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IFFO RS Global Standard for Responsible Supply of Marine Ingredients

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**Global Standard for Responsible Supply of Marine Ingredients** Fishery Assessment Methodology and Template Report V2.0



| Fishery Under Assessment | Calanus finmarchicus ( <i>C. finmarchicus</i> )<br>Norway Economic Zone (NEZ) |  |
|--------------------------|---|--|
| Date                     | September 2019  |  |
| Assessor                 | Jim Daly  |  |

| Application details and summary of the assessment outcome                                    |  |                        |     |        |                            |  |  |
|--|--|------------------------|-----|--------|----------------------------|--|--|
| Name: Calanus AS   | Name: Calanus AS                                 |                        |     |        |                            |  |  |
| Address:   |  |                        |     |        |                            |  |  |
| Country: Norway  | Country: Norway Zip:                             |                        |     |        |                            |  |  |
| Tel. No.:  |  | Fax. No.:              |     |        |                            |  |  |
| Email address: <u>ase.kr</u>   | istine@calanus.no                                | Applicant Code II      |     | IFFO-F | FFO-RS 201                 |  |  |
| Key Contact: Åse Kr  | ristine Rognmo Mikalsen                          | Title: Quality Manager |     |        |                            |  |  |
| Certification Body D   | etails   |                        |     |        |                            |  |  |
| Name of Certification  | ı Body:  | SAI Global             | Ltd |        |                            |  |  |
| Assessor NamePeer ReviewerAssessment<br>DaysInitial/Surveillance/Re-<br>approvalWhole<br>pro |  |                        |     |        | Whole fish/ By-<br>product |  |  |
| Jim Daly   | Jim Daly Vito Romito 2 Surveillance 1 Whole fish |                        |     |        |                            |  |  |
| Assessment Period  | 2018-2019  |                        |     |        | ĺ                          |  |  |

| Scope Details                        |  |
|--------------------------------------|--|
| Management Authority (Country/State) | Ministry of Trade, Industry and Fisheries (Norway) |
| Main Species                         | C. finmarchicus                                    |
| Fishery Location                     | Norway Economic Zone (NEZ)                         |
| Gear Type(s)                         | Calanus bespoke AS pelagic trawl                   |
| Outcome of Assessment                |  |
| Overall Outcome                      | PASS   |
| Clauses Failed                       | NONE   |
| Peer Review Evaluation               | APPROVE  |
| Recommendation                       | PASS   |



#### **Assessment Determination**

*Calanus finmarchicus*, with a one-year life-cycle, is one of the most commonly found species of zooplankton (copepods) in the subarctic waters of the North Atlantic. Together with other closely related species annual biomass production is in the range of 200-400 million tons (Norway's Institute of Marine Research (IMR)). These species are key components in the food web of the North Atlantic and are of commercial interest as they are high in protein and contain omega-3 fatty acids and antioxidants.

The management of fisheries in Norway falls under the jurisdiction of the Ministry of Trade, Industry and Fisheries (Department of Fisheries and Aquaculture). A Directorate of Fisheries and Aquaculture acts as the Ministry' s advisory and executive body. The main research body is the Institute of Marine Research (IMR)

A national Management Plan has been published (2016) and a hearing process amongst stakeholders completed. The geographical area defined in the plan is the Norwegian Economic Zone (NEZ) and outside 12nm of the Jan Mayen zone (Figure 1). Regulations to follow the Management plan are expected to be finalised by 2019.

Norway's Fisheries Directorate has estimated average biomass of *Calanus sp* at 33 million tons. As part of the Management Plan a precautionary and sustainable annual catch of 165, 000 tons was recommended. The plan has been evaluated by Norway's Ministry of Trade, Industry and Fisheries.

In May 2019 the Ministry announced a total commercial quota (copepods including *Calanus sp*) of 254,000 tons annually. Under the regulations announced, no vessel quotas are currently set. The Ministry issued tenders for 10 area-restricted vessel licenses: 3,000 tons can be harvested between the 1,000m contour line (depth) and the Norwegian Baseline; the remainder must be harvested outside the 1,000m contour line. This is in line with the Ministry's long-term plan for ecosystem-based management plans.

There has been no decision yet who will be granted a license. The trial license awarded to the Norwegian based Calanus AS (allowing extraction of 5,000 tonnes of copepods annually in coastal waters up to 2022) is unaffected by the licensing of commercial harvesting which, when awarded, will have a duration of 10 years. In 2017, Calanus AS harvested 747 tons of *Calanus sp*, in 2018 1,360 tons. In 2015 total landings were 513 tons.

Calanus AS has currently contracted two active vessels, licensed and monitored by Norway's Fisheries Directorate, using a bespoke pelagic trawl with a minimum mesh size of  $2000 \,\mu$  m throughout the trawl to limit bycatch of fish fry and small fish. Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of *C. finmarchicus* and each vessels' cargo capacity.

The extent of the fraction of ETP species within the total amount of bycatch is not yet estimated. There is currently no visual way to separate larvae / juveniles belonging to ETP species from larvae / juveniles belonging to non-ETP species. In 2018 Calanus AS collected a set of samples for genetic analysis by the Institute of Marine Research (IMR). Results of this study should be included in future assessments of the



effect on ETP species from the *Calanus* fishery. Due to low towing speeds (approximately one knot/hr) adult fish, ETP species and mobile bycatch may escape the trawl.

*Calanus sp* (including *C. finmarchicus*) are not listed in the current CITES appendices of endangered species and are not listed in the current IUCN Redlist of threatened species (websites accessed 19.09.19).

*Calanus sp* (including *C. finmarchicus*) are approved for use under the current IFFO-RS Whole fish Standard v 2.0 to produce fish meal and fish oil.

#### **Peer Review Comments**

*Calanus finmarchicus*, with a one-year life-cycle, is one of the most commonly found species of zooplankton (copepods) in the subarctic waters of the North Atlantic. . Estimates of annual production of *C. finmarchicus* in the Norwegian Sea have been calculated at 290 x  $10^6$ t. The Fisheries Directorate determined a trigger level, based on a pre-cautionary approach, of 10% of the advisory TAC = 330,000t. The Directorate then calculated a total Norwegian annual quota (precautionary) of 50% of this trigger level = 165, 000t equivalent to 0.06% of the estimated annual production.

The Ministry issued tenders for 10 area-restricted vessel licenses: 3,000 tons can be harvested between the 1,000m contour line (depth) and the Norwegian Baseline; the remainder must be harvested outside the 1,000m contour line. This is in line with the Ministry's long-term plan for ecosystem-based management plans.

The extent of the fraction of ETP species within the total amount of bycatch is not yet estimated. There is currently no visual way to separate larvae / juveniles belonging to ETP species from larvae / juveniles belonging to non-ETP species. If the amount of bycatch during fishery is deemed above acceptable limits, the fishing vessels relocate, and hunt for grounds with lower abundance of bycatch. Genetic analysis to establish the potential for bycatch and ETP larvae/eggs is underway.

Due to the very large biomass of Calanus *sp* (including *C. finmarchicus*) the peer reviewer agrees that *Calanus sp*. should be approved for use under the current IFFO-RS Whole fish Standard v 2.0 to produce fish meal and fish oil. However, results of analysis on bycatch and ETP species should be kept under a close look in the next audit.

#### Notes for On-site Auditor

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



#### **General Results**

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

#### **Species-Specific Results**

| Category   | Species             | % landings | Outcome (Pass/Fail) |      |  |
|------------|---------------------|------------|---------------------|------|--|
| Category A | C. finmarchicus sp. |            | A1                  | PASS |  |
|            |                     | 99.9       | A2                  | PASS |  |
|            |                     |            | A3                  | PASS |  |
|            |                     |            | A4                  | PASS |  |

[List all Category A and B species. List approximate total % age of landings which are Category C and D species; these do not need to be individually named here]

### HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

#### Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

- 1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
- 2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
- 3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for each Category A species.
- 4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
- 5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
- 6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
- 7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** the minimum requirements.

#### **By-products**

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The '% landings' column can be left empty; all by-products are considered as Category C and D.



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- 2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
- 3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
- 4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 M3, F1 F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

### SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the 'target' or 'main' species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the 'bycatch' or 'minor' species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

# Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The 'stock' column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The 'management' column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases, it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

#### **TYPE 1 SPECIES (Representing 95% of the catch or more)**

**Category A:** Species-specific management regime in place. **Category B:** No species-specific management regime in place.

#### TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)

**Category C:** Species-specific management regime in place. **Category D:** No species-specific management regime in place.

| Common name Latin name St | ock % of landings | Management | Category |
|---------------------------|-------------------|------------|----------|
|---------------------------|-------------------|------------|----------|



| N/A | C. finmarchicus sp | NEZ | 99.9% | Norway Ministry of<br>Trade, Industry and<br>Fisheries | А |
|-----|--------------------|-----|-------|--|---|
|-----|--------------------|-----|-------|--|---|

#### MANAGEMENT

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

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

#### Evidence

#### M1.1:

The management of fisheries in Norway falls under the jurisdiction of the Ministry of Trade, Industry and Fisheries (Department of Fisheries and Aquaculture). A Directorate of Fisheries and Aquaculture acts as the Ministry's advisory and executive body. The main research body is the Institute of Marine Research (IMR). A map of the Norwegian Economic Zone (NEZ) and other fisheries cited in this report is provided (Figure 1).

Both Ministry and Directorate develop and apply fishery laws and regulations through an ongoing interactive process referred to as the Regulatory Chain (Figure 2). Scientific research and advice take key positions within the chain, ensuring understanding of the stock and broader ecosystem are considered. The Ministry is based in Oslo, the Directorate and Institute in Bergen.

The Department for Fisheries and Aquaculture is responsible for matters related to fisheries, the fishing fleet and the aquaculture industry. The Department manages:

- Quota negotiations with the European Union and others.
- International fisheries agreements.
- Prevention of IUU fishing.
- Fishing regulations and rights including licensing.
- Aquaculture policy and management.
- Environmental sustainability of the aquaculture industry including fish health and welfare.

The Directorate of Fisheries and Aquaculture's role is:

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- To provide analyses, statistics and advice.
- Implement political decisions.
- Process applications and appeals.
- Conduct monitoring and control.
- Actively cooperate with trade and industry, the research community and other public services.
- Knowledge sharing with various stakeholders and the public.





Figure 1: Norway fishing zones (adapted from FAO Fisheries and Aquaculture-Country Profiles) R14

After a long period of experimental harvesting (since 2003) a national Management Plan (2016) for *C. finmarchicus* harvesting has been developed, and a national hearing process amongst stakeholders completed. The management area proposed in the Plan is the Norwegian Economic Zone (NEZ) and outside 12nm in the Jan Mayen zone with most of the fishery occurring in an area deeper than 1000m. The Management Plan is based on long-term ecosystem-based management in line with the precautionary principle and other obligations under the Marine Resources Act (MRA). Regulations to follow the Management plan are expected to be finalised by 2019.

#### 2019 Update:

In May 2019 Norwegian authorities announced a total commercial quota (*Calanus sp*) of 254,000t annually and issued tenders for 10 area-restricted vessel licenses. There has been no decision yet who will be granted a license; these decisions are subject to appeal. There will be no vessel-specific quotas awarded.

The trial license awarded to the Norwegian based company Calanus AS (2018), allowing extraction of 5,000 tonnes of copepods in coastal waters up to 2022, is unaffected by the licensing of commercial harvesting.

There is an organisation responsible for managing the fishery R1-R6, R11

#### M1.2:

The main research body is the Institute of Marine Research (IMR) with 1,000 employees. The main activities are research, advisory work and monitoring. In January 2018 IMR was merged with NIFES (National Institute of Nutrition and Seafood Research). IMR have an office in Tromsø; research stations in Matre, Austevoll and Flødevigen. IMR also have several laboratories that analyse samples taken through its monitoring and research programmes.

Ecosystem research surveys are conducted by IMR and international partners. Survey activities cover a substantial part of the Nordic Seas at different seasons. Regular data collection from transects, located at the inflow and outflow regions of ocean basins serve as indicators for the biological and physical state of the basins (Gimsøy, Svinøy, Fugløy).

The following surveys are conducted (multiple vessels, several nations):

- Ecosystem survey North Sea
- Ecosystem survey Norwegian Sea
- Ecosystem survey Barents Sea
- Winter survey Barents Sea
- Strategic Initiative Arctic

The following variables are collected:

- Juveniles and larvae of commercial species.
- Abundance of commercial demersal and pelagic fish species.



- Plankton (including *C. finmarchicus sp.*).
- Benthic organisms.
- Marine mammals and birds.
- Physical conditions and pollution.

IMR is an independent knowledge provider and publicises research results both in Norway and internationally. A Scientific Advisory Board has been in place at NIFES since 2011. The Board contributes to ensuring professional quality and development within the scope of the Institute's objectives and limitations. Biomass and other data collected from regular ecosystem research surveys and transects are collated and added to fishery-dependent data generated for stock assessment purposes. A precautionary approach is adopted, only a marginal percentage is allowed for the fishery.

Survey data on plankton is provided to the ICES Working Group on Integrated Ecosystem Assessments for the Norwegian Sea (WGINOR). WGINOR held a meeting on the dynamics of the Norwegian Sea ecosystem in conjunction with the Eco Nor Se project in Bergen (16-19 October 2018). This Working Group has a three-year work programme which includes focussing, through modelling, on single vs. multispecies harvest control rules for the development of ecosystem-based advice, and outstanding issues for integrated assessments. A report on their activities was published in Nov 2018.

Survey data is also presented to ICES Working Group of International Pelagic Surveys (WGIPS). The most recent report was published by ICES following a meeting in Jan 2019. The core objectives Group are to combine and review results of annual pelagic ecosystem surveys to provide indices for stocks of herring, sprat, mackerel, boarfish, and blue whiting in the Northeast Atlantic, Norwegian Sea, North Sea, and Western Baltic; and to coordinate timing, coverage and methodologies for upcoming 2019 surveys.

There is an organisation responsible for collecting data and assessing the fishery. **R8-R10** 

#### M1.3:

The Ministry aids in coordinating efforts of the various ministries to ensure a sound, unified, future-oriented industrial and seafood policy. Norway's fishing industry has developed from a 'free fishing' activity to a fully-fledged industry complete with quotas and concessions. The Norwegian management system takes form as a 'Regulatory Chain', an annual, interactive process based on incremental change (Figure 2). The Regulatory chain incorporates stages such as gathering research data, quota negotiations with other states, as well as allocating quotas to the various vessel groups.

A 2009 Report outlined strategies in place to ensure sustainable harvesting of all marine resources. Sustainable management and harvesting are based on best available understanding and scientific advice from ICES and the IMR. Norway has committed to international agreements on sustainable management for all fish stocks under its management; entailing defined exploitation rates and minimum limit for spawning stocks.



Section 1 (purpose) of the Marine Resources Act (MRA) outlines the Norwegian Government's commitment to sustainability:

The purpose of this Act is to ensure sustainable and economically profitable management of wild living marine resources and genetic material derived from them, and to promote employment and settlement in coastal communities.

Section 7 (Principle for management of wild living marine resources and fundamental considerations) of the MRA gives power to the Ministry to evaluate which types of management measures are necessary to ensure sustainable management of wild living marine resources including the use of the precautionary and ecosystem approaches. This Section also ensures management measures help to maintain the material basis for Sami culture (indigenous, used to be considered a nomadic people, living above the Arctic Circle).

Fishery management organisations are publically committed to sustainability **R12-R13** 

#### M1.4:

The Directorate of Fisheries operates under the following legal instruments:

#### Marine Resources Act (MRA):

The Act describes a precautionary and sustainable management of marine resources used to adopt scientific recommendations. This law details, among other things, the structure of the management system, the obligation for sustainable, science-based management and ecosystem considerations. The Act contains technical regulations for commercial and recreational fisheries and applies to all harvesting and other utilisation of wild living marine resources and the genetic material derived from them.

Chapter 3 of the Act (Catch quantities and quotas) allows the Ministry to prescribe maximum permitted quantities (national quotas) of marine resources that may be harvested, expressed in terms of weight, volume, number of individuals, the number of days harvesting is permitted, or in other terms.

Chapter 4 of the Act (Conduct of harvesting operations and other utilisation of wild living marine resources) specifies that all catches of fish shall be landed (discard ban). The Ministry also may by regulations grant exemptions from the obligation to land catches and may also prohibit discarding of biological waste.

Chapters 6 & 7 of the Act specifies arrangements for control and enforcement including facilitating vessel inspections, use of logbooks to record catches and powers of the Directorate of Fisheries Inspectors to issue orders to stop a vessel, haul in gear, seal gear and obtain documents, relevant information and objects if they suspect infringements of the fisheries legislation have occurred.

Chapter 8 outlines measures in place to deter illegal, unreported and unregulated (IUU) fishing. Chapter 11 empowers the Ministry to impose coercive and infringement fines to ensure compliance with provisions made in or under the Act. The MRA entered into force on 06 June 2008.



Fishery management organisations are legally empowered to take management actions **R12** 

#### M1.5:

Representatives of the fishing industry and governmental authorities cooperate in the formulation of the regulatory chain (Figure 2). Scientific research and advice take key positions within the chain, ensuring understanding of the stock and broader ecosystem are considered.

The involvement of stakeholders in management decisions is achieved through the Advisory Meeting for Fisheries Regulations representing fishermen's associations, fishing industries, trade unions, the Sami Parliament, local authorities, environmental organisations and other stakeholders.

Both ICES (when available) and IMR advice are factored heavily into management decisions, and in turn direction and specifics of future research are guided by experiences within the fishery throughout the year.

A regulatory council with representatives from both parties debate on the distribution of quotas within the fishing industry and provide advice for the Ministry of Fisheries. The Ministry then decides on final management strategies:



ICES Advisory Committee (ACOM) translates ICES science into advice on the sustainable use and protection of marine ecosystems.



There is a consultation process through which fishery stakeholders are engaged in decision-making **R13**, **R15** 

#### M1.6:

The Directorate's communications office is organised directly under the Directorate. This office has overall responsibility for all external and internal information, including continuous development of strategic communication within the Directorate. Other main areas of responsibility are the maintenance and development of the Directorate's Internet and intranet pages, presentation of information material for the public and tourists visiting Norway and providing advice of a professional nature within the organisation.

The Communication Office is also on the editorial board of the English-language website <u>www.fisheries.no</u> through which authorities provide information about Norwegian fisheries and aquaculture management.

The decision-making process is transparent, with processes and results publically available. Information on fisheries management; real-time closures and other announcements are made available on the Directorate's website. The Regulatory Chain is described online and updated frequently. The European Union has three fisheries agreements with Norway, namely the bilateral, the trilateral and the neighbouring agreements. All meetings are published online:

The decision-making process is transparent, with processes and results publically available **R16-R18** 

| References  |
|---|
| R1: Encyclopaedia of Life (C. finmarchicus)   |
| http://eol.org/pages/340423/details (accessed 19.09.18)   |
| R2: Norway sees commercial fishery in copepods <i>FiskerForum</i> (accessed 19.09.19)                     |
| https://fiskerforum.com/norway-sees-commercial-fishery-in-copepods/                                       |
| R3: Directorate of Fisheries: Norwegian-Fisheries-Management  |
| https://www.fiskeridir.no/English/Fisheries/Norwegian-Fisheries-Management (accessed 19.09.19)            |
| R4: Ministry of Trade Industry and Fisheries  |
| https://www.regjeringen.no/en/id4/ (accessed 19.09.19)  |
| R5: C. finmarchicus AS Ltd (September 2018): Client Pers. Comm. with Dr. Cecilie Broms, IMR.              |
| Planktologist Calanus AS Client Application to IFFO-RS 18pp   |
| <b>R6</b> : Ministry of Climate and the Environment (2017) Report to Parliament: Update of the integrated |
| management plan for the Norwegian Sea; Meld. St. 35 (2016-2017)   |
| https://www.regjeringen.no/en/dokumenter/meldst35-20162017/id2547988/sec5?q=calanus#KAP5-5                |
| (accessed 19.09.19)   |
| R7: IMR Barents Sea Survey (2017) 88pp  |
| https://www.hi.no/filarkiv/2017/09/2-2017-imr-pinro_winter_survey_report_final.pdf/nb-no                  |
| <b>R8:</b> Institute of Marine Research (IMR)   |
| http://www.imr.no/en (accessed 18.09.19)  |
|   |

**R9:** WGINOR 2018: ICES WGINOR (Nov 2018) Integrated Ecosystem Assessments Steering Group 2018/IEASG:10 Ref Sicom 127pp



Http://ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/IEASG/2018/WGINOR/WG

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**R10**: WGIPS (Jan 2019) ICES WORKING GROUP OF INTERNATIONAL PELAGIC SURVEYS 499pp http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGIPS%20r eport%202019.pdf

**R11** Norwegian Ministry of Fisheries and Coastal Affairs (2009) Strategy for an Environmentally Sustainable Norwegian Aquaculture Industry 38pp

https://www.regjeringen.no/globalassets/upload/fkd/vedlegg/diverse/2009/strategy-for-an-sustainableaquaculture.pdf

**R12:** Department for Fisheries and Aquaculture (2010): Act relating to the management of wild living marine resources (Marine Resources Act) 17pp

https://www.regjeringen.no/globalassets/upload/fkd/vedlegg/diverse/2010/marineresourcesact.pdf **R13:** Regulatory Chain of Norwegian Fisheries Management:20pp

https://www.regjeringen.no/globalassets/upload/fkd/brosjyrer-og-veiledninger/folder.pdf

R14: FAO Fishery and Aquaculture Country Profiles: Norway Legal Framework

http://www.fao.org/fishery/facp/NOR/en#CountrySector-LegalFrameworkOverview

**R15:** ICES ACOM: <u>https://www.ices.dk/community/groups/Pages/ACOM.aspx</u>

**R16:** Ministry of Fisheries and Coastal Affairs (2007): Official Norwegian Fisheries Management Site (EN) 20pp https://www.regjeringen.no/globalassets/upload/fkd/brosjyrer-og-veiledninger/folder.pdf

**R17:** Norwegian Fisheries Management pdf 20pp <u>www.fisheries.no</u> (EN)

**R18:** Fisheries Directorate Communications Unit:

https://www.fiskeridir.no/English/About-the-directorate/About-the-departments/The-communication-Unit (accessed 19.09.19)

Standard clauses 1.3.1.1, 1.3.1.2



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

#### Evidence

#### M2.1:

Enforcement is split into three branches:

- The Directorate of Fisheries (Control Section): monitors and controls the entire value chain through quayside controls, sales inspections, post landing audits and inspections at sea. Quota control and compliance to regulations are the focus areas. Controls are conducted within Norwegian Economical Zone (NEZ) and the Fisheries Zones surrounding Svalbard and Jan Mayen (Figure 1). A Fisheries Monitoring Centre (FMC) ensures 24/7 monitoring of fishing activities. Inspectors may board vessels at any time when at sea.
- The Coast Guard (Ministry of Defence) conducts control of both Norwegian and foreign flagged vessels, performing more than 1,800 vessel inspections annually. Main areas of control are for resource, quota, and customs violations and to verify adherence to technical fishery regulations.
- Sales organisations (e.g. *Norges Sildesalgslag*, a pelagic sales organization) is a legal intermediary for settlement between buyer and seller for all first-hand landings. These organisations also perform landing controls, comply statistics and cooperate closely with the Directorate.

The Directorate performs annual strategic risk analyses which gives guidance for future focus areas and enforcement tactics. In 2018 Calanus AS have not received any notifications of non-compliance either during or after harvesting of *C. finmarchicus* (Client communication).

Catches of *C. finmarchicus sp* are reported daily to the Directorate from each vessel (currently two vessels in the fishery belonging to Calanus AS) and the total landing is additionally reported at port through a Landing Certificate. It is the responsibility of each commercial participant to adhere to individual licensing conditions. Currently Calanus AS are the only entity issued with commercial fishing permits.

Fishing inside baselines is prohibited. Fishing inside 12 nm (Jan Mayen-zone, Figure 1) is also prohibited. The Directorate may also require that inspectors/observers are put on board vessels. Vessels must comply to the requirements of a standardized biological sampling system devised by the Directorate in association with Calanus AS.

There is an organisation responsible for monitoring compliance with fishery laws and regulations **R19-R21** 



#### M2.2:

Norway has a landing obligation and to avoid discarding, small quota overshoots are landed. The value of the catch is then administratively withdrawn from the vessel and counted against the TAC. If more serious quota infractions occur, the Directorate can administer fines, withdraw quota or submit a police report, which will hand the issue over to the criminal system. Fishing license and a license to purchase fish may also be withdrawn as can the value of the catch.

Chapter 11 (Coercive and infringement fines) of the MRA empowers the Ministry to impose fines to ensure compliance with provisions made in or under the Act. A coercive fine is a continuous fine that becomes effective from a specified deadline for complying with an order. The Ministry may in special cases reduce or waive a coercive fine that has accrued. The Ministry may order any person that wilfully or through negligence contravenes provisions made in or under this Act to pay an infringement fine.

Chapter 12 of the MRA (Criminal Liability) notes that any person that wilfully or through negligence contravenes provisions laid down in specific Sections of the Act are liable to fines or to a term of imprisonment not exceeding one year, unless more severe penal provisions apply.

With respect to Calanus harvesting, the license to Calanus AS is provided by the Ministry, and violations of the license will be addressed by the Ministry. However, the usual procedure is to transport sanctions to a lower level, and in this case the Directorate of Fisheries determine sanctions, time and scale of. Appeals can be made to the Ministry and "Ombudsmann" appointed by the Norwegian Parliament to safeguard the rights of individual citizens.

There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken. The only commercial stakeholder in the fishery (Calanus AS) has never been sanctioned by Directorate inspectors. Calanus AS regularly have inspectors from the Fisheries Monitoring Centre (FMC) onboard.

#### R12, R19

#### M2.3:

At present, Calanus AS is the only commercial participant in this fishery, and the company has contracted two active vessels. Catches are reported daily to the Directorate of Fisheries from each vessel, and total landings reported at port through a Landing Certificate. The Directorate (Control Section): monitors and controls the entire value chain through quayside controls, sales inspections, post landing audits and inspections at sea.

Norway adopted a black list of vessels engaged in IUU activities in Northeast Atlantic waters in 1994 and banned such vessels from fishing in Norwegian waters. The concept of a black list was later adopted by several Regional Fisheries Management Organizations (RFMO's).



In May 2019 the Ministry announced a total commercial quota (copepods including Calanus sp) of 254,000 tons annually. The Ministry then issued tenders for 10 area restricted vessel licenses: No vessel quotas have been set. There has been no decision yet who will be granted a license

There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing. **R18-R19** 

#### M2.4:

Chapter 7 (Control and enforcement) Section 47 (Placing inspectors and observers on board vessels) of the MRA obliges vessel owners, when requested, to provide board and lodging at the vessel's expense and use of communication equipment without charge. The Ministry may adopt regulations relating to;

- The duties of an observer.
- Which vessel groups and how many vessels are to carry an inspector or observer on board.
- How these vessels are to be selected.

VMS transmitters on Norwegian vessels must be approved by the Directorate and installed only by those authorized by the Directorate. Norwegian vessels involved in fishing operations 15m and above are required to comply with position reporting. This also includes vessels of 12m (Norway and EU) when operating in the Skagerrak area. Foreign vessels of 24m or more (15m or more in the case of EU vessels) are subject to position reporting when operating in Norwegian waters outside Skagerrak. By January 2014 approximately 575 Norwegian vessels were subject to position reporting.

Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS. **R12; R18-R21** 

### References

**R19:** Norway Fisheries Directorate: Control and Enforcement

https://www.fiskeridir.no/English/Fisheries/Control-and-enforcement (accessed 19.09.19)

**R20:** Norway Fisheries Directorate: Utøvelsesforskriften (Real-time fisheries management law):

http://www.fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/J-meldinger/Gjeldende-J-meldinger/J-125-2016

R21: Norway Fisheries Directorate: Electronic Reporting Systems:

https://www.fiskeridir.no/English/Fisheries/Electronic-Reporting-Systems (accessed 19.09.19)

**R22:** Kurt Tande, Snorre Angell, Morten Winje & Ole Petter Pedersen (NORUT) Annual Report (2016) Copepod Harvesting CALANUS pdf 14pp

Standard clause 1.3.1.3



### CATEGORY A SPECIES

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

| Species Name     |        | ame                  | Calanus C. finmarchicus sp.   |      |
|------------------|--------|----------------------|---|------|
| <b>A1</b>        | Data ( | Vinimum Requirements |   |      |
| A1.1 Landings of |        | Landings d           | ata are collected such that the fishery-wide removals of this species are   | PASS |
|                  | known. |                      |   |      |
| A1.2 Sufficient  |        | Sufficient a         | additional information is collected to enable an indication of stock status | PASS |
|                  |        | to be estimated      | ated.   |      |
|                  |        |                      | Clause outcome:   | PASS |

#### Evidence

#### A1.1- A1.2:

Fishing effort is measured through daily reports of catch, calculation of catch per hour and a Landing Certificate presented to Directorate inspectors on landing. At present, Calanus AS is the only commercial participant in this fishery, the company has currently contracted two active vessels. Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of *C. finmarchicus* and each vessels cargo capacity. The Company harvested 747t from a TAC of 165,000t in 2017 and 1,360t in 2018 (Source R5 Client Pers. Comm.; Dr. Cecilie Broms, IMR Norway).

The following fishery-dependent data is collected:

- ES70, EK80 echosounder acoustic data/haul.
- Video recording of biomass transferred from trawl sack to vessel.
- Total biomass, start-end position, duration of haul, fishing depth, weather and sea state/haul.
- Bycatch in ml per 500 ml catch photographed and recorded.
- Samples of bycatch eggs and bycatch taken/haul.
- Every 4th haul has a triple sample taken and analysed rom various parts of the trawl sack for each haul (2018 only).
- Total catch weighed and recorded at port during landing.
- Genetic samples of selected species < 10 samples taken at sea.
- Samples of frozen landings for analysis of fat, proteins, water and additional chemical properties.

Acoustic data/haul are provided to the authorities for stock assessment purposes. All samples are analysed at IMR and reported when the analysis is complete. Work is usually completed within 6-8 months after the season has finished (early August).

Annual estimates of biomass and production are provided by IMR and for other selected species (Figure 3):







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

## Evidence $A_2 = A_2 = A_2$

#### A2.1-A2.2:

No regular stock assessments are undertaken specifically for *C. finmarchicus*. However, survey activities cover a substantial part of the Nordic Seas at different seasons. Regular data collection from transects, located at the inflow and outflow regions of ocean basins serve as indicators for the biological and physical state of the basins. Data on *C. finmarchicus* is collected during these surveys. Fishing effort is measured through daily reports of catch, Landing Certificates are presented to Directorate inspectors on landing during the season (Summer months).

The Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR) aims to conduct and further develop Integrated Ecosystem Assessments for the Norwegian Sea as a step towards implementing the ecosystem approach. It is WGINOR's role to develop an operational approach for integrated assessment of the Norwegian Sea ecosystem based on a common framework.

Annual surveys include: IESNS: International Ecosystem Survey in the Nordic Seas (May since 1995) and IESSNS: International Ecosystem Summer Survey in the Nordic Seas (July-August). Results of these surveys are submitted for discussion to ICES WGIPS (Working Group of International Pelagic Surveys).

The 2015 IESSNS comprised a standardised pelagic trawl swept area method to obtain abundance indices and study the spatial distribution of Northeast Artic mackerel in relation to other pelagic fish stocks, ecological and environmental factors in the Nordic Seas. One of the main objectives was to provide age-disaggregated abundance indices on an annual basis with uncertainty estimates for NEA mackerel applicable as a tuning series in the stock assessment. During these surveys the average concentration of zooplankton (including copepods) is also measured.

The *C. finmarchicus* distribution is closely linked to the circulation pattern of the ocean currents, local production conditions also play an important role in how much *C. finmarchicus* is produced, thereby how large the biomass is at a given time. *C. finmarchicus* lifecycle is adjusted to the seasonal production of phytoplankton.

Stock assessments (surveys) and catch consider all fishery removals and biological characteristics of the species.



#### R6; R9-R10

#### A2.3:

The stock in Norwegian waters is viable and biologically in good or average condition. Estimates of annual production of *C. finmarchicus* in the Norwegian Sea have been calculated at  $290 \times 10^6$  t. The stock biomass of *C. finmarchicus* is estimated to be about 33 x 10<sup>6</sup>t in the Norwegian Sea. Using the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) quota estimation method for Krill (*Euphausia superba*) an exploitation degree (10 % of estimated standing stock) would be 3.3 x 10<sup>6</sup>t. The IMR provided this TAC to the Fisheries Directorate on an advisory level.

The Fisheries Directorate then determined a trigger level, based on a pre-cautionary approach, of 10% of the advisory TAC = 330,000t. The Directorate then calculated a total Norwegian annual quota (precautionary) of 50% of this trigger level = 165,000t equivalent to 0.06% of the estimated annual production.

The total Norwegian annual quota was then divided into two areas:

- NEZ: Area between baselines and 1000 m depth: 3,000t (max of 10 specific catch permits ca 350-500t/vessel)
- NEZ, Jan Mayen: Area deeper than 1000m and outside 12 nm in the Jan Mayen zone: 162, 000t (No restrictions regarding the participation of the fishery in this area). (Figure 1)

In May 2019 the Ministry announced a total commercial quota of 254,000 tons annually. Under the regulations announced no vessel quotas are set. Licenses have yet to be issued. The same area restrictions that applied under the original quota regime also apply to the 2019 quota.

The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.

#### R2, R6; R22-R24

#### A2.4-A2.5:

Representatives of the fishing industry and governmental authorities cooperate in the formulation of the regulatory chain (Figure 2). Scientific research and advice take key positions within the chain, ensuring understanding of the stock and broader ecosystem are considered.

The involvement of stakeholders in management decisions is achieved through the Advisory Meeting for Fisheries Regulations representing fishermen's associations, fishing industries, trade unions, the Sami Parliament, local authorities, environmental organisations and other stakeholders.

Assessments are subject to internal or external peer review and are made publicly available. Biomass estimates were provided in a published 2017 Ministerial Report to Parliament **R2, R4, R6, R13, R22** 



#### References

**R23** Commission for the Conservation of Antarctic Marine Living Resources CCAMLAR: Krill fisheries <u>https://www.ccamlr.org/en/fisheries/krill-fisheries-and-sustainability</u>

**R24**: Langard, L (2016): Norwegian management Plan for Harvesting *C. finmarchicus* 6th Zooplankton Production Symposium ICES/PICES 2016 pdf 17pp

Standard clause 1.3.2.2, 1.3.2.1.2, 1.3.2.1.4



| Δ3 | Harvest Strategy - Minimum Requirements |  |      |  |
|----|---|--|------|--|
|    | A3.1                                    | There is a mechanism in place by which total fishing mortality of this species is  | PASS |  |
|    |   | restricted.  |      |  |
|    | A3.2                                    | Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy. | PASS |  |
|    | A3.3                                    | Commercial fishery removals are prohibited when the stock has been estimated to be<br>below the limit reference point or proxy (small quotas for research or non-target catch<br>of the species in other fisheries are permissible).   | PASS |  |
|    |   | Clause outcome:  | PASS |  |

#### Evidence

#### A 3.1 – A 3.3:

Catch permits allocated by the Ministry (2003-17) to one Company (Calanus AS) have allowed precautionary harvests only up to 1,000t annually prior to 2018 and now up to 5,000t per year for 2018-2022. In 2017 Calanus AS (IFFO-RS Client, trial licence) harvested 747t, in 2018 1,360t. Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of *C. finmarchicus* and each vessels' cargo capacity (currently two vessels in the fishery). Source

Catches of C. finmarchicus sp are reported daily to the Directorate from each vessel (currently two vessels in the fishery belonging to Calanus AS) and the total landing is additionally reported at port through a Landing Certificate. It is the responsibility of each commercial participant to adhere to individual licensing conditions. Currently Calanus AS are the only entity issued with commercial fishing permits.

Chapters 6 & 7 of the MRA specifies arrangements for control and enforcement including facilitating vessel inspections, use of logbooks to record catches and powers of the Directorate of Fisheries Inspectors to issue orders to stop a vessel, haul in gear, seal gear and obtain documents, relevant information and objects if they suspect infringements of the fisheries legislation have occurred.

The Directorate also has the power to impose seasonal and geographic restrictions; total time-at-sea restrictions; gear restrictions and other effort restrictions if deemed necessary. For example, for quotas allocated from 2018-2022 a maximum of 3,000t *C. finmarchicus* can be fished between the Norwegian and Fjordic Baselines.

There is a mechanism in place by which total fishing mortality of this species is restricted. Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. The stock in Norwegian waters is viable and biologically in good or average condition (Source IMR).

#### R2, R5-R6; R22; R24

#### References

Standard clause 1.3.2.1.3



| A4 | A 1 Stock Status - Minimum Requirements |   |      |  |  |
|----|---|---|------|--|--|
|    | A4.1                                    | The stock is at or above the target reference point, OR IF NOT:   | PASS |  |  |
|    |   | The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT:<br>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited. |      |  |  |
|    |   | Clause outcome.   | PASS |  |  |

#### Evidence

The stock in Norwegian waters is viable and biologically in good or average condition (source IMR). Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of *C. finmarchicus* and each vessels cargo capacity.

Estimates of annual production of *C. finmarchicus* in the Norwegian Sea have been calculated at 290 x  $10^6$  t. The stock biomass of *C. finmarchicus* is estimated to be about 33 x  $10^6$ t in the Norwegian Sea. An exploitation degree (10 % of estimated standing stock, used in other commercial fisheries for plankton) would be 3.3 x  $10^6$ t. The IMR provided this TAC to the Directorate on an advisory level. The Directorate then determined a trigger level, based on a pre-cautionary approach, of 10% of this advisory TAC = 330,000t. A total Norwegian annual quota (precautionary) of 50% of this trigger level = 165, 000t equivalent to 0.06% of the estimated annual production was then calculated by the Directorate.

In May 2019 the Ministry announced a total commercial quota of 254,000 tons annually. Under the regulations announced no vessel quotas are set. Licenses have yet to be issued. The same area restrictions that applied under the original quota regime also apply to the 2019 quota

The stock is at or above the target reference point **R2, R5-R6** 

References



### FURTHER IMPACTS

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

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

#### Evidence

#### F1.1:

Marine species listed as threatened, found in Norwegian waters include 8 fish, 8 birds, 4 mammals, 8 molluscs, 3 crustaceans, 2 annelids, 3 vascular plants and 9 species of algae. The overall number listed (2015) as threatened is two higher than in the previous edition of Norway's Red List. One species, the North Atlantic right whale, has been listed as regionally extinct since the first edition of the Red List was published in 1998.

Statistics and biomass models show a population decline of 70-90 % of Golden redfish *S. norvegicus* since 1990. Under criteria developed by IUCN this species is classified in Norwegian waters as endangered. Combining lists from several endangered species lists the following may also be found in Norwegian waters: Shark (spp); Atlantic Cod; Atlantic Halibut; European Eel; Long-nosed stake; Porbeagle and Rabbitfish. The bespoke Calanus trawl is a pelagic trawl employs an appropriately designed bycatch sorting grid. The main purpose of this grid is to minimize bycatch of larvae and juveniles. If the amount of bycatch during fishery is deemed above acceptable limits, the fishing vessels relocate, and hunt for grounds with lower abundance of bycatch.

There is a potential for the fishery to affect ETP species through accidental bycatch of ETP larvae and juveniles. The extent of the fraction of ETP species within the total amount of bycatch is not yet estimated; due to the reason that there is no visual or straight forward way to separate larvae/juveniles belonging to ETP species from larvae / juveniles belonging to non-ETP species.

The only way to determine this fraction is through genetic analysis in a laboratory. During the 2018 fishing season, Calanus AS collected a set of samples specifically for this purpose. These samples are to be analysed by IMR and will be a first step to determine any effect on ETP species (larvae and juveniles) from the *C*. *finmarchicus* fishery. Due to low towing speeds (approximately one knot/hr) adult fish, ETP species and mobile bycatch may escape the trawl.

Interactions with adult ETP species are recorded. **R25; R30-R32** 

F1.2:



There is a monitoring programme inherent to the Calanus Fishery. This programme is designed in collaboration with IMR and the Directorate. For every haul a visual interpretation of bycatch can be conducted retrospectively; for all hauls there is a sample taken of the catch to assess the amount of eggs, larvae and juveniles. All samples are analysed at the IMR and reported when the analysis is complete. This work is usually completed within 6-8 months after the season has finished (early August).

There is no substantial evidence that the fishery has a significant negative effect on ETP species. **R25; R32** 

#### F1.3:

Authorities continue to develop a management plan for the stock which will be based on long-term ecosystembased management in line with the precautionary principle and other obligations under the MRA. Ongoing research will further define the important role of *Calanus* in the marine ecosystem and the effect of removals of this species on its role of supporting higher trophic levels (including ETP'S) in the ecosystem.

If the fishery is known to interact with ETP species, measures are in place to minimise mortality. **R5-R6; R12** 

**References p28** 

Standard clause 1.3.3.1

| <b>F2</b> | Impacts on Habitats - Minimum Requirements |  |      |  |  |
|-----------|--|--|------|--|--|
|           | F2.1                                       | Potential habitat interactions are considered in the management decision-making  | PASS |  |  |
|           |  | process.   | 10   |  |  |
|           | F2.2                                       | There is no substantial evidence that the fishery has a significant negative impact on physical habitats.                          | PASS |  |  |
|           | F2.3                                       | If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts. | PASS |  |  |
|           |  | Clause outcome.  | PASS |  |  |

#### Evidence

#### F2.1 - F2.2

Pelagic trawling is done at a ship speed of about 1knot/hr. The fuel consumption of the participating vessels is in the range from 50-70 1/hr. 30-50 % of what is normally consumed by similar sized vessels during bottom trawling for Pollock in the North Sea.

The bespoke Calanus trawl is a pelagic trawl with minimal impact on the ocean floor. A bycatch sorting grid has been designed. The main purpose of this grid is to minimize bycatch of larvae and juveniles. Permits are awarded in the fishery on condition of a minimum mesh size of 2000  $\mu$  m throughout the trawl to limit bycatch of fish fry and small fish. If the amount of bycatch during fishery is deemed above acceptable limits, the fishing vessels relocate, and hunt for grounds with lower abundance of bycatch.



Potential habitat interactions are considered in the management decision-making process. There is no substantial evidence that the fishery has a significant negative impact on physical habitats. **R5, R25, R24, R32** 

#### F2.3:

There is a monitoring programme inherent to the *Calanus* Fishery; designed in collaboration with IMR and the Directorate. The Directorate also has the power to impose seasonal and geographic restrictions; total time-at-sea restrictions; gear restrictions and other effort restrictions if deemed necessary. For example, for quotas allocated from 2018-2022 a maximum of 3,000t *C. finmarchicus* can be fished between Norwegian and Fjordic Baselines.

The Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR) aims to conduct and further develop Integrated Ecosystem Assessments for the Norwegian Sea as a step towards implementing the ecosystem approach. It is WGINOR's role to develop an operational approach for integrated assessment of the Norwegian Sea ecosystem based on a common framework. Data is provided to WGINOR from ICES surveys in the assessment area to assist WGINOR in their objectives.

Chapter 7 (Control and enforcement) Section 47 (Placing inspectors and observers on board vessels) of the MRA obliges vessel owners, when requested, to provide board and lodging at the vessel's expense and use of communication equipment without charge. Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of C. finmarchicus and each vessels cargo capacity.

If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts

#### R6; R12; R24; R29

Standard clause 1.3.3.2



| F3 Ecosystem Impacts - Minimum Requirements |      |  |      |  |
|---|------|--|------|--|
| 10  | F3.1 | The broader ecosystem within which the fishery occurs is considered during     | PASS |  |
|   |      | the management decision-making process.  |      |  |
|   | F3.2 | There is no substantial evidence that the fishery has a significant negative   | PASS |  |
|   |      | impact on the marine ecosystem.  |      |  |
|   | F3.3 | If one or more of the species identified during species categorisation plays a | PASS |  |
|   |      | key role in the marine ecosystem, additional precaution is included in         | l (  |  |
|   |      | recommendations relating to the total permissible fishery removals.            |      |  |
|   |      | Clause Outcome:  | PASS |  |

### Evidence

#### F3.1:

A paper presented in 2017 outlined the practical implementation of the Ecosystem Approach to Fisheries Management (EAFM) in Norway. This involves defining management objectives and tools to achieve an overview of management needs while integrating conservation issues and stakeholder involvement.

An ICES Report (WGINOR) of the Working Group on Integrated Ecosystem Assessments for the Norwegian Sea was published in Nov 2018. Issues effecting the variation in *Calanus finmarchicus* levels on herring recruitment were discussed during a scoping meeting with Fisheries Organisations.

Several questions for further research were presented during the Working Group discussion, including:

- Is there a large effect of climate change on population dynamics and distribution of *Calanus finmarchicus*?
- Are there changes in the distribution of Calanus finmarchicus? If so, does this affect distributions of fish stocks?

The broader ecosystem within which the fishery occurs is considered during the management decision-making process.

#### R9; R29

#### F3.2:

If the amount of bycatch during fishery (visual inspection) is deemed above acceptable limits, fishing vessels relocate, and hunt for grounds with lower abundance of bycatch. However, this decision is subject to the judgement of the Captain and the Representative of Calanus AS on board. Work is ongoing to establish objective guidelines for relocation. It is expected that this will be implemented in the Regulatory Framework within 1-2 years (2019).

Most commercial fish species that live in the Norwegian Sea and the Barents Sea spawn on the Norwegian coast, primarily from the Møre coast in the south to Tromsøflaket in the north (approx. 62  $^{\circ}$  N and 70  $^{\circ}$  N). Most fish species have pelagic eggs, within the top 50m of the water column. Exceptions include bottom spawning herring. Eggs, larvae and fry drift North with the coastal current, eggs spawned in the South will be found as larvae and fry further North later in the season.



RESPONSIBLE SUPPLY

### IFFO RS Fishery Assessment Peer Review

A study undertaken by the Directorate in 2017 looked at bycatch levels in the *Calanus* fishery. Two vessels undertook 157 trawls (April-July) 2017 with a total capture of 747t eggs bycatch (rauåte) and 660t larvae/juvenile bycatch. A total of 135 trawls were analysed for the presence of larvae/fry; all 157 trawls were analysed for the presence of eggs. The first increase in egg bycatch was in early May; followed by an increase in larvae by-catch later. Toward end June bycatch levels dropped as eggs, larvae and fry drifted North, away from the fishing area (Figure 4):



Figure 4: The average interference of eggs and larvae per hour trawling through the capture season (average over 2 days for both boats) R32

Bycatch consisted of eggs from 13 fish species/groups; and larvae and juveniles from 15 species groups. Total catch of Calanus during these trawls was 747t. Eggs of cod, haddock and tusk accounted for 75% of all eggs retained in the trawls; herring and cod larvae and fry were the most common larvae bycatch. Other retained species are non-commercial. These included gelatinous forms (jellyfish) and zooplankton of similar size to Calanus. However, the amount of these species is highly insignificant due to low abundance.

Bycatch of both herring and cod larvae in 2017 (for each tonne of Calanus total of 700,000 larvae retained) was more than double that of previous years. The authors point to varying recruitment; improved survival of cod larvae; variation in environmental conditions and choice of fishing location/time.

Had the entire quota of Calanus (1,000t) being fished in 2017 the authors estimate that, assuming all larvae would have lived to recruit, a total of 96,000 cod would not have been recruited to the fishery (age 3 years).

#### IFFO RS Fishery Assessment Peer Review

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RESPONSIBLE SUPPLY

### IFFO RS Fishery Assessment Peer Review

The authors of the 2017 report conclude that bycatch levels of larvae and eggs reported in 2017 do not constitute any significant increases in mortality and considers that bycatch in the 2017 fishery had negligible effects on fish stocks.

Common redfish is a vulnerable stock in the assessment area. Redfish do not have egg and larval stages but are vulnerable in their youngest stages. A small portion of coastal cod will also be caught as bycatch in the area between baselines and 4nm, along with the common redfish in their youngest stages. For this reason, among others, the commercial quota (when applied) for *Calanus* within the coastal current (from baseline to 1,000m depth) will be restricted to 3,000t.

There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem. **R24-R25; R28; R32** 

#### F3.3:

A bycatch sorting grid has been designed (Figure 4). The main purpose of this grid is to minimize bycatch of larvae and juveniles, during summer months. Grid dimensions are calculated to allow catches of *C*. *finmarchicus*, while juveniles and larvae of fish and other species are directed out through the end section of the trawl (Figure 5):



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Figure 5: Calanus AS by-catch sorting grid (R25)

If the amount of bycatch during fishery (visual inspection) is deemed above acceptable limits, fishing vessels relocate, and hunt for grounds with lower abundance of bycatch. The precautionary approach is applied to all fisheries in Norway, and this strategy has proven effective. Few stocks have been decimated below critical thresholds and there has been no major breakdowns or collapses of stocks. The precautionary approach is entailed within the MRA. In the *Calanus* fishery to date no commercial licences have been issued,

If one or more of the species identified during species categorisation plays a key role in the marine ecosystem, additional precaution is included in recommendations relating to the total permissible fishery removals

To minimise ecosystem effects of the fishery two projects, supported by Calanus AS are ongoing:



- Use of drones to provide for a better spatial mapping of the stock. The effect is a reduction in time spent searching for *Calanus*.
- OASIS. The objective of this project is to develop a new generation of harvesting equipment which will allow Calanus AS harvest on lower concentrations compared to previously, and to avoid areas with high presence of larvae and juveniles.

Additional precaution is included in recommendations relating to the total permissible fishery removals. **R24-R25; R27-R28; R32** 

#### References

**R25** Cecilie Broms, Espen Strand, Webjørn Melle: IMR (2017): Bycatch (eggs, larvae and fry) in the Calanus fishery. pdf 17pp (NO)

**R26** Gullestad, P et al (2017) Marine Policy Vol 77 pp104-110 Towards Ecosystem based fisheries management in Norway (2017) EN

https://www.sciencedirect.com/science/article/pii/S0308597X16305383

**R27:** Drone fishing project (Calanus AS) pdf 20pp: EFFEKTIVISERING AV HØSTING ETTER RAUDÅTE VED HJELP AV DRONER (Annen).**NO** 

**R28:** Calanus AS et al OASIS 2 - 2nd Generation Zooplankton Harvesting System (Feb 2018) 17pp EN R29 WGINOR 2017: Steering Group on Integrated Ecosystem Assessments: ICESCM 2018/SSGIEA:10 PDF 42pp

**R30** Norwegian Environment Agency: Red List (2015) <a href="https://www.biodiversity.no/Pages/135380">https://www.biodiversity.no/Pages/135380</a>**R31** Norwegian Red List (Norwegian only): <a href="https://www.artsdatabanken.no/Rodliste">https://www.biodiversity.no/Pages/135380</a>

**R32** IMR Pers. Comm (2018) Protocol for sampling of fish eggs, larvae and juvenile interference pdf 4pp *Standard clause 1.3.3.3* 

### IFFO RS Fishery Assessment Peer Review Template

This section comprises a summary of the fishery being assessed against version 2 of the IFFO RS Standard. This information should be drawn from the Application Form, which was submitted to the Certification Body.

| Fishery under assessment                | Calanus finmarchicus (C. finmarchicus) Norway Economic Zone (NEZ) |
|---|---|
| Management authority<br>(Country/State) | Ministry of Trade, Industry and Fisheries (Norway)                |
| Main species                            | C. finmarchicus   |
| Fishery location                        | Norway Economic Zone (NEZ)  |
| Gear type(s)                            | Calanus bespoke AS pelagic trawl                                  |



# Summary: in this section, provide any additional information about the fishery that the reviewers feel is significant to their decision.

This is a peer review of a surveillance report and therefore focusses only on changes since the initial assessment. The assessment team has indicated that these changes are limited to the following sections:

- Assessment determination
- M1.2 & M2.3
- A1, A2.3, A4
- F1, F2, F3

Overall these changes are supported by evidence, and are not considered by the peer reviewer to have introduced any additional uncertainty into the report. The conclusions of the assessment team continue to be supported by the contents of the report.



The purpose of the Fishery Assessment Peer Review is to ensure that the contents of the Fishery Assessment Report are accurate, consistent, and supported by the evidence provided by the assessor. The Fishery Assessment Report is conducted by an approved Certification Body Representative with expertise covering the IFFO RS fishery assessment process, and fisheries management in general.

The following elements form the basis of the Fishery Assessment Peer Review evaluation:

A. Review of the full Fishery Assessment study conducted on the fishery raw material to confirm the evaluation against the IFFO RS fishery approval criteria, including the following areas:

• Ensure the fishery under assessment has been accurately characterised using the best available scientific understanding of the biological stock(s) and the catch composition.

• Ensure the species characterisation underpinning the structure of the report is accurate and defensible, including making sure that all relevant species have been included in the assessment.

• Confirm that throughout the report all significant statements and pass/fail ratings are supported by adequate evidence, including references.

• Confirm that the report as a whole has been fully completed according to the process described in the IFFO RS fishery assessment guidance.





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#### **Summary of Peer Review Outcomes**

This section summarises the outcomes of the peer review process. Peer reviewers should review all of the application documentation with the primary objective of answering the key questions listed in the table below. Reviewers should use their expert knowledge of the IFFO RS fishery assessment process and IFFO RS application process to determine whether the questions should be answered Yes or No. Where the situation is more complicated, reviewers may instead answer "See Notes". Whichever of the three answers is chosen, additional information may be provided in the relevant section of this template.

|  | YES | NO | See<br>Notes |
|--|-----|----|--------------|
| A – Fishery Assessment   |     |    |              |
|  |     |    |              |
| 1. Has the fishery assessment been fully completed, using the recognised         | YES |    |              |
| IFFO RS fishery assessment methodology and associated guidance?                  |     |    |              |
| 2. Does the Species Categorisation section of the report reflect the best        | YES |    | Х            |
| current understanding of the catch composition of the fishery?                   |     |    |              |
| 3. Are the scores in the following sections accurate (i.e. do the scores reflect |     |    |              |
| the evidence provided)?  |     |    |              |
| Section M - Management   | YES |    |              |
| Category A Species   | YES |    | Х            |
| Category B Species   | n/a |    |              |
| Category C Species   | n/a |    |              |
| Category D Species   | n/a |    |              |
| Section F – Further Impacts  | YES |    |              |
|  |     | *  | •            |

#### **Detailed Peer Review Responses**

Peer reviewers may provide additional explanation as to review outcomes in this section of the report. Reviewers do not need to fill out every section of the detailed responses; if the answer to a Key Question is clear-cut, no additional detail may be necessary. However, where there is complexity, uncertainty, or any other information the Application Committee should be made aware of, the peer reviewer may enter it here.

If any comments are linked to the FAP, reference the section they refer to, to allow the IPAC to find the pertinent information.

Boxes may be extended if more space is required.

1. Is the scoring of the fishery consistent with the IFFO RS standard, and clearly based on the evidence presented in the assessment report?

The scoring of the fishery is consistent with the IFFO RS standard, as far as the standard and assessment methodology is applicable to this type of fishery.

2. Has the fishery assessment been fully completed, using the recognised IFFO RS fishery assessment methodology and associated guidance?

The fishery assessment has been fully completed, notwithstanding the other notes in this peer review report.

3. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?

• The Species Categorisation section of the report does not provide a reference for the catch composition. It is presumed this originates from one or more of the references later in the report but this could be clarified.

3M. Are the scores in "Section M – Management" accurate?

The scores in this section are accurate.

3A. Are the "Category A Species" scores accurate?

• Additional evidence would be helpful in relation to A1.2, to demonstrate the stock status over time.

3B. Are the "Category B Species" scores accurate? No Category B species were identified.

3C. Are the "Category C Species" scores accurate? No Category C species were identified.

3D. Are the "Category D Species" scores accurate? No Category D species were identified.

3F. Are the scores in "Section F – Further Impacts" accurate?

The scores in this section are accurate.

Optional: General comments on the Peer Review Draft Report

