



## MarinTrust Standard V2

# Whole fish Fishery Assessment Report Template

**MarinTrust Programme**

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**Table 1 Application details and summary of the assessment outcome**

Application details and summary of the assessment outcome			
<b>Name:</b>			
<b>Address:</b>			
<b>Country:</b> Norway		<b>Zip:</b>	
<b>Tel. No.</b>		<b>Fax. No.</b>	
<b>Email address:</b>		<b>Applicant Code</b>	
<b>Key Contact:</b>		<b>Title:</b>	
Certification Body Details			
<b>Name of Certification Body:</b>		Global Trust certification	
<b>Assessor Name</b>	<b>CB Peer Reviewer</b>	<b>Assessment Days</b>	<b>Initial/Surveillance/ Re-approval</b>
Virginia Polonio	Geraldine Criquet	3	Re-approval
<b>Assessment Period</b>	To May 2021		
Scope Details			
<b>Management Authority (Country/State)</b>		Ministry of Trade, Industry and Fisheries (Norway)	
<b>Main Species</b>		<i>Calanus finmarchicus</i>	
<b>Fishery Location</b>		FAO 27 Northeast Atlantic Norway Economic Zone (EEZ)	
<b>Gear Type(s)</b>		Calanus bespoke AS pelagic trawl	
Outcome of Assessment			
<b>Overall Outcome</b>		PASS	
<b>Clauses Failed</b>		NONE	
<b>CB Peer Review Evaluation</b>		Agree with the assessor's determination.	
<b>Fishery Assessment Peer Review Group Evaluation</b>		Approved – see <a href="#">appendix</a>	

Recommendation	Approved
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## Table 2. Assessment Determination

Assessment Determination
<p><i>C. finmarchicus</i> is a large planktonic copepod (Zooplankton) whose chief diet includes diatoms, dinoflagellates, and other micro planktonic organisms. <i>C. finmarchicus</i> is a key component in the food web of the North Atlantic, providing sustenance for a variety of marine organisms including fish, shrimp, and whales.</p> <p><i>C. finmarchicus</i> is most commonly found in the Norwegian and North Seas as well as throughout the colder waters of the North Atlantic; off Canada; in the Gulf of Maine and in the Western and Northern Svalbard (Figure 1).</p> <p>Together with other closely related species, annual biomass production in the assessment area is in the range of 290 x 10<sup>6</sup> t (2016 data). The stock biomass of <i>C. finmarchicus</i> is estimated to be about 33 x 10<sup>6</sup> t in the Norwegian Sea. A trial license awarded to the Norwegian based Calanus AS (allowing extraction of a maximum 5,000 t of copepods annually in coastal waters from 2018 - 2022) is unaffected by the licensing of commercial harvesting which, when awarded, will have a duration of 10 years.</p> <p>In 2020, the Ministry announced a total commercial quota of 254,000 t annually, equivalent to 0.06% of estimated annual production. Tenders have been issued for 10 area-restricted vessel licenses. Under the regulations announced, no vessel quotas are currently set. Commercial licenses have yet to be allocated.</p> <p>Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of <i>C. finmarchicus</i> and the vessel's cargo capacity. No analytical stock assessments are undertaken specifically for <i>C. finmarchicus</i>. However, acoustic 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 of the biological and physical state of the basins. Data on <i>C. finmarchicus</i> is collected during these surveys.</p> <p>There is a potential for the fishery to affect ETP species through accidental bycatch of 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 way to separate larvae/juveniles belonging to ETP species from larvae / juveniles belonging to non-ETP species.</p> <p>A study undertaken by the Institute in 2017 looked at bycatch levels in the fishery. Bycatch consisted of eggs from 13 fish species/groups; and larvae and juveniles from 15 species groups. Eggs of cod, haddock and tusk accounted for 75% of all eggs retained; herring and cod larvae and fry were the most common larval bycatch.</p> <p><i>C. finmarchicus</i> is not listed in the current CITES appendices of endangered species and is not listed in the current IUCN Redlist of threatened species. <i>C. finmarchicus</i> is approved for use under the current MarinTrust Whole fish Standard v 2.0 to produce fish meal and fish oil</p>
Fishery Assessment Peer Review Comments
<p>The assessor correctly classified the Calanus stock in conformity with the Species categorisation requirements. The fishery is managed by the Norway management system. There is a monitoring, surveillance and control system in place. There is a harvest strategy in place to ensure that stocks are fished at sustainable levels. Data are collected and stocks are assessed.</p> <p>The stock Calanus stock in Norwegian waters is viable and biologically in good or average condition There is a mechanism in place by which total fishing mortality of the stock is restricted.</p> <p>There is no evidence that the fishery impacts significantly habitats, ETP species and the ecosystem.</p> <p>Therefore, all stocks should be awarded continued approval for the production of fishmeal and fish oil under the IFFO-RS v 2.0 standard.</p>

Notes for On-site Auditor

### Table 3 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

### Table 4 Species- Specific Results

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

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	<i>C. finmarchicus</i> sp.	97.3*	A1	PASS
			A2	PASS
			A3	PASS
			A4	PASS

Table 5 Species Categorisation Table

Common name	Latin name	Stock	IUCN Redlist Category <sup>1</sup>	% of landings	Management	Category
Calanus	<i>Calanus finmarchicus</i> sp	Norway EZZ	Not listed	97.3 %	Norway Ministry of Trade, Industry and Fisheries	A
<b>Species categorisation rationale</b>						
The categorisation has been done following the approach given in the initial assessment as no additional information has been submitted to the assessment team for this re-approval. As the gear type is modified to increase the efficiency to catch Calanus the percentage of non-target species is negligible, and the only species assessed is the target species. As there is a management plan the species has been assessed under category A.						

<sup>1</sup> <https://www.iucnredlist.org/>

## MANAGEMENT

The two clauses in this section (M1, M2) relate to the general management regime applied to the fishery under assessment. The clauses should be completed by providing sufficient evidence to justify awarding each of the requirements a pass or fail rating. A fishery must meet all the minimum requirements in every clause before it can be recommended for approval.

M1 Management Framework – Minimum Requirements		
<b>M1.1</b>	There is an organisation responsible for managing the fishery.	Yes
<b>M1.2</b>	There is an organisation responsible for collecting data and assessing the fishery.	Yes
<b>M1.3</b>	Fishery management organisations are publicly committed to sustainability.	Yes
<b>M1.4</b>	Fishery management organisations are legally empowered to take management actions.	Yes
<b>M1.5</b>	There is a consultation process through which fishery stakeholders are engaged in decision-making.	Yes
<b>M1.6</b>	The decision-making process is transparent, with processes and results publicly available.	Yes
<b>Clause outcome:</b>		PASS
<p><b>M1.1 There is an organisation responsible for managing the fishery.</b></p> <p>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. Both Ministry and Directorate develop and apply fishery laws and regulations through an ongoing interactive process referred to as the Regulatory Chain (Figure 1), in place since the 1970’s.</p> <p>Scientific advice takes key positions within the chain, ensuring understanding of fish stocks and broader ecosystem issues are considered. A Stock table, and a table of "Catches of data-poor species" constitute the system in Norway for monitoring management principles. Along with a Fisheries table, both establish a framework for developing an ecosystem-based fisheries management by providing a basis and tools for prioritising the needs of new and/or revised management measures. The Stock Table includes information on the status of stocks, exploitation level, management objectives and priorities for action. The Fisheries Table includes information for each fishery on species and size selectivity, discard problems, incidental mortality, effect on bottom habitats, etc. Elements of both tables are graded according to impact or importance and presented with traffic light colours (high (red), medium (yellow) or low (green)) to facilitate overviews.</p> <p>A Regulatory Council then debate on quota distribution and provide advice for the Ministry. The Ministry decide on final management strategies. The scope of the Regulatory Chain was broadened by provisions of the new Marine Resources Act (2009) to include ecosystem and biodiversity related issues (see also M1.5).</p> <p>The Department is responsible for matters related to fisheries, the fishing fleet and aquaculture industry. The Department manages, inter alia:</p> <ul style="list-style-type: none"> <li>• Quota negotiations with the European Union and others.</li> <li>• International fisheries agreements including those with the Regional RFMO (NEAFC North East Atlantic Fisheries Commission) • Prevention and deterrence of IUU fishing.</li> <li>• Fishing regulations and fishing rights including licensing for Norwegian flagged and Third Country vessels wishing to fish in Norwegian waters. The Directorate of Fisheries and Aquaculture’s role is, inter alia:             <ul style="list-style-type: none"> <li>• Provide analyses, statistics and advice in support of management decisions. • As an executive entity implement political decisions.</li> <li>• Process applications and appeals, when necessary.</li> </ul> </li> </ul>		



- Conduct monitoring and control of the fisheries.
- Actively cooperate with trade and industry, the research community and other public services.
- Knowledge sharing with various stakeholders and the public

The Norwegian Sea (NWS) connects with the Northeast Atlantic Ocean to the southwest, the Icelandic Waters ecoregion and Greenland Sea to the west along the edge to the shallower Iceland Sea between the Faroe Islands, and northwards to Jan Mayen. To the south it borders to the shallower North Sea along the 62°N parallel between Norway and the Faroe Islands, and to the northeast with the shallower Barents Sea.

From 2017-2019 the Norwegian Sea has become markedly fresher due both to an Atlantic Inflow and an increase in influx of Arctic water from the East Icelandic Current. Data on Zooplankton biomass (May time-series from 1995 to the present) was presented in WGINOR's 2019 Report (M 1.2).

A national Management Plan (2016) for *C. finmarchicus* harvesting was developed, and a national hearing process amongst stakeholders completed at that time. The management area proposed 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 1,000m.

In 2020 Norwegian authorities announced a total commercial quota of 254,000t annually and issued tenders for 10 area-restricted vessel licenses. There has been no decision yet on who will be granted a license; decisions when made are subject to appeal. There will be no vessel-specific quotas awarded. The trial license awarded to Calanus AS allowing this Company to extract 5,000t of copepods annually in coastal waters up to 2022 is unaffected by the licensing of commercial harvesting.

#### **M1.2 There is an organisation responsible for collecting data and assessing the fishery.**

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

Fisheries advice is provided by the International Council for the Exploration of the Sea (ICES). Environmental issues are managed by Norwegian agencies, through OSPAR and ICES through Working Groups like (WGINOR) the Working Group on Integrated Ecosystem Assessments for the Norwegian Sea.

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).

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. The Fisheries Directorate calculated a total Norwegian annual quota (precautionary). Catch limit is an exploitation degree of 10 % of the estimated standing stock would be 10 % of 33 mill t = 3.3 mill t. Trigger level: based on a pre-cautionary approach is the 10 % of 3.3 mill t set at 330 000 t. The total Norwegian quota is suggested to include the NEZ and the Jan Mayen zone in the Norwegian Sea. This area constitutes 50.6% of the total area for the Norwegian Sea, therefore the total quota is defined as 165,000 t (330 000 x 50%).

This Working Group has a three-year work programme (2018-2021) which includes focussing, through modelling, on single vs. multispecies harvest control rules for the development of ecosystem-based advice, and on outstanding issues to facilitate the

development of integrated ecosystem assessments (IEA's). Survey data from IMR is also presented to the ICES Working Group of International Pelagic Surveys (WGIPS). The core objectives of this Working 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 surveys

**M1.3 Fishery management organisations are publicly committed to sustainability.**

The Ministry aids in coordinating efforts of 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. A 2009 Report outlined strategies in place to ensure the sustainable harvesting of all marine resources. Sustainable management and harvesting are based on best available understanding and scientific advice from both ICES and 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, see M1.4) outlines Norway'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

**M1.4 Fishery management organisations are legally empowered to take management actions.**

The Marine Resources Act (MRA, entered into force on 06 June 2008) 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 MRA 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 1 (Introductory provisions) Section 3 provides a comprehensive scope of the MRA: 'all harvesting and other utilisation of wild living marine resources and genetic material derived from them. Wild living marine resources means fish, marine mammals that spend part or all of their life cycle in the sea, plants and other marine organisms that live in the sea or on or under the seabed and that are not privately owned. As part of the zooplankton food web found in the Norwegian and North Seas the management of *C. finmarchicus* harvesting is covered in the MRA.

Chapter 1 Section 7 notes that the application of the Ecosystem Approach to Fisheries Management (EAFM) is now mandatory in Norway. This Section gives the Ministry the power to: 'evaluate which types of management measures are necessary to ensure sustainable management of wild living marine resources' This includes looking at effective control of harvesting methods and the way gear is used consider the need to reduce possible negative impacts on living marine resources. Chapter 3 (Catch quantities and quotas) Section 11 empowers the Ministry to prescribe: 'maximum permitted quantities (national quotas) of wild living 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.

Chapters 6 (Arrangements for control and enforcement) & Chapter 7 (Control and enforcement) of the MRA specifies arrangements for 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 (Measures against illegal, unreported and unregulated fishing) outlines measures in place to deter illegal, unreported and unregulated (IUU) fishing. Chapter 11 (Coercive fines and infringement fines) empowers the Ministry to impose coercive and infringement fines to ensure compliance with provisions made in or under the Act. Norway ratified the UN Agreement on Straddling and Migrating Fish Stocks and the UN Convention on the Law Of the Sea in 1996.

**M1.5 There is a consultation process through which fishery stakeholders are engaged in decision-making.**

Representatives of the fishing industry and governmental authorities cooperate in the formulation of the Regulatory Chain (Figure 1). 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 Advisory Meetings 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.



**Figure 1.** Regulatory chain of Norwegian fishery management. Source: Directorate of Fisheries Norway.

**M1.6 The decision-making process is transparent, with processes and results publicly available.**

Norway has a bilateral fisheries agreement with the European Union (joint management of shared stocks), trilateral arrangements with Iceland and the Faroe Islands and neighbouring agreements with other coastal states in the region. All meetings and key decisions are published online. The Directorate’s Communications office has overall responsibility for all external and internal information, including continuous development of strategic communication. Other main areas of responsibility are the maintenance and development of the Directorate’s Internet and intranet pages, presentation of information material for 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 [www.fisheries.no](http://www.fisheries.no) through which authorities provide information about Norwegian fisheries regulations and aquaculture management.

**References**

Ministry of Trade Industry and Fisheries-Norway <https://www.regjeringen.no/en/id4/> (accessed 08.04.20) R2: Directorate of Fisheries: Norwegian-Fisheries-Management <https://www.fiskeridir.no/English/Fisheries/Norwegian-Fisheries-Management> (accessed 08.04.20) R3: FAO Fisheries and Aquaculture Country Profile: <http://www.fao.org/fishery/facp/NOR/en>

Regulatory Chain of Norwegian Fisheries Management:  
[pp https://www.regjeringen.no/globalassets/upload/fkd/brosjyrer-og-veiledninger/folder.pdf](https://www.regjeringen.no/globalassets/upload/fkd/brosjyrer-og-veiledninger/folder.pdf)

Department for Fisheries and Aquaculture (2009): 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>

ICES Ecosystem Overviews Norwegian Sea Ecoregion (17pp) Dec 2019.  
[http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/EcosystemOverview\\_NorwegianSea\\_2019.pdf](http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/EcosystemOverview_NorwegianSea_2019.pdf)

Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR 2019) 52 pp Vol 2 Issue 29.



closely with the Directorate. The Directorate performs annual strategic risk analyses which gives guidance for future focus areas and enforcement tactics. Catches of *C. finmarchicus sp* are reported daily to the Directorate from the harvesting vessel (one vessel harvesting in 2019). Total landings are additionally reported at port through a Landing Certificate. 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 the client company Calanus AS.

**M2.2 There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken.**

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 counts 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 *C. finmarchicus* harvesting, the trial license to the client Calanus AS is provided by the Ministry, any violations of the license would be addressed by the Ministry. Appeals can be made to the Ministry and “Ombudsmann” appointed by the Norwegian Parliament to safeguard the rights of individual citizens. 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 during harvesting.

**M2.3 There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing.**

Norway adopted a Blacklist 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 blacklist was later adopted by several Regional Fisheries Management Organizations (RFMO’s). Among the list are included vessels that have taken part in fishing outside quota arrangements in international waters for a stock subject to regulations in waters under Norwegian fisheries jurisdiction. The Norwegian Blacklist was updated on 20.02.2020. No vessels have been added to the list since 2016. The current IUU list is updated on the Directorate’s website and is divided into 3 sections:

IUU-list 1: All vessels are covered by measures including prohibition of landing, transshipment, delivery of supplies, delivery of services and access to port. Vessels on this list are not granted the right to fly the flag of Norway nor a license to operate in the Norwegian EEZ.

IUU-list 2: Measures for vessels on this list include prohibition of landing, transshipment, delivery of supplies and delivery of services. These vessels can be granted access to port but will be inspected upon arrival.

IUU-list 3: This list identifies vessels involved in cases where a decision to lay down prohibitions is about to be made. The current list (updated 21.03.2018) is populated by reference to actions undertaken by RFMO’s worldwide to combat IUU fishing (NEAFC, IOTC etc).

The Directorate’s website (Control and Enforcement) does not have any record of vessel detentions or arrests for IUU fishing in 2019-20 to date.

**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.**

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 also 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.

The Directorate (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. VMS transmitters on Norwegian vessels must be approved by the Directorate and installed only by those authorized. Norwegian flagged vessels involved in fishing operations of overall length 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 overall length 24m or more (15m or more in the case of EU vessels) are subject to mandatory position reporting when operating in Norwegian waters outside Skagerrak. By January 2014 approximately 575 Norwegian vessels were subject to position reporting. Norway is currently a signatory to agreements on electronic exchange of catch and activity reports from most of the waters where Norwegian fishing vessels operate. In 2013 a bilateral agreement on electronic exchange of catch and activity data was made between Norway and Iceland. Norway has also reached an agreement with Russia (October 2012). However, the date for entry into force is not yet decided (March 2015 update). All data is stored by the Directorate and only accessible to authorized personnel who are subject to a duty of confidentiality.

**References**

Norway Fisheries Directorate: Control and Enforcement  
<https://www.fiskeridir.no/English/Fisheries/Control-and-enforcement>  
 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>  
 Norway Fisheries Directorate IUU List: <https://www.fiskeridir.no/English/Fisheries/IUU-list>  
 Norway Fisheries Directorate Black list pdf 17pp:  
<https://www.fiskeridir.no/English/Fisheries/Norwegian-Black-List>  
 Norway Fisheries Directorate: Electronic Reporting Systems:  
<https://www.fiskeridir.no/English/Fisheries/Electronic-Reporting-Systems>

Links	
<b>MARINTRUST Standard clause</b>	1.3.1.3
<b>FAO CCRF</b>	7.7.2
<b>GSSI</b>	D1.09

## 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. The clauses should be completed by providing sufficient evidence to justify awarding each of the requirements a pass or fail rating. The species must achieve a pass rating against all requirements to be awarded a pass overall. **If the species fails any of these clauses it should be re-assessed as a Category B species.**

<b>Species Name</b>		<i>Calanus finmarchicus</i>	
<b>A1</b>	<b>Data Collection - Minimum Requirements</b>		
	<b>A1.1</b>	Landings data are collected such that the fishery-wide removals of this species are known.	Yes
	<b>A1.2</b>	Sufficient additional information is collected to enable an indication of stock status to be estimated.	Yes
			<b>Clause outcome:</b> PASS
<p><b>A1.1 Landings data are collected such that the fishery-wide removals of this species are known.</b></p> <p>Fishing effort is measured through daily reports of catch, calculation of catch per hour and Landing Certificates presented to Directorate inspectors on landing. At present, Calanus AS is the only commercial participant in this fishery, with one vessel contracted for harvesting in 2020. Norwegian authorities have allocated a total annual quota of 254.000 tons of <i>Calanus finmarchicus</i>, with an option for commercial vessels to apply for 10 licenses Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of <i>C. finmarchicus</i> and the vessel's cargo capacity.</p> <p><b>A1.2 Sufficient additional information is collected to enable an indication of stock status to be estimated.</b></p> <p>The following fishery-independent data is collected:</p> <ul style="list-style-type: none"> <li>• ES70, EK80 echosounder acoustic data/haul.</li> <li>• Video recording of biomass transferred from trawl sack to vessel.</li> <li>• Total biomass, start-end position, duration of haul, fishing depth, weather and sea state/haul.</li> <li>• Bycatch in ml per 500 ml catch photographed and recorded.</li> <li>• Samples of bycatch eggs and bycatch taken/haul.</li> <li>• Every 4th haul has a triple sample taken and analysed from various parts of the trawl sack for each haul (2018 only).</li> <li>• Total catch weighed and recorded at port during landing.</li> <li>• Genetic samples of selected species &lt; 10 samples taken at sea.</li> <li>• 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.</li> </ul> <p>All samples are analysed at IMR and reported when the analysis is complete. Stock biomass of calanus is estimated to be about 33 mill t in the Norwegian Sea.</p>			
<b>References</b>			
<p>Calanus AS website: <a href="https://www.calanus.no/resource/">https://www.calanus.no/resource/</a></p> <p>ICES. 2019. Norwegian Sea Ecoregion – Ecosystem overview. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, Section 12.1, <a href="https://doi.org/10.17895/ices.advice.5748">https://doi.org/10.17895/ices.advice.5748</a></p>			
<b>Links</b>			
<b>MARINTRUST Standard clause</b>		1.3.2.1.1, 1.3.2.1.2, 1.3.2.1.4, 1.3.1.2	

FAO CCRF	7.3.1, 12.3
GSSI	D.4.01, D.5.01, D.6.02, D.3.14

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

**Clause outcome:** PASS

**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.**

No analytical stock assessments are undertaken for *C. finmarchicus*. However, annual acoustic surveys 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 of the biological and physical state of the basins. Data on *C. finmarchicus* is collected during these surveys. Estimates of *C. finmarchicus* production in the Norwegian Sea have formed the basis for commercial quota calculations. Annual surveys undertaken in the assessment area include: IESNS: International Ecosystem Survey in the Nordic Seas (since 1995) IESSNS: International Ecosystem Summer Survey in the Nordic Seas (July-August). Results of these surveys are submitted for discussion to ICES Working Group of International Pelagic Surveys (WGIPS).

The fishery is managed by the Norwegian authorities who have allocated a total annual quota of 254.000 tons of *Calanus finmarchicus*, with an option for commercial vessels to apply for 10 licenses.

**A2.2 The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.**

Of the total quota of 254.000 tons, 3000 tons can be harvested between the 1000 meters bathymetric contour line and the Norwegian Baseline. The remainder will have to be harvested on the outside. The issuance of a commercial total quota has no formal impact on the research quota awarded to Calanus AS. Further, there will be no designated vessel quotas and the commercial licenses will have a duration of 10 years. The *C. finmarchicus* stock in Norwegian waters is viable and biologically in good or average condition (Source: Update of the integrated management plan for the Norwegian Sea, Meld. St. 35 (2016–2017) Report to the Storting (white paper). Norwegian Ministry of Climate and Environment. 17pp). Estimates of annual production of *C. finmarchicus* in the Norwegian Sea have been calculated at 290 x 106 t.

**A2.3 The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.**

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 106 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 estimated annual production (biomass).



**A2.4 The assessment is subject to internal or external peer review.**

Representatives of the fishing industry and governmental authorities cooperate in the formulation of the Regulatory Chain (Figure 1). 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.

**A2.5 The assessment is made publicly available.**

Biomass estimates from IMR are made available to Government and form part of Ministerial Reports to Parliament which are then made available to the public in the form of updated Management Plans. A Regulatory Council debate on quota distribution and provide advice for the Ministry. The Ministry then decides on final management strategies. The scope of the Regulatory Chain was broadened by provisions of the new Marine Resources Act (MRA 2009) to include ecosystem and biodiversity related issues. The Directorates Communication Office provide information about fisheries regulations and aquaculture management on their website

**References**

Calanus AS website: <https://www.calanus.no/resource/> R22: Kurt Tande, Snorre Angell, Morten Winje & Ole Petter Pedersen (NORUT).

Annual Report (2016) Copepod Harvesting CALANUS pdf 14pp R23: Calanus AS Ltd: Client Pers. Comm. Dr. Cecilie Broms, IMR. Planktologist Calanus AS Client Application to IFFO-RS (2018-2020) 18pp

Update of the integrated management plan for the Norwegian Sea, Meld. St. 35 (2016–2017) Report to the Storting (white paper). Norwegian Ministry of Climate and Environment. 110pp. <https://www.regjeringen.no/en/dokumenter/meld.-st.-35-20162017/id2547988/?ch=2>

ICES Workshop on Scrutinizing of Acoustic data from the IESSNS Survey (WKSCRUT2) Volume 2 Issue 13 38p [Http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2020/WKSCRUT2%20Report%202019.pdf](http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2020/WKSCRUT2%20Report%202019.pdf)

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

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

[The management of Calanus finmarchicus](#)

Links	
MARINTRUST Standard clause	1.3.2.1.2, 1.3.2.1.4, 1.3.1.2
FAO CCRF	12.3
GSSI	D.5.01, D.6.02, D.3.14

A3 Harvest Strategy - Minimum Requirements		
A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted.	Yes

A3.2	Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.	Yes
A3.3	Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).	Yes

**Clause outcome:** PASS

**A3.1 There is a mechanism in place by which total fishing mortality of this species is restricted.**

The Ministry issued an annual quota of 254, 000t in 2020. A total of 10 commercial licenses will be awarded. There has been no decision yet who will be granted a license. There will also be an appeals round. 3,000t of the annual quota can be harvested between the 1000m contour line and Norwegian Baseline. The remainder must be harvested outside the 1000m contour line. There will be no vessel quotas. Commercial licenses will have a duration of 10 years. Fishing effort is limited by the physical construction of the fishing gear, by freezing facility, seasonal vertical migration of *C. finmarchicus* sp and each vessels' cargo capacity.

**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.**

In 2017, Calanus AS harvested 747t of *C. finmarchicus* sp, in 2018 1,360t and in 2019 352t. To date, in 2020, there has been no harvesting. The trial license awarded to Calanus AS allows extraction of up to 5,000t annually up to 2022.

**A3.3 Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).**

Catches of *C. finmarchicus* sp are reported daily to the Directorate from each vessel and total landings additionally reported at port through Landing Certificates. It is the responsibility of each commercial participant to adhere to individual licensing conditions.

Chapter 1 Section 7 of the MRA notes that the application of the Ecosystem Approach to Fisheries Management (EAFM) is now mandatory in Norway. Section 7 gives the Ministry the power to: 'evaluate which types of management measures are necessary to ensure sustainable management of wild living marine resources' This includes looking at effective control of harvesting methods and the way gear is used considering the need to reduce possible negative impacts on living marine resources.

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 to issue orders to stop a vessel, haul in gear, seal gear and obtain documents, relevant information and objects if they suspect infringements of 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

**References**

[The management of Calanus finmarchicus](#)

ICES. 2019. Norwegian Sea Ecoregion – Ecosystem overview. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, Section 12.1, <https://doi.org/10.17895/ices.advice.5748>

[Search - regjeringen.no](#)

Standard clause 1.3.2.1.3

<b>Links</b>	
<b>MARINTRUST Standard clause</b>	1.3.2.1.3, 1.3.2.1.4
<b>FAO CCRF</b>	7.2.1, 7.22 (e), 7.5.3
<b>GSSI</b>	D3.04, D6.01

<b>A4</b>	<b>Stock Status - Minimum Requirements</b>	
	<b>A4.1</b>	<p>The stock is at or above the target reference point, OR IF NOT:</p> <p>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:</p> <p>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.</p>
		<b>Clause outcome:</b> Yes
<p><b>A4.1 The stock is at or above the target reference point, OR IF NOT:</b></p> <p><b>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:</b></p> <p><b>The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.</b></p> <p>Based on a precautionary approach, the quota has initially been set at 254,000 tons per year, which is significantly lower than the potential sustainable yield. A total of 10 commercial licenses will be awarded. The stock biomass of <i>C. finmarchicus</i> is estimated to be about 33x106 t in the Norwegian Sea. The annual quota awarded in 2019 is equivalent to 0.06% of estimated annual production.</p> <p>The stock in Norwegian waters is viable and biologically in good or average condition (source Update of the integrated management plan for the Norwegian Sea, Meld. St. 35 (2016–2017). Report to the Storting (white paper). Norwegian Ministry of Climate and Environment .17pp ).</p>		
<p><b>References</b></p> <p><a href="#">The management of Calanus finmarchicus</a>          ICES. 2019. Norwegian Sea Ecoregion – Ecosystem overview. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, Section 12.1, <a href="https://doi.org/10.17895/ices.advice.5748">https://doi.org/10.17895/ices.advice.5748</a>  <a href="#">Search - regjeringen.no</a></p>		
<b>Links</b>		
<b>MARINTRUST Standard clause</b>	1.3.2.1.4	
<b>FAO CCRF</b>	7.2.1, 7.2.2 (e)	
<b>GSSI</b>	D6 01	

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

**F1.1 Interactions with ETP species are recorded.**

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.

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 (*Sebastes 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 (*Gadus morhua*); Atlantic Halibut (*Hippoglossus hippoglossus*); European Eel (*Anguilla anguilla*); Long-nosed skate (*Dipturus oxyrinchus*); Porbeagle (*Lamna nasus*) and Rabbitfish (*Chimaera monstrosa*). Due to low towing speeds (approximately one knot/hr) adult fish, ETP species and mobile bycatch may also escape the trawl.

**F1.2 There is no substantial evidence that the fishery has a significant negative effect on ETP species.**

There is a monitoring programme inherent to the 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. If the amount of bycatch during fishery (visual inspection) is deemed above acceptable limits (currently 10% of catch by volumetric sampling) fishing vessels relocate, and hunt for grounds with lower abundance of bycatch. A study undertaken by the Directorate in 2017 looked at bycatch levels in the Calanus fishery. Bycatch consisted of eggs from 13 fish species/groups; and larvae and juveniles from 15 species groups. 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.

**F1.3 If the fishery is known to interact with ETP species, measures are in place to minimise mortality.**

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 Authorities continue to develop a management plan for the stock based on long-term ecosystem-based management in line with the precautionary principle and other obligations under the MRA.

Ongoing research will further define the important role of *C. finmarchicus* 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. The Red List for Species has become an important tool for management of economically less important and endangered species.

Management measures to avoid species found on this list may include not fishing in protected areas, gear restrictions and other measures laid down in the MRA. Species on the official Red List or otherwise known to be in a precarious state, will be subject to evaluation according to Section 7 (Principle for management of wild living marine resources and fundamental considerations) of the MRA, giving 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.

**References**

Norway Red List <https://www.biodiversity.no/Pages/135380> R29 Cecilie Broms, Espen Strand, Webjørn Melle: IMR (2017): Bycatch (eggs, larvae and fry) in the Calanus fishery. pdf 17pp (NO)

Commercial Exploitation of Zooplankton in the Norwegian Sea: Eduardo Grimaldi and Svein Helge Gjøsund SINTEF Fisheries and Aquaculture Norway.	
<b>Links</b>	
<b>MARINTRUST Standard clause</b>	1.3.3.1
<b>FAO CCRF</b>	7.2.2 (d)
<b>GSSI</b>	D4.04, D.3.08

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

**F2.1 Potential habitat interactions are considered in the management decision-making process.**

Pelagic fishing by multinational fleets is the major activity in the Norwegian Sea Ecoregion. The number of fishing vessels is declining while vessel size is increasing. The Norwegian commercial fleet has the highest fishing activity in the shelf area, particularly along the coast of Norway and the continental shelf edge.

Bottom trawls are regulated along the Norwegian continental slope through closed areas to avoid extended damage on fragile and vulnerable benthic communities and reef-building organisms.

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 µm 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. The ICES Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR) aims to conduct and further develop Integrated Ecosystem Assessments (IEA's) 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. The application of the Ecosystem Approach to Fisheries Management (EAFM) is now mandatory in Norway. The Ministry has power to: 'evaluate which types of management measures are necessary to ensure sustainable management of wild living marine resources' This includes looking at effective control of harvesting methods and the way gear is used to consider the need to reduce possible negative impacts on living marine resources, including marine habitats. Additional ecosystem considerations will be incorporated as new scientific knowledge becomes available concerning multispecies interactions, effects of fishing on benthic habitats and the effects of by-catch of fish, seabirds and marine mammals, where relevant.

**F2.2 There is no substantial evidence that the fishery has a significant negative impact on physical habitats.**

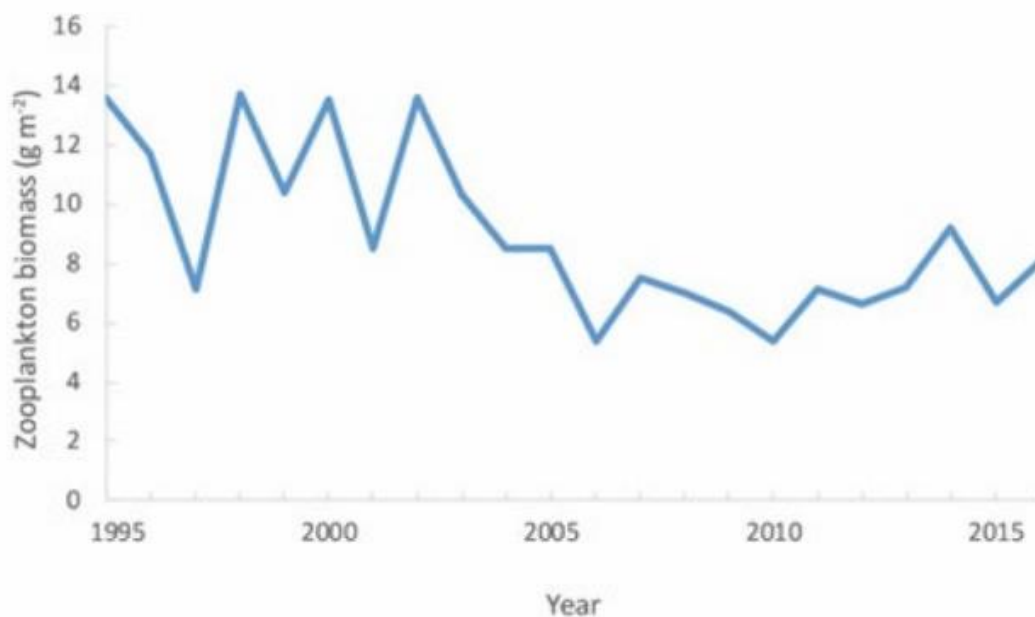
Most commercial fish species living in the Norwegian Sea spawn on the Norwegian coast. Most fish species have pelagic eggs, within the top 50m of the water column. Exceptions include bottom spawning herring. Eggs, larvae and fry drift North with the coastal current, eggs spawned in the South will be found as larvae and fry further North later in the season. The bespoke Calanus trawl is a pelagic trawl with minimal impact on the ocean floor.

**F2.3 If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.**

<p>There is a monitoring programme inherent to the Fishery; designed in collaboration with IMR and the Directorate. The Directorate has the power to impose seasonal and geographic restrictions; total time-at-sea restrictions; gear restrictions and other effort restrictions if deemed necessary.</p> <p>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. If the amount of bycatch during fishing is deemed above acceptable limits, the fishing vessels relocate, and hunt for grounds with lower abundance of bycatch. If the fishery is known to interact with physical habitats, these data would be captured in observer reporting.</p>	
<p><b>References</b></p> <p>Gullestad, P et al (2017) Marine Policy Vol 77 pp104-110 Towards Ecosystem based fisheries management in Norway (2017) EN <a href="https://www.sciencedirect.com/science/article/pii/S0308597X16305383">https://www.sciencedirect.com/science/article/pii/S0308597X16305383</a></p>	
<p><b>Links</b></p>	
<b>MARINTRUST Standard clause</b>	1.3.3.2
<b>FAO CCRF</b>	6.8
<b>GSSI</b>	D.2.07, D.6.07, D3.09

<b>F3</b>	<b>Ecosystem Impacts - Minimum Requirements</b>		
	<b>F3.1</b>	The broader ecosystem within which the fishery occurs is considered during the management decision-making process.	Yes
	<b>F3.2</b>	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	Yes
	<b>F3.3</b>	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.	Yes
<b>Clause outcome:</b>			PASS
<p><b>F3.1 The broader ecosystem within which the fishery occurs is considered during the management decision-making process.</b></p> <p>C. finmarchicus is important ecologically because it shows rapid responses to climate variability, including shifts in species' distribution and abundance. C. finmarchicus is a key component in the food web of the North Atlantic, providing sustenance for a variety of marine organisms including fish, shrimp, and whales. Calanoid copepods (especially C. finmarchicus) were the most important contributor to the overall diet of mackerel in years studied (2011-14 &gt;70%, source WGINOR 2019). WGINOR research functional connections and linkages within the ecosystem, compiling time-series on absolute abundance of major components of the physical and biological ecosystem and look to develop models suitable for integrated ecosystem assessment. Two statistical methods were introduced (WGINOR 2019) as possible tools to develop food web assessment of the pelagic ecosystem in the Norwegian Sea, empirical dynamic modelling and modelling based on principles of chance and necessity. Future work involves evaluating both models and assessing whether they are useful tools to make short term forecast for food web status. Development of a framework for ecosystem warning signals was also reported on in the 2019 Report. Another goal of WGINOR is to utilize multispecies and ecosystem models to evaluate effects of single and multispecies harvest control rules on fishing yield and ecosystem state of the pelagic ecosystem (Norwegian Sea). WGINOR will report on these and other findings by 2021. One project will look at changes in the distribution of C finmarchicus and the effect on distribution of fish stocks</p>			
<p><b>F3.2 There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.</b></p> <p>One of the most important zooplankton groups in the Norwegian Sea is the genus Calanus, both in numbers and biomass. In the Norwegian coastal and Atlantic habitats C. finmarchicus dominates the zooplankton biomass in spring and summer, and C. helgolandicus is also found in southern and eastern parts of these habitats. In the Arctic habitat C. hyperboreus is important.</p>			

Of other species, the krill *Thysanoessa inermis*, *T. longicaudata*, and *Meganyctiphanes norvegica* are widespread, the latter especially in the warmer Atlantic and coastal habitats. The amphipod *Themisto libellula* is abundant in the Arctic, and *T. abyssorum* in the Atlantic habitats. The seasonal pulse of zooplankton production starts in southern and eastern parts of the Norwegian Sea, with a time delay towards the colder areas in the western and northern parts.



**Figure 2.** Indices of zooplankton dry weight ( $\text{g m}^{-2}$ ) sampled in May in and near the Norwegian Sea, from 1995 to 2016. For details see ICES (2016a).

Bycatch consisted of eggs from 13 fish species/groups; and larvae and juveniles from 15 species groups. 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 *C. finmarchicus*. However, the amount of these species is highly insignificant due to low abundance. The authors of the 2017 report concluded 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. Echo sounders at different frequencies have been deployed which map *C. finmarchicus* more efficiently and give information on catch/by-catch ratio before the net is deployed

**F3.3 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.**

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. 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 have been no major breakdowns or collapses of stocks.

The precautionary approach is entailed within the MRA. An update was provided on two projects, supported by Calanus AS, to minimise ecosystem effects of the fishery.

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. The Oasis 2 floatation rig testing has been postponed until 2021. Testing of scale models of the rig in a flume tank showed

<p>promising results for full scale testing. The rig will include a net for selection/separation of incoming biomass to reduce bycatch levels.</p> <p>Drones: These could be used to provide for a better spatial mapping of the stock. The effect would be a reduction in time spent searching for <i>C. finmarchicus</i>; reducing fuel emissions and search costs. Calanus AS are continuing to examine this option.</p>	
<p><b>References</b></p> <p>Drone fishing project (Calanus AS) pdf 20pp: EFFEKTIVISERING AV HØSTING ETTER RAUDÅTE VED HJELP AV DRONER (Annen).</p> <p>Calanus AS OASIS 2 - 2nd Generation Zooplankton Harvesting System (Feb 2018) 17pp <a href="https://www.calanus.no/resource/R">https://www.calanus.no/resource/R</a></p> <p>Wourms, J.P., 1991. Reproduction and development of Sebastes in the context of the evolution of piscine viviparity. Environ. Biol. Fish. 30:111-126</p>	
<p><b>Links</b></p>	
<b>MARINTRUST Standard clause</b>	1.3.3.3
<b>FAO CCRF</b>	7.2.2 (d)
<b>GSSI</b>	D.2.09, D3.10, D.6.09

## SOCIAL CRITERION

In addition to the scored criteria listed above, applicants must commit to ensuring that vessels operating in the fishery adhere to internationally recognised guidance on human rights. They must also commit to ensuring there is no use of enforced or unpaid labour in the fleet(s) operating upon the resource.



## Appendix A - Determining Resilience Ratings

The assessment of Category B species described in this assessment report template utilises a resilience rating system suggested by the American Fisheries Society. This approach was chosen because it is also used by FishBase, and so the resilience ratings for many thousands of species are freely available online. As described by FishBase, the following is the process used to arrive at the resilience ratings:

*“The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classification of a fish population or species into categories of high, medium, low and very low resilience or productivity (Musick 1999). If no reliable estimate of  $r_m$  (see below) is available, the assignment is to the lowest category for which any of the available parameters fits. For each of these categories, AFS has suggested thresholds for decline over the longer of 10 years or three generations. If an observed decline measured in biomass or numbers of mature individuals exceeds the indicated threshold value, the population or species is considered vulnerable to extinction unless explicitly shown otherwise. If one sex strongly limits the reproductive capacity of the species or population, then only the decline in the limiting sex should be considered. We decided to restrict the automatic assignment of resilience categories in the Key Facts page to values of  $K$ ,  $t_m$  and  $t_{max}$  and those records of fecundity estimates that referred to minimum number of eggs or pups per female per year, assuming that these were equivalent to average fecundity at first maturity (Musick 1999). Note that many small fishes may spawn several times per year (we exclude these for the time being) and large live bearers such as the coelacanth may have gestation periods of more than one year (we corrected fecundity estimates for those cases reported in the literature). Also, we excluded resilience estimates based on  $r_m$  (see below) as we are not yet confident with the reliability of the current method for estimating  $r_m$ . If users have independent  $r_m$  or fecundity estimates, they can refer to Table 1 for using this information.”*

Parameter	High	Medium	Low	Very low
Threshold	0.99	0.95	0.85	0.70
$r_{max}$ (1/year)	> 0.5	0.16 - 0.50	0.05 - 0.15	< 0.05
$K$ (1/year)	> 0.3	0.16 - 0.30	0.05 - 0.15	< 0.05
Fecundity (1/year)	> 10,000	100 - 1000	10 - 100	< 10
$t_m$ (years)	< 1	2 - 4	5 - 10	> 10
$t_{max}$ (years)	1 - 3	4 - 10	11 - 30	> 30

[Taken from the FishBase manual, “Estimation of Life-History Key Facts”, <http://www.fishbase.us/manual/English/key%20facts.htm#resilience>]

## Glossary

**Non-target:** Species for which the gear is not specifically set, although they may have immediate commercial value and be a desirable component of the catch. OECD (1996), Synthesis report for the study on the economic aspects of the management of marine living resources. AGR/FI(96)12

**Target:** In the context of fishery certification, the target catch is the catch of stock under consideration by the unit of certification – i.e. the fish that are being assessed for certification and ecolabelling. (GSSI)

## Appendix

### MarinTrust Fishery Assessment Peer Review Template

This section comprises a summary of the fishery being assessed against version 2 of the MarinTrust Standard.

Fishery under assessment	Norway <i>Calanus finmarchicus</i> fishery
Management authority (Country/State)	Ministry of Trade, Industry and Fisheries (Norway)
Main species	<i>Calanus finmarchicus</i>
Fishery location	FAO 27 Northeast Atlantic, Norway EEZ
Gear type(s)	Bespoke Calanus AS pelagic trawl

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

The peer reviewer has no concerns in relation to the *C. finmarchicus* stock itself, either in terms of fishery management or stock status. However, due to the relatively novel nature of the fishing activity, the peer reviewer considers that additional focus should be placed on fishery bycatch. Detailed notes are provided in the 'Species Categorisation' section of this peer review report.

## Summary of Peer Review Outcomes

Peer reviewers should review the fishery assessment report with the primary objective of answering the key questions listed in the table below. Where the situation is more complicated, reviewers may instead answer “See Notes”.

	YES	NO	See Notes
<b>A – Fishery Assessment</b>			
1. Has the fishery assessment been fully completed, using the recognised MarinTrust fishery assessment methodology and associated guidance?	YES		
2. Does the Species Categorisation section of the report reflect the best current understanding of the catch composition of the fishery?			X
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		
Category B Species	n/a		
Category C Species	n/a		
Category D Species	n/a		
Section F – Further Impacts	YES		X

## Detailed Peer Review Justification

Peer reviewers should provide support for their answers in the boxes provided, by referring to specific scoring issues and any relevant documentation as appropriate.

Detailed justifications are only required where answers given are one of the ‘No’ options. In other (Yes) cases, either confirm ‘scoring agreed’ or identify any places where weak rationales could be strengthened (without any implications for the scores).

Boxes may be extended if more space is required.

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

Yes, although see notes on species categorisation.

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

Yes, although see notes on species categorisation.

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

- The catch composition table does not provide a reference for the estimate that 97.3% of landings are *C. finmarchicus*. The previous surveillance report (April 2020) states that the value is sourced from a personal communication from the applicant, and based on 2017/18 trial data.

- Section A1.2 of the May 2021 surveillance report states that bycatch samples are taken from every haul, and are analysed by the IMR.
- Section F1.2 of the May 2021 surveillance report states that cod, herring and tusk made up 75% of all egg bycatch, and that herring and cod were the most common larval bycatch.
- Based on these three points, the peer reviewer has reached the following conclusions:
  1. The species categorisation appears to be based on 2017/18 data, provided by the applicant. If more recent data is available from a more neutral organisation, such as the IMR, this should be used instead.
  2. If there are species which are regularly represent more than 0.1% of the catch – which appears to be the case for cod and may also be the case for other species – these should be assessed as Type 2 species.

The peer reviewer recognises that the second conclusion may pose challenges due to the bycatch being caught prior to recruitment to the main stock. However, in this relatively new and novel fishery it does seem appropriate that the applicant should provide additional assurance in relation to the potential impacts of fishing activity on bycatch species, particularly now the IMR has 3+ years of catch data.

**3M. Are the scores in “Section M – Management” clearly justified?**

Yes, the scores in this section are justified.

**3A. Are the “Category A Species” scores clearly justified?**

Yes, the scores in this section are justified.

**3B. Are the “Category B Species” scores clearly justified?**

There are currently no Category B species identified in the report.

**3C. Are the “Category C Species” scores clearly justified?**

There are currently no Category C species identified in the report.

**3D. Are the “Category D Species” scores clearly justified?**

There are currently no Category D species identified in the report.

**3F. Are the scores in “Section F – Further Impacts” clearly justified?**

- Based on the current catch information, the scores in section F are justified. However, if the species categorisation is reviewed as recommended elsewhere in this peer review report, this may also affect sections F1 and/or F3.

Optional: General comments on the Peer Review Draft Report