillance audit**

| Year | Anniversary date of certificate | Proposed date of surveillance audit | Rationale |
|---|---|---|---|
| e.g. 1 | e.g. May 2018 | e.g. July 2018 | e.g. Scientific advice to be released in June 2018, proposal to postpone audit to include findings of scientific advice |
| | | | |

**Table 34 Surveillance level justification**

| Year | Surveillance activity | Number of auditors | Rationale |
|---|---|---|---|
| e.g.3 | e.g. On-site audit | e.g. 1 auditor on-site with remote support from 1 auditor | e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely. |
| | | | |

## 8.8 Risk-Based Framework outputs – delete if not applicable

*To be drafted at Client and Peer Review Draft Report stage*

### 8.8.1 Consequence Analysis (CA)

The CAB shall complete the Consequence Analysis (CA) table below for each data-deficient species under PI 1.1.1, including rationales for scoring each of the CA attributes.

Reference(s): FCP v2.2 Annex PF Section PF3

**Table X – CA scoring template**

| | Scoring element | Consequence subcomponents | Consequence score |
|---|---|---|---|
| Principle 1: Stock status outcome | | Population size | |
| | | Reproductive capacity | |
| | | Age/size/sex structure | |
| | | Geographic range | |
| Rationale for most vulnerable subcomponent | | | |
| Rationale for consequence score | | | |

### 8.8.2 Productivity Susceptibility Analysis (PSA)

The CAB shall include in the report an MSC Productivity Susceptibility Analysis (PSA) worksheet for each Performance Indicator where the PSA is used and one PSA rationale table for each data-deficient species identified, subject to FCP v2.2 Section PF4. If species are grouped together, the CAB shall list all species and group them indicating which are most at-risk.

Reference(s): FCP v2.2 Annex PF Section PF4

| **Table X – PSA productivity and susceptibility attributes and scores** | | |
|---|---|---|
| Performance Indicator | | |
| **Productivity** | | |
| Scoring element (species) | | |
| **Attribute** | Rationale | Score |
| Average age at maturity | | **1 / 2 / 3** |
| Average maximum age | | **1 / 2 / 3** |
| Fecundity | | **1 / 2 / 3** |
| Average maximum size<br>Not scored for invertebrates | | **1 / 2 / 3** |
| Average size at maturity<br>Not scored for invertebrates | | **1 / 2 / 3** |
| Reproductive strategy | | **1 / 2 / 3** |
| Trophic level | | **1 / 2 / 3** |
| Density dependence<br>Invertebrates only | | **1 / 2 / 3** |
| **Susceptibility** | | |
| Fishery<br>Only where the scoring element is scored cumulatively | *Insert list of fisheries impacting the given scoring element (FCP v2.2 Annex PF 7.4.10)* | |
| **Attribute** | Rationale | Score |
| Areal Overlap | *Insert attribute rationale. Note specific requirements in FCP v2.2 Annex PF4.4.6.b, where the impacts of fisheries other than the UoA are taken into account* | **1 / 2 / 3** |
| Encounterability | *Insert attribute rationale. Note specific requirements in FCP v2.2 Annex PF4.4.6.b, where the impacts of fisheries other than the UoA are taken into account* | **1 / 2 / 3** |
| Selectivity of gear type | | **1 / 2 / 3** |

| | | |
|---|---|---|
| Post capture mortality | | **1 / 2 / 3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | *Insert weights or proportions of fisheries impacting the given scoring element (FCP v2.2 Annex PF4.4.4)* | **1 / 2 / 3** |

**Table X – Species grouped by similar taxonomies (if FCP v2.2 Annex PF4.1.5 is used)**

| Species scientific name | Species common name (if known) | Taxonomic grouping | Most at-risk in group? |
|---|---|---|---|
| e.g. Genus species subspecies | | Indicate the group that this species belongs to, e.g. *Scombridae, Soleidae, Serranidae, Merluccius spp.* | Yes / No |
| | | | |
| | | | |
| | | | |
| | | | |

### 8.8.3 Consequence Spatial Analysis (CSA)

The CAB shall complete the Consequence Spatial Analysis (CSA) table below for PI 2.4.1, if used, including rationales for scoring each of the CSA attributes.

Reference(s): FCP v2.2 Annex PF Section PF7

**Table X – CSA rationale table for PI 2.4.1 Habitats**

| **Consequence** | Rationale | Score |
|---|---|---|
| Regeneration of biota | | **1 / 2 / 3** |
| Natural disturbance | | **1 / 2 / 3** |
| Removability of biota | | **1 / 2 / 3** |
| Removability of substratum | | **1 / 2 / 3** |
| Substratum hardness | | **1 / 2 / 3** |
| Substratum ruggedness | | **1 / 2 / 3** |
| Seabed slope | | **1 / 2 / 3** |
| **Spatial** | Rationale | Score |
| Gear footprint | | **1 / 2 / 3** |
| Spatial overlap | | **1 / 2 / 3** |
| Encounterability | | **1 / 2 / 3** |

### 8.8.4 Scale Intensity Consequence Analysis (SICA)

The CAB shall complete the Scale Intensity Consequence Analysis (SICA) table below for PI 2.5.1, if used, including rationales for scoring each of the SICA attributes.

Reference(s): FCP v2.2 Annex PF Section PF8

**Table X – SICA scoring template for PI 2.5.1 Ecosystem**

| | Spatial scale of fishing activity | Temporal scale of fishing activity | Intensity of fishing activity | Relevant subcomponents | Consequence Score |
|---|---|---|---|---|---|
| Performance Indicator PI 2.5.1 Ecosystem outcome | | | | Species composition | |
| | | | | Functional group composition | |
| | | | | Distribution of the community | |
| | | | | Trophic size/structure | |
| Rationale for spatial scale of fishing activity | | | | | |
| Rationale for temporal scale of fishing activity | | | | | |
| Rationale for intensity of fishing activity | | | | | |
| Rationale for consequence score | | | | | |

## 8.9 Harmonised fishery assessments

The Norway beaked redfish fishery under assessment is, to the team's knowledge, the only beaked redfish fishery under assessment in Norwegian EEZ. Therefore, there is no possibility to harmonise scores for Principle 1.

There are however several MSC fisheries targeting other species in the Norwegian and Barents Seas, such as cod, haddock or saithe. Some of the PIs under Principle 2 and Principle 3 can be harmonized with results in overlapping fisheries, especially for those taking place only in Norwegian waters.

Harmonisation process is defined by the Fisheries Certification Process v2.1 and the MSC's Interpretation log. The overlapping fisheries have been identified as fisheries operating within FAO area 27 ICES Subareas 1 and 2. Only MSC fisheries using the same version of the assessment tree (MSC Fisheries Standard v. 2.01 – Annex SA) should be harmonised, as required by FCP v2.1 Annex PB § 1.2.1).

Specifically, MSC interpretation (see https://mscportal.force.com/interpret/s/article/What-are-the-MSC-requirements-on-harmonisation-multiple-questions-1527586957701) describes which (and how) PIs should be harmonised for a fishery under assessment. According to the interpretation, the intent is that harmonisation is needed in fisheries that are effectively assessing the same thing.

- FCR v2.0 guidance section GPB3 confirms that harmonisation should always be conducted for Principle 1 where the same fish stock/s is/are scored in the overlapping fisheries (which is not the case for the present UoA).
- Harmonisation may also sometimes be needed in the case of Principle 2. Species which are taken by two or more UoAs should, however, still be partially harmonised, to ensure consistent interpretation on whether the species are above or below the point of recruitment impairment (PRI) or any biologically based limits (BBLs), or any relevant national or international limits, in PIs 2.1.1, 2.2.1 and 2.3.1 respectively (first part of scoring issue a in each of these PIs). Scoring should also be harmonised for the cumulative outcome requirements of the same scoring issues, found at the SG80 level in each case, so long as the species is main in both cases (see FCR v2.0 GPB3). These considerations are required wherever the two UoAs have some P2 species in common even where the P1 species/stocks are different. Harmonisation is not required for two different UoAs for those clauses that refer only to the impact of the specific UoA (e.g. scoring issue 2.1.1b, all of PIs 2.1.2, 2.1.3 etc).
- Harmonisation should also be considered in the case of any overlapping parts of Principle 3, such as "governance and policy" component of Principle 3, for fisheries under the same overall management framework.

A summary of the harmonisation requirements for overlapping fisheries is given below. No harmonisation is required for P2 PIs and SIs that are not listed in the table below:

**Table 35 Harmonization requirements**

| PIs / SIs | Harmonise? | Comments |
|---|---|---|
| All P1 PIs | Yes | P1 always considers the impacts of all fisheries on a stock, so any fisheries which have the same P1 species (stocks) should be harmonised. |
| PI 2.1.1a | Partially | For stocks that are 'main' in both UoAs, harmonise status relative to PRI (at SG60, 80 and 100), and if below PRI, harmonise cumulative impacts at SG80 (not at SG60). |
| PI 2.2.1a | Partially | For stocks that are 'main' in both UoAs, harmonise status relative to BBL (at SG60, 80 and 100), and if below BBL, harmonise cumulative impacts at SG80 (not at SG60). |
| PI 2.3.1a | Partially | Harmonise recognition of any limits applicable to both UoAs (at SG60, 80 and 100), and cumulative effects of the UoAs at SG80 and SG100 (not at SG60). |
| PI 2.4.1b | Partially | Harmonise recognition of VMEs where both UoAs operate in the same 'managed area/s' (as in SA3.13.5). |
| PI 2.4.2a,c | Partially | Harmonise scoring at SG100, since all fishery impacts are considered (not at SG60 or 80). |
| All P2 PIs | Yes, if -> | Two UoAs are identical in scope, even if the UoCs are different (e.g. separate clients). |
| PIs 3.1.1-3 | Yes, if -> | Both UoAs are part of the same larger fishery or fleet, or have stocks in either P1 or P2 which are at least partially managed by the same jurisdiction/s (nation states, RFMOs or others) or under the same agreements. Harmonisation may sometimes be possible for those management arrangements that apply to both UoAs (noting the limitations accepted in GPB3). |
| PIs 3.2.1-4 | Yes, if -> | Both UoAs have stocks within either P1 or P2 which are at least partially managed by the same jurisdiction/s (nation states, RFMOs or others) or under the same agreements. Harmonisation is needed for those management arrangements that apply to both UoAs, e.g. at the RFMO level but not the national level in the case of two separate national fleets both fishing the same regional stock. |

Harmonisation of the Norway beaked redfish fishery was done as desk review of relevant fishery reports and agreed scoring process with the Norway NEA cod offshore cod and NEA haddock offshore fishery, which take place in Norwegian waters under Norwegian jurisdiction.

**Principle 1:** There are no beaked redfish fisheries MSC certified in the Norwegian EEZ. There is no possibility to harmonise PIs under Principle 1.

**Principle 2:** Direct harmonization would only be possible with Norwegian fisheries operating the same fishing grounds. The Norwegian NEA cod, haddock and saithe fisheries operate in the same fishing grounds (Norwegian Sea under Norwegian jurisdiction) but also Barents Sea grounds under Russian jurisdiction, Therefore, direct harmonization can´t be conducted regardless of much of the information related to management and information background is very similar and information of overlapping fisheries has been taken into account when scoring management and information PIs.

All fisheries operating in the Norwegian EEZ (within FAO 27 subareas 1 & 2) were reviewed to identify any overlap in ETP species interaction and identification of VMEs. These are harmonization requirements for Principle 2 PIs:

- PI 2.1.1 (a) DNV is required to harmonise the outcome of NEA cod and saithe as main species in the Norway NEA offshore haddock fishery.
- PI 2.3.1 (a) DNV is required to harmonise recognition of any limits set for ETP species as with those evaluated under the assessments of Norway NEA cod offshore fishery and Norway NEA haddock offshore fishery.
- PI 2.4.1 (a,b) DNV is required to harmonise the recognition of VMEs when operating in the same managed area as with those evaluated under the assessments of Norway NEA cod offshore fishery and Norway NEA haddock offshore fishery.

**Principle 3:** The fishery is harmonised with overlapping Norwegian fisheries targeting NEA cod offshore fishery, Norway NEA haddock offshore fishery and Norway NEA saithe fishery. There is very little difference between the relevant fisheries. Evaluations are consistent in relation to scoring.

- PIs 3.1.1 is harmonised.

**Table 36 Overlapping fisheries**

| *Fishery name* | *Certification status and date* | *Status* | *Assessment tree* | *FAO Area* | *ICES area* | *Gear* | *Performance Indicators to harmonise* |
|---|---|---|---|---|---|---|---|
| *Norway NEA haddock offshore (>12nm) fishery* | *Certified 26.04.2010 DNV GL* | *Surveillance 1* | *FS v2.01 Annex SA* | *27* | *I & II* | *Trawl, longline, gillnet, Danish seine, hook & line* | *PI 2.3.1.a & PI 2.4.1.b PI 3.1.1; 3.1.2 & 3.1.3* |
| *Norway NEA cod offshore (>12nm) fishery* | *Certified 26.04.2010 DNV GL* | *Surveillance 1* | *FS v2.01 Annex SA* | *27* | *I & II* | *Trawl, longline, gillnet, Danish seine, hook & line* | *PI 2.3.1.a & PI 2.4.1.b PI 3.1.1; 3.1.2 & 3.1.3* |
| *Norway North East Arctic saithe fishery* | *Certified 16.06.2008 DNV GL* | *N/A* | *CR v 1.3* | *27* | *I & II* | *Bottom trawls, Gillnets and Entangling Nets - Gillnets, Hooks and Lines, Seine Nets - Boat or vessel seines - Danish seines, Surrounding Nets - With purse lines (purse seines),* | *NA* |
| *AGARBA Spain Barents Sea cod* | *Certified 28.11.2013 Bureau Veritas Certification* | *Surveillance 1* | *FCR v 2.0 Annex SA* | *27* | *I & II* | *Bottom trawl* | *PI 2.3.1.a & PI 2.4.1.b PI 3.1.1; 3.1.2 & 3.1.3* |

**Table 37 Scoring differences – Principle 2 PI 2.4.1.b: Identification of VMEs identified in the FAO 27 subdivision 1 & 2 area.**

| Performance Indicators (PIs) | Cold water Corals - Lophelia reefs & Solenosmilia variabilis reef | Coral Gardens - hard and soft | Sponges | Seapens | Burrowing Megafauna |
|---|---|---|---|---|---|
| Norway beaked redfish | Yes | Yes | Yes | Yes | No |
| Norway North East Arctic haddock | Yes | Yes | Yes | Yes | No |
| Norway North East Arctic Cod | Yes | Yes | Yes | Yes | No |
| AGARBA Spain Barents Sea cod | Yes | Yes | Yes | Yes | No |

**Table 38 Scoring differences Principle 3**

| Performance Indicators (PIs) | Norway beaked redfish fishery | Norway NEA haddock offshore (>12nm) | Norway NEA cod offshore (>12nm) | Norway North East Arctic cold water prawn |
|---|---|---|---|---|
| PI 3.1.1 | >80 | 95 | 95 | 95 |
| PI 3.1.2 | >80 | 100 | 100 | 85 |
| PI 3.1.3 | >80 | 100 | 100 | 100 |

## 8.10 Objection Procedure – delete if not applicable

*To be added at Public Certification Report stage*

The CAB shall include in the report all written decisions arising from the Objection Procedure.

Reference(s): MSC Disputes Process v1.0, FCP v2.2 Annex PD Objection Procedure

## 8.11 Client Agreeement

## 8.12 References

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## 8.13 Vessel list (if applicable)

## 8.14 Landing sites (if applicable)

# 9 Template information and copyright

This document was drafted using the ‘MSC Reporting Template v1.2’.



**Template version control**

| Version | Date of publication | Description of amendment |
|---|---|---|
| 1.0 | 17 December 2018 | Date of first release |
| 1.1 | 29 March 2019 | Minor document changes for usability |
| 1.2 | 25 March 2020 | Release alongside Fisheries Certification Process v2.2 |

A controlled document list of MSC program documents is available on the MSC website (msc.org).

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