MarinTrust Standard V2

Whole fish Fishery Assessment

Calanus finmarchius, FAO 27 Atlantic Northeast, Norway EEZ

WF03

MarinTrust Programme
Unit C, Printworks
22 Amelia Street
London
SE17 3BZ
E: standards@marin-trust.com
T: +44 2039 780 819

Abbreviations

AIS	Automatic Identification System
Blim	Biomass limit reference point (biological lower threshold for spawning-stock biomass)
Bpa	Precautionary biomass reference point
CB	Certification Body
CITES	Convention on International Trade in Endangered Species
DVM	Diel Vertical Migration
DoF	Directorate of Fisheries (Norway)
EEZ	Exclusive Economic Zone
ETP	Endangered, Threatened or Protected species
FAO	Food and Agriculture Organization of the United Nations
FMSY	Fishing Mortality at Maximum Sustainable Yield
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
IMR	Institute of Marine Research (Norway)
IUCN	International Union for Conservation of Nature
LCA	Life Cycle Assessment
MCS	Monitoring, Control and Surveillance
MSY	Maximum Sustainable Yield
NORWECOM.e2e	Norwegian end-to-end ecosystem model used for Calanus harvest simulation
RCN	Research Council of Norway
SSB	Spawning Stock Biomass
TAC	Total Allowable Catch
UUU	Unselective, Unsustainable and Unmonitored fishing
VME	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System
XSAM	Extended Statistical Catch-at-Age Model (used for herring stock assessment)

Table 1 Application details and summary of the assessment outcome

Application details and summary of the assessment outcome			
Name(s): Calanus AS			
Country: Norway			
Email address:		**Applicant Code**	
Certification Body Details			
Name of Certification Body:		**LRQA**	
Assessor Name	**CB Peer Reviewer**	**Assessment Days**	**Initial/Surveillance/ Re-approval**
Virginia Polonio	Jose Peiro Crespo	3	Surveillance 1
Assessment Period	April 2025 – April 2026		
Scope Details			
Management Authority (Country/State)	Ministry of Trade, Industry and Fisheries (Norway)		
Main Species	*Calanus finmarchicus*		
Fishery Location	FAO 27 Atlantic Northeast, Norway EEZ		
Gear Type(s)	Midwater trawl		
Outcome of Assessment			
Overall Outcome	Pass		
Clauses Failed	None		
CB Peer Review Evaluation	Pass		
Fishery Assessment Peer Review Group Evaluation	Pass		
Recommendation	Pass		

Table 2. Assessment Determination

Assessment Determination
All General and Category-specific Clauses of the MarinTrust V2.0 standard have been fully assessed against the most recent available scientific data, regulatory documentation, and fishery monitoring records for the Norwegian *Calanus finmarchicus* fishery. Based on this evaluation, each clause received a "PASS" outcome, supported by the following findings: **M1 Management Framework:** The fishery is managed under Norway's Marine Resources Act (2008), which establishes a robust legal basis for precautionary, ecosystem-based management. Operational oversight is provided by the Directorate of Fisheries, with scientific input from the Institute of Marine Research (IMR). Regulatory decisions are based on public consultation, stakeholder engagement, and transparent documentation. The framework includes a national Total Allowable Catch (TAC), strict licensing, spatial limitations, and stakeholder consultation procedures. The process is transparent and aligned with ecosystem-based fisheries management principles. Peer reviewers have repeatedly confirmed the robustness of this governance model. **M2 Surveillance, Control and Enforcement:** Monitoring, control and surveillance (MCS) measures are strong and multi-institutional. The Directorate of Fisheries and the Norwegian Coast Guard conduct real-time monitoring through Vessel Monitoring System (VMS) /Automatic Identification System (AIS) logbooks, port controls, and observer programs. Vessels are subject to daily catch reporting and scientific sampling protocols. The fishery is considered to pose negligible unselective, unsustainable and unmonitored fishing (UUU) risk, and Norway consistently ranks among the lowest-risk countries on the IUU Fishing Index. As noted in both current and previous assessments, no major non-compliance or enforcement incidents have occurred in the Calanus fishery. **F1 Impacts on ETP Species:** The fishery operates offshore, in deep waters far from sensitive habitats of Endangered, Threatened or Protected (ETP) species: marine mammals, seabirds, turtles. Midwater trawls operate at low speeds and are selective for plankton, minimizing risks of entanglement or capture. There have been no recorded interactions with ETP species in any observer data or audit reports. The fishery also holds third-party ecolabel certifications (e.g. Friend of the Sea), further demonstrating its adherence to low-impact practices. Surveillance and audit reports confirm that the fishery poses negligible risk to ETP fauna. **F2 Impacts on Habitats:** The gear used consists of fine-mesh pelagic trawls that operate in the upper water column (0–20 m depth), well above the seabed and benthic habitats. The fishery occurs in open oceanic areas, avoiding sensitive coastal or bottom habitats. Inshore harvest limits (e.g. 10,000 t cap) and "move-on" rules triggered by larval bycatch thresholds act as additional safeguards for nursery areas and fjord ecosystems. According to both IMR and the Directorate, of Fisheries (DoF) there is no evidence of physical habitat disturbance linked to Calanus operations. **F3 Ecosystem Impacts:** *C. finmarchicus* is a key forage species and plays a central role in carbon cycle. However, harvest levels are extremely low (<<1% of estimated biomass), and ecosystem models confirm that even full TAC exploitation would have no measurable impact on predator populations or food-web dynamics. Monitoring of plankton indices and predator condition (e.g. herring, seabirds) supports the conclusion that the fishery has no detectable impact on ecosystem structure or function.

The management framework includes adaptive tools to respond to ecological shifts, such as phenological changes or trophic disruptions.

In summary, the Calanus fishery meets the requirements of all MarinTrust V2.0 clauses under a framework that combines scientific rigor, institutional robustness, and a high level of ecological precaution. Its status as a low-impact, data-monitored, and adaptively managed fishery fully supports a pass determination across all assessment categories.

Fishery Assessment Peer Review Comments

I concur with the assessor's evaluation. There have been no significant changes in management since the previous assessment. Catches of the target species remain well below the Total Allowable Catch (TAC) and are taken only under an experimental license due to constraints such as low profitability and gear limitations. The impacts on various ecosystem components—including ETP species, non-target species and the seabed—are minimal and have been appropriately considered by the authorities and thoroughly addressed in this assessment.

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	No Category A Species		
Category B	Raudåte (*Calanus finmarchicus*)	99.2%	Pass
Category C	Herring (*Clupea harengus*)	<1%	Pass
Category C	Redfish (*Sebastes spp*)	<1%	Pass
Category D			

Catch proportions are derived from the most recent bycatch analysis conducted by the Institute of Marine Research (Broms et al., 2022), which found that herring and redfish represent 0.42% and 0.14% of the total catch, respectively. These values confirm their classification as Category C species under MarinTrust V2.0 criteria.

Redfish bycatch corresponds to larval stages of at least two different species (likely S*ebastes mentella* and *S. norvegicus*), and is extremely limited in scale—well below thresholds of biological concern.

As in previous assessments, there are no Category A species due to the absence of formal stock assessments or reference points for *C. finmarchicus,* which remains classified under Category B.

Table 5. Species Categorisation

Common name	Latin name	Stock	IUCN Redlist Category[1]	% of landings	Management	Category
Raudåte	*Calanus finmarchicus*	Norway EEZ	Not Listed	99.2%	No	B
Herring	*Clupea harengus*	Norwegian spring/spawning herring (Subareas 1,2,5 and divisions 4.a and 14.b)	Least Concern[2]	0.42%	Yes	C
Redfish	*Sebastes spp*	Various	Golden redfish: Vulnerable [3] Beaked redfish: Least Concern [4]	0.14%	Yes	C

Species categorisation rationale

Calanus finmarchicus

Main target species representing over 99% of landings. No formal analytical stock assessment or reference points exist, but biomass estimates (~33 million tonnes) and ecosystem modelling demonstrate very high productivity and minimal fishery impact. Managed under Table B(b) as a data-limited, resilient species. The most recent quantified bycatch assessment (Broms et al., 2022) confirmed that >99% of total catch is *C. finmarchicus,* with bycatch levels ranging from 0.3% to 0.8% by weight. Surveillance data from 2023–2024 support these levels, with no increase in bycatch observed (Directorate of Fisheries, 2024b).

Clupea harengus

Minor larval bycatch in the Calanus fishery (~0.42% in 2021). This species is subject to full analytical stock assessment by ICES, using the XSAM model which integrates both fishery-independent and fishery-dependent data (ICES, 2024). Although recruitment has declined since 2016, spawning-stock biomass is projected to remain well above the precautionary and limit reference points. Removals from the Calanus fishery are considered negligible and are not included in stock assessments (ICES, 2024a; Directorate of Fisheries, 2024b).

Sebastes spp

The Calanus fishery occasionally encounters *Sebastes* spp larvae, representing only 0.14% of total catch in 2021 (~1.6 t), a biologically negligible amount (Broms et al., 2022). The main species are *S. mentella*, with stable biomass and a precautionary TAC (ICES, 2024b), and *S. norvegicus*, which remains critically depleted and under a fishing moratorium (ICES, 2022). Removals by the Calanus fishery are considered

[1] https://www.iucnredlist.org/
[2] https://www.iucnredlist.org/species/155123/4717767
[3] https://www.iucnredlist.org/species/18237880/45863343
[4] https://www.iucnredlist.org/species/154816/115238709

negligible by scientific authorities and are not included in stock assessments. No significant larval occurrences have been reported in recent years, and no move-on rules have been triggered (Directorate of Fisheries, 2024b).

References

Broms, C., Melle, W., & Ellertsen, B. (2022). Larval bycatch observations in the Norwegian Calanus fishery. IMR Technical Report Series, No. 2022/15. https://www.hi.no/resources/innblanding-av-fiskelarver-og-yngel-i-raudatefangster-2021.pdf

Directorate of Fisheries (2024a). Regulation of *Calanus finmarchicus* harvesting (FOR-2024-12-05-2943). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

Directorate of Fisheries. (2024b). Regulatory Meeting Brief – November 2024: Raudåte. https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2/november-2023/saksdokumenter/sak-25-2023-rodate.pdf

ICES (2022). Golden redfish (Sebastes norvegicus) in subareas 1 and 2 (Northeast Arctic). ICES Advice 2022 – reg.27.1-2. https://doi.org/10.17895/ices.advice.19453697

ICES (2024a). Beaked redfish (Sebastes mentella) in subareas 5, 12 and 14 and NAFO subareas 1 and 2 (shallow pelagic stock). ICES Advice 2024. https://doi.org/10.17895/ices.advice.25019495

ICES (2024b). Herring (Clupea harengus) in subareas 1, 2, and 5, and in divisions 4.a and 14.a (Norwegian spring-spawning herring). ICES Advice 2024 – her.27.1-24a514a. https://doi.org/10.17895/ices.advice.21856509.v1

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		
	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.	Pass
	M1.3	Fishery management organisations are publicly committed to sustainability.	Pass
	M1.4	Fishery management organisations are legally empowered to take management actions.	Pass
	M1.5	There is a consultation process through which fishery stakeholders are engaged in decision-making.	Pass
	M1.6	The decision-making process is transparent, with processes and results publicly available.	Pass
		Clause outcome:	PASS

M1.1 There is an organisation responsible for managing the fishery.

The competent authority for fisheries management in Norway is the Ministry of Trade, Industry and Fisheries (MTIF), which oversees the sustainable use of marine resources under the Marine Resources Act (2008). The DoF operates under MTIF and is directly responsible for implementing management measures for the *Calanus finmarchicus* fishery. This includes licensing, regulation development, quota allocation, monitoring, and compliance enforcement.

DoF's operational mandate covers three key areas: marine resource management, aquaculture, and coastal zone use. It collaborates with other public bodies, industry actors, and research institutions (e.g. IMR) to ensure sustainable and knowledge-based fisheries governance (Directorate of Fisheries, 2024a).

The Calanus fishery is managed through specific national regulations. As of 2025, the applicable regulation is FOR-2024-12-05-2943, which outlines all legal requirements, access conditions, and annual quotas. The regulation empowers authorities to adjust measures dynamically and implement closures if sustainability thresholds are reached (Directorate of Fisheries, 2024b).

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

The IMR is the designated scientific body responsible for monitoring *C. finmarchicus* in Norwegian waters. It carries out extensive plankton surveys in the Norwegian Sea and Barents Sea using multi-gear sampling, acoustic technologies, satellite data, and biophysical modelling tools—most notably the NORWECOM.e2eend-to-end ecosystem model (Institute of Marine Research, 2024; Skaret et al., 2021).

IMR also participates in the Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR), which evaluates ecosystem trends, including plankton dynamics and predator-prey interactions relevant to Calanus fishery.

IMR estimates the standing biomass of C. *finmarchicus* in the Norwegian Exclusive Economic Zone (EEZ) at approximately 33 million tonnes (Hansen et al., 2021; Nofima, 2023). No formal analytical stock assessment exists yet, but ongoing research is enhancing biomass estimation methods through genomics, optical plankton counters, and remote sensing (Akvaplan-niva, 2024; Forskning.no, 2024).

Recent advancements include the use of eDNA and optical identification methods to distinguish *Calanus* sibling species and validate species composition (Forskning.no, 2024). These tools have improved taxonomic accuracy in key monitoring zones, especially in coastal and transitional waters.

All fishing vessels are required to collect, and report catch and bycatch data. Sampling protocols for larval bycatch are defined by IMR and enforced through logbooks, VMS, and mandatory biological sampling onboard (Directorate of Fisheries, 2024b; Regulation FOR-2024-12-05-2943).

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

Norway is internationally recognized for its ecosystem-based fisheries management approach (Gullestad et al., 2017). The Marine Resources Act (2008) mandates the application of the precautionary principle and requires management to ensure long-term resource conservation, biodiversity protection, and optimal use of marine resources. This is reflected in the Calanus regulation (Directorate of Fisheries, 2024b), which limits fishing to a TAC of 254,000 tonnes—less than 1% of the estimated stock—and further restricts inshore harvests to protect larval fish habitats. IMR's 2023 risk analysis concluded that increasing the inshore quota to 10,000 tonnes would not compromise ecological integrity (Directorate of Fisheries, 2023). A separate 3,000 t experimental quota supports innovation and scientific research.

DoF's vision "Marine life – our common responsibility" is embedded across policies and operational frameworks, emphasizing a user-oriented and environmentally conscious approach (Directorate of Fisheries, 2024a).

All decision-making incorporates scientific advice and stakeholder input. Management rules explicitly include ecosystem safeguards such as bycatch thresholds, area-based restrictions, and seasonal closures aligned with ecological conditions (Directorate of Fisheries, 2024b).

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

The DoF exercises full legal authority under the Marine Resources Act (2028) to:

- Set or adjust TACs, sub-quotas, and access zones.
- Enforce real-time closures based on observed bycatch or ecosystem risk.
- Suspend or revoke licenses for non-compliance.
- Implement new regulations or revise quotas annually.

The Act also grants the DoF the right to inspect fishing vessels at sea and in port, and to prosecute IUU-related activity, supported by complementary legislation such as the Coast Guard Act (1997) (Marine Resources Act, 2008; Directorate of Fisheries, 2024c).

The Calanus fishery regulations are reviewed and updated every year based on scientific data and public consultation (Directorate of Fisheries, 2024b). Emergency closures and spatial restrictions (e.g., "move-on" provisions) are enforceable under the law and have been applied in other Norwegian fisheries.

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

The Calanus fishery regulations are reviewed and updated every year based on scientific data and public consultation (Directorate of Fisheries, 2024b). The process is institutionalised under Section 8 of the Marine Resources Act through the "Council for Regulatory Advice." The Regulatory Meeting (Reguleringsmøtet), held annually since the 1970s, is a core component of fisheries governance (Gullestad et al., 2017; FAO, 2022). Emergency closures and spatial restrictions (e.g., "move-on" provisions) are enforceable under the law and have been applied in other Norwegian fisheries. For example, recent adjustments to the inshore harvest limit (from 3,000 t to 10,000 t) were based on a scientific evaluation by IMR and requests from industry stakeholders seeking commercial viability (Directorate of Fisheries, 2023).

Draft regulations are published on Regjeringen.no for public comment, and the DoF holds Regulatory Meetings with representatives from the fishing industry, science institutions (IMR, Nofima), Sami communities, NGOs, and government agencies (Directorate of Fisheries, 2024b).

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

All fishery regulations, background documents, monitoring protocols, and scientific reports are publicly available through the websites of the DoF and IMR. Most publications are offered in both Norwegian and English. Key documents include:

- The Calanus management regulation:(Directorate of Fisheries, 2024b)
- Regulatory meeting briefs and consultation results (Directorate of Fisheries, 2024b)
- IMR's stock and ecosystem reports (Institute of Marine Research, 2024)
- Surveillance audit reports

Norway's regulatory system prioritizes public accessibility through online databases such as Regjeringen.no and the Electronic Reporting Systems portal, which support traceability and stakeholder oversight (Directorate of Fisheries, 2024d). The public has access to regulation histories, quota usage, and compliance data. Vessels must also submit annual summaries detailing their contributions to gear development, data collection, and scientific cooperation—adding transparency and traceability to fishery development ((Directorate of Fisheries, 2024b)).

References

Akvaplan-niva (2024) Migratory Crossroads: Predicting the dynamics of a great vertical migration in a changing habitat. https://akvaplan.no/en/project/migratory-crossroads

Directorate of Fisheries (2023) Regulatory Meeting Brief for 2025: Raudåte. https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2/november-2023/saksdokumenter/sak-25-2023-rodate.pdf

Directorate of Fisheries (2024a) About the Directorate of Fisheries. https://www.fiskeridir.no/english/about-us/about-the-directorate-of-fisheries

Directorate of Fisheries (2024b) Regulation of *Calanus finmarchicus* harvesting (**FOR-2024-12-05-2943**). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

Directorate of Fisheries (2024c) Norwegian Black List. https://www.fiskeridir.no/English/Fisheries/Norwegian-Black-List

Directorate of Fisheries (2024d) Fisheries Monitoring Centre (FMC). https://www.fiskeridir.no/English/Fisheries/Fisheries-Monitoring-Centre

FAO (2022) Fishery and Aquaculture Country Profiles – The Kingdom of Norway. https://www.fao.org/fishery/en/facp/nor

Forskning.no (2024) Species identification challenges in Calanus fisheries: genetic monitoring advances. https://www.forskning.no

Gullestad, P., Abotnes, A. M., Bakke, G., Skern-Mauritzen, M., Nedreaas, K., & Søvik, G. (2017) Towards ecosystem-based fisheries management in Norway: practical tools for tracking and prioritising issues. Marine Policy, 77, 104–110.

Hansen, C., Skogen, M. D., Utne, K. R., Broms, C., Strand, E., & Hjøllo, S. S. (2021) Patterns, efficiency and ecosystem effects when fishing Calanus in the Norwegian Sea using an individual-based model. Marine Ecology Progress Series, 680, 15–32.

Marine Resources Act (2008) Act relating to the management of wild living marine resources. https://www.regjeringen.no/globalassets/upload/fkd/vedlegg/diverse/2010/marineresourcesact.pdf

Nofima (2023) Slow progress in the fishery for *Calanus finmarchicus.* https://nofima.com/results/slow-progress-in-the-fishery-for-calanus-finmarchicus

Skaret, G., Hjøllo, S. S., Utne, K. R., & Hansen, C. (2021) Fishing Calanus in the Norwegian Sea: ecosystem modelling and risk assessment. Marine Ecology Progress Series, 680, 15–32. 2

Links	
MarinTrust Standard clause	1.3.1.1, 1.3.1.2
FAO CCRF	7.2, 7.3.1, 7.4.4, 12.3
GSSI	D.1.01, D.4.01, D2.01, D1.07, D1.04,

M2	**Surveillance, Control and Enforcement - Minimum Requirements**		
	M2.1	There is an organisation responsible for monitoring compliance with fishery laws and regulations.	Pass
	M2.2	There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken.	Pass
	M2.3	There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing.	Pass
	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.	Pass
		Clause outcome:	PASS

M2.1 There is an organisation responsible for monitoring compliance with fishery laws and regulations.

The DoF is the lead agency responsible for monitoring compliance with regulations governing the Calanus fishery. The DoF conducts oversight of licensing, quotas, logbook verification, and landing inspections. At sea, enforcement patrols are carried out by the Norwegian Coast Guard, which has the legal mandate to inspect vessels and ensure regulatory compliance under the Marine Resources Act (2008) and Regulation FOR-2024-12-05-2943 (Directorate of Fisheries, 2024a).

The Norwegian Coast Guard has full authority to inspect fishing activities within Norwegian jurisdiction, including the right to board vessels and verify catches, as established in its legal mandate [Norwegian Coast Guard, 2024].

Control duties at landing sites are jointly conducted by DoF and fish sales organizations, which cross-check reported landings against vessel quotas (Directorate of Fisheries, 2024b).

In addition, the DoP and IMR have authority to place scientific observers on board any vessel operating under a Calanus license at any time, and fishers are required to provide access free of charge. These observers support data collection and help verify bycatch compliance and sampling protocols (Directorate of Fisheries, 2024a).

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

The Marine Resources Act (2008) provides a comprehensive legal framework for enforcement. Sanctions include:

- Fines and penalties for exceeding quotas or violating area restrictions
- Suspension or revocation of licenses
- Confiscation of illegal catches or gear
- Criminal charges in severe cases (e.g., unlicensed fishing or fraud).

Norwegian enforcement policy follows a tiered approach: oral warnings, administrative fines, quota reductions, license revocation, and penal charges (Directorate of Fisheries, 2024b).Catch values exceeding a vessel's legal quota can be seized and allocated to control purposes by the fish sales organization under national regulations.

These measures are supported by the Coast Guard Act and the Act on First-Hand Sales of Marine Resources (2013), both of which allow for confiscation and criminal liability in aggravated cases (Act on First-Hand Sales, 2013; Norwegian Coast Guard,

2024). As of 2024, no serious infractions have been recorded in the Calanus fishery, largely due to its small scale, experimental nature, and tight oversight.

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

The Calanus fishery operates under limited entry: only a small number of vessels (primarily Calanus AS) hold valid licenses. Each vessel must follow strict rules on area, season, gear type, and bycatch management. All fishing trips are tracked via:

- VMS
- AIS
- Electronic logbooks
- Mandatory biological sampling

The DoF maintains a "Norwegian Black List" of vessels suspected or convicted of IUU activity. No vessels linked to Calanus operations have appeared on this list since the fishery began (Directorate of Fisheries, 2024c). Norway ranks among the lowest-risk countries globally in the IUU Fishing Index (IUUFI, 2024).

All catches are reported to the DoF and cross-verified with landing declarations. Scientific observers and port inspectors provide additional verification. To date, surveillance audits and enforcement reports indicate very high compliance rates. The fishery is fully traceable and transparent. There is no evidence of IUU activity or unregulated removals.

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.

Norway employs a multi-layered Monitoring, Control and Surveillance (MCS) system to ensure compliance:

- VMS and AIS data are reviewed in real time to monitor vessel positions.
- Electronic logbooks track catch composition, location, and effort.
- At-sea inspections are conducted by the Coast Guard, which can board vessels without notice.
- Scientific observers, appointed by IMR or the DoF, conduct biological sampling of catches—including larval bycatch quantification.
- Port inspections validate landings against declared volumes.

Monitoring is coordinated through the Fisheries Monitoring Centre (FMC), a 24/7 operations hub run by DoF. The FMC oversees electronic reporting, satellite tracking, and violation alerts for all Norwegian and foreign vessels operating in Norwegian waters (Directorate of Fisheries, 2024d).

Annual reporting is mandatory for license holders, including documentation of their contribution to gear innovation, research, and environmental monitoring.

The Calanus fishery also employs a mandatory sampling protocol: if a catch contains >10% fish larvae by volume, the vessel must relocate ("move-on" rule). Observers verify compliance and enforce adaptive management in real time (Directorate of Fisheries, 2024a). These MCS measures are considered robust and well-suited to the scale of the fishery.

References

Act on First-Hand Sales of Marine Resources (2013) https://leap.unep.org/en/countries/no/national-legislation/act-first-hand-purchase-wild-marine-resources-no-75-2013

Directorate of Fisheries (2024) Regulation of *Calanus finmarchicus* harvesting (**FOR-2024-12-05-2943**). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

Directorate of Fisheries (2024b) Control and enforcement. https://www.fiskeridir.no/English/Fisheries/Control-and-enforcement

Directorate of Fisheries (2024c) Norwegian Black List. https://www.fiskeridir.no/English/Fisheries/Norwegian-Black-List

Directorate of Fisheries (2024d) Fisheries Monitoring Centre (FMC). https://www.fiskeridir.no/English/Fisheries/Fisheries-Monitoring-Centre

Gullestad, P., et al. (2017) Towards ecosystem-based fisheries management in Norway. Marine Policy, 77, 104–110.

Institute of Marine Research (IMR) (2024) Species Facts: *Calanus finmarchicus*. https://www.hi.no

IUU Fishing Index (2024) Country profile: Norway. https://iuufishingindex.net/profile/norway

Norwegian Coast Guard (2024) Rules and Regulations. https://www.forsvaret.no/en/organisation/navy/coastguardnorway/rules-and-regulations

Links	
MarinTrust Standard clause	1.3.1.3
FAO CCRF	7.7.2
GSSI	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.**

Species Name	N/A

A1	**Data Collection - Minimum Requirements**		
	A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	
	A1.2	Sufficient additional information is collected to enable an indication of stock status to be estimated.	
		Clause outcome:	

A1.1 Landings data are collected such that the fishery-wide removals of this species are known.

A1.2 Sufficient additional information is collected to enable an indication of stock status to be estimated.

References

Links

MarinTrust Standard clause	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.	
	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.	
	A2.5	The assessment is made publicly available.	
		Clause outcome:	

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.

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 estimate of the status of the biological stock relative to a reference point or proxy.

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

A2.5 The assessment is made publicly available.

References	
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.	
	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.	
	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).	
		Clause outcome:	

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

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).

References
Standard clause 1.3.2.1.3

Links	
MarinTrust Standard clause	1.3.2.1.3, 1.3.2.1.4
FAO CCRF	7.2.1, 7.22 (e), 7.5.3
GSSI	D3.04, D6.01

A4	**Stock Status - Minimum Requirements**		
	A4.1	The stock is at or above the target reference point, OR IF NOT: 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: The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.	
		Clause outcome:	

A4.1 The stock is at or above the target reference point, OR IF NOT: **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:** **The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.**
References

Links	
MarinTrust Standard clause	**1.3.2.1.4**
FAO CCRF	**7.2.1, 7.2.2 (e)**
GSSI	**D6 01**

CATEGORY B SPECIES

Category B species are those which make up greater than 5% of landings in the applicant raw material, but which are not subject to a species-specific research and management regime sufficient to pass all Category A clauses. If there are no Category B species in the fishery under assessment, this section can be deleted.

Category B species are assessed using a risk-based approach. The following process should be completed once for each Category B species.

If there are estimates of biomass (B), fishing mortality (F), and reference points

It is possible for a Category B species to have some biomass and fishing mortality data available. When sufficient information is present, the assessment team should use the following risk matrix to determine whether the species should be recommended for approval.

TABLE B(A) - F, B AND REFERENCE POINTS ARE AVAILABLE

Biomass is above MSY / target reference point	Pass	Pass	Pass	Fail	Fail
Biomass is below MSY / target reference point, but above limit reference point	Pass, but re-assess when fishery removals resume	Pass	Fail	Fail	Fail
Biomass is below limit reference point (stock is overfished)	Pass, but re-assess when fishery removals resume	Fail	Fail	Fail	Fail

Biomass is significantly below limit reference point (Recruitment impaired)	Fail	Fail	Fail	Fail	Fail
	Fishery removals are prohibited	**Fishing mortality is below MSY or target reference point**	**Fishing mortality is around MSY or target reference point, or below the long-term average**	**Fishing mortality is above the MSY or target reference point, or around the long-term average**	**Fishing mortality is above the limit reference point or above the long-term average (Stock is subject to overfishing)**

If the biomass / fishing pressure risk assessment is not possible

Initially, the resilience of each Category B species to fishing pressure should be estimated using the American Fisheries Society procedure described in Musick, J.A. (1999). This approach is used as the resilience values for many species and stocks have been estimated by FishBase and are already available online. For details of the approach, please refer to Appendix A. Determining the resilience provides a basis for estimating the risk that fishing may pose to the long-term sustainability of the stock. Table B(b) should be used to determine whether the species should be recommended for approval.

TABLE B(B) - NO REFERENCE POINTS AVAILABLE. B = CURRENT BIOMASS; B_{AV} = LONG-TERM AVERAGE BIOMASS; F = CURRENT FISHING MORTALITY; F_{AV} = LONG-TERM AVERAGE FISHING MORTALITY.

B > B_{av} and F < F_{av}	Pass	Pass	Pass	Fail
B > B_{av} and F or F_{av} unknown	Pass	Pass	Fail	Fail
B = B_{av} and F < F_{av}	Pass	Pass	Fail	Fail
B = B_{av} and F or F_{av} unknown	Pass	Fail	Fail	Fail
B > B_{av} and F > F_{av}	Pass	Fail	Fail	Fail
B < B_{av}	Fail	Fail	Fail	Fail
B unknown	Fail	Fail	Fail	Fail
Resilience	**High**	**Medium**	**Low**	**Very Low**

Species Name		*Calanus finmarchicus*
B1	Species Name	*Calanus finmarchicus*
	Table used (Ba, Bb)	B(b) – For species with no formal stock assessment or reference points
	Outcome	PASS

Biomass Estimates and Stock Status

The standing biomass of Calanus finmarchicus in the Norwegian EEZ is estimated at approximately 33 million tonnes (wet weight), based on large-scale ecosystem modelling and plankton surveys (Directorate of Fisheries, 2016; Institute of Marine Research, 2024). Although this biomass estimate originates from model-based calculations from 2016, it continues to be validated through annual IMR ecosystem surveys.

A reconstructed copepod biomass time series for the Norwegian Sea (1995–2019) indicates a stable or increasing trend since 2016, supporting the continued relevance of the biomass estimate (Planque et al., 2022). Zooplankton indices for 2023–2024 remain stable or slightly elevated compared to previous years (ICES, 2024; Falkenhaug & Gaard, 2024).

Biomass data are derived from Norwegian Sea ecosystem cruises using WP2 and MOCNESS plankton nets, acoustic sensors, and NORWECOM.e2e modelling. These surveys are updated annually by IMR to inform the harvest control rule.

Under data-limited conditions, the current biomass (B) of ~33 million tonnes is considered above the long-term average (B > Bav), while fishing mortality (F) remains negligible (F < Fav) based on consistently low catches.

Catch and Exploitation Levels

Table 1. Calanus catch in tonnes 2019 – 2024.

Year	Catch (t)	% of TAC Used
2019	352	0.14%
2020	0	0.00%
2021	1,156	0.46%
2022	1,335	0.53%
2023	59	0.02%
2024	194	0.08%

(Source: Directorate of Fisheries, 2024)

In both 2023 and 2024, the full reported catch was landed under research permits. According to IMR and DoF records, no vessels holding commercial Calanus quotas have operated since 2020.

Catch monitoring includes mandatory reporting via electronic logbooks, VMS/AIS tracking, and onboard biological sampling. This ensures traceability and compliance even under low-effort conditions.

Although the TAC has remained unchanged since 2019, uptake has been minimal. The majority of landings in all years shown have occurred under a single experimental license held by Calanus AS. No commercial licenses have been activated, and the commercial portion of the TAC remains unused.

The reasons for low exploitation are primarily economic and operational. Studies by Nofima (2023) and recent regulatory reviews (Directorate of Fisheries, 2024) cite low profitability, gear limitations, and seasonal overlap with other more lucrative fisheries as limiting factors.

Resilience

C. finmarchicus is classified as a highly resilient species, following the framework proposed by Musick (1999) and adopted in FishBase. This classification is based on the species' biological traits:

•Short generation time: The species completes its life cycle in approximately one year, with rapid reproduction and overwintering in the copepodite stage (Institute of Marine Research, 2024; Planque et al., 2022).

•High fecundity: Females produce hundreds of eggs per clutch, often multiple times during the season (Hansen et al., 2021; Giske et al., 1994).

•Broad geographic distribution: The species is widespread across the Norwegian Sea and North Atlantic sub-Arctic waters (ICES, 2024).

•Large population size and productivity: The estimated standing biomass exceeds 33 million tonnes (Directorate of Fisheries, 2016), with annual production estimated between 180 and 290 million tonnes (Zooca, 2024).

These traits contribute to a strong recovery potential and ecological robustness, making C. finmarchicus less vulnerable to fishing pressure.

According to the risk matrix in Table B(b) of the MarinTrust standard, the biomass (B) is above the long-term average (B > Bav), and fishing mortality (F) is substantially below any proxy for average fishing pressure (F < Fav), due to removals consistently below 1% of the TAC. This confirms a PASS outcome based on high biological resilience and negligible fishing impact. According to the risk matrix in Table B(b) of the MarinTrust standard, the biomass (B) of C. finmarchicusis considered to be above the long-term average (B > Bav), and fishing mortality (F) is substantially below any proxy for average fishing pressure (F < Fav), due to removals consistently below 1% of the TAC. This confirms a pass outcome based on high biological resilience and negligible fishing impact.

Precautionary Management Measures

A comprehensive set of precautionary management controls is in place for the Calanus fishery in Norway:

•TAC capped at <1% of standing biomass: The national Total Allowable Catch is set at 254,000 tonnes/year, based on an estimated standing biomass of ~33 million tonnes (DoF, 2016; Directorate of Fisheries, 2024).

•Inshore harvest limit (10,000 tonnes/year): To protect sensitive spawning and nursery habitats within the 1000 m isobath, inshore catches are capped. This measure was revised upward from 3,000 t following a 2023 IMR risk assessment, which found no significant ecological risk from increasing the cap (IMR, 2024).

•Experimental quota (3,000 tonnes/year): Reserved for research, gear development, and ecosystem impact studies. Allows harvest within fjord systems under scientific oversight, supporting innovation while minimizing ecological risk (Directorate of Fisheries, 2024).

•Spatial and temporal restrictions: The fishery is conducted offshore, typically from May to August, when copepods are near the surface and fish larvae concentrations are lower (Directorate of Fisheries, 2024).

•Bycatch move-on rule: Any tow exceeding 10% fish larvae by volume requires immediate relocation to mitigate impact on juvenile fish populations (Directorate of Fisheries, 2024).

•Monitoring and enforcement tools: All vessels operate under VMS/AIS tracking, with mandatory logbooks and portside biological sampling. Observers may be placed on board during experimental trips (Directorate of Fisheries, 2024).

•Annual regulatory review: Management measures are reviewed annually during the Norwegian Directorate of Fisheries' "Reguleringsmøtet" process, ensuring the framework remains science-based and adaptive (Directorate of Fisheries, 2024).

These measures ensure that the fishery remains biologically sustainable, precautionary, and compatible with ecosystem-based management.

Conclusion

The *C. finmarchicus* fishery operates with negligible exploitation and under strict, precautionary management. The species shows no evidence of stock decline and is monitored through ecosystem models and survey data. Its classification under Table B(b) is fully justified, and the fishery receives a pass outcome.

References

Act on First-Hand Sales of Marine Resources (2013) https://leap.unep.org/en/countries/no/national-legislation/act-first-hand-purchase-wild-marine-resources-no-75-2013

Directorate of Fisheries (2016) Management Plan for Raudåte. https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Rapporter/2016/Forvaltningsplan-for-raudaate

Directorate of Fisheries (2024) Regulation of *Calanus finmarchicus* harvesting (FOR-2024-12-05-2943). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

Falkenhaug, T., & Gaard, E. (2024) Zooplankton monitoring at fixed station time series records: Seasonal indices tracking change in mesozooplankton biomass and abundance of *Calanus finmarchicus*. ICES Journal of Marine Science, 82(4), fsaf037

FishBase (2024) Species profile: *Calanus finmarchicus*. https://www.fishbase.se

Giske, J., Aksnes, D. L., Balino, B. M., Kaartvedt, S., Lie, U., Nordeide, J. T., et al. (1994) Vertical distribution and trophic interactions of zooplankton. ICES Journal of Marine Science, 51(3), 385–403

Hansen, C., Skogen, M. D., Utne, K. R., Broms, C., Strand, E., & Hjøllo, S. S. (2021) Patterns, efficiency and ecosystem effects when fishing Calanus. Marine Ecology Progress Series, 680, 15–32

ICES (2024) WGINOR: Working Group on the Integrated Assessments of the Norwegian Sea. ICES Scientific Reports, 6(23),1-120. https://doi.org/10.17895/ices.pub.25526548.v1

Musick, J.A. (1999) Criteria to define extinction risk in marine fishes. Fisheries, 24(12), 6–14

Nofima (2023) Slow progress in the fishery for *Calanus finmarchicus.* https://nofima.com/publication/2156674/

Planque, B., Favreau, A., Husson, B., Mousing, E. A., Hansen, C., Broms, C., & Sivel, E. (2022) Quantification of trophic interactions in the Norwegian Sea. ICES Journal of Marine Science, 79(6), 1815–1830

Zooca (2024) Zooca Calanus Oil – A sustainable marine lipid. https://www.zooca.no

Links	
MarinTrust Standard clause	**1.3.2.2, 4.1.4**
FAO CCRF	**7.5.1**
GSSI	**D.5.01**

CATEGORY C SPECIES

In a whole fish assessment, Category C species are those which make up less than 5% of landings, but which are subject to a species-specific management regime. In most cases this will be because they are a commercial target in a fishery other than the one under assessment.

Clause C1 should be completed for **each** Category C species. If there are no Category C species in the fishery under assessment, this section can be deleted. Where a species fails this Clause, it may be assessed as a Category D species instead, EXCEPT if there is evidence that it is currently below the limit reference point.

Species Name		Herring*, Clupea harengus*	
C1	**Category C Stock Status - Minimum Requirements**		
	C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	Pass
	C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	Pass
		Clause outcome:	PASS

C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.

The most recent stock assessment for Norwegian spring-spawning herring (*Clupea harengus)* in ICES subareas 1, 2, and 5, and in divisions 4.a and 14.a, was conducted by the ICES Working Group on Widely Distributed Stocks (WGWIDE) and published in September 2024. The assessment uses the statistical assessment model XSAM, which explicitly incorporates catches-at-age from commercial fisheries and scientific surveys (ICES, 2024).

Although discards and bycatch are not modelled explicitly, they are considered negligible by ICES (ICES, 2024), including removals from the Calanus fishery, where herring bycatch is primarily in the form of planktonic larvae. These removals represent <0.5% of total catch by weight and are biologically insignificant, as documented in larval bycatch observations from 2021 (Broms et al., 2022).

C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.

The 2024 ICES advice indicates that fishing mortality (F) in 2024 was estimated at 0.134 for ages 5–12+, which is between the precautionary reference point (Fpa) and the limit reference point (Flim). Spawning-stock biomass (SSB) is projected to be 2.933 million tonnes in 2025, which is well above the limit biomass reference point (Blim), as well as Bpa and MSY Btrigger.

The 2024 catch advice issued by ICES under the joint management plan of Norway, the EU, the UK, Iceland, the Faroe Islands and the Russian Federation recommends that catches in 2024 should not exceed 390,010 tonnes.

Conclusion

The fishery removals of *C. harengus* by the Calanus fishery are extremely limited and have been consistently considered negligible by scientific authorities. The species is formally assessed by ICES using a data-rich model that includes commercial catches. The SSB remains above biological reference points, and the fishery is managed under an internationally agreed long-term plan. Accordingly, *C. harengus* qualifies under Category C with a pass outcome.

References

Broms, C., Melle, W., & Ellertsen, B. (2022) Larval bycatch observations in the Norwegian Calanus fishery. IMR Technical Report No. 2022/15. https://www.hi.no/resources/innblanding-av-fiskelarver-og-yngel-i-raudatefangster-2021.pdf

ICES (2024) Herring (*Clupea harengus*) in subareas 1, 2, and 5, and in divisions 4.a and 14.a – her.27.1-24a514a. ICES Advice, September 2024. https://www.hav.fo/wp-content/uploads/2024/09/ICES_nordhavssild_2024_her.27.1-24a514a.pdf

Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

Species Name	Redfish, *Sebastes spp*	
C1	**Category C Stock Status - Minimum Requirements**	
C1.1	Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.	Pass
C1.2	The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.	Pass
	Clause outcome:	PASS

C1.1 Fishery removals of the species in the fishery under assessment are included in the stock assessment process, OR are considered by scientific authorities to be negligible.

The most recent bycatch observations in the Calanus fishery indicate that eggs and larvae of *Sebastes* species accounted for approximately 0.14% of the total catch by weight in 2021, equivalent to around 1.6 tonnes (Broms et al., 2022). This level of removal is biologically insignificant and well below any threshold that would require consideration in formal stock assessments. Scientific authorities, including ICES, do not include removals from the Calanus fishery in the assessments of either *Sebastes mentella* or *Sebastes norvegicus,* confirming their negligible impact (ICES, 2022; ICES, 2024).

C1.2 The species is considered, in its most recent stock assessment, to have a biomass above the limit reference point (or proxy), OR removals by the fishery under assessment are considered by scientific authorities to be negligible.

The most recent scientific advice, published in 2022, confirms that Sebastes norvegicus continues to show low levels of mature biomass, below both the biological limit and precautionary reference values. Fishing pressure remains too high, and reproductive success is weak. The stock is considered to be in critical condition and is subject to a zero-catch recommendation (ICES, 2022). However, the Calanus fishery's removals of this species are limited to incidental larval bycatch and remain biologically negligible, at approximately 1.6 tonnes in 2021 (Broms et al., 2022).

For Sebastes mentella, the 2024 scientific assessment for the shallow pelagic stock in the northeast Atlantic indicates a stable or increasing population size, with fishing pressure within sustainable levels. The total allowable catch recommended for 2024 remains precautionary at 70,164 tonnes (ICES, 2024). Larval removals by the Calanus fishery are not reflected in the assessment, confirming that they are well below the level of biological concern.

Conclusion

The removals of *Sebastes* spp by the Calanus fishery are limited to incidental larval bycatch, are extremely small in volume, and have been confirmed by scientific authorities to be negligible. No significant concentrations of larvae have been observed in recent years, and redfish removals are not considered in any stock assessment. Accordingly, *Sebastes* spp qualifies under Category C with a pass outcome.

References

Broms, C., Melle, W., & Ellertsen, B. (2022) Larval bycatch observations in the Norwegian Calanus fishery. IMR Technical Report No. 2022/15. https://www.hi.no/resources/innblanding-av-fiskelarver-og-yngel-i-raudatefangster-2021.pdf

ICES (2022). Golden redfish (Sebastes norvegicus) in subareas 1 and 2 (Northeast Arctic). ICES Advice 2022 – reg.27.1-2. Published 15 June 2022. International Council for the Exploration of the Sea. https://doi.org/10.17895/ices.advice.19453697

ICES (2024). Beaked redfish (Sebastes mentella) in ICES subareas 5, 12, and 14 (Iceland and Faroe grounds, North of Azores, East of Greenland) and in NAFO subareas 1 and 2 (shallow pelagic stock <500 m). ICES Advice 2024. International Council for the Exploration of the Sea. https://doi.org/10.17895/ices.advice.25019495	
Links	
MarinTrust Standard clause	1.3.2.2
FAO CCRF	7.5.3
GSSI	D.3.04, D5.01

CATEGORY D SPECIES

D1	Species Name	N/A	
	Productivity Attribute	**Value**	**Score**
	Average age at maturity (years)		
	Average maximum age (years)		
	Fecundity (eggs/spawning)		
	Average maximum size (cm)		
	Average size at maturity (cm)		
	Reproductive strategy		
	Mean trophic level		
		Average Productivity Score	
	Susceptibility Attribute	**Value**	**Score**
	Availability (area overlap)		
	Encounterability (the position of the stock/species within the water column relative to the fishing gear)		
	Selectivity of gear type		
	Post-capture mortality		
		Average Susceptibility Score	
		PSA Risk Rating (From Table D3)	
		Compliance rating	
	Further justification for susceptibility scoring (where relevant) *For susceptibility attributes, please provide a brief rationale for scoring of parameters where there may be uncertainty affecting your decision*		
References			
Standard clauses 1.3.2.2			

Category D species are those which make up less than 5% of landings and are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. The comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	High productivity (Low risk, score = 1)	Medium productivity (medium risk, score = 2)	Low productivity (high risk, score = 3)
Average age at maturity	<5 years	5-15 years	>15 years
Average maximum age	<10 years	10-25 years	>25 years
Fecundity	>20,000 eggs per year	100-20,000 eggs per year	<100 eggs per year
Average maximum size	<100 cm	100-300 cm	>300 cm
Average size at maturity	<40 cm	40-200 cm	>200 cm
Reproductive strategy	Broadcast spawner	Demersal egg layer	Live bearer
Mean Trophic Level	<2.75	2.75-3.25	>3.25

Susceptibility attributes	Low susceptibility (Low risk, score = 1)	Medium susceptibility (medium risk, score = 2)	High susceptibility (high risk, score = 3)
Areal overlap (availability) Overlap of the fishing effort with the species range	<10% overlap	10-30% overlap	>30% overlap
Encounter ability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounter ability).	Medium overlap with fishing gear.	High overlap with fishing gear (high encounter ability). Default score for target species
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught.	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear.	b Individuals < half the size at maturity can escape or avoid gear.	b Individuals < half the size at maturity are retained by gear.
Post-capture mortality (PCM) The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival.	Evidence of some released post-capture and survival.	Retained species or majority dead when released.

D3		Average Susceptibility Score		
		1 - 1.75	1.76 - 2.24	2.25 - 3
Average Productivity Score	1 - 1.75	PASS	PASS	PASS
	1.76 - 2.24	PASS	PASS	TABLE D4
	2.25 - 3	PASS	TABLE D4	TABLE D4

D4	Species Name		
	Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements		
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	
		Outcome:	

Evidence

D4.1: The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.

D4.2 There is no substantial evidence that the fishery has a significant negative impact on the species.

References

Links	
MarinTrust Standard clause	1.3.2.2, 4.1.4
FAO CCRF	7.5.1
GSSI	D.5.01

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.

F1	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 ETP species.	Pass
	F1.3	If the fishery is known to interact with ETP species, measures are in place to minimise mortality.	Pass
		Clause outcome:	PASS

F1.1 Interactions with ETP species are recorded.

The Calanus fishery is subject to a rigorous monitoring framework that includes explicit provisions for recording and reporting any interactions with ETP species. All vessels operating under a Calanus harvesting permit are required to follow a biological sampling protocol approved by the IMR. This includes systematic observation and documentation of any incidental encounters with marine mammals, seabirds, or other protected fauna during fishing operations (Directorate of Fisheries2024a; Skaret et al., 2021)

Annual bycatch surveys have been implemented since 2019, with observers systematically recording plankton-associated fauna and larval fish composition. No ETP interactions have been reported since the inception of the regulated fishery (Broms et al., 2022).

Additionally, the DoF mandates the presence of scientific observers on selected trips, particularly those conducted under experimental permits. These observers verify compliance with environmental protocols and record any observations of ETP species. To date, no interactions with ETP species have been recorded in logbooks, observer reports, or enforcement data (Directorate of Fisheries, 2024a).

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

Fishing for *C. finmarchicus* takes place in the offshore Norwegian Sea and adjacent deepwater zones, generally in areas deeper than 1,000 meters, and well away from the feeding or migratory corridors of known ETP species. The gear used—slow-towed (ca. 1 knot), fine-mesh midwater trawls—is specifically designed for selective capture of zooplankton in the upper water column (10–60 m), minimizing the potential for interaction with larger marine vertebrates (Skaret et al., 2021).

ETP species listed in the Norwegian Red List (e.g., cetaceans and seabirds) are not commonly present in offshore Calanus harvesting zones, further reducing the likelihood of spatial or behavioural overlap (Norwegian Biodiversity Information Centre, 2024)

The company Calanus AS holds a Friend of the Sea certification, which includes requirements to avoid bycatch of threatened species and mandates the use of low-impact fishing technology (Zooca, 2024).

These findings confirm that the fishery operates with negligible risk to ETP species under current conditions.

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

Although no interactions with ETP species have been documented to date, regulatory safeguards are in place to ensure immediate response should any such interactions occur. Under the Marine Resources Act (2008) and the Nature Diversity Act (2009), all protected species are afforded strong legal protection, including:

- Prohibition of disturbance or harm to marine mammals, birds, and other listed species.
- Authority for the Directorate of Fisheries to impose emergency closures or require operational changes if needed.
- Flexibility to update the Regulation FOR-2024-12-05-2943 mid-season to incorporate new mitigation measures.

The annual regulatory cycle includes discussions on ETP risk, and the DoF may revise operational protocols if future monitoring detects any relevant interactions (Directorate of Fisheries, 2024b).

The fishery's management framework is therefore capable of adaptive response, ensuring that any emergent ETP risk would be addressed proactively and effectively.

References

Broms, C., Strand, E., & Melle, W. (2022) Mix of fish larvae and fry in Calanus catches, 2021. IMR Technical Report No. 2022/15. https://www.hi.no/resources/innblanding-av-fiskelarver-og-yngel-i-raudatefangster-2021.pdf

Directorate of Fisheries. (2024a). Regulation of Calanus finmarchicus harvesting (**FOR-2024-12-05-2943**). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

Directorate of Fisheries. (2024b). Regulatory Meeting Brief for 2025: Raudåte. Retrieved from https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2

Institute of Marine Research (IMR). (2024). Species Facts: *Calanus finmarchicus*. Retrieved from https://www.hi.no

Marine Resources Act (2008) Act of 6 June 2008 No. 37 relating to the management of wild living marine resources. https://sherloc.unodc.org/cld/uploads/res/document/havressurslova-the-marine-resources-act_html/Havressurslova_The_Marine_Resources_Act_EN.pdf

Nature Diversity Act (2009) Act of 19 June 2009 No. 100 relating to the management of biological, geological and landscape diversity. https://www.regjeringen.no/en/dokumenter/nature-diversity-act/id570549

Norwegian Biodiversity Information Centre. (2024). Norwegian Red List for Species 2021 (updated 2024). https://www.biodiversity.no/

Skaret, G., Hjøllo, S. S., Utne, K. R., & Hansen, C. (2021). Fishing Calanus in the Norwegian Sea: ecosystem modelling and risk assessment. Marine Ecology Progress Series, 680, 15–32.

Zooca. (2024). Sustainability – Calanus oil harvesting methods. Retrieved from https://www.zooca.no/calanusoljen/baerekraft/

Links	
MarinTrust Standard clause	1.3.3.1
FAO CCRF	7.2.2 (d)
GSSI	D4.04, D.3.08

F2	**Impacts on Habitats - Minimum Requirements**		
	F2.1	Potential habitat interactions are considered in the management decision-making process.	Pass
	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

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

The Calanus fishery is managed through a highly precautionary framework that explicitly incorporates spatial planning to avoid sensitive marine habitats. Each year, the Norwegian Directorate of Fisheries conducts a regulatory review process—in consultation with the Institute of Marine Research (IMR)—that includes the evaluation of potential interactions with spawning areas, fjord ecosystems, and benthic habitats (Directorate of Fisheries, 2023 and 2024a).

These considerations are reflected in the zoning structure defined in Regulation FOR-2024-12-05-2943, which limits access to inshore areas (inside the 1000-meter isobath) and restricts harvest volumes in these regions.

This framework is also aligned with the Nature Diversity Act (2009), which requires managers to maintain habitat integrity, ecosystem functioning, and precaution in human activities affecting biodiversity (Government of Norway, 2024).

In 2023, regulatory authorities reviewed the potential effects of increasing the coastal harvest limit from 3,000 to 10,000 tonnes. Based on updated knowledge of fjord productivity and larval fish distributions, no evidence of habitat degradation was identified at that scale (Directorate of Fisheries, 2023).

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

The Calanus fishery uses non-bottom-contacting, fine-mesh pelagic trawls that operate entirely within the water column, typically at depths of 10–60 meters. There is no physical contact with the seabed, and therefore no risk of gear-induced disturbance to benthic substrates, coral gardens, sponge grounds, or other vulnerable marine ecosystems. Trawling near the seabed is avoided not only for environmental reasons, but also because it would damage the fine-mesh gear used to harvest Calanus (Skaret et al., 2021; Zooca, 2024; Nofima, 2024).

No documented evidence of sediment disturbance or habitat alteration has been reported in Calanus fishing areas since regulated harvest began in 2019.

The offshore nature of the activity—mostly beyond the continental shelf—places it spatially distant from typical habitats of concern. As of 2025, no evidence of habitat degradation or alteration has been linked to this fishery. Regional ecosystem monitoring in the Norwegian Sea—such as the IESSNS 2024 post-cruise report and the ICES WGINOR assessments—has not detected any indications of benthic disturbance or broader physical impacts attributable to pelagic zooplankton fisheries operating in offshore waters (IESSNS, 2024; ICES, 2024).

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

Although the fishery does not directly interact with benthic habitats, Norway has instituted multiple precautionary controls to reduce any indirect ecological pressure in coastal and midwater zones:

- A zonal TAC structure that limits inshore harvest to 10,000 tonnes/year (less than 4% of the total TAC) to protect fish larval habitats and fjord ecosystems.
- A mandatory “move-on” rule, enforced through Regulation FOR-2024-12-05-2943 (Directorate of Fisheries, 2024), requiring vessels to relocate if any tow contains more than 10% fish larvae by volume.
- An IMR-designed sampling protocol that ensures systematic monitoring of catch composition, including any bycatch with potential habitat implications.

If any indications of habitat disruption were detected, emergency closures or regulatory changes could be implemented mid-season under the authority of the Marine Resources Act (2008).

These safeguards ensure that even if unforeseen interactions with sensitive habitats were to occur, the fishery would respond promptly to minimize its impact.

References

Directorate of Fisheries (2023) Regulatory Meeting Brief for 2025: Raudåte. https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2

Directorate of Fisheries (2024a) Regulation of *Calanus finmarchicus* harvesting (**FOR-2024-12-05-2943**). https://lovdata.no/dokument/LTI/forskrift/2024-12-05-2943

IESSNS (2024) International Ecosystem Summer Survey in the Nordic Seas – Post-cruise report. https://www.fiskeridir.no/english/Coastal-management/Marine-scientific-research/cruises-2024/IESNS_survey_report2024.pdf

ICES (2024) WGINOR: Working Group on the Integrated Assessments of the Norwegian Sea. https://doi.org/10.17895/ices.pub.25526548.v1

Marine Resources Act (2008) Act of 6 June 2008 No. 37 relating to the management of wild living marine resources. https://sherloc.unodc.org/cld/uploads/res/document/havressurslova-the-marine-resources-act_html/Havressurslova_The_Marine_Resources_Act_EN.pdf

Nature Diversity Act (2009) Act of 19 June 2009 No. 100 relating to the management of biological, geological and landscape diversity. https://www.regjeringen.no/en/dokumenter/nature-diversity-act/id570549

Nofima (2023) En studie av det norske fisket etter raudåte – Økonomi, marked og utviklingsbehov. https://nofima.com/publication/2156674/ (In English: A study of the Norwegian fishery for Calanus – Economy, market, and development needs)

Skaret, G., Hjøllo, S. S., Utne, K. R., & Hansen, C. (2021) Fishing Calanus in the Norwegian Sea: ecosystem modelling and risk assessment. Marine Ecology Progress Series, 680, 15–32

Zooca (2024) Sustainability – Fishing technology used for Calanus oil. https://www.zooca.no/calanusoljen/baerekraft/

Link	
MarinTrust Standard clause	1.3.3.2
FAO CCRF	6.8
GSSI	D.2.07, D.6.07, D3.09

F3	Ecosystem Impacts - Minimum Requirements		
	F3.1	The broader ecosystem within which the fishery occurs is considered during the management decision-making process.	Pass
	F3.2	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	Pass
	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.	Pass
		Clause outcome:	PASS

F3.1 The broader ecosystem within which the fishery occurs is considered during the management decision-making process.

Calanus finmarchicus is a keystone species in the pelagic ecosystems of the North Atlantic and it is the dominant species of the mesozooplankton in the Norwegian Sea (e.g. Hirche et al., 2001; Hjøllo t al., 2012). It represents the primary zooplankton forage for numerous commercially and ecologically important predators including herring, blue whiting, cod larvae, minke whales, and seabirds such as puffins and kittiwakes (Prokopchuk & Sentyabov, 2006; Bachiller et al., 2018; Langøy et al., 2012; Hansen et al., 2021). Its biomass dominates the mesozooplankton community, and its seasonal vertical migrations are tightly coupled with the timing of phytoplankton blooms and predator feeding activity (Giske et al., 1994; Jónasdóttir et al., 2015).

The species also plays a major role in biogeochemical cycling through the "lipid pump." During diapause, *C. finmarchicus* descends to deep waters (>1000 m) carrying lipid stores, thus contributing to long-term carbon sequestration (Jónasdóttir et al., 2015; Kristiansen et al., 2021). This ecological function is considered in management discussions as part of Norway's ecosystem-based approach.

Recent assessments by WGINOR and ICES have reinforced the role of Calanus as a critical component of North Atlantic trophodynamics, with cascading effects across pelagic food webs (ICES, 2024).

Management reflects this ecological importance through:

- A very conservative TAC of 254,000 tonnes/year, based on <1% exploitation of an estimated 33 million tonne standing stock (Nofima, 2023; Directorate of Fisheries, 2024).
- Regular scientific advice and modelling of food web interactions, notably via the NORWECOM.e2e model (Skaret et al., 2021; Planque et al., 2022).

F3.2 There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.

Ecosystem-level impacts are integrated into the Calanus regulatory framework. For example:

- IMR ecosystem surveys assess plankton biomass and predator condition indices annually.
- Ecosystem modelling scenarios (e.g. Hansen et al., 2021) simulate intensified Calanus fishing and project negligible effects on predator populations or zooplankton standing biomass even at full TAC.
- ICES WGINOR and Norwegian national reports provide regular ecosystem status assessments, which inform quota stability and spatial restrictions.

In 2023, IMR evaluated whether an increase in coastal harvest from 3,000 to 10,000 tonnes would affect larval fish nurseries or predator foraging areas, and concluded there would be no significant ecological impact (Directorate of Fisheries, 2023).

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.

In addition to trophic models and ecological indicators, recent catch statistics—Table 1—help illustrate the extremely low level of fishery removals in comparison to ecosystem production and predator demand.

Trophic models (Planque et al., 2022) confirm that natural mortality from predators such as fish, seabirds, and marine mammals far exceeds that caused by fishing. Specifically, more than 60% of *C. finmarchicus* mortality is due to natural predation, while fishery-induced mortality remains below 0.1%.

Annual production of *C. finmarchicus* is estimated at 180–290 million tonnes (Zooca, 2024), reinforcing the species' buffering capacity. Diet analyses further show that *C. finmarchicus* represents less than 37% of the total diet in key pelagic predators like herring, mackerel, and blue whiting (Planque et al., 2022; ICES, 2024).

These ecological factors support the conclusion that current Calanus fishing does not produce significant disruption in food web structure or zooplankton biomass.

In addition to trophic interactions, *C. finmarchicus* plays a central role in biogeochemical cycles, particularly through the lipid pump, which contributes to long-term carbon sequestration (Kristiansen et al., 2021). The resilience of the North Atlantic ecosystem to moderate zooplankton removal has also been assessed and confirmed through empirical studies and ecosystem indicators (Botterell et al., 2023).

Despite the ecological significance of *C. finmarchicus,* actual removals have been extremely low relative to ecosystem consumption. For example, the Norwegian spring-spawning herring stock alone consumes over 10 million tonnes of *C. finmarchicus* annually (Planque et al., 2022).

Model projections confirm that even full utilization of the 254,000 t TAC would not cause measurable depletion in predator populations (Hansen et al., 2021; Zooca, 2024). Ecosystem survey data from 2023 and 2024 continue to show stable or increasing biomass levels (Falkenhaug & Gaard, 2024).

Additionally, spatial management measures—such as exclusion from fjords, limitation to offshore zones, and the move-on rule for bycatch—serve to avoid impacts on critical nurseries and foraging areas ((Directorate of Fisheries, 2024)

The Calanus fishery is biologically sustainable, underexploited, and highly resilient. Its classification under Table B(b) remains valid and justified.

References

Bachiller, E., Utne, K. R., Jansen, T., & Huse, G. (2018). Bioenergetics modeling of the annual consumption of zooplankton by pelagic fish feeding in the Northeast Atlantic. PLoS One, 13(1), e0190345.

Botterell, Z. L. R., Nash, R. D. M., & Fernandes, P. G. (2023). Resilience of North Atlantic ecosystems to zooplankton harvesting: A synthesis of indicators and empirical studies. ICES Journal of Marine Science, 80(2), 452–465.

Directorate of Fisheries. (2023). Regulatory Meeting Brief for 2025: Raudåte. https://www.fiskeridir.no/Yrkesfiske/Dokumenter/Reguleringsmoetet2

Directorate of Fisheries. (2024). Regulation of Calanus finmarchicus harvesting (FOR-2024-12-05-2943). https://lovdata.no/static/lovtidend/ltavd1/2024/sf-20241205-2943.pdf

Falkenhaug, T., & Gaard, E. (2024). Zooplankton monitoring at fixed station time series records: Seasonal indices tracking change in mesozooplankton biomass and abundance of Calanus finmarchicus. ICES Journal of Marine Science, 82(4), fsaf037.

Giske, J., Aksnes, D. L., Balino, B. M., Kaartvedt, S., Lie, U., Nordeide, J. T., et al. (1994). Vertical distribution and trophic interactions of zooplankton. ICES Journal of Marine Science, 51(3), 385–403.

Hansen, C., Skogen, M. D., Utne, K. R., Broms, C., Strand, E., & Hjøllo, S. S. (2021). Patterns, efficiency and ecosystem effects when fishing Calanus. Marine Ecology Progress Series, 680, 15–32.

Hirche, H.-J., Brey, T., & Niehoff, B. (2001). A high frequency time series at Ocean Ship Station M (Norwegian Sea): Population dynamics of Calanus finmarchicus. Marine Ecology Progress Series, 219, 205–219.

Hjøllo, S. S., Huse, G., Skogen, M. D., & Melle, W. (2012). Modeling secondary production in the Norwegian Sea with a fully coupled physical/primary production/individual-based Calanus model system. Marine Biology Research, 8(5–6), 508–526.

ICES (2024). WGINOR: Working Group on the Integrated Assessments of the Norwegian Sea. https://doi.org/10.17895/ices.pub.25526548.v1

Jónasdóttir, S. H., Visser, A. W., Richardson, K., & Heath, M. R. (2015). Seasonal copepod lipid pump promotes carbon sequestration. Proceedings of the National Academy of Sciences, 112(4), 12122–12126.

Kristiansen, T., Aksnes, D. L., Hjøllo, S. S., Strand, E., & Skogen, M. D. (2021). The lipid pump revisited: Contribution of Calanus finmarchicus to carbon sequestration in the northern North Atlantic. Frontiers in Marine Science, 8, 698020.

Langøy, H., Nøttestad, L., Skaret, G., Broms, C., & Fernö, A. (2012). Overlap in distribution and diets of Atlantic mackerel, Norwegian spring-spawning herring and blue whiting in the Norwegian Sea during late summer. Marine Biology Research, 8(5–6), 442–460.

Nofima. (2023). Slow progress in the fishery for Calanus finmarchicus. https://nofima.com/publication/2156674/

Planque, B., Huse, G., Utne, K. R., & Slotte, A. (2022). Trophic interactions in the Norwegian Sea. ICES Journal of Marine Science, 79(6), 1815–1830.

Prokopchuk, I., & Sentyabov, E. (2006). Diets of herring, mackerel, and blue whiting in the Norwegian Sea in relation to Calanus finmarchicus distribution and temperature conditions. ICES Journal of Marine Science, 63(1), 117–127.

Skaret, G., Hjøllo, S. S., Utne, K. R., & Hansen, C. (2021). Ecosystem effects of Calanus harvesting. Marine Ecology Progress Series, 680, 15–32.

Zooca. (2024). Zooca Calanus Oil – A sustainable marine lipid. https://www.zooca.no

Links	
MarinTrust Standard clause	1.3.3.3
FAO CCRF	7.2.2 (d)
GSSI	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 rm. 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]

Appendix B - External Peer Review Report

Assessment and determination summary

Fishery name	**Norwegian Calanus (Calanus finmarchicus) Mid-water trawl Fishery**
MarinTrust report code	
Type 1 species (common name, Latin name)	*Calanus (Calanus finmarchicus)*
Fishery location	*FAO 27 Atlantic Northeast, Norway EEZ*
Gear type(s)	*Mid-water trawl*
Management authority (country/state)	*Ministry of Trade, Industry and Fisheries (Norway)*
Certification Body recommendation	*Approved*
FAPRG reviewer recommendation	Agree with CB determination

Summary of peer review outcomes

Summary *Provide any information about the fishery that the reviewers feel is significant to their decision. This summary is used by the Certification Body in the Fishery Assessment Report.*
The peer reviewer is in agreement with each section of the assessment. The assessment is thoroughly presented and with the most recent available evidence.
General comments on the draft report provided to the peer reviewer
Peer reviewer agrees with the synopsis. The fishery is very limited in licensed vessels (mainly belonging to Calanus AS) and CB peer reviewer notes that catches of the target species remain well below the Total Allowable Catch (TAC) and are taken only under an experimental license due to constraints such as low profitability and gear limitations. Were conditions to change, bringing greater interest in the fishery, the Norwegian management regime would appear to be in good standing (adaptive regulation, strong scientific arm, thorough monitoring and control system and transparent decision processes) to support a sustainable fishery.

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

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?	Yes

3. Are the scores in the following sections consistent with the MarinTrust requirements (i.e. do the scores reflect the evidence provided)?	Yes
Section M – Management Requirements	Yes
Category A Species	n/a
Category B Species	Yes
Category C Species	Yes
Category D Species	n/a
Section E – Ecosystem Impacts	Yes

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. Has the fishery assessment been fully completed, using the recognised MarinTrust fishery assessment methodology and associated guidance?	Yes
This is a surveillance assessment and has been completed in accordance with the current methodology and associated guidance for V3 fisheries Guidance doc(Issued April 2024).	
Certification Body response	
Acknowledged, thank you.	

2. Does the species categorisation section of the report reflect the best current understanding of the catch composition of the fishery?	Choose an item.
The species categorisation section reflects the current understanding, using the most recent reference documentation available;the most recent bycatch analysis conducted by the Institute of Marine Research Broms, C., Melle, W., & Ellertsen, B. (2022). Larval bycatch observations in the Norwegian Calanus fishery. IMR Technical Report Series, No. 2022/15. https://www.hi.no/resources/innblanding-av-fiskelarver-og-yngel-iraudatefangster-2021.pdf	
Certification Body response	
Acknowledged, thank you.	

3. Is the scoring of the fishery consistent with the MarinTrust requirements, and clearly based on the evidence presented in the assessment report?	Choose an item.

Scoring is consistent with MT methods and guidance. The surveillance report is very well evidenced with recent publications and structured in a logical and concise manner.
Certification Body response
Acknowledged, thank you.

3a. Are the "Category A Species" scores clearly justified?	n/a
Calanus is not managed using a formal management regime with reference points, although a management plan is in place . There is research, but there is only a broad estimation of total biomass and an extremely precautionary TAC is applied and there is accurate data, sufficient to assess the fishery under a Cat B assessment. Peer reviewer in agreement to assess as Cat B species.	
Certification Body response	
Acknowledged, thank you.	

3b. Are the "Category B Species" scores clearly justified?	Yes
Table B(b) is used for – For species with no formal stock assessment or reference points. Evidence is presented logically and accurately, with catch data from 2019 to 2024 using most recent Directorate of Fisheries data, 2024 and noting that under data-limited conditions, the current biomass (B) of ~33 million tonnes is considered above the longterm average (B > Bav), while fishing mortality (F) remains negligible (F < Fav) based on consistently low catches. The risk matrix in Table B(b) has been applied accordingly, with the biomass (B) is above the long-term average (B > Bav), and fishing mortality (F) is substantially below any proxy for average fishing pressure (F < Fav), due to removals consistently below 1% of the TAC. A small note at B1; the assessor states 'Large population size and productivity: The estimated standing biomass exceeds 33 million tonnes (Directorate of Fisheries, 2016), with annual production estimated between 180 and 290 million tonnes (Zooca, 2024)'. Peer reviewer understood that the reference to 180-290 million tonnes refers to the total zooplankton biomass of the Norwegian sea and not a single species?	
Certification Body response	
Acknowledged, thank you.	

3c. Are the "Category C Species" scores clearly justified?	Yes

There are 2 Cat C species - Norwegian spring-spawning herring (Clupea harengus) and Redfish - Sebastes species (Sebastes mentella or Sebastes norvegicus)

In both cases, removals are considered negligible by the scientific authorities (ICES. IMR) and are not included in the stock assessments of these species. Removals of herring which represent <0.5% of total catch by weight and are biologically insignificant, as documented in larval bycatch observations from 2021 (Broms et al., 2022) Similarly, removals of sebastes (eggs and larvae) accounted for approximately 0.14% of the total catch by weight in 2021, equivalent to around 1.6 tonnes The fishery meets Cat C criteria.

Certification Body response
Acknowledged, thank you.

3d. Are the "Category D Species" scores clearly justified?	n/a

There are no unmanaged Type 2 species.

Certification Body response

Are the scores in "Section M – Management Requirements" clearly justified?	Yes

Section M scores are clearly justified, presented in accordance with method and guidance. Referenced with core Norwegian Regulation0 Marine Resources Act and most recent evidence on the activities of the Norwegian DIrecorate of Fisheries concerning Calanus regulation and fishery monitoring,including Coast Guard, control duities at landings, VMS, E-logs, scientific observation, sanctions. There are limited licenses for the fishery; under a scientfic title and mainly for the principal company; Calanus AS. No evidence of IUU identified. Assessor also includes IUU Fishing Index (Norway) as supporting evidence of absence of IUU. Section M criteria are well evidenced and justified for pass score.

Certification Body response
Acknowledged, thank you.

Are the scores in "Section E – Ecosystem Impacts" clearly justified?	Yes

Section E scores are justified with referenced evidence. There is systematic observation and documentation of any incidental encounters with marine mammals, seabirds, or other protected fauna during fishing operations of calanus licensed vessels; there is an annual bycatch survey supporting the evidence of herring and redfish larvae bycatch, no ETP's have been reported. If it occurred,the assessor identified the regulations allowing for cessation of fishing and amendment of the regulation to include mitigation measures. Assessor notes that fishing is conducted deep midwater, towed at 1 knt using fine mesh nets, with no reported evidence showing a risk to habitat impact. The assessor correclty identifies calaunus as a keystone ecosystem species as the primary zooplankton forage for numerous commercially and ecologically important predators- herring, blue whiting, cod larvae, minke whales, and seabirds such as puffins and kittiwakes. Ecosystem-level impacts are integrated into the Calanus regulatory framework. Assessor provides the
evidence that there is no risk to ecocsystem impact from the fishery; 'Specifically, more than 60% of C. finmarchicus mortality is due to natural predation, while fishery-induced mortality remains below 0.1%'.
Certification Body response
Acknowledged, thank you.

Optional: General peer reviewer comments on the draft report
The report is presented in accordance with MT methodology and guidance. Peer reviewer in agreement with the Pass score.
Certification Body response
Acknowledged, thank you.

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)