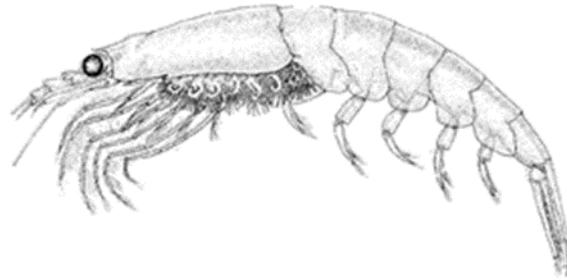


MSC SUSTAINABLE FISHERIES CERTIFICATION

Off-Site Surveillance Visit - Report for Aker Biomarine Antarctic Krill Fishery



3rd Surveillance stage

September / 2018

Certificate Code	F-ACO-0100
Prepared For:	Aker Biomarine
Prepared By:	Acoura Marine
Authors:	Geir Hønneland, Lucia Revenga & Andrew Payne

Assessment Data Sheet

Fishery name	Aker Biomarine Antarctic krill	
Species and Stock	Antarctic krill (<i>Euphausia superba</i>)	
CAB name	Acoura Marine	
CAB contact details	Address	6 Redheughs Rigg Edinburgh EH12 9DQ
	Phone/Fax	0131 335 6662
	Email	fisheries@acoura.com
	Contact name(s)	Louise Allan
Client contact details	Address	Aker Biomarine Oksenøyveien 10 1366 Lysaker NO P.O. Box 74
	Phone/Fax	+47 97981593
	Email	cilia.indahl@akerbiomarine.com
	Contact name(s)	Cilia Holmes Indahl

Contents

1	Introduction	4
1.1	Scope of Surveillance	4
1.2	Aims of the Surveillance.....	4
1.3	Certificate Holder Details	4
2	Surveillance Process	6
2.1	Findings of the original assessment.....	6
2.2	Surveillance Activity	6
2.2.1	Surveillance team details	6
2.2.2	Date & Location of surveillance audit.....	6
2.2.3	Stakeholder consultation & meetings.....	6
2.2.4	What was inspected	6
2.2.5	Stakeholder Consultation	6
2.3	Surveillance Standards	6
2.3.1	MSC Standards, Requirements and Guidance used	6
2.3.2	Confirmation that destructive fishing practices or controversial unilateral exemptions have not been introduced.....	6
3	Updated Fishery Background	7
3.1	Changes in the management system (P3).....	7
3.2	Changes in relevant regulations.....	7
3.3	Changes to personnel involved in science, management or industry.....	7
3.4	Changes to scientific base of information including stock assessments (P1)	7
3.5	Changes and updates on Ecosystem issues (P2)	9
3.6	Harmonisation	12
3.7	Changes which may impact traceability.....	12
3.8	TAC and catch data	13
3.9	Summary of Assessment Conditions	13
4	Results	14
4.1	Recommendation 1	14
5	Conclusion.....	15
5.1	Summary of findings	15
6	References	16
	Appendix 1 – Re-scoring evaluation tables (if necessary)	17
	Appendix 2 - Stakeholder submissions (if any).....	18
	Appendix 3 - Surveillance audit information (if necessary)	26
	Appendix 4 - Additional detail on conditions/ actions/ results (if necessary)	27
	Appendix 5 - Revised Surveillance Program (if necessary).....	28

1 Introduction

1.1 Scope of Surveillance

This report outlines the findings of the 3rd Annual Surveillance of the Aker Biomarine Antarctic krill fishery. The scope of the certified fishery and therefore of this surveillance is specified in the Unit of Certification set out below:

Species:	Antarctic krill (<i>Euphausia superba</i>)
Geographical area:	CCAMLR Area 48, Antarctic Sea
Method of capture:	Pelagic trawl using own patented Eco-Harvesting system
Stock:	Antarctic krill in CCAMLR Area 48
Management System:	Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) Government of South Georgia and the South Sandwich Islands (GSGSSI) Licensing by the Norwegian government.
Client Group:	All Aker BioMarine Antarctic vessels targeting Antarctic Krill in the Antarctic Sea area covered in CCAMLR Area 48, using Pelagic trawl and their own patented Eco-Harvesting system.

Other Eligible Fishers:	None.
-------------------------	-------

1.2 Aims of the Surveillance

The purpose of the annual Surveillance Report is fourfold:

1. to establish and report on whether or not there have been any material changes to the circumstances and practices affecting the original complying assessment of the fishery;
2. to monitor the progress made to improve those practices that have been scored as below “good practice” (a score of 80 or above) but above “minimum acceptable practice” (a score of 60 or above) – as captured in any “conditions” raised and described in the Public Report and in the corresponding Action Plan drawn up by the client;
3. to monitor any actions taken in response to any (non-binding) “recommendations” made in the Public Report;
4. to re-score any Performance Indicators (PIs) where practice or circumstances have materially changed during the intervening year, focusing on those PIs that form the basis of any “conditions” raised.

Please note: The primary focus of this surveillance audit is to assess changes made in the previous year. For a complete picture, this report should be read in conjunction with the Public Certification Report for this fishery assessment which can be found here:

<https://fisheries.msc.org/en/fisheries/aker-biomarine-antarctic-krill/@@assessments>

1.3 Certificate Holder Details

Aker BioMarine is a Norwegian integrated biotech company providing BioMarine ingredients through an optimized value chain, from raw materials to customer. The company currently operates two fishing vessels, the Saga Sea, which has been operating since 2005/06, and the Antarctic Sea, which commenced operating in 2012, as well as a transport vessel, La Manche, that carries the krill to the

company's own storage facility in Uruguay. A third krill fishing vessel, the Juvel, was purchased in spring 2017, but has not been put into operation.

2 Surveillance Process

2.1 Findings of the original assessment

The fishery had no conditions or recommendations at the point of recertification. One recommendation was introduced at the time of the 1st surveillance audit and one at the 3rd surveillance.

2.2 Surveillance Activity

2.2.1 Surveillance team details

This off-site surveillance visit was carried out by Andrew Payne (P1 expert), Lucia Revenga (P2 expert) and Geir Hønneland (P3 expert). The Team Leader was Geir Hønneland. Summaries of the team's CVs can be found in the announcement for the surveillance.

2.2.2 Date & Location of surveillance audit

The off-site audit took place on the week commencing 23rd July 2018. The topic of the discussion was to determine whether any changes had taken place in the fishery during the surveillance period that might have an impact on the scoring of P1, P2 or P3.

2.2.3 Stakeholder consultation & meetings

See section 2.2.2 above.

2.2.4 What was inspected

See section 2.2.2 above.

2.2.5 Stakeholder Consultation

A total of 31 stakeholder organisations and individuals having relevant interest in the assessment were identified and consulted during this surveillance audit. The interest of others not appearing on this list was solicited through the postings on the MSC website.

2.3 Surveillance Standards

2.3.1 MSC Standards, Requirements and Guidance used

This surveillance audit was carried out according to the MSC Fisheries Certification Requirements v1.3.

2.3.2 Confirmation that destructive fishing practices or controversial unilateral exemptions have not been introduced

No indication was given or suggested during the surveillance audit to suggest that either of these practices is in evidence for this fishery.

3 Updated Fishery Background

3.1 Changes in the management system (P3)

The fishery is managed under the auspices of CCAMLR, which coordinates scientific research and observer programmes, establishes a scientifically defensible catch trigger level calculated from a rigorously determined Precautionary Upper Catch Limit and distributes quotas between subareas. Recruitment and biomass reference points are considered in the management system. The Norwegian Directorate of Fisheries issues fishery permits and performs quota control of the client vessels.

The client works actively with, and provides financial support to, NGOs and scientific institutes, contributing to knowledge production beyond that provided by CCAMLR and participating states. Aker BioMarine has a dedicated policy to lie ahead of the regulatory system, to drive regulations forward instead of just responding to them. As an example, there is 100% observer coverage of their vessels while the CCAMLR requirement is 50%, although this proportion is being formally raised through management directives (see Section 3.5 below).

In 2017, WWF-Australia took over from WWF-Norway as the client's main contact point in WWF, following an internal decision in WWF. Telephone meetings are organized between the two every sixth week, in addition to discussions of running issues. The client continues to work within the Association of Responsible Krill Harvesting Companies (ARK), which during the surveillance period has been joined by China National Fisheries Corporation (CNFC). The ARK parties meet at monthly teleconferences. In 2015, the Antarctic Wildlife Research Fund (AWR) was established by the client in partnership with the Antarctic and Southern Ocean Coalition (ASOC). The fund's mission is to ensure a resilient Antarctica through filling critical gaps in ecosystem research and monitoring.

There are no changes in the management system of the fishery, at neither international (CCAMLR) nor national level in Norway

3.2 Changes in relevant regulations

See section 3.5 below.

3.3 Changes to personnel involved in science, management or industry

None.

3.4 Changes to scientific base of information including stock assessments (P1)

The fishery for Antarctic krill is of interest to several countries, with Norway catching most over the past couple of decades, and that fishery dominated by the UoC fishery. The CCAMLR database contains all catch data for the species collected since 1973, soon after the fishery started, with early catches dominated by vessels operated by countries of the former Soviet bloc. The assessment methodology employed by CCAMLR scientists since the early 2000s has been consistent. A Precautionary Catch Level (PCL) is set using a set of decision rules to determine the proportion of the stock that can be fished while still achieving the objectives of the Convention. To do this, the population of krill is projected forward in time using a model to allow the effects of different catch levels to be simulated. For each projection a starting point is chosen at random and the population projected forward with the key parameters (such as recruitment, growth and mortality) drawn at random from plausible ranges to account for natural variability (and uncertainty in these parameters). Hence, recruitment and biomass limit reference points are built into the analysis and assessment.

An annual TAC is not advised either overall for the whole CAMLR Convention Area or for the present main fishing area, Area 48. However, based on the results of the last fully synoptic survey of the whole fishing area carried out in 2000 (Trathan *et al.* 2001), but taking only a fraction of the population estimated using a generalised yield model and with updates associated with methodological improvement associated with the processing and analysis of acoustic data (SC-CAMLR-XXIX, Annex 5, paragraphs 2.40 to 2.44), an annual PCL of 5.61 million tonnes is determined and has remained constant since 2010. (The estimate of pristine biomass B_0 associated with that value determined from the survey is 60.3 million tonnes, with a CV of 12.8%.) However, such a large figure for extraction overall (the PCL), or even broken down as shown below into the main subareas of the fishery (48.1,

48.2, 48.3 and 48.4), carries with it a risk that the fishery could be spatially restricted, resulting in localised, potentially negative, ecosystem impacts.

Under its standard methodology, the trigger level for extractions from Area 48 has been annually reconfirmed by the CCAMLR Scientific Committee at 620 000 t, and that is what the value was for the 2017 season. However, that maximum is subdivided further using decision rules to yield the percentage maxima of the stock that can be taken in each of the four fishing Subareas (25% or 155 000 t in 48.1; 45% or 279 000 t in each of 48.2 and 48.3; 15% or 93 000 t in 48.4). It is not envisioned that the overall trigger level will be revised until another synoptic survey is carried out (see below) and also that efforts have been made to manage the fishery according to small-scale management units (SSMUs), for which CCAMLR has been collecting and making available basic catch data for some time.

Key issues and information from the Fishery Reports issued by CCAMLR over the past four years, starting just before the recertification was undertaken, plus Norwegian client information, are listed below.

- Krill catches in Subarea 48.1, where the austral summer fishery has historically started, reached their trigger level so were stopped in May of 2014, 2015 and 2016 (the latter two, both on 28 May). In the 2017 season, the fishery in 48.1 continued until 10 July when it was stopped as it approached (but not exceeded) the trigger level. This management control seems therefore to be quite effective.
- Krill catches in Subarea 48.2 were much larger in the 2017 season than in the previous two seasons as changes in sea-ice cover (and hence fishing vessel accessibility) in the region were recorded. Catches were notably higher than normal there between January and March, with krill catches in the adjacent Subarea 48.1 picking up mainly in April. With total catches increasing in 48.2, the converse happened with krill capture in 48.3, the most northern subarea, traditionally taken in the austral winter between June and September. After a few years of seemingly being on a gradual upward trajectory, they dropped significantly in 2017, and as in Subarea 48.2, did not reach the trigger level for fishing.
- No krill catches have been recorded in Subarea 48.4 for the most recently completed fishing seasons.
- After peaking at >316 kt in the 2014 fishing season (the largest reported annual krill catch since 1991, when the Soviet bloc fishery ended), the total 2015 krill catch dropped to some 225 kt, rebounded to nearly 260 kt in 2016, then dropped again to 236 929 t in 2017. The gradual upward trajectory in total catches from the mid-2000s to the mid-2010s seems therefore to have stalled, and the overall trigger level for Area 48 is still on the far horizon at current catching levels.
- Confirming Norway's current position as the major utiliser of krill in Area 48, some two-thirds of the area's total annual catch of Antarctic krill in the 2017 season was taken by the UoC fishery. Within this proportion overall, the UoC fishery took 52% of the 2017 catch in Subarea 48.1, 98% in Subarea 48.2 and 62% of the catch in Subarea 48.3.
- Efforts to conduct another synoptic survey of the krill stock, although unanimously decreed as necessary by CCAMLR member country scientists, have been bedeviled over the years by the prohibitive costs involved. A fresh large-scale biomass survey has, however, been planned for January and February of 2019, with Norway a major contributor to the effort. From a scientific perspective, this is good news, because basing an estimate of biomass on the results of a formally integrated survey conducted 17 years ago is open to criticism related to possible climate-change-influenced environmental effects and related variations in krill predator biomasses.
- Sampling levels are scientifically and administratively deemed to be adequate and observation levels are 100% in the UoC fishery, though not yet quite at that level in the whole fishery (with 100% the target in a couple of years' time).
- Formal subdivision of the Subarea management units into agreed SSMUs, although still recommended by CCAMLR, has not yet been implemented, although many samples of, for example, length frequency, are recorded and submitted to CCAMLR according to provisional SSMU.

- The notification system wherein all countries and vessels expecting to fish in the forthcoming season have to tell CCAMLR formally of their intention by the preceding 30 June is by international standards a powerful management measure underpinning scientific assessment and management of the stock. Five countries (covering 13 vessels) notified such intention for the current 2018 season, namely Chile, China, Republic of Korea, Norway and Ukraine, but the quantum of their projected catches is not known accurately and may well exceed the trigger level, raising questions about the actual value of the notification system. History also shows that subsequent revision of fishing intentions still takes place.

Given the above, though, it is concluded from a stock assessment and management perspective that the UoC and total krill fishery in Area 48 are well managed scientifically and administratively, with appropriate precautionary biomass and recruitment reference points underpinning formal management rules. Therefore, no change to the scores for any P1 category need be entertained at this second annual surveillance.

3.5 Changes and updates on Ecosystem issues (P2)

The CCAMLR XXXVI meeting, held in October 2017, served to review or implement different Conservation Measures, in order to better manage the ecosystem impacts of the fisheries in the CCAMLR area. Next CCAMLR meeting will be held in October 2018. Additional voluntary actions were also agreed at the time of the XXXVI meeting. The following table lists the different Conservation Measures related to environmental impacts which are in place for the 2017/2018 season.

Conservation Measures in place in the 2017/2018 fishing season (related to environmental issues).

C.M. Number	Conservation Measure	Areas where applies	Fisheries to which applies	Seasons in which applies
Research and experiments				
24-01 (2017)	The application of conservation measures to scientific research.	All areas (except for waters adjacent to the Kerguelen, Crozet and Prince Edward Islands).	All fisheries	All seasons
24-04 (2017)	Establishing Special Areas for Scientific Study in newly exposed marine areas following ice-shelf retreat or collapse.	Areas 48.1, 48.5, 88.3	All fisheries	All seasons
24-05 (2017)	Fishing for research purposes pursuant to Conservation Measure 24-01.	All areas	All fisheries	All seasons, commencing 2018/19
Minimisation of Incidental Mortality				
25-03 (2016)	Minimisation of the incidental mortality of seabirds and marine mammals in the course of trawl fishing in the Convention Area.	All areas (except for waters adjacent to the Kerguelen and Crozet Islands).	All trawl fisheries	All seasons
Environmental Protection				
26-01 (2015)	General environmental protection during fishing.	All areas (except for waters adjacent to the Kerguelen, Crozet and Prince Edward Islands).	All fisheries	All seasons
FISHERY REGULATIONS				
General Measures				

C.M. Number	Conservation Measure	Areas where applies	Fisheries to which applies	Seasons in which applies
31-01 (1986)	Regulation of fishing around South Georgia (Statistical Subarea 48.3).	Area 48.3	All species on which fisheries are permitted	All seasons
31-02 (2007)	General measure for the closure of all fisheries.	All areas (except for waters adjacent to the Kerguelen, Crozet and Prince Edward Islands).	All Fisheries	All seasons
Fishing Seasons, Closed Areas and Prohibition of Fishing				
32-01 (2001)	Fishing seasons.	All areas	All fisheries	All seasons
Bycatch limits				
33-03 (2017)	Limitation of by-catch in new and exploratory fisheries in the 2017/18 season (applies to various skates, and rays, <i>Macrourus</i> spp. and other by-catch species (see Annex 33-03/A).	Various areas (except for waters adjacent to the Kerguelen, Crozet and Prince Edward Islands).	All new and exploratory fisheries	2017/2018 season
Krill fisheries				
51-01 (2010)	Precautionary catch limitations on <i>Euphausia superba</i> in Statistical Subareas 48.1, 48.2, 48.3 and 48.4	Areas 48.1, 48.2, 48.3, 48.4	Krill fisheries	All seasons
51-02 (2008)	Precautionary catch limitation on <i>Euphausia superba</i> in Statistical Division 58.4.1	Area 58.4.1	Krill fisheries	All seasons
51-03 (2008)	Precautionary catch limitation on <i>Euphausia superba</i> in Statistical Division 58.4.2	Area 58.4.2	Krill fisheries	All seasons
51-04 (2017)	General measure for exploratory fisheries for <i>Euphausia superba</i> in the Convention Area in the 2017/18 season	Various areas.	All exploratory krill fisheries.	2017/18 season
51-06 (2016)	General measure for scientific observation in fisheries for <i>Euphausia superba</i>	All areas	Krill fisheries	All seasons
51-07 (2016)	Interim distribution of the trigger level in the fishery for <i>Euphausia superba</i> in Statistical Subareas 48.1, 48.2, 48.3 and 48.4	Areas 48.1, 48.2, 48.3, 48.4	Krill fisheries	2016/17 to 2020/21 seasons
Protected areas		Period in force		
91-01 (2004)	Procedure for according protection to CEMP sites	Indefinite		
91-02 (2012)	Protection of the values of Antarctic Specially Managed and Protected Areas	Indefinite		
91-03 (2009)	Protection of the South Orkney Islands southern shelf	Reviewed at five-year intervals		
91-04 (2011)	General framework for the establishment of CCAMLR Marine Protected Areas	Indefinite		

C.M. Number	Conservation Measure	Areas where applies	Fisheries to which applies	Seasons in which applies
91-05 (2016)	Ross Sea region marine protected area	35 years, commencing 1 December 2017, to be reviewed at the 2051 Commission meeting		
Resolutions		Areas	Fisheries	Period in force
10/XII	Resolution on harvesting of stocks occurring both within and outside the Convention Area	All areas	All fisheries	All seasons
22/XXV	International actions to reduce the incidental mortality of seabirds arising from fishing	All areas	All fisheries	All seasons
28/XXVII	Ballast water exchange in the Convention Area	All areas	All fisheries	All seasons
30/XXVIII	Climate change	All areas	All fisheries	All seasons
31/XXVIII	Best available science	All areas	All fisheries	All seasons

Regarding the application of Conservation Measure 25-03 on the minimization of incidental mortalities of seabirds and marine mammals, for 2016 a total of nine seabird mortalities was reported from the krill fishery, one in Subarea 48.2 and eight in Subarea 48.1. There were also three reported mortalities of Antarctic fur seal (*Arctocephalus gazella*) in the fishery in Subarea 48.3. From January to September 2017, in the krill fishery, there were no fur seal mortalities and two seabird mortalities, one each in Subarea 48.1 and Subarea 48.2.

Regarding general information on bycatch by the krill fishery, the WG-FSA-16/04 (Working Group on Fish Stock Assessment) provided detailed information using data on fish by-catch in the krill fishery from commercial catch (95 513 hauls) and from the Scheme of International Scientific Observation (11 875 hauls). The analysis indicated that painted rockcod (*Lepidonotothen larseni*) and spiny icefish (*Chaenodraco wilsoni*) are the most frequently reported species in both datasets. The estimated total annual mass of fish by-catch in a 300 000 tonnes krill fishery would be 370 tonnes, comprising 40% mackerel icefish (*Champscephalus gunnari*) and 30% painted rockcod (*Lepidonotothen larseni*) (<https://www.ccamlr.org/en/system/files/00%20KRI48%202017.pdf>). The length-frequency distribution of all taxa for which >100 fish were measured had a modal size class of <10 cm. The fish species taken as by-catch in the krill fishery are the same species (and size classes) as those reported in the diet of krill-dependent predators. According to CCAMLR, there is evidence of both an increase in the data quality from the observer scheme, as reflected in the reduced confidence intervals around the frequency of occurrence data, as well as an increase in the fish by-catch reported in the commercial krill catch data.

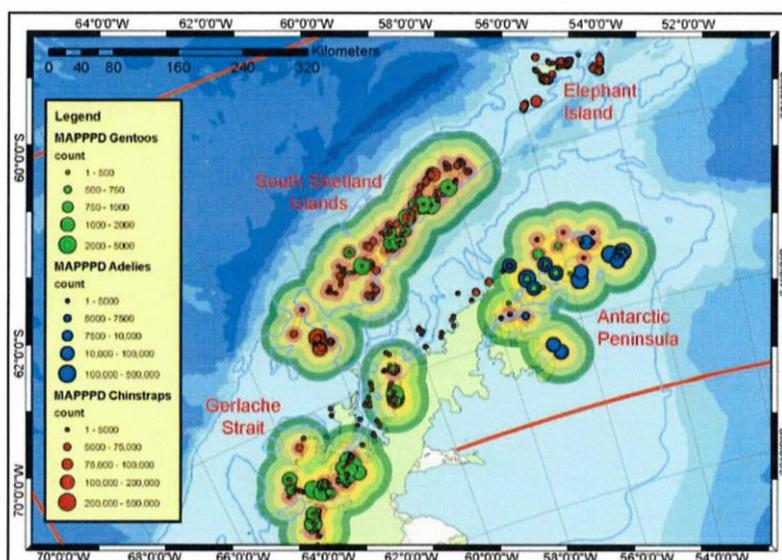
The CCAMLR Ecosystem Monitoring Program (CEMP) continues to work searching for changes in the krill-based ecosystem to provide a basis for regulating harvesting of Antarctic marine living resources in accordance with the 'ecosystem approach'. Information on the CEMP can be found in WG-EMM-16/08, 16/09 and 16/10 (Working Group on Ecosystem, Monitoring and Management).

At the XXXVI meeting, the CCAMLR Scientific Committee recommended expanding the collection of by-catch data on invertebrates, including crystal krill, during krill fishing operations. Such information is not currently reported and would serve to evaluate the level of crystal krill taken by the krill fishery.

Regarding ARK voluntary action measure to protect penguins while breeding, following CCAMLR Scientific Committee advice on the need to apply a temporary one-year closure around the colonies where there had been gentoo penguin (*Pygoscelis papua*) mortality events during the 2016 Antarctic summer, AKR voluntarily decided not to fish during the 2016-2017 fishing season close to the penguin colonies where these events had happened (at 3 sites in Subarea 48.1). In the same line, in July 2018, ARK agreed to voluntarily restrict fishing for krill in zones covering about 74000 km² in the Antarctic Peninsula. This initiative, which will limit krill harvesting around penguin colonies, will be implemented from 1st January 2019. Specifically, ARK companies pledge to keep fishing effort up to 40 kilometres away from the coast from October to March, depending on the conservation needs of colonies of Adélie, chinstrap and gentoo penguins while breeding around the Antarctic Peninsula, off South Shetland and

in the Gerlache Strait. The commitment will see the seasonal closure gradually implemented into a permanent closure from 2020, of which size and limits are to be decided after an independent review of the implementation, of scientific data collected and the potential impact on the commercial fishery (see <http://www.ark-krill.org/index.cfm/7/News>).

Figure 1: The South Shetland Islands and Antarctic Peninsula. Proposed voluntary coastal buffers focussed around the major breeding aggregations of chinstrap (red), Adélie (blue) and Gentoo (green) penguins; breeding site information for penguins is from MAPPPD. Proposed buffers are shown at 10 km (pink), 20 km (yellow), 30 km (lime green) and 40 km (bottle green).



Source: http://files.zetta.no/www-ark-krill-org/_upl/ark_vrz_map_rev.jpg

Further, AKER fishing vessels willingly participate in scientific research (together with ARK Association) through different means (see <http://www.ark-krill.org/index.cfm/2/What-we-do>):

- Undertaking annual transects in Subareas 48.1 and 48.2
- Willingness to participate in a multinational large-scale krill synoptic survey in Area 48 in 2019 as proposed by Norway, in order to update the CCAMLR-2000 survey data which is used to estimate sustainable yield. ARK members have allocated ship time for participation in the survey.
- Two ARK representatives are actively participating in an e-group to discuss a proposal by Argentina and Chile for a Marine Protected Area in Domain 1 (the Antarctic Peninsula) which was presented to CCAMLR in 2017.

The information gathered over the years through different means by different nations and institutions has served to update the central database on krill abundance over the years (KRILLBASE). This database compiles information on abundance data (numerical density, no. m⁻²) of postlarval *E. superba* and salp individuals together with environmental information. The aim is to provide a temporo-spatial data resource to support a variety of research such as biogeochemistry, autecology, higher predator foraging and food web modelling in addition to fisheries management and conservation (Atkinson *et al.* 2017).

3.6 Harmonisation

The DERIS S.A – Pesca Chile Antarctic Krill Fishery was certified 6th September 2018 (Roel *et al.* 2018). There are no significant differences in scoring between the two fisheries.

3.7 Changes which may impact traceability

None.

3.8 TAC and catch data

The Antarctic krill fishery is managed not in terms of a TAC, but in terms of a scientifically justified and robustly managed Precautionary (Upper) Catch Limit, PCL, which currently is 620 000 t for the whole fishery (see the P1 commentary in section 3.4 above). That quantum is further subdivided into trigger levels per subarea (i.e. maximum annual catches by the whole fishery) of 155 000 t for 48.1, 279 000 t for 48.2 and 48.3 and 93 000 t for 48.4. These Subarea maxima have never been taken concomitantly in a single year, so the total for the subareas exceeds the PCL but in terms of annual catches the PCL is not breached. UoC catches against the PCL and trigger levels are listed in the table below.

Table 3.8-1 Catch Limits and Catch Data

Total green weight catch by UoC	Season 2017	Subarea 48.1	77 674	tonnes
	01/12/2016 –	48.2	67 503	
	30/11/2017	48.3	11 564	
		48.4	0	
	Season 2016	Subarea 48.1	79 178	tonnes
	01/12/2015 –	48.2	33 668	
	30/11/2016	48.3	42455	
		48.4	0	

3.9 Summary of Assessment Conditions

There were no conditions or recommendations attached to the fishery at recertification. One recommendation was introduced at the 1st surveillance audit, following a stakeholder submission from the Pew Charitable Trust. A second recommendation was added at the 3rd surveillance audit, as a result of a stakeholder submission from WWF (see Appendix 2).

Recommendation 1

Aker Biomarine should continue implementing the standard operating procedure they agreed to during the 2nd surveillance of its 1st MSC certification (prior to the establishment of CM 51-07). This was described as follows, 'AKBM have introduced a standard operating procedure (covering both Saga Sea and Antarctic Sea) requiring skippers to determine the availability of krill in an area; if the swarm being fished seems to be the only available in an area, then the vessel will move on before fishing the available krill – so fishing in a manner that would help to prevent localised depletion within an area.'

Recommendation 2

Bearing in mind the importance of data collection and the ratio of bycatch in the assessment process, the client is recommended to collect and prepare information on bycatch in order to update the 2012 information on bycatch levels and on the bycatch species composition for the recertification process. The client is encouraged to maintain the <2% bycatch level.

4 Results

4.1 Recommendation 1

Aker Biomarine continues to implement the standard operating procedure whereby the fishing vessels move on before fishing the available krill if the swarm being fished seems to be the only one available in the area (see section 3.9 above).

Status of Recommendation

The client is on target in implementing Recommendation 1.

5 Conclusion

5.1 Summary of findings

The fishery remains certified and the Surveillance Plan unchanged (Reduced Surveillance).

6 References

Atkinson A, Hill SL, Pakhomov E, Siegel V, Anadon R, Chiba S, Daly KL, Downie R, Fielding S, Fretwell P, Gerrish L, Hosie GW, Jessopp MJ, Kawaguchi S, Krafft BA, Loeb V, Nishikawa J, Peat HJ, Reiss CS, Ross RM, Langdon B, Quetin, Schmidt K, Steinberg DK, Subramaniam RC, Tarling GA, Ward P (2017). KRILLBASE: a circumpolar database of Antarctic krill and salp numerical densities, 1926-2016. Earth Syst. Sci. Data, 9: 193-210 (doi:10.5194/essd-9-193-2017)

CCAMLR Krill fisheries: <https://www.ccamlr.org/en/fisheries/krill-fisheries>

CCAMLR Krill fishery report 2016:

https://www.ccamlr.org/en/system/files/00%20KRI48%202016%20v1_1.pdf

CCAMLR SC-CAMLR-XXXVII/03. Report of the Working Group on Ecosystem Monitoring and Management (Cambridge, United Kingdom, 9 to 13 July 2018), 4 September 2018.

CCAMLR Schedule of Conservation Measures in force 2017/2018:

https://www.ccamlr.org/en/system/files/e-schedule2017-18_0.pdf

<https://www.ccamlr.org/en/system/files/00%20KRI48%202017.pdf>

<http://www.ark-krill.org/index.cfm/7/News>

http://files.zetta.no/www-ark-krill-org/_upl/ark_vrz_map_rev.jpg

<http://www.ark-krill.org/index.cfm/2/What-we-do>

CCAMLR WG-EMM-18/22. Uncertainty in Reported Geographical Distribution and Weight of Krill Catches from Norwegian Krill Fishing Vessels Operating Continuous Fishing Systems. 22 June 2018.

Roel, B, Campodonico, I and Ríos, J (2018). DERIS S.A – Pesca Chile- Antarctic Krill Fishery: Public Certification Report. <https://fisheries.msc.org/en/fisheries/deris-s.a.-pesca-chile-antarctic-krill-fishery/@assessments>

Trathan, PN, Watkins, JL, Murray, AWA, Brierley, AS, Everson, I, Goss, C, Priddle, J, Reid, K, Ward, P, Hewitt, R, Demer, D, Naganobu, M, Kawaguchi, S, Sushin, V, Kasatkina, SM, Hedley, S, Kim, S, Pauly, T (2001). The CCAMLR-2000 krill synoptic survey: a description of the rationale and design. CCAMLR Science, 8. 1-23.

Appendix 1 – Re-scoring evaluation tables (if necessary)

N/a.

Appendix 2 - Stakeholder submissions (if any)



Louise Allen
Acoura Marine
E-mail: fisheries@acoura.com

WWF-UK

Registered office

The Living Planet Centre
Rufford House, Brewery Road
Woking, Surrey GU21 4LL

Tel: +44 (0)1483 426444

info@wwf.org.uk

wwf.org.uk

23rd July 2018

Re: WWF comments to the Aker Biomarine Antarctic krill fishery surveillance audit

Contact Information		
Contact Name	Sarah	Davie
Title	Dr	
<i>On behalf of (organisation, company, government agency, etc.) – if applicable</i>		
Organisation	WWF-UK	
Department	Polar Unit	
Position	Polar Programme Specialist	
Description	WWF is the world's leading independent conservation organisations. Our mission is to create a world where people and wildlife can thrive together.	
Mailing Address, Country	The Living Planet Centre, Rufford House, Brewery Road, Woking, Surrey, GU21 4LL, UK	
Phone	+ 44 (0)1483 412256	
Email	sdavie@wwf.org.uk	
Assessment Details		

Fishery	Aker Biomarine Antarctic krill fishery		
CAB	Acoura Marine		
Assessment Stage	Fishery	Date	Name of Individual/Organisation Providing Comments
<input checked="" type="checkbox"/> Surveillance ¹ Opportunity to provide information to the CAB about any changes in the fishery since certification and/or the achievements made towards conditions.	Aker Biomarine Antarctic krill fishery	23/07/2018	Sarah Davie WWF-UK

Nature of Comment	Justification Please attach additional pages if necessary.
<input checked="" type="checkbox"/> I wish to alert the assessment team to important changes in the circumstances of this fishery relevant to the MSC certification. <input checked="" type="checkbox"/> Other (please specify)	<p>WWF has a long history of involvement with the MSC certification of fisheries around the globe promoting the sustainability of fisheries and to recognise advancements that fisheries have been making. In this instance there are a number of areas which WWF-UK feel require close attention during the surveillance audit of the Aker BioMarine Antarctic krill fishery:</p> <ol style="list-style-type: none"> 1) WWF-UK would like to highlight the need for Aker BioMarine to demonstrate compliance to CCAMLR CMs 21-03 and 23-06 relating to catch reporting for vessels using the continuous fishing system such as those used by Aker BioMarine vessels. As was highlighted at the XXXVI Commission meeting of CCAMLR (paragraph 5.6-5.7), there has been "difficulty in identifying if the vessels were compliant". This is not acceptable for an MSC certified fishery, there should be no doubt as to vessel compliance to Conservation Measures issued by CCAMLR. Should this be a difficulty at present, compliance would need to be written into the certification as a condition to ensure compliance is determined before the next surveillance else risk losing certification.

¹ [MSC Fisheries Certification Requirements, v2.0 section 7.23](#)

CAB response:

The client fishery uses a flowscale to measure the exact amount of krill caught. While this provides the exact number, questions were raised at CCAMLR regarding when krill was caught compared to when it was registered on the flowscale. Aker BioMarine and the flag state addressed the issue by engaging the Institute of Marine Research (IMR) to conduct a study of i) the amount of krill measured in the client vessels' holding tanks, providing an accurate estimate of the catch as soon as it comes on board the vessel; ii) the time from when krill is registered in the trawl opening until it enters the receiving tanks of the vessel (to ensure that there is no mismatch between registered catch positions and estimated catch; and iii) impacts on the spatial displacement to investigate whether temporal delays lead to any significant spatial displacement. The study was presented by IMR/Norway at the WG-EMM meeting in Cambridge 9-13 July 2018. According to the report from the meeting (p. 9), 'The Working Group noted that in the context of: (i) CM 23-06 (closure of the fishery), the reporting procedures do not impact on CCAMLR management of the vessel catch and the overall krill fishery (ii) CM 21-03 (two-hourly catch reporting by continuous vessels) the method used to estimate the catches (holding tank krill depth) is considered appropriate but requires standardisation, in terms of an agreed protocol that is consistent across vessels and in its application on the vessel.'

- 2) Since the MSC certification was issued, Aker BioMarine has operationalised an additional vessel within the fishery. The impact of this additional vessel on krill removals by Aker BioMarine, total removals, and the increased pressure on the ecosystem needs to be assessed within the surveillance review as to whether precautionary principles are upheld and certification is still appropriate.

CAB response:

In 2018, three fishing vessels operated for AKER Biomarine: the Saga Sea, the Antarctic Sea and the recently acquired (2017) Juvel. The Juvel previously fished for another Norwegian krill-fishing company, Rimfrost (and was also MSC-certified when it fished for them, though it never operated the continuous pumping method followed by the other two Aker Biomarine vessels). Rimfrost self-suspended its MSC certification when it ceased krill fishing and sold the Juvel to Aker BioMarine. Therefore, although not part of the continuous pumping Aker BioMarine certified fishery, it still delivered catches to a company that is well aware of certification requirements and would certainly comply with CCAMLR rules in terms of MSC requirements. Although having an extra vessel operating in the 2017/18 season and subsequently might result in Aker's overall (but not MSC-certified) catches rising, this would have little influence on the certification being considered here because all krill fishing vessels operating in the Southern Ocean,

including the Juvel, only do so under a robust quota system associated with prior notifications (considered in advance following scientific advice) to CCAMLR.

The annual TAC for the SW Atlantic sector of CCAMLR is still scientifically determined to be more than 5 million tonnes, comfortably within the 60 million tonnes unexploited biomass calculated for the species. However, CCAMLR has for many years constrained catches (that are reported according to strict deadlines) within a 620 000 t 'trigger' level distributed across four of the Subareas of Area 48, the known hotspot for krill exploitation. This 'trigger' level is therefore only some 1% of the estimated the unexploited, or virgin, biomass of krill in the region. The annual catches are an even lower proportion and CCAMLR has currently decreed that expansion of the krill fishery beyond the trigger level can only take place if scientific data indicate that such catches would continue to be sustainable. <https://www.ccamlr.org/en/fisheries/krill-fisheries-and-sustainability>

Combined catch limits (trigger levels) for the 2017/2018 season in Area 48: 620000 t. Subarea 48.1, 155000 t; Subarea 48.2, 279000 t; Subarea 48.3, 279000 t; Subarea 48.4, 93000 t; Subarea 48.6, N/A; <https://www.ccamlr.org/en/fisheries/krill-fisheries>

For its management of the krill fishery, CCAMLR has always taken into account ecosystem needs when establishing catch limits for each subarea and is also working actively towards establishing smaller scale management units within each subarea to optimise this (ecosystem controlling) effort. Total catch limits (and the total annual catches of krill, even with new entrants to the krill fishery) have not changed since the Juvel changed its ownership to Aker Biomarine, so increased pressure on the ecosystem is neither anticipated nor proven.

- 3) The risk to by-catch species during Antarctic krill fishing operations needs to be established, in particular impacts on crystal krill (*Euphausia crystallophias*), as highlighted at the XXXVI Commission meeting of CCAMLR (paragraph 6.11). By-catch data collection could be made a requirement of MSC certification.

CAB response:

*Detailed information on fish bycatch reported from the krill fishery was provided in WG-FSA-16/04 using data on fish bycatch in the krill fishery from commercial catch (C1) data (95 513 hauls) and SISO data (11 875 hauls). The analysis indicated that painted rockcod (*Lepidonotothen larseni*) and spiny icefish (*Chaenodraco wilsoni*) are the most frequently reported species in both datasets. The estimated total annual mass of fish by-catch in a 300 000 t krill fishery would on the basis of these data be 370 t, 40% mackerel icefish (*Champscephalus gunnari*) and 30%*

painted rockcod (Lepidonotothen larseni).
<https://www.ccamlr.org/en/system/files/00%20KRI48%202017.pdf> (p. 9).

The UoA has always maintained 100% observer coverage on board its fishing vessels, with observer tasks specified in the Scientific Observers Manual, following the CCAMLR Scheme of International Scientific Observation. The observer's tasks are listed in Annex I of the Manual, and include, among others:

- sampling catches to determine biological characteristics,*
- recording biological data by species caught,*
- recording bycatches, their quantity and other biological data,*
- recording entanglement and incidental mortality of birds and mammals,*
- recording the procedure by which declared catch weight is measured.*

Reports submitted by CCAMLR scientific observers (who are country-independent) show catch details for all species and a summary of the biological data collected. Comprehensive information on the length, weight, sex and maturity of the fish sampled is recorded in the observer's electronic logbook. Sampling methodology is established in Part II, section 11 of the Manual, and although comprehensive, focuses on fish bycatch.

Following AKER BioMarine's first MSC certification, and in order to meet the second condition that arose then, information from observers' reports for the period 2007–2011 was submitted to MRAG for analysis of larval fish bycatch. The results of the analysis showed standardized counts of icefish, lanternfish and nototheniid individuals per tonne sampled. Together, the three groups account for ~1000 individuals per sampled tonne. As a precautionary proxy, one may consider that each larva weighs about 2 g, yielding a final weight of 2 kg of retained larvae per tonne of product brought aboard and sampled. In other words, 0.2% of the total catch other than krill may be considered as retained species.

In terms of collecting observer and bycatch data, the assessment team stress again that the UoA has maintained 100% observer coverage of its fishing operations since certification, whereas only 50% observer coverage is currently mandatory. In 2016, the Commission agreed to revise CM 51-06 to introduce a phased increase in the required observer coverage in the krill fishery to achieve a target coverage rate of no less than 50% of vessels during the 2016/17 and 2017/18 fishing seasons, no less than 75% of vessels during the 2018/19 and 2019/20 fishing seasons, and complete coverage subsequently. Therefore, the UoA observer rate is already more than currently demanded by CCAMLR.

The ASOC proposal to expand of collecting bycatch data on invertebrates, including crystal krill, must be put to CCAMLR this requirement should be lifted to CCAMLR to establish which tasks (of the many they currently have to meet) observers must prioritize. In any case, the bycatch collections carried out by

CCAMLR observers are already considered by the assessment team to be very comprehensive.

- 4) The base nature of krill fishing poses the risk of small scale local depletions impacting on krill-dependent predators such as penguins, seabirds, seals and whales. In addition to local small scale depletion risks there is also a risk of disrupting the flow of krill across CCAMLR area 48 in particular if too much is caught in one area. WWF-UK welcomes the voluntary commitment made in July 2018 by ARK (of which Aker BioMarine is a member) to avoid fishing in a number of coastal areas around the Antarctic Peninsula from the 2019 fishing season onwards to reduce competition with penguin species during the breeding season. It should be noted that the areas proposed by ARK are not the only vulnerable areas across the Antarctic krill fishery. WWF-UK believe that this new commitment should be written into the MSC certification as a condition of the certification to ensure it is enforced.

CAB response:

As WWF is aware and repeated above (see comment 2), there are different catch limits for each Area 48 fishing subareas, set in order to avoid local depletion of the stock and ensure predator needs. As WWF points out, ARK members agreed in July 2018 to voluntarily restrict fishing for krill in zones covering about 74000 km² around the Antarctic Peninsula. This initiative, which will limit krill harvesting around many of the known penguin colonies, will be implemented from 1 January 2019. Specifically, ARK companies have pledged to constrain fishing effort to at least 40 km from the coast from October to March, depending on the conservation status of colonies of Adélie, chinstrap and gentoo penguins while breeding around the Antarctic Peninsula, off South Shetland and in the Gerlache Strait. This commitment will see the seasonal closure gradually implemented into a permanent one from 2020, and catch sizes and limits will be decided after an independent review of the implementation results of scientific data collected and the potential impact on the commercial fishery. <http://www.ark-krill.org/index.cfm/7/News>

The assessment team considers that this new commitment serves to better support the scores obtained by the UoA under PI 2.5.1 and 2.5.2 (100 and 80, respectively), so the team believes that raising a new condition to certification at this stage would merely penalise the fishery for broadening and fully accepting their environmental commitments to the fishery. However, a future surveillance or assessment team will have the opportunity to follow up the success of the enforcement of this voluntary commitment at both the 4th surveillance and recertification processes, which generally run concurrently, starting in late 2019..

- 5) WWF-UK also welcomes ARKs acknowledgment of the need for a network of Antarctic Marine Protected areas. WWF-UK see this industry led announcement as a positive move toward more permanent protection of the waters surrounding Antarctica. We appreciate that a variety of research is continuing within the area to understand and minimise impacts on the ecosystem, however we believe more needs to be done to improve our understanding, particularly direct measurement of how the fishery interacts and impacts both the local and wider ecosystem.

CAB response:

The assessment team agrees that ongoing multinational research serves to foster better understanding of the Antarctic ecosystem as well as how the krill fishery impacts that and obviously that the more research undertaken and shared through the auspices of CCAMLR the better. We also note that while many scientific institutions and countries contribute to this ongoing research, Aker BioMarine's own vessels participate in it (planned through ARK) by:

- *undertaking annual transects across Subareas 48.1 and 48.2*
- *their willingness (several ARK members have allocated ships' time for the purpose) to participate in a multinational large-scale krill synoptic survey in Area 48 in 2019 as proposed by Norway (the previous fully synoptic survey is now more than 16 years ago)*
- *two ARK representatives actively participating in an e-group to discuss a proposal by Argentina and Chile for a Marine Protected Area in Domain 1 (the Antarctic Peninsula), which was presented to CCAMLR in 2017.*

Bearing in mind the massive size of the Antarctic ecosystem, the assessment team considers that such research would be better undertaken under the auspices of CCAMLR and its various research groups, with Aker BioMarine's (and ARK's) fishing vessels collaborating as required.

Please feel free to contact the undersigned should you have any question. WWF-UK looks forward to your prompt reply and will continue to provide inputs to the MSC certification of the wild capture fisheries.

Yours faithfully,

Sarah Davie
Polar Program Specialist
WWF-UK

Appendix 3 - Surveillance audit information (if necessary)

N/a.

Appendix 4 - Additional detail on conditions/ actions/ results (if necessary)

N/a.

Appendix 5 - Revised Surveillance Program (if necessary)

N/a.