DNV·GL

SURVEILLANCE NO. 2

Surveillance audit – Report for the Norway Skagerrak and Norwegian Deep cold water prawn fishery

Norges Fiskarlag

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Objective:

The objective of this report is the second surveillance audit of the Norway Skagerrak and Norwegian Deep cold water prawn fishery.

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GLOSSARY

Abbreviations & acronyms

AIS	Automated Identification System
CL	Carapace length
CPUE	Catch per unit effort
DCF	(EU) Data Collection Framework
EC	European Commission
EEZ	Exclusive Economic Zone
ETP	Endangered, threatened or protected species
EU	European Union
FAM	Fisheries Assessment Methodology
HCR	Harvest Control Rule
ICES	International Council for the Exploration of the Sea
IMR	Institute of Marine Research
LPUE	Landings Per Unit Effort
LTMS	Long Term Management Strategy
MSC	Marine Stewardship Council
MSE	Management Strategy Evaluation
NAFO	Northwest Atlantic Fisheries Organisation
NIPAG	NAFO/ICES Pandalus Assessment Group
OSPAR	Oslo and Paris Commission for the protection and conservation of the North-East Atlantic and its Resources
PI	Performance Indicator
RTC	Real Time Closure
SG	Scoring Guidepost
SLU	Swedish University of Agricultural Sciences
SSB	Spawning stock biomass
TAC	Total Allowable Catch
VME	Vulnerable Marine Ecosystems
VMS	Vessel Monitoring System
WWF	World Wide Fund for Nature

Stock assessment reference points

B_{lim}	Minimum biomass below which recruitment is expected to be impaired or the stock dynamics are unknown.

B_{msy}	Biomass corresponding to the maximum sustainable yield (biological reference point); the peak value on a domed yield-per-recruit curve.
B_{pa}	Precautionary biomass below which SSB should not be allowed to fall to safeguard it against falling to Blim.
$B_{trigger}$	Value of spawning stock biomass (SSB) that triggers a specific management action.
F	Instantaneous rate of fishing mortality.
F_{lim}	Fishing mortality rate that is expected to be associated with stock 'collapse' if maintained over a longer time (precautionary reference point).
F_{msy}	F giving maximum sustainable yield (biological reference point).
F_{pa}	Precautionary buffer to avoid that true fishing mortality is at Flim when the perceived fishing mortality is at Fpa.
K	Carrying Capacity
MSY	Maximum Sustainable Yield
PA	Precautionary Approach

1 GENERAL INFORMATION

Table 1 General information

<table>
<tr><td>Fishery name</td><td colspan="3">Norway Skagerrak and Norwegian Deep cold water prawn fishery</td></tr>
<tr><td>Unit(s) of Assessment (UoA)</td><td colspan="3">
<table>
<tr><td>Species:</td><td>Northern shrimp, cold water prawn (Pandalus borealis)</td></tr>
<tr><td>Stock:</td><td>Northern shrimp in Skagerrak and Norwegian Deep</td></tr>
<tr><td>Geographical area:</td><td>ICES Divisions IIIa West and IVa East (Skagerrak and Norwegian Deep) in Norwegian and EU waters.</td></tr>
<tr><td>Harvest method:</td><td>Bottom trawl</td></tr>
<tr><td>Management:</td><td>The stock is managed according to EU-Norway agreement, Norwegian national management systems and advised by ICES.</td></tr>
<tr><td>Client group:</td><td>All fishing operators targeting Northern shrimp (Pandalus borealis) in the ICES Divisions IIIa West and IVa East (Skagerrak and Norwegian Deep) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.</td></tr>
<tr><td>Other eligible fishers:</td><td>No other eligible fishers have been identified</td></tr>
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</td></tr>
<tr><td>Date certified</td><td>14 June 2016</td><td>Date of expiry</td><td>13 June 2021</td></tr>
<tr><td>Surveillance level and type</td><td colspan="3">Surveillance level 6 (surveillance level 2 or more (normal surveillance) according to v. 1.3)

On-site surveillance</td></tr>
<tr><td>Date of surveillance audit</td><td colspan="3"></td></tr>
<tr><td rowspan="5">Surveillance stage</td><td>1st Surveillance</td><td colspan="2"></td></tr>
<tr><td>2nd Surveillance</td><td colspan="2">x</td></tr>
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<tr><td>Other (expedited etc)</td><td colspan="2"></td></tr>
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This report contains the findings of the second annual MSC Fisheries surveillance audit conducted for the Norway Skagerrak and Norwegian Deep cold water prawn fishery during 12-13 November 2018.

The purpose of this annual Surveillance Report is:

1. To establish and report on any material changes to the circumstances and practices affecting the original complying assessment of the fishery;
2. To monitor the progress made to comply with any Conditions raised and described in the Public Certification Report of 14.06.2016 and in the corresponding Action Plan drawn up by the client;
3. To monitor any actions taken in response to any Recommendations made in the Public Report;
4. To re-score any Performance Indicators (PI) where practice or circumstances have materially changed during the intervening year, focusing on those PIs that form the basis of Conditions raised.

The primary focus of this surveillance report is to review the changes occurred since the previous year. For a complete picture of the fishery, this report should be read in conjunction with the Public Certification Report available for download at www.msc.org.

2 BACKGROUND

2.1 Stock Status

The shrimp fishery in the Norwegian Deep and Skagerrak has been exploited by Norwegian and Swedish vessels since the end of the 19th century and by Danish vessels since the 1930s. The fishery expanded in the 1960s and by 1970 landings had reached 5,000 tonnes. In 1981 landings exceeded 10,000 tonnes after which landings fluctuated but steadily increased to a peak of around 16,000 tonnes in 2004 (Figure 1, Table 2). Total catches, estimated as the sum of landings and discards, decreased from 2008 to 2012, most likely due to poor recruitment, but are now showing signs of increasing particularly in the light of the 2014 recruitment index which is the highest level of recruitment in the recent time series (NAFO/ICES, 2017). In 2017 total catches were more than 12,400 tonnes. Landings and estimated total catches by Norwegian vessels are shown in Table 2.

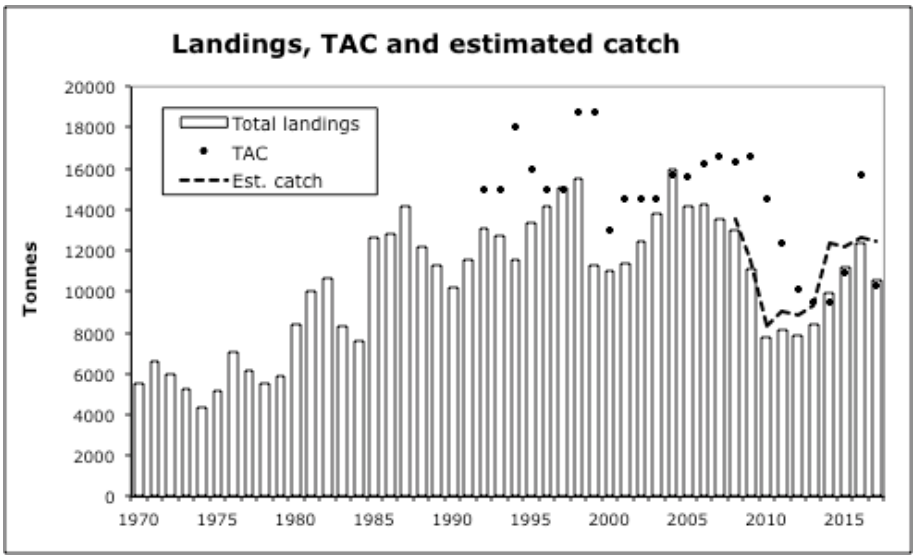

Figure 1. Northern shrimp in Skagerrak and Norwegian Deep: Total landings by all fleets, total catch including discards from 2008 to 2017, and TAC (source: NAFO/ICES, 2017).

Table 2. Northern shrimp in the Skagerrak and Norwegian Deep: TACs, landings and estimated discards and catches in tonnes (source: NAFO/ICES, 2018).

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016[1]	2017
Advised TAC[2]	15000	15000	13000	8800	*	5800	6000	10900	13721	10316
Agreed TAC	16300	16600	14558	12380	10115	9500	9500	10900	15696	10316
Denmark landings	2274	2224	1301	1601	1454	2026	2432	2709	1997	2173
Norway landings	8261	6362	4673	4800	4852	5179	6123	6808	8305	6778
Sweden landings	2479	2483	1781	1768	1521	1191	1397	1644	2095	1634
Total landings	13014	11069	7755	8169	7827	8396	9952	11161	12397	10585
Est. Swedish discards	540	337	386	504	671	265	572	325	87	99
Est. Norw. Discards		94	133	247	292	459	1289	476	162	1549
Est. Danish discards		36	53	123	88	185	526	204	35	206
Total catch	13554	11536	8327	9043	8878	9305	12339	12166	12681	12439

[1]Advised and agreed TACs from October 2015 were changed in March 2016 following the benchmark assessment.
[2]From 2014 TAC advice has been given for catches

The Norwegian and Danish shrimp fleets have changed significantly over the last 25 years. In Norway the shrimp fleet has declined by more than 50% from 423 vessels in 1995 to 214 vessels in 2017, with more than half of the large vessels using twin trawls (NAFO/ICES, 2018). Unstandardised catch rates (landings per unit effort, LPUE) from the Norwegian shrimp fishery are significantly higher for twin trawls than single trawls (Søvik and Thangstad, 2014b). In Denmark vessel numbers have decreased from 138 in 1987 to only 8 in 2018 (Sofie Smedegaard Mathiesen, DFPO, pers. comm.). The Swedish shrimp fleet (defined as those vessels that catch more than 10 tonnes of shrimp per year) has decreased from more than 60 vessels in 1995-1997 to below 40 vessels in 2011-2017 and the percentage of landings from twin trawlers has increased from 7% to over 50% since 2006 (NAFO/ICES, 2018).

Shrimp landed in the Skagerrak and Norwegian Deep fishery are separated into high value large shrimp boiled on board and smaller low value shrimp landed raw to the industry for further processing. In 2013 in the Norwegian fleet 43% of the landings were boiled shrimp and 57% raw fresh shrimp (Søvik and Thangstad, 2014b). Shrimp lose weight when boiled, and the fraction of the landings consisting of boiled shrimp is corrected using a conversion factor of 1.13 to obtain an estimate of fresh weight caught (Søvik and Thangstad, 2014b). In the Danish fleet, the majority of landings are of fresh raw shrimp, although the proportion of the landings that are boiled has been increasing in recent years (Sofie Smedegaard Mathiesen, DFPO, pers. comm.). In comparison the ratio of boiled to raw shrimp in the Swedish fishery has remained at 1:1 over the last few years (Ulmestrand *et al*., 2016).

Discarding of shrimp in the Skagerrak and Norwegian Deep may occur because the shrimp are smaller than the commercial size of 15 mm carapace length (CL) or through high-grading which is the practice of discarding small to medium size low value shrimp and replacing with larger, higher value shrimp. High-grading is most likely to occur in fisheries where the TAC is restricting the activity of the fleet, which has been the case recently in the Swedish fishery, but recent changes by Swedish Agency for Marine and Water Management (SwAM) in the quota allocation system has helped to ensure that quotas are not restrictive. In addition new markets have been developed for the smaller shrimps, reducing the incentive to discard. In Denmark, catches have consistently been under the Danish TAC, and so there is no need for Danish vessels to undertake high-grading. In Norway the landings (corrected for boiling) over the period 2006 to 2013 varied between 54% and 97% of the Norwegian TAC (Søvik and Thangstad, 2014b) which would suggest that the TAC was not previously overly-restrictive of the activity of the fleet. However from time to time within-year landings have reached the 4-monthly TAC and the Directorate of Fisheries has had to close

the fishery, suggesting that there is potentially some incentive to high-grade in the Norwegian fishery. Although high-grading may occur within the Norwegian fleet, it has not been observed regularly (Modulf Overvik, Directorate of Fisheries, pers. comm.) In 2017 and 2018, The TAC for the Norwegian fleet has included a carry-over of 10% of the TAC from the previous year suggesting that additional quota may have been required in 2017 and 2018 to meet the fleet capacity.

The stock assessment takes into account discard rates and since 2014 ICES has provided advice on total catches including discards. Since last year's surveillance audit, there has been a significant change in the way that discard rates are estimated for the Norwegian fleet which has resulted in the estimate of total catch exceeding the TAC in 2017. There has been no change to the procedure for estimating discard rates in the Danish and Swedish fleets where observer sampling of total catch composition has been carried out by both Danish and Swedish scientists under the European Commission's Data Collection Framework (DCF). Discard rates in the Danish fleet based on observer data were estimated at between 2 and 8% of the total catch in 2008-2013, then increased to 18% in 2014, but declined back down to 7% in 2015, and was only 2% in 2016 (ICES, 2017a) primarily due to the development of markets for even the smallest shrimps. Discard rates increased to 9% in 2017 in Denmark, but this increase was due primarily to one unusual trip by a vessel which resulted in high numbers of discards and the low number of samples within the fishery in 2017, and discard rates in 2018 in the Danish fleet are expected to decline once again (Ole Ritzau Eigaard, DTU Aqua, pers. comm.). The discard rate in the Swedish fleet was between 12 and 31% from 2008-2014, declined to 17% in 2015, and was only 4% and 6% on Swedish vessels in 2016 and 2017 respectively (NAFO/ICES, 2017), primarily due to the use of large mesh nets in Sweden.

There are no observer data for the Norwegian fleet, so Norwegian discards in the Skagerrak have previously been estimated by applying the Danish discards to landings ratio to Norwegian landings, and in the Norwegian Deep where no observer data are available, discarded shrimp have been assumed to be primarily shrimp under 15 mm CL and have been estimated from length distributions of the catch. In 2017 IMR in Norway estimated discards by comparing length-frequency distributions of on-board samples of unsorted catches with landings samples. The results were surprising in that the Norwegian discard rate was estimated at 19% which resulted in an overall discard rate of 15% in the fishery, and inevitably casts doubts on the assumed discard rates in the Norwegian fleet in previous years (2% and 7% in 2015 and 2016 respectively). Comparison of the size distribution of the catch with landings samples suggests that the discarding may be due to high-grading as opposed to discarding of the very small shrimps, and examination of the raw vs. boiled components of the catch with those from landings also suggests that some high-grading may occur (Guldborg Søvik, IMR, pers. comm.). However industry representatives expressed concerns that the sampling may not be representative suggesting that the majority of samples were taken from vessels which catch large numbers of small shrimps, and that with the TACs not being overly-restrictive and a market for all sizes of shrimps, there is no incentive for Norwegian vessels to high-grade. IMR will continue to estimate discard rates and investigate any uncertainties underlying the estimates (Guldborg Søvik, IMR, pers. comm.).

The shrimp stock in the Skagerrak and Norwegian Deep area is assessed annually by the joint NAFO/ICES *Pandalus* Assessment Group (NIPAG). There have been major changes in the assessment methodology over the last two years and since the original certification report (DNV GL, 2016). An ICES benchmark in 2011 and 2013 evaluated two assessment models - a stochastic length-based assessment model (Neilson *et al*., 2015) and a Bayesian surplus production model

(Hvingel, 2014). The preferred model was the analytical length-based model but because of various inconsistencies in the fitting of the model, the advice for 2014 and 2015 was based on the surplus production model. The surplus production model was the methodology used at the time of the original certification. The 2015 stock assessment concluded that the time series of relative biomass estimated from the model showed that the stock biomass had been above MSY $B_{trigger}$ since the early 1990s and the median estimate of fishing mortality had remained below F_{MSY} since the early 1990s (ICES, 2015). The model predicted that fishing at F_{MSY} implied catches of no more than 21,500 tonnes in 2016 and the risk of stock biomass falling below B_{lim} and $B_{trigger}$ was 0% if such an exploitation rate was maintained (ICES, 2015).

Following the 2015 stock assessment and the consequent ICES advice for 2016 based on that assessment, ICES convened a new benchmark (ICES, 2016a) focused on exploring two alternative length-based models: one of them had already been presented at the previous inter-benchmark process for this stock (see above discussion), whereas the other one, implemented in Stock Synthesis (SS3), was developed for the benchmark. The fits to the data were better for the model implemented in SS3, particularly for the survey length–frequency distributions, which are a very important source of information to determine the strength of the incoming age-1 group. The model developed in SS3 has internally a quarterly time-step and the selection pattern of the fishery is modelled as length-based. This allows the shrimp to be increasingly selected by the fishery as they grow through the year, which is particularly relevant to age-1 shrimp and appears to be a determining factor in achieving good model performance, in comparison with the alternative length-based model.

The benchmark agreed to use the length-based model developed in Stock Synthesis for the assessment of this *Pandalus* stock because it provides the better fit to the data of the two length-based models considered and this type of model is able to deal with the variable stock dynamics. Retrospective analysis and sensitivities were explored and considered acceptable and strengthened confidence in the approach. Reference points were computed at the benchmark in January 2016 based on the definition of the *Pandalus* stock as being a medium-lived species. Under the MSY framework, ICES uses two reference points for providing advice, F_{MSY} and MSY $B_{trigger}$, and B_{lim} and B_{pa} are also used under the ICES Precautionary Approach (Table 3).

Table 3. Northern shrimp in Skagerrak and Norwegian Deep: Reference points computed at the 2016 benchmark. (Source: ICES, 2016a).

	TYPE	VALUE	TECHNICAL BASIS
MSY Approach	MSY $B_{trigger}$	9900 t	5th percentile of equilibrium distribution of SSB when fishing at F_{MSY}, constrained to be no less than B_{pa}
	F_{MSY}	0.62	F that maximises median equilibrium yield (defining yield as the total catch)
Precautionary Approach	B_{lim}	6300 t	B_{loss} (lowest observed SSB)
	B_{pa}	9900 t	$B_{lim} * \exp(1.645 * \sigma)$, where $\sigma = 0.27$
	F_{lim}	1.00	F that leads to 50% probability of SSB < B_{lim}
	F_{pa}	0.68	$F_{lim} * \exp(-1.645 * \sigma)$, where $\sigma = 0.23$

The quarterly length-based analytical assessment model, implemented in Stock Synthesis (SS3) has now been used for three annual assessments based on stock surveys in early 2016, 2017 and 2018 and fishery data from 2015-2017. The trajectories of biomass and fishing mortality up to 2016 estimated by the new length-based model (Figure 2) were similar to those from the stock production model with biomass declining between 2008 and 2012 and then showing an increase

until 2016. However the reference points for the length-based model had been revised such that the evaluation of stock status in relation to reference points was much less favourable than the stock status evaluated from the stock production model. Since 2016, the estimates of stock biomass have declined below $MSYB_{trigger}$, and F has been above F_{MSY} since 2011 except for 2015 (Figure 2) (NAFO/ICES, 2017, updated in 2018). Based on an estimated total catch in 2017 of 12,439 tonnes and an estimated recruitment of 7270 million, the length-based model estimates stock biomass to be 7844 tonnes at the beginning of 2018, and F was estimated at 0.74 in 2017, which is above F_{MSY} for this fishery.

As stock biomass had fallen below $MSYB_{trigger}$ (9900 tonnes), ICES advice for 2018 is based upon rebuilding the stock back above $MSYB_{trigger}$ by reducing the fishing mortality below F_{MSY} as follows:

$F = F_{MSY} \times (SSB_{2018}/MSYB_{trigger})$

where SSB_{2018} is the estimated spawning stock biomass in 2018.

Using this correction factor for fishing mortality, ICES advised that when the MSY approach is applied, catches in 2018 should be no more than 8,571 tonnes (ICES, 2018a). A total catch of 8,571 tonnes represents a reduction in TAC from 2017 to 2018 of 16.9%. The main reasons for the reduction in the advice is that the catches in 2017, particularly the discards, were higher than assumed in the 2017 assessment and because SSB_{2018} is below MSY $B_{trigger}$ (ICES, 2018a). The decline in SSB below $MSYB_{trigger}$ may have been caused by setting TACs too high in previous years based upon the advice using the previous assessment methodology which may have been overestimating stock biomass. In addition the discard rate in the Norwegian fleet may have been higher in the past than previously assumed during annual stock assessments.

Setting the TAC for 2018 based upon a reduced F below F_{MSY} should result in an increase in stock biomass of 18.4% resulting in a predicted stock biomass of 9291 tonnes on 1 January 2019, which is moving back towards MSYBtrigger of 9900 tonnes. However it should be noted that the EU-Norway consultations set the TAC for 2018 at 8900 tonnes, which is 3.5% higher than advised by ICES (see section 2.3 for further details). The predicted stock biomass on 1 January 2019 will be lower than that given in the ICES advice.

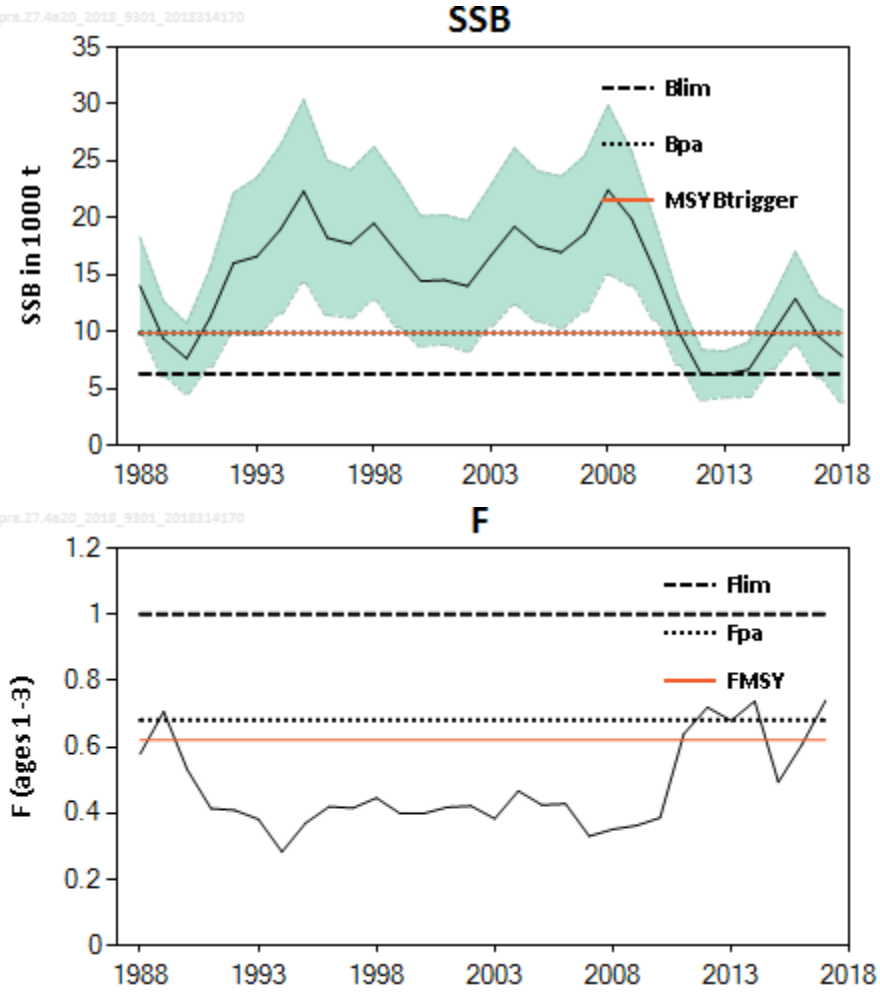

Figure 2. Northern shrimp in Skagerrak and Norwegian Deep: 2018 stock assessment output - estimates of biomass (SSB) and fishing mortality (F). SSB is depicted with 90% confidence intervals. (Source: ICES, 2018a).

At last year's surveillance audit in April 2017, the audit team concluded that it was necessary to re-score PI 1.1.1 because the estimated stock biomass had fallen below MSYBtrigger. The audit team concluded that the stock was not at or fluctuating around its target reference point and therefore the fishery no longer met the SG80 for scoring issue b. As PI 1.1.1 then scored less than 80, this triggered the scoring of PI 1.1.3 Stock Rebuilding. Since last year's surveillance audit, the stock has now declined again (ICES, 2018a) and it is now necessary to re-evaluate the scoring for scoring issue a for PI 1.1.1 (stock status relative to recruitment impairment). Recent Guidance on the MSC Interpretations Page for scoring stock status for ICES stocks states that the SG80 is met for PI 1.1.1a when the stock is estimated above 1/2 of the distance between B_{lim} and B_{pa} (identical to MSY $B_{trigger}$). In the March 2018 stock assessment, the model estimated that stock biomass would be 7844 tonnes at the beginning of 2018 (ICES, 2018a). As B_{lim} and MSY $B_{trigger}$ are defined as 6,300 and 9,900 tonnes respectively, the midpoint of these two stock levels is 8,100 tonnes. The March 2018 stock estimate is therefore below the point ½ way between the two reference points and therefore PI 1.1.1a would need to be re-scored at 60. However ICES has issued new advice in November 2018 (ICES, 2018b) based upon re-running the stock assessment

model with updated catch data for the first two quarters of 2018, and assuming that the catch for 2018 will be equivalent to the agreed EU/Norway quota of 8900 tonnes plus an additional 612 tonnes banked by Norway from 2017, giving a total estimated catch for 2018 of 9512 tonnes. This would correspond to a fishing mortality for 2018 of 0.56, which is significantly below F_{MSY}, and provides an estimate of stock biomass on 1 January 2019 of 8685 tonnes (ICES, 2018b). This revised estimate of stock biomass on 1 January 2019 is above the ½ way point between the two reference points (B_{lim} and MSY $B_{trigger}$) and therefore PI 1.1.1a can continue to be scored at 80.

At the 1st surveillance audit in 2017, a full re-evaluation of the fishery against PI 1.1.1 and the scoring of PI 1.1.3 was presented. No further revisions to these scores are required at this 2nd surveillance audit.

2.2 Impact on the ecosystem

Shrimp trawlers use an otter trawl net, which is held open by trawl doors. An increasing number of Norwegian vessels use twin trawls and in 2011-2014 twin trawls were used by more than half of the trawlers larger than 15m (Søvik and Thangstad, 2014b). Twin trawls use a clump in the middle to keep the net near the bottom. The weight of the doors is between 0.5 and 1.0 tonnes and the weight of the clump is around 1.0 to 2.0 tonnes. The ground rope is prevented from making contact with the sea bottom primarily by plastic bobbins of 20 cm in diameter.

The minimum mesh size in this fishery is 35 mm, although many vessels voluntarily use a 40 to 45 mm mesh size in order to avoid catching very small shrimp. Shrimp fishing occurs throughout the year in depths of 100 to 500 m. Most vessels fish both within and outside the 4nm Norwegian baseline.

The standard trawl may have significant by-catch other than *Pandalus borealis*, and all vessels in the UoC use a Nordmore selective grid incorporated into the standard trawl to target shrimps providing a relatively clean catch of shrimp with very little by-catch. The Nordmore grid has a bar spacing of 19mm which excludes the capture of fish that are approximately 20 mm or more and has been shown to reduce by-catch significantly. Under the EU–Norway agreement, the selective grid is mandatory for all vessels in the Skagerrak, except within 4nm of the Norwegian coastline. In January 2015, the mandatory use of a sorting grid was extended to cover the fishery in the Norwegian Deep, although many Norwegian vessels were already using the grid in this area and inside the 4nm baseline. If vessels have a fish quota, then within the grid trawl they are permitted to use a fish retention device or "tunnel", a 120mm square mesh tunnel at the grid's fish outlet. The tunnel retains larger commercial fish but may also prevent the escape of non-commercial species.

Data provided by the Directorate of Fisheries show that landings in the Norwegian shrimp fishery from 2016 to 2018 comprised of 82% to 85% shrimp and 15% to 18% other bycatch species. In each year around 50 bycatch species were recorded of which the most common species landed were saithe and cod as in previous years. Other significant species landed (>10 tonnes per annum) were monkfish, ling, pollock, hake, haddock, Norway pout, crayfish, witch flounder, halibut and skates.

Whilst there is a prohibition on discarding in Norway and therefore all bycatch species should be landed, discarding of bycatch species still occurs in the Norwegian shrimp fleet. In the absence of an observer programme in Norway, information on total catch composition from the Danish and

Swedish vessels fishing in both the Skagerrak and Norwegian Deep provides an estimate of the amount of bycatch species taken by the Norwegian fishery in the trawls with grid and trawls with grid and tunnel, but there is a lack of information on the bycatch of small inshore Norwegian vessels fishing within the 4nm baseline where a grid is not mandatory because there are no comparable data for Danish and Swedish vessels in this area. During the original assessment (DNV GL, 2016), a condition was raised because there was no information on bycatches from Norwegian vessels fishing inside the 4nm baseline using a trawl without a grid, because the catch composition would be expected to be different from those vessels fishing outside 4nm where the use of a grid is mandatory. At the first surveillance audit in 2017, the Client and stakeholders reported that it was very difficult to obtain reliable data because most Norwegian vessels fish both within and outside the 4nm baseline and therefore use a grid at all times and because those smaller vessels which fish without a grid are likely to change their discarding practices when observers are on board.

At this 2nd surveillance audit, the Directorate of Fisheries provided information on the total landings of shrimp and other species from different size categories of shrimp vessels, i.e. <10m, 10-12m and >12m. Those vessels <10m would be expected to fish a greater proportion of their time within the 4nm baseline and therefore may have a different catch composition to the larger vessels. The data showed that the smaller vessels had a higher proportion of shrimps in their total catch than the larger vessels, suggesting that bycatches including discarded individuals may be relatively low in the trawls without a grid, but this may be simply because the larger vessels were more likely to use a tunnel over the grid to target commercial species. The data relate only to landings and not total size compositions and without a dedicated observer programme on the smaller vessels fishing inside the 4nm without a grid, reliable information on total catch composition cannot be obtained. However as from 1 January 2019, the use of a grid will be mandatory on all Norwegian vessels irrespective of whether they are fishing inside or outside the 4nm baseline, and therefore there will no longer by a requirement to obtain data on total catch compositions from vessels fishing without a grid.

Bottom trawl gears are known to impact on habitat structure and function, and areas with biotic habitats generated by aggregations or colonial growth of single species are particularly vulnerable. Maerl and seagrass beds are also considered to be vulnerable to the effects of trawling gears. The shrimp trawl used in the Norwegian fishery is relatively light in comparison with other trawls and is therefore expected to impact significantly less on habitat features. VMS data of the shrimp fleet demonstrates that most of the fishing activity is confined to soft seabed sediments such as mud and sandy mud in the Skagerrak. There are a number of Natura 2000 sites designated in the Skagerrak in particular the Skagens Glen and the Bratten, and the OSPAR Commission lists a number of sensitive habitats that can be found in the Skagerrak. These include coral gardens, deep sea sponge aggregations, Zostera beds, Lophelia pertusa reefs and seapen and burrowing megafauna communities but shrimp trawling is unlikely to occur in the more complex habitats because the Norwegian shrimp vessels will actively avoid any area where the gear might become entangled.

The distribution of fishing activity of Norwegian shrimp vessels as described by VMS data and knowledge of the activity of small coastal vessels confirms that the key Natura 2000 site in which Norwegian shrimp trawling occurs is the Bratten. There is also some fishing activity in the Skagens Gren area, but Norwegian vessels do not fish in the inshore areas of Koster and Varedofjorden and Gullmarsfjorden. VMS data provided by the Directorate of Fisheries for 2014 to 2017 (Figures 3 to 6) and comparison with data from 2011 to 2013 show that there has been no

significant change to fishing grounds in recent years. The Client undertook a survey of fishermen in 2018 which showed that there had been no reports of any catches of either corals or sponges in recent years in established fishing areas. As such, regulation J-128-2011 (requiring that catches of more than 30 kg corals or 400 kg of sponges must be reported and move-on rules apply) had not been triggered, and this was confirmed by the Directorate of Fisheries. Only 20% of fishermen reported fishing in 'new' areas outside established fishing grounds and these new fishing positions normally constituted less than 5% of fishing activity. Only one fisherman reported catching any corals in new fishing areas, and there were no reports of catches of sponges in new areas.

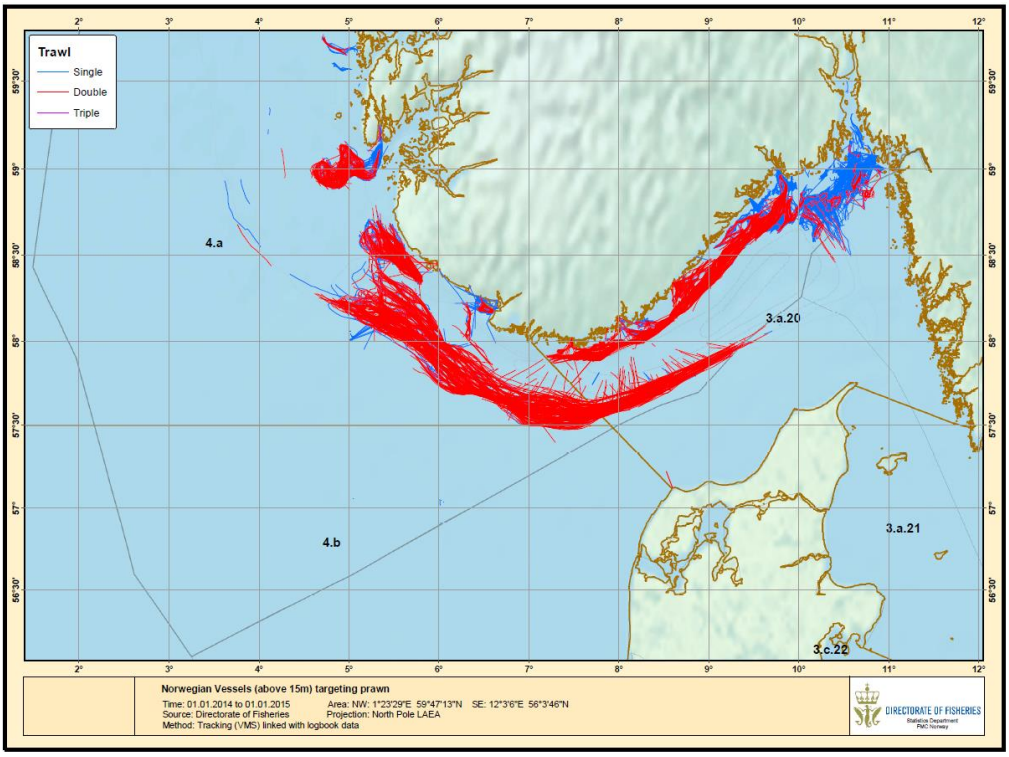

Figure 3. Fishing activity of Norwegian shrimp vessels in 2014 based upon VMS data linked with log book data. Red, blue and purple lines represent single, twin and triple trawls respectively. (Source: Directorate of Fisheries)

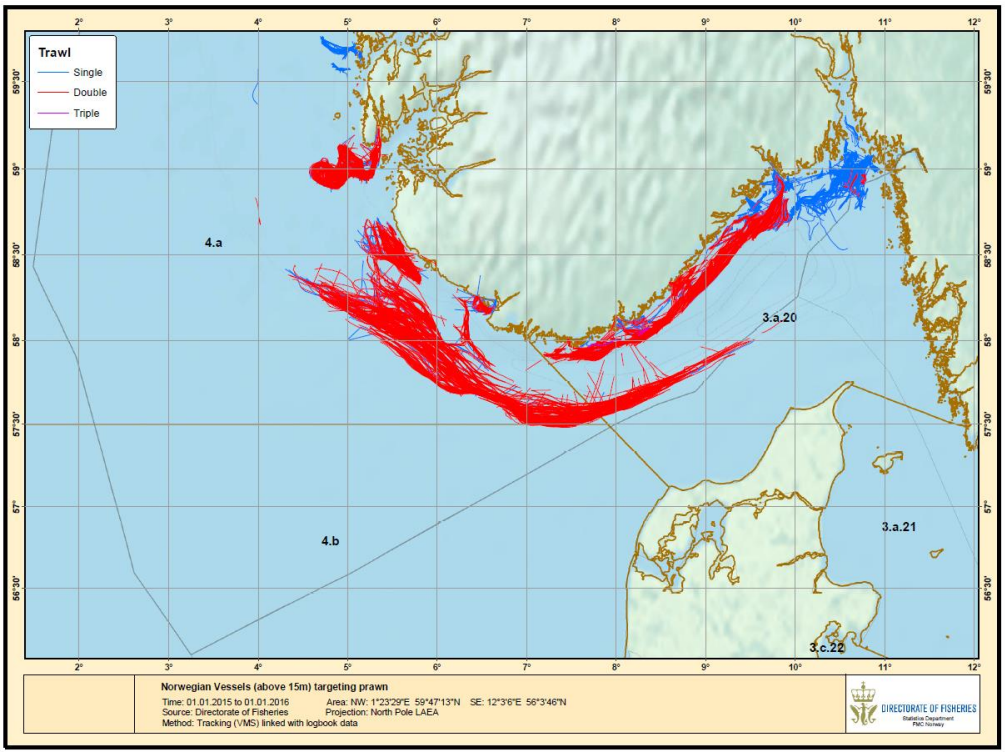

Figure 4. Fishing activity of Norwegian shrimp vessels in 2015 based upon VMS data linked with log book data. Red, blue and purple lines represent single, twin and triple trawls respectively. (Source: Directorate of Fisheries)

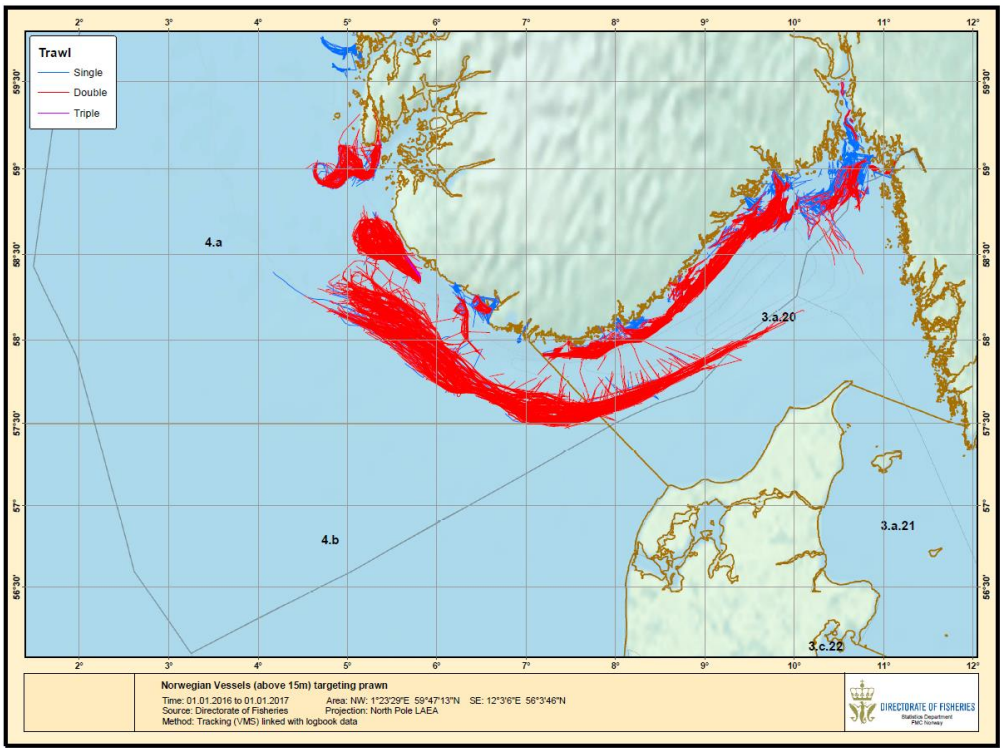

Figure 5. Fishing activity of Norwegian shrimp vessels in 2016 based upon VMS data linked with log book data. Red, blue and purple lines represent single, twin and triple trawls respectively. (Source: Directorate of Fisheries)

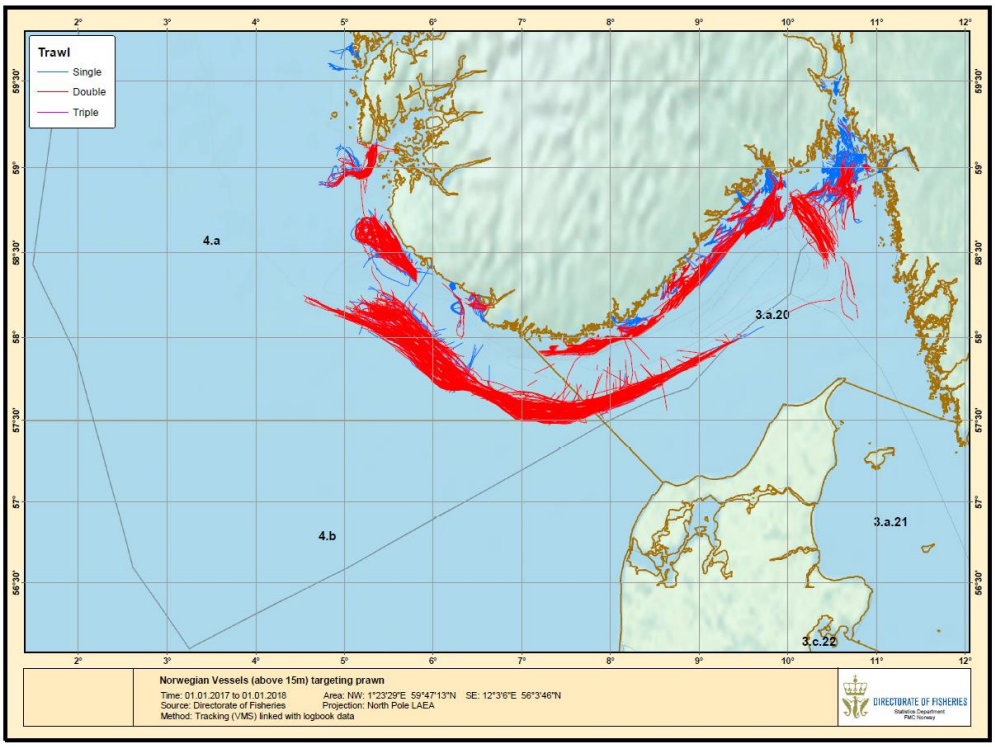

Figure 6. Fishing activity of Norwegian shrimp vessels in 2017 based upon VMS data linked with log book data. Red, blue and purple lines represent single, twin and triple trawls respectively. (Source: Directorate of Fisheries)

Whilst there are a number of measures in place to protect vulnerable habitats from shrimp trawling, the original certification report (DNV GL, 2016) identified deficiencies in the regulations which resulted in the raising of conditions. Full protection for horn corals and deep sea sponge aggregations was not yet in place in the Bratten, there was a lack of implementation of specific management measures to restrict fishing activity in many of the protected areas, and there was no mechanism for recording interactions between fishing gear and VME habitats.

In September 2016 the European Commission adopted the recommendations developed by the Swedish regional governmental body Västra Götaland, which was later negotiated with Denmark and Germany regarding fishing regulations in the Bratten Natura 2000 site. As a result of this regulation, 27% of the area will be protected and within that area all fishing gears will be prohibited. This will be controlled through mandatory use of AIS which clearly indicates the location of the fishing. These measures (EU-COM delegated regulation (C(2016) 5549 final)) were adopted by the Commission on the 5th of September 2016 and were implemented in early 2017. VMS data from all national fleets provides evidence that no shrimp fishing activity now occurs in areas of Bratten closed to protect corals and sponges.

2.3 Changes to the management system

The fishery has been managed primarily through a TAC since 1992. Since 2013, TACs have been modified annually based on stock estimates from firstly a stock production model and, since 2016, a length-based stock assessment model. The TAC is shared amongst the three countries based on historical landings with Norway, Denmark and Sweden receiving 58-60%, 26-28% and 14% respectively in 2011-2017. The Norwegian annual quota is then sub-divided into three four-month

periods January-April, May-August and September–December with 40%, 30% and 30% respectively of the total annual quota. This allows supply to the market to be controlled and the Norwegian Directorate of Fisheries can close the fishery during any of these 4-monthly periods if the quota is reached. In addition to the overall quota within these 4-monthly periods, in 2014 vessels are allocated an individual in the three 4-monthly periods. Until 2018 there has been no formally agreed harvest control rule (HCR) for this fishery, but the TAC has been implicitly modified in response to the annual stock assessments undertaken by NIPAG.

ICES advice has been set within the MSY framework since 2014. In recent years TACs have been changed in line with declining stock biomass, but it cannot be concluded that TACs have always been set fully in line with ICES advice in the past. However since 2015, the EU/Norway consultations have set TACs in line with ICES advice, although in October 2015, ICES advice was that catches in 2016 should be no more than 21,500 tonnes implying landings of no more than 18,598 tonnes (ICES, 2015), but the EU-Norway consultations set the 2016 TAC at a lower level than that advised by ICES. However the ICES benchmark on *Pandalus* in March 2016 (ICES, 2016a) produced an updated assessment of the stock based on a new assessment model, and consequently provided revised advice that catches in 2016 should be no more than 13,721 tonnes, implying landings of no more than 11,869 tonnes. As this revised TAC advice was produced during the fishing season, EU countries and Norway met to discuss the new ICES advice on reduced catch limits, and as the TAC for 2016 had already been set lower than the ICES advice, the EU and Norway consequently reduced the TAC for 2016 by 10%. There were discrepancies identified within the Norwegian stock survey in 2016, and as a result the 2016 assessment of the shrimp stock by NIPAG was not accepted by ICES. With no new ICES advice for 2017, the EU-Norway consultations agreed to set an interim TAC of 10,000 tonnes for 2017 including 3,000 tonnes for Division IVa. This interim TAC would be applied on a pro-rata basis to cover the first four months of the year in the case of Norway and the first six months of the year in the case of EU countries. The assessment team concluded that as far as was possible during this period of uncertain stock status, TACs were being set in line with ICES advice. An updated stock assessment was carried out in early 2017 following the 2017 Norwegian stock survey, following which ICES issued new advice that catches in 2017 should be no more than 10,316 tonnes (ICES, 2017a). The EU/Norway Commission set the TAC for 2017 in line with the new ICES advice (EU/Norway, 2017a). The TAC for Norway was set at 6126 tonnes, but Norway also activated a carry forward of 10% of the 2016 quota of 930 tonnes resulting in an overall Norwegian quota of 7056 tonnes. Following minor updates to the stock assessment in October 2017, ICES advised that when the MSY approach is applied, catches in 2018 should be no more than 10,475 tonnes. The EU/Norway Commission set the TAC for 2018 in line with the new ICES advice (EU/Norway, 2017b), but noted that this would be an interim TAC which would be revised following the updated stock assessment based on the 2018 stock survey, and the subsequent ICES advice for this stock. The ICES advice would be in accordance with the Norwegian discard ban and the EU landings obligation which will be implemented for *Pandalus* in 2018.

Following the 2018 stock survey, new ICES advice was issued in March 2018 which stated that when the MSY approach is applied, catches in 2018 should be no more than 8,571 tonnes (ICES, 2018). However EU/Norway consultations in April 2018 (EU/Norway, 2018) set the TAC at 8,900 tonnes which is 3.8% higher than the TAC advised by ICES, and represents a 15% reduction in TAC in comparison with the 16.9% reduction advised by ICES. Although the agreed quota was above that advised by ICES, it should be noted that the ICES advice was based upon a fishing mortality below F_{MSY} because the current SSB is below $MSYB_{trigger}$, and the agreed quota is still

below that based upon fishing at F_{MSY} and could therefore still be considered as precautionary. The Norwegian allocation of the overall quota for 2018 was set at 5239 tonnes and Norway activated a carry forward of 10% of the 2017 quota of 612 tonnes resulting in an overall Norwegian quota of 5851 tonnes.

ICES issued new advice in November 2018 (ICES, 2018b) based upon re-running the stock assessment model with updated catch data for the first two quarters of 2018, and assuming that the catch for 2018 will be equivalent to the agreed EU/Norway quota of 8900 tonnes plus the additional 612 tonnes banked by Norway from 2017, giving a total estimated catch for 2018 of 9512 tonnes. Based on the newly-adopted Long Term Management Strategy (see below), ICES advises that catches for the first two quarters of 2019 should be no more than 4608 tonnes (ICES, 2018b). (The advised TAC for the first two quarters of year N is based on multiplying the full TAC from the short term forecast for year N with the average proportion of quarterly catches ([Q1+Q2]/[Q1+Q2+Q3+Q4]) from the previous 5 years.)

In summary there have been a number of changes with the way in which TAC advice is given by ICES. Previously assessments in September/October were based on stock surveys undertaken in January/February and then TAC advice was given for the following year. In effect this meant that TACs were based on stock surveys that had been carried out a full year previously. For 2017 and 2018 an interim TAC was set as normal at the end of the previous year, but this was then updated following the annual stock survey at the beginning of the TAC year. For 2019, ICES was requested to provide advice in October/November 2018 that covers the first two quarters of 2019 and is based on the Long Term Management Strategy. ICES will then be requested to update the stock assessment following the stock survey in January/February 2019 and subsequently provide updated advice on catches for the whole of 2019. There are however no plans at present for the EU/Norway consultations to change the quota year from the calendar year of January-December.

In addition to the TAC, management measures include restricted entry licensing, a minimum mesh size of 35mm (although most vessels voluntarily use a larger mesh size to reduce the catch of undersized shrimp), restrictions in the amount of landed by-catch and the mandatory use of a grid with a maximum bar spacing of 19mm in the fishery in both the Skagerrak and Norwegian Deep outside the Norwegian 4nm boundary. In January 2019, the mandatory use of a sorting grid will be extended to cover the fishery inside the Norwegian 4nm baseline. In Norway there is also a minimum landing size of 6.5 cm total length (recently reduced from 7cm), maximum bycatch limits, and a regulation that requires that any interactions between fishing gear and corals and sponges (above specified limits) must be recorded and "move-on" rules apply.

As described in last year's surveillance audit report, the EU and Norway have been requesting ICES advice on various elements of a management plan including harvest control rules, interannual TAC flexibility, taking account of uncertainty in discard rates and changes in TAC year (ICES 2016b, ICES 2017b), the result of which is an agreement between Norway and EU on a Long Term Management Strategy (LTMS) which will come into effect on 1 January 2019. The management strategy is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of F_{TARGET} and MSYBtrigger that provides the highest yield without exceeding the 5% probability level of the biomass falling below Blim over a 30 year period. ICES undertook evaluations based on different levels of risk criteria, but eventually EU/Norway chose to accept the standard risk criteria adopted by ICES in such evaluations. The agreed management strategy is set out below.

LONG TERM MANAGEMENT STRATEGY FOR NORTHERN SHRIMP (*Pandalus borealis*) IN DIVISIONS 3.A AND 4.A EAST (SKAGERRAK AND KATTEGAT AND NORTHERN NORTH SEA IN THE NORWEGIAN DEEP)

The Parties agree to implement a Long Term Management Strategy (LTMS) for the Northern shrimp in the Northern North Sea (Norwegian Deep) and in the Skagerrak.
The objective of this LTMS is to provide for sustainable fisheries with high and sustainable yields in conformity with the precautionary approach.
For the purpose of this Long Term Management Strategy, the following definitions shall apply:

- "SSB" means the estimate according to ICES of the Spawning Stock Biomass at the beginning of the TAC year.
- $B_{TRIGGER}$ is the value of spawning stock biomass (SSB) that triggers a specific management action.
- F_{TARGET} is the fishing mortality to be included in the algorithm for pre-agreed management actions as a function of variables related to the status of the stock.

Values for $B_{TRIGGER}$ and F_{TARGET} are fixed in the light of the latest available ICES advice, at levels of 9 900 t and 0.59 respectively. The TAC will be established for each calendar year (from January 1st to December 31st).

- By end of the year N-1, a preliminary TAC will be adopted by the Parties based on ICES catch forecast for the six first months of the year N, released in March of year N-1.
- The Parties will establish the final TAC for the entire year N in light of the ICES stock advice released in March of year N.

When establishing the preliminary and the final TACs he following rules shall apply:

- a. When the SSB at the start of the year is estimated at or above $B_{TRIGGER}$ the Parties will fix a TAC consistent with a fishing mortality rate of F_{TARGET}.
- b. When the SSB at the start of the year is estimated below $B_{TRIGGER}$, the Parties will fix a TAC consistent with a fishing mortality rate of F_{TARGET} x (SSB/$B_{TRIGGER}$).

The TAC will include all removals made from the stock.
When SSB is estimated to be at or above $B_{TRIGGER}$, the TAC derived from paragraph (a) can be deviated with up to 10 % according to the "banking and borrowing" scheme described in Annex III to this Agreed Record.
This LTMS will be applicable from 1st of January 2019 onwards.

This management strategy shall be revised by the end of 2021 or following the next ICES benchmark of the stock.

It should be noted that the LTMS differs slightly from the current ICES advice on setting of TACs in that ICES uses a value for F_{MSY} of 0.62 (ICES, 2018b), whereas the LTMS agreed by EU and Norway considers an F_{TARGET} of 0.59. This discrepancy can be explained by the fact that the ICES simulations evaluated the best combination of F_{TARGET} and $MSYB_{trigger}$ producing the highest yield over a 30 year period, but including the option of being able to bank or borrow 10% of quota from one year to the next. Addition of the banking/borrowing option requires that the F_{TARGET} should be reduced in order for the probability of the SSB falling below Blim not to increase above 5% in any 30-year period.

Following the agreement on the LTMS which essentially formalises current ICES advice, the audit team concluded that the condition on harvest control rules could be closed (see progress in relation to Condition 1). However it appears that fishing mortality in recent years has regularly exceeded F_{MSY} suggesting that TACs have been set too high in many recent years, which has contributed to declining stock biomass in the last two years. In addition, discard rates in the Norwegian fleet, and consequently total removals may have been underestimated in recent years. The audit team also noted that in 2017 and 2018 Norway has included within its TAC a carry-over of 10% of its previous year's allocation of the TAC, despite the fact that overall TACs have been exceeded in some recent years, and that such carry-overs of "unused" quotas from previous years are not permitted under the LTMS when the SSB is below $MSYB_{trigger}$, as is the current estimate of SSB. The audit team concluded that there was no longer sufficient evidence to conclude that the harvest strategy was working and therefore the fishery no longer meets the SG80 for PI 1.2.1b, and therefore a new condition was raised. (See re-scoring tables and the new conditions in Appendices 1 and 2.)

New legislation has been implemented for the shrimp fishery in addition to the legislation closing areas of the Bratten to trawling and extending the mandatory use of the grid to the area within the 4nm Norwegian baseline. In January 2016, Norway introduced a system of real–time closures (RTCs) in the Pandalus fishery. If the catch consists of more than 15 % undersized shrimp, that area is closed for 14 days and if the catch consists of more than 10 % undersized shrimp the vessel must move to another area. Under this system, the Norwegian Directorate of Fisheries has closed areas for shrimp fishing on a number of occasions in 2016 to 2017 in the Norwegian economic zone south of 62 ° N. See the following link to the Directorate of Fisheries website where these closures are announced – https://www.fiskeridir.no/Yrkesfiske/Regelverk-og-reguleringer/Stängning-og-aping

A system of RTCs that cover all national fleets has now been agreed at a meeting of the EU/Norway consultations in September 2018. Action is triggered if the proportion of shrimps below 6.5mm total length (14.8 mm carapace length (CL)) exceeds 20%, and is determined by the national state. In Norway this is expected to be action recommended by the Coastguard and then implemented by the Directorate of Fisheries. A localised area of the fishery will be closed if the proportion of small shrimps exceeds the threshold. The area of the closure will depend on localised geographic features but will not exceed 50 nm^2. The area will be closed to fishing for 14 days to vessels from all national fleets but there will be an exemption for those fishing with size-selective gear which includes a sorting grid with a maximum bar spacing of 19mm in the upper part of the grid and a minimum bar spacing of 9.5mm in the lower part of the grid which allows escape of the smallest shrimps. The new legislation will be implemented from July 2019.

The Directorate of Fisheries has put forward proposals to extend the use of electronic log books to all vessels in the shrimp fleet in order to obtain more reliable catch and effort data for all shrimp vessels. Initial dialogue suggests that this proposal will be accepted by the fishing industry.

There were a few instances of minor non-compliance in the shrimp fleet in 2017, but these relate primarily to document control or landing site and have no impact on the sustainability of the fishery.

There have been no changes to personnel or responsibilities within the Ministry of Trade, Industry and Fisheries, the Directorate of Fisheries and the Institute of Marine Research which would have a significant influence on the way in which the shrimp fishery is managed.

2.4 CoC considerations

The smart phone app that was introduced in February 2015 for smaller vessels that are not required to have electronic logbook (<12 m in Skagerrak and <15 m in Norwegian Deep) for recording and reporting catches is still in normal operation. The app gives the position only when the catch is recorded at the end of the day, not during fishing. However the traceability system, and also that these vessels do not go outside the geographical area included in the UoC, ensures that the risk for mixing of certified by non-certified catch by landing is negligible.

The fishery authorities have suggested to extend the requirement for mandatory electronic logbook system to all vessels, also the smallest vessels.

There are no changes in landing points from earlier years and the catch that is landed by foreign vessels cannot be mixed with certified catch based on the traceability system described in the Public Certification Report.

All buyers of the shrimp catch are now CoC certified.

The systems of tracking and tracing in the fishery are still considered sufficient to make sure all prawn and prawn products identified and sold as certified by the fishery originate from the certified fishery.

Norway Skagerrak cold water prawn products landed by Norwegian vessels, recorded by the Directorate of Fisheries and the sales organizations, and sold through or by approval from the sales organizations, are eligible to enter further Chain of Custody. The scope of the MSC Fishery certification is up to the point of landing and Chain of Custody commences from the point of landing and sale.

Sales organisations:

- Rogaland Fiskesalgslag
- Skagerakfisk

2.5 Catch data

Table 4 TAC and Catch Data

TAC	**Year**	2018	**Amount**	8900 t*
UoA share of TAC	**Year**	2018	**Amount**	5851 t**
UoC share of TAC	**Year**	2018	**Amount**	5851 t**
Total green weight catch by UoC	**Year (most recent)**	2017	**Amount**	6778 t***
	Year (second most recent)	2016	**Amount**	8305 t***

* TAC is based upon total catches including discards

**Norwegian share of TAC includes a carry-over of 612 t from the 2017 allocation

*** Landings recorded by ICES – corrected for loss in weight due to boiling

2.6 Summary of Assessment Conditions

Table 5 Summary of Assessment Conditions

Condition number	Performance indicator (PI)	Status	PI original score	PI revised score
1	1.2.2	Closed	65	80
2	2.2.3	Closed	75	80
3	2.4.1	Closed	75	80
4	2.4.2	Closed	75	80
5	2.4.3	On target	75	75
6 (new)	1.2.1	Newly-raised	80	70

3 THE ASSESSMENT PROCESS

3.1 Scope of the assessment

The MSC Fisheries CR and guidance v2.0 define the Unit of Certification (UoC) (i.e., the unit entitled to receive an MSC certificate) as follows:
"The target stock or stocks (= biologically distinct unit/s) combined with the fishing method/gear and practice (including vessel type/s) pursuing that stock and any fleets, groups of vessels, or individual vessels of other fishing operators."
The fisheries covered by this certification are defined as described in Table 6 below.

Table 6 UoC

Fishery name:		Norway Skagerrak and Norwegian Deep cold water prawn fishery
Unit of certification	**Species:**	Northern shrimp, cold water prawn *(Pandalus borealis).*
	Stock:	Northern shrimp in Skagerrak and Norwegian Deep
	Geographical area:	ICES Divisions IIIa West and IVa East (Skagerrak and Norwegian Deep) in Norwegian and EU waters.
	Harvest method:	Bottom trawl.
	Management:	The stock is managed according to EU-Norway agreement, Norwegian national management systems and advised by ICES.
	Client group:	All fishing operators targeting Northern shrimp (*Pandalus borealis*) in the ICES Divisions IIIa West and IVa East (Skagerrak and Norwegian Deep) using bottom trawl as harvesting method and operating under quota issued by authorities of Norway.
	Other eligible fishers:	No other eligible fishers have been identified.

As there are no other eligible fishers the UoC is the same as the UoA (Unit of Assessment).

3.2 History of the assessments

3.2.1 Summary of the original assessment

The intent of the Norway Skagerrak and Norwegian Deep cold water prawn fishery to become MSC certified was announced on 26 March 2015, and the fishery received its certification on 1 June 2016. Scope of certification is up to the point of landing and chain of custody commences from point of sale/landing.

The assessment process for the original certification followed the protocols set out in the MSC Fisheries Certification Methodology. The assessment team used the default assessment tree as defined in the MSC Fishery Certification Requirements version 1.3. The initial assessment was carried out by DNV GL project manager Sigrun Bekkevold and Principle Experts Julian Addison (Principle 1&2) and Geir Hønneland (Principle 3). Julian Addison was team leader. Around 95 stakeholders were identified and consulted during the assessment process.

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any of the individual MSC Criteria. The initial certification scores of the three Principles are provided in Table 7.

Table 7 Principle scores – Original assessment:

Principle	Score
Principle 1 – Target Species	80.6
Principle 2 – Ecosystem	80.3
Principle 3 – Management system	93.3

The fishery achieved a score of below 80 against 5 scoring indicators. The assessment team therefore set 5 conditions for continuing certification that the client is required to address. There were 4 recommendations set. Conditions are presented in full in section 4 of this annual surveillance report.

3.2.2 First annual surveillance – 2017

The first surveillance audit was performed as an on-site audit and conducted according to MSC Certification Requirements, version 2.0 dated 01 October 2014. The default assessment tree, set out in the MSC Certification Requirements, version 1.3, was used for this surveillance audit.

The surveillance was announced on the MSC website on 28 February 2017 followed by a supporting notice to stakeholders issued by the MSC on the same date. Direct email notification was also sent to the stakeholders that had previously been identified for this fishery, inviting interested parties to contact the audit team.

The surveillance visit for this fishery was conducted on 3 and 4 April 2017. Member of the original assessment team, Julian Addison, and DNV GL project manager Sigrun Bekkevold gathered input from the Ministry of Trade, Industry and Fisheries, Directorate of Fisheries, Institute of Marine Research, WWF as well as from the fishery client.

The fishery remained in conformance with the scope criteria relating to unilateral exemption and destructive fishing practices (Certification Requirements v2.0 section 7.4.) The fishery cannot be considered as an enhanced fishery as it does not meet the enhanced fisheries criteria required under the MSC CR 7.4.

The audit team re-scored PI 1.1.1 as the most recent stock assessment showed that stock biomass had fallen below MSY Btrigger and therefore it was concluded that the stock is not at or fluctuating around its target reference point and therefore the fishery no longer meets the SG80 for scoring issue b. As PI 1.1.1 now scores less than 80, this triggers the scoring of PI 1.1.3 Stock Rebuilding. With a reduction in score for PI 1.1.1 and PI 1.1.3 subsequently being scored, the overall score for Principle 1 was recalculated, although in fact the original score remained unchanged (Table 8).

Table 8 Principle scores following first surveillance audit:

Principle	Score
Principle 1 – Target Species	80.6
Principle 2 – Ecosystem	80.3
Principle 3 – Management System	93.3

3.2.3 Second annual surveillance – 2018

The second surveillance audit was performed as an on-site audit and conducted according to MSC Certification Requirements, version 2.0 dated 01 October 2014. The default assessment tree, set out in the MSC Certification Requirements, version 1.3, was used for this surveillance audit.

The surveillance was announced on the MSC website on 5 October 2018 followed by a supporting notice to stakeholders issued by the MSC on the same date. Direct email notification was also sent to the stakeholders that had previously been identified for this fishery, inviting interested parties to contact the audit team.

The surveillance visit for this fishery was conducted on 12 and 13 November 2018 in Oslo and Bergen. Member of the original assessment team, Julian Addison, and DNV GL project manager Sigrun Bekkevold gathered input from the Ministry of Trade, Industry and Fisheries, Directorate of Fisheries, Institute of Marine Research as well as from the fishery client. A meeting was planned with WWF but was cancelled because of illness.

A list of participants and issues discussed in the surveillance meetings are shown in Table 9.

Table 9. List of participants and issues discussed

Date	Name and affiliation	Key issues
12.11.2018	**Client group** • Jan Birger Jørgensen, Norges Fiskarlag • Erlend Grimsrud, Norges Fiskarlag • Kjell-Arild Tøfte, Skagerakfisk • Jan Bredsand, Skagerakfisk	1. Review of basic info about the company: • Changes in ownership or organisational structure • Roles and responsibilities in the MSC Fishery certification process • Updated vessel/certificate member list 2. Review of fishing operations: • Changes in fishing season, allocation of fishing days, fishing areas and gear used (specifications) • Changes in recording of catch and effort data 3. Review of impact on ecosystem: • List of all by-catch of fish species (species and quantities 3 preceding years) • List of by-catch of marine mammals, birds, ETP species (species and quantities) • Changes in recording of bycatch of fish and shellfish species, marine mammals, ETP species and birds • Changes in discarding practices • Change of protected habitats • Natura 200 sites • Changes in the overlap of the fishery with sensitive habitats and closed areas 4. Compliance with rules and regulations • Change in control, surveillance and monitoring routines • Disputes with national/ international authorities during 2016/2017/2018. • Records of sanctions and penalties (if any) for 2016/2017/2018. 5. Chain of Custody start. Changes in: • Traceability system on board and at landing • Labelling of products/changes in

		labelling of products • Landing sites • First point of landing • First point of sale • Main products/change in product range • Main markets 6. Review of progress against conditions and recommendations <u>Progress against conditions and recommendations:</u> Condition 1 - Harvest Control Rules Condition 2 – Information on By-catch Condition 3 – Harm to habitat structure Condition 4 – Strategy in place regarding risk of harm to habitat structure Condition 5 - Information to determine the risk posed to habitat types Recommendations 1-4
12.11.2018	**The Norwegian Ministry for Trade, Industry and Fisheries** • Geir Ervik, Ministry • Martine Werring-Westly. Ministry • Jan Birger Jørgensen, Norges Fiskarlag	• Function, role and responsibility • Changes in harvest strategy for the shrimp fisheries, including regulations limiting fishing effort and harvest control rules • Changes in short-term and long-term management objectives for the shrimp fisheries • Changes in consultation and decision-making process for the stocks of the shrimp fisheries • Changes in mechanisms for resolution of legal disputes • Changes in regulations for the shrimp fisheries in the relevant geographical area • Changes in control, surveillance and monitoring routines/regulations applied to the shrimp fisheries in the relevant geographical area • Changes in level of slipping/discards • Changes in strategy for minimising or eliminating ETP by-catch • Changes in strategy and plans for protection of sensitive habitats • Fishermen's compliance with laws and regulations. • Significant discrepancies found at landing control for the shrimp fisheries in the last year • Catch data for the most recent fishing season • Changes in observed fishing pattern (gear used, fishing area, number of boats, fishing season) • Updated VMS data for the shrimp fisheries Changes in research strategy or

		programmes for the shrimp fishery
13.11.2018	**Directorate of Fisheries and IMR** • Modulf Overvik (DoF) • Guldborg Søvik (IMR)	**Management** • Function, role and responsibility • Changes in harvest strategy for the fisheries, including regulations limiting fishing effort and harvest control rules • Changes in short-term and long-term management objectives for the fisheries • Changes in consultation and decision-making process • Changes in mechanisms for resolution of legal disputes • Changes in regulations for the fisheries in the relevant geographical area • Changes in control, surveillance and monitoring routines/regulations applied to the fisheries in the relevant geographical area • Changes in strategy for minimising or eliminating ETP by-catch • Changes in strategy and plans for protection of sensitive habitats • Fishermen's compliance with laws and regulations. • Significant discrepancies found at landing control for the fisheries in the last year • Updated VMS data for the fisheries **Research** • Changes in sampling programmes/level of sampling and surveys including observer programmes • Integration of national data collection programmes and stock assessments with ICES assessments. • Changes in stock status, stock structure and recruitment • Catch data for the most recent fishing season • Changes in monitoring programmes for bycatch, discard, and ETP species • Changes in level of slipping/discards • Changes in impact of the fishery on marine habitats and the ecosystem. • Changes in research strategy or programmes for the fishery

The fishery remains in conformance with the scope criteria relating to unilateral exemption and destructive fishing practices (Certification Requirements v2.0 section 7.4.) The fishery cannot be considered as an enhanced fishery as it does not meet the enhanced fisheries criteria required under the MSC CR 7.4.

The audit team concluded that the harvest strategy had not been working in recent years and therefore the fishery no longer met the SG80 for PI 1.2.1b, and a new condition was raised against PI 1.2.1. However the audit team concluded that the conditions on PIs 1.2.2, 2.2.3, 2.4.1 and 2.4.2 had now been met and these PIs could now be scored at 80. A full re-evaluation of the fishery against PIs 1.2.1, 1.2.2, 2.2.3, 2.4.1 and 2.4.2 and the new conditions on PI 1.2.1 can be found in Appendix 1. Following the various changes, the overall scores for Principles 1 and 2 were recalculated (Table 10).

Table 10 Principle scores following second surveillance audit:

Principle	Score
Principle 1 – Target Species	81.3
Principle 2 – Ecosystem	81.0
Principle 3 – Management System	93.3

3.3 Harmonisation

The Swedish cold water prawn fishery was the first cold water prawn fishery in the Skagerrak, Kattegat and Norwegian Deep to undergo MSC assessment. Subsequently both the Danish and Norwegian cold water prawn fisheries entered the MSC full-assessment process. All fisheries contracted DNV GL to conduct these assessments which strongly facilitated the harmonisation process. Complementary assessment trees were used, information was shared and conclusions with respect to evaluation, scoring and conditions were consistent as is required under CI3.2.3.2. Annual surveillance audits are also harmonised across the three fisheries, although the surveillance audits are held at different times of the year, and so scores for PI 1.1.1 may differ across fisheries if annual stock assessments show significant changes in stock status from year to year.

4 RESULTS

Table 11 Condition 1

Performance Indicator(s) & Score(s)	**Insert relevant PI number(s)**	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
	1.2.2 There are well defined and effective harvest control rules in place	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. The selection of the harvest control rules takes into account the main uncertainties.	**65**
Condition	By the fourth annual surveillance, well defined harvest control rules (HCRs) shall be implemented for the shrimp stock to ensure that the exploitation rates are reduced as limit reference points are approached. The HCRs should take into account the uncertainties underlying the assessment of stock status and the uncertainties in estimates of discard rates		
Milestones	**Annual surveillance 1**: Show written evidence of consultation with relevant authorities and stakeholder groups in relation to options for HCRs. **Annual surveillance 2:** Provide an evaluation of options considered for potential HCRs **Annual surveillance 3**: Propose HCR to relevant authorities **Annual surveillance 4**: Implementation of HCR through consultation with relevant authorities.		
Client action plan	**Action 1.1** NFA will engage with the IMR and Ministry of Trade, Industry and Fisheries (hereby referred to as "the Ministry") to evaluate the current status and progress towards implementing a HCR in the fishery. **Action 1.2** In year 2 NFA will provide an evaluation of options for potential HCRs **Action 1.3** In year 3 NFA will propose the HCR to relevant authorities. As the Danish and Swedish components of the fishery are also certified under the same condition, NFA will liaise with these counterparts in evaluating and proposing a HCR **Action 1.4** In year four, NFA will cooperate with stakeholders and management authorities and urge them to implement HCRs.		
Progress on Condition [Year 1]	Discussions on a management plan for shrimp in the Skagerrak and Norwegian Deep have been ongoing within the Fisheries Consultations between the EU and Norway on the regulation of fisheries in Skagerrak and Kattegat since 2014. In 2016 Norway requested advice from ICES on a management strategy including a TAC determined by an explicit harvest control rule, in-year revisions of the TAC based on the January stock survey, inter-annual quota flexibility, and the sensitivity of TAC calculations to uncertainty about discard rates of both small non-marketable shrimps and		

	medium size shrimps through high-grading. The management strategy contained the following two elements: 1. The Parties shall set a TAC for Northern shrimp within the range of fishing mortalities that is consistent with fishing at maximum sustainable yield provided that this is forecast to result in a biomass equal to or greater than Bpa at the end of the TAC year. 2. Where fishing at Fmsy would result in a biomass that is forecasted to be less than Bpa, the Parties agree that the lower and upper bounds of the fishing mortality range referred to in paragraph 1 are reduced linearly to zero. ICES used simulation software to evaluate the proposed harvest control rule (HCR) and advised that the HCR would be precautionary if the target fishing mortality is set at 0.52 or lower, and that F is linearly reduced to zero at stock levels below the MSYBtrigger of 9900 tonnes. These calculations are based on long term average recruitment levels, but lower recruitment levels have been observed from 2008-2014, and if such lower levels of recruitment persist, then a lower target F of 0.32 would be required for the HCR to be precautionary. The evaluation showed that the performance of the HCR was not influenced by including inter-annual quota flexibility. ICES did not however evaluate the effect of in-year revisions of the quota or varying discarding levels. The ICES advice was published in October 2016. The audit team concluded that the Client had provided written evidence of consultation with relevant authorities and stakeholder groups in relation to options for HCRs including taking into account uncertainties underlying the assessment of stock status. The Year 1 milestone had therefore been met for this condition.
Status of condition	On target
Progress on Condition [Year 2]	As described in last year's surveillance audit report, the EU and Norway have been requesting ICES advice on various elements of a management plan including harvest control rules, interannual TAC flexibility, taking account of uncertainty in discard rates and changes in TAC year (ICES 2016c, ICES 2017b), the result of which is an agreement between Norway and EU on a Long Term Management Strategy (LTMS) which will come into effect on 1 January 2019. The management strategy is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of F_{TARGET} and MSYBtrigger that provides the highest yield without exceeding the 5% probability level of the biomass falling below Blim over a 30 year period. ICES undertook evaluations based on different levels of risk criteria, but eventually EU/Norway chose to accept the standard risk criteria adopted by ICES in such evaluations. The agreed management strategy is set out below.
	LONG TERM MANAGEMENT STRATEGY FOR NORTHERN SHRIMP (*Pandalus borealis*) IN DIVISIONS 3.A AND 4.A EAST (SKAGERRAK AND KATTEGAT AND NORTHERN NORTH SEA IN THE NORWEGIAN DEEP) The Parties agree to implement a Long Term Management Strategy (LTMS) for the Northern shrimp in the Northern North Sea (Norwegian Deep) and in the Skagerrak. The objective of this LTMS is to provide for sustainable fisheries with high and sustainable yields in conformity with the precautionary approach. For the purpose of this Long Term Management Strategy, the following definitions shall apply: ✦ "SSB" means the estimate according to ICES of the Spawning Stock

	Biomass at the beginning of the TAC year. ✦ $B_{TRIGGER}$ is the value of spawning stock biomass (SSB) that triggers a specific management action. ✦ F_{TARGET} is the fishing mortality to be included in the algorithm for pre-agreed management actions as a function of variables related to the status of the stock. Values for $B_{TRIGGER}$ and F_{TARGET} are fixed in the light of the latest available ICES advice, at levels of 9 900 t and 0.59 respectively. The TAC will be established for each calendar year (from January 1st to December 31st). ✦ By end of the year N-1, a preliminary TAC will be adopted by the Parties based on ICES catch forecast for the six first months of the year N, released in March of year N-1. ✦ The Parties will establish the final TAC for the entire year N in light of the ICES stock advice released in March of year N. When establishing the preliminary and the final TACs he following rules shall apply: • a. When the SSB at the start of the year is estimated at or above $B_{TRIGGER}$ the Parties will fix a TAC consistent with a fishing mortality rate of F_{TARGET} . • b. When the SSB at the start of the year is estimated below $B_{TRIGGER}$, the Parties will fix a TAC consistent with a fishing mortality rate of F_{TARGET} x (SSB/$B_{TRIGGER}$). The TAC will include all removals made from the stock. When SSB is estimated to be at or above $B_{TRIGGER}$, the TAC derived from paragraph (a) can be deviated with up to 10 % according to the "banking and borrowing" scheme described in Annex III to this Agreed Record. This LTMS will be applicable from 1st of January 2019 onwards. This management strategy shall be revised by the end of 2021 or following the next ICES benchmark of the stock.
	The LTMS differs slightly from the current ICES advice on setting of TACs in that ICES uses a value for Fmsy of 0.62 (ICES, 2018a) whereas the LTMS agreed by EU and Norway considers an F_{TARGET} of 0.59. This discrepancy can be explained by the fact that the ICES simulations evaluated the best combination of F_{TARGET} and MSYBtrigger producing the highest yield over a 30 year period, but including the option of being able to bank or borrow 10% of quota from one year to the next. Addition of the banking/borrowing option requires that the F_{TARGET} should be reduced in order for the probability of the SSB falling below Blim not to increase above 5% in any 30-year period. Following from the agreement of the new LTMS, the audit team concluded that there was a well-defined HCR in place, and that as the HCR is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of fishing mortality and MSY $B_{trigger}$ that provides

	the highest yield without exceeding the 5% probability level of the biomass falling below B_{lim} over a 30 year period, and that discard rates are taken into account, the selection of the harvest control rules takes into account the main uncertainties. The condition can therefore be closed.
Status of condition	Closed

Table 12 Condition 2

Performance Indicator(s) & Score(s)	**Insert relevant PI number(s)**	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
	2.2.3 Information on the nature and the amount of bycatch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage bycatch.	Sufficient data continue to be collected to detect any increase in risk to main bycatch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the strategy).	**75**
Condition	By the third annual surveillance, provide evidence of the level of discarding in inshore areas for vessels which do not use a grid, and implement appropriate measures to provide better evidence of the level of discarding.		
Milestones	**Annual surveillance 1**: Provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. **Annual surveillance 2:** Continue to provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. Consider appropriate measures to provide better evidence of the level of discarding. **Annual surveillance 3:** Continue to provide evidence of the level of discarding in inshore areas for vessels which do not use a grid. Implement appropriate measures to provide better evidence of the level of discarding.		
Client action plan	**Action 2.1** NFA will enter dialogue with IMR and the Directorate of Fisheries to summarize the current knowledge basis of discard levels in inshore areas, and determine what can be done to improve the data. **Action 2.2** Depending on the outcome of 2.1, NFA will in SA 2-3 propose taking the identified necessary steps to fill in any knowledge gaps concerning the level of discards for vessels that do not use a grid.		
Progress on Condition [Year 1]	There is no observer programme in Norway as in theory discarding is prohibited, but there is undoubtedly some discarding of small shrimp occurring in Norway. ICES estimates Norwegian discards in the Skagerrak by applying the Danish discards to landings ratio to Norwegian landings, and in the Norwegian Deep where no observer data are available, discarded shrimp are assumed to be primarily shrimp under 15 mm CL and are estimated from length distributions of the catch. Norwegian vessels are permitted to fish inside the 4nm baseline using a trawl without a grid, so the catch composition would be expected to be different from those vessels outside 4nm where the use of a grid is mandatory. There are no comparable data from Danish or Swedish vessels from the same area which would provide an estimate of discards in the coastal Norwegian fishery, so a condition was raised to obtain information on the catch composition from this sector of the fleet.		

	At the surveillance audit the Client did not provide any discard data from the coastal fleet, but provided information that the lack of discard data from vessels which are not required to use a grid may not be a problem in the future. On 1 April 2017 new legislation was introduced which prohibits the sorting of the catch on board except for one initial sort which will separate out the largest shrimps to be boiled on board. No sorting of the remaining catch is permitted, so that in theory no discarding can take place, although it is not clear what impact this new legislation will have on non-target species. There have also been a series of multi-agency initiatives to improve the selectivity of the gear aimed at reducing discarding of both small shrimps and non-target species. Most importantly the Client reported that around 60% of all vessels that fish inside the 4nm baseline now use a grid voluntarily, and meetings during the site visit confirmed that there is now support across the management agencies, scientific institutes, fishing industry and WWF for the introduction as soon as possible of mandatory use of the grid within the 4nm baseline.
Status of condition	Whilst there was support from across the range of stakeholders for the mandatory use of the grid within the 4nm baseline which will obviate the need for this condition, the legislation has yet to be introduced. The Client did not provide any data on the level of discarding from vessels fishing inside 4nm without a grid and so the audit team considered that the condition was behind target.
Progress on Condition [Year 2]	At this 2nd surveillance audit, the Client and stakeholders reiterated that it was very difficult to obtain reliable data because most Norwegian vessels fish both within and outside the 4nm baseline and therefore use a grid at all times, and because those smaller vessels which fish without a grid are likely to change their discarding practices when observers are on board. There are still no observer data available from the vessels fishing within 4nm without a grid. However the Directorate of Fisheries provided information on the total landings of shrimp and other species from different size categories of shrimp vessels, i.e. <10m, 10-12m and >12m. Those vessels <10m would be expected to fish a greater proportion of their time within the 4nm baseline and therefore may have a different catch composition to the larger vessels. The data showed that the smaller vessels had a higher proportion of shrimps in their total catch than the larger vessels, suggesting that bycatches including discarded individuals may be relatively low in the trawls without a grid, but this may be simply because the larger vessels were more likely to use a tunnel over the grid to target commercial species. The data relate only to landings and not total size compositions and without a dedicated observer programme on the smaller vessels fishing inside the 4nm without a grid, reliable information on total catch composition cannot be obtained. The Ministry and Directorate of Fisheries announced that as from 1 January 2019 the use of a grid will be mandatory on all Norwegian vessels irrespective of whether they are fishing inside or outside the 4nm baseline, and therefore there will no longer by a requirement to obtain data on total catch compositions from vessels fishing without a grid. The condition can therefore be closed.
Status of condition	Closed

Table 13 Condition 3

Performance Indicator(s) & Score(s)	**Insert relevant PI number(s)**	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
	2.4.1 The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	**75**
Condition	By the third annual surveillance, provide evidence that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm.		
Milestones	**Annual surveillance 1**: Collate information for the assessment of risk that the shrimp fishery reduces coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm. Show written evidence of consultation with relevant authorities to identify mechanisms for reducing the risk if necessary. **Annual surveillance 2:** Provide evidence if necessary that the risk of impact of the shrimp fishery on coral gardens and deep sea sponge aggregations has been reduced. **Annual surveillance 3**: Provide evidence to demonstrate that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm.		
Client action plan	**Action 3.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 3.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 3.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.		
Progress on Condition [Year 1]	At the surveillance audit the Client reported that in September 2016 the European Commission adopted the recommendations developed by the Swedish regional governmental body Västra Götaland, which was later negotiated with Denmark and Germany regarding fishing regulations in the Bratten Natura 2000 site. As a result of this regulation, 27% of the area will be protected and within that area all fishing gears will be prohibited. This will be controlled through mandatory use of AIS which clearly indicates the location of the fishing. These measures (EU-COM delegated regulation (C(2016) 5549 final)) were adopted by the Commission on the 5th of September 2016 and were implemented in early 2017. With the adoption by		

	the EU Commission of the restriction on fishing in the Bratten area, the audit team considered that the work conducted had more than met the Year 1 milestone for this condition. However there may be other areas where coral gardens and sponge aggregations are vulnerable to shrimp fishing, and an evaluation of the potential impact of shrimp in those areas and, if necessary, the introduction of appropriate management measures to minimise that impact, will be required before the condition can be closed.
Status of condition	On target.
Progress on Condition [Year 2]	The new fishing regulations in Bratten were implemented on January 25, 2017 through Commission delegated regulation (EU) 2017/118 of 5 September 2016 (EU, 2017). There is continuing evidence from VMS data that Norwegian shrimp vessels do not fish in other areas where corals and sponges are found such as Koster and Varedofjorden, Gullmarsfjorden and Skagens Gren. A survey of fishermen showed that fishing activity rarely takes place outside established areas, and that when fishing has occurred in 'new' areas in recent years, interactions with sponges have not be recorded, and on one occasion only has an interaction with corals been recorded. In conjunction with other management measures, the audit team considered that following the implementation of the new EU legislation, it can be concluded that the shrimp fishery is highly unlikely to reduce coral gardens and deep sea sponge aggregations to a point where there would be serious or irreversible harm. The Year 2 and year 3 milestones have been met, and the condition can now be closed.
Status of condition	Closed

Table 14 Condition 4

Performance Indicator(s) & Score(s)	**Insert relevant PI number(s)**	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
	2.4.2 There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types.	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	**75**
Condition	By the third annual surveillance, specific management measures which minimize the impact of fishing activities on habitat within all designated protected areas should be implemented if necessary to ensure that the shrimp fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.		
Milestones	**Annual surveillance 1**: Show written evidence of consultation with relevant authorities to consider specific management measures including area closures and move-on rules to restrict fishing activity within all protected areas. **Annual surveillance 2:** Propose specific management measures to restrict fishing activity in all protected areas to relevant authorities. **Annual surveillance 3**: Implementation of specific management measures to minimize the impact of fishing activities on habitat within all designated		

	protected areas through consultation with relevant authorities.
Client action plan	**Action 4.1** NFA will liaise with the Directorate of Fisheries and Institute of Marine Research to assess the current data basis on the extent of potential harm to habitat structure in the area of operations. Through for example VMS analysis, it may be possible to quantify whether serious or irreversible harm is taking place. **Action 4.2** In the event that the evidence shows that serious or irreversible harm is taking place, NFA consult the IMR and the Directorate of Fisheries to determine what management measures can be taken to mitigate this. Cooperation with Swedish and Danish fisheries clients over regulations will also be sought. **Action 4.3** Depending on the outcome of 3.2, NFA will propose these measures, and seek to see them implemented within SA 4.
Progress on Condition [Year 1]	At the surveillance audit the Client reported that in September 2016 the European Commission adopted the recommendations developed by the Swedish regional governmental body Västra Götaland, which was later negotiated with Denmark and Germany regarding fishing regulations in the Bratten Natura 2000 site. As a result of this regulation, 27% of the area will be protected and within that area all fishing gears will be prohibited. This will be controlled through mandatory use of AIS which clearly indicates the location of the fishing. These measures (EU-COM delegated regulation (C(2016) 5549 final)) were adopted by the Commission on the 5th of September 2016 and were implemented in early 2017. With the adoption by the EU Commission of the restriction on fishing in the Bratten area, the audit team considered that the work conducted had more than met the Year 1 milestone for this condition. However there may be other areas where habitat structure is vulnerable to shrimp fishing, and an evaluation of the potential impact of shrimp in those areas and, if necessary, the introduction of appropriate management measures to minimise that impact, will be required before the condition can be closed.
Status of condition	Ahead of target
Progress on Condition [Year 2]	The new fishing regulations in Bratten were implemented on January 25, 2017 through Commission delegated regulation (EU) 2017/118 of 5 September 2016 (EU, 2017). There is continuing evidence from VMS data that Norwegian shrimp vessels do not fish in other areas where vulnerable habitats are found such as Koster and Varedofjorden, Gullmarsfjorden and Skagens Gren. A survey of fishermen showed that fishing activity rarely takes place outside established areas, and that when fishing has occurred in 'new' areas in recent years, interactions with sponges have not be recorded, and on one occasion only has an interaction with corals been recorded. The available evidence shows that it is highly unlikely that the fishery would cause serious or irreversible harm to vulnerable habitat in areas other than Bratten within which the fishery operates. In conjunction with other management measures, including the avoidance by fishermen of any areas of corals and sponges in order to protect their trawls, the audit team considered that following the implementation of the new EU legislation for the Bratten, it can be concluded that specific management measures which minimise the impact of fishing activities on habitat within all designated protected areas are now in place to ensure that the shrimp fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm. The condition can now be closed.

Status of condition	Closed

Table 15 Condition 5

Performance Indicator(s) & Score(s)	**Insert relevant PI number(s)**	**Insert relevant scoring issue/ scoring guidepost text**	**Score**
	2.4.3 Information is adequate to determine the risk posed to habitat types by the fishery and the effectiveness of the strategy to manage impacts on habitat types.	Sufficient data continue to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	**75**
Condition	By the third annual surveillance, ensure that information on interactions of fishing operations with VME habitats is collected on a continuous basis.		
Milestones	**Annual surveillance 1**: Develop and implement procedures for monitoring and recording all interactions with VME habitats in every fishing haul. Provide an analysis of collected data to determine whether significant impacts are likely. **Annual surveillance 2:** Continue to collect data on interactions between fishing operations and VME habitats and provide an analysis of collected data to determine whether significant impacts are likely. **Annual surveillance 3:** Continue to collect data on interactions between fishing operations and VME habitats, provide an analysis of collected data to determine whether significant impacts are likely, and provide evidence that procedures for monitoring, recording and analysing all interactions with VME habitats in every fishing haul have been fully implemented.		
Client action plan	**Action 5.1** NFA will engage with IMR and the Directorate of Fisheries to evaluate practice and relevance of the J-40-2016 move-on rule in the southern component of prawn fisheries, as well as other data collection on habitat impacts. **Action 5.2** In year two, NFA will propose and implement necessary measures to improve data collection on interactions with sensitive habitats. **Action 5.3** In SA 3-4 NFA will provide analysis of collected data and determine whether significant impacts are likely. Potential action arising from this information is interlinked with actions pertaining to PI 2.4.1 and 2.4.2		
Progress on Condition [Year 1]	The Client reported that they had met the Directorate of Fisheries to evaluate the move-on rule. Following discussion it was concluded that the move-on rule was largely irrelevant in the Skagerrak and Norwegian Deep fishery as shrimp fishing did not occur in areas where corals and sponges are found, and certainly not where densities are such that the threshold for moving on would be reached. In addition to the move-on rule for interaction of fishing with corals and sponges, there is a requirement to record any interactions		

	with Vulnerable Marine Ecosystems (VMEs) by recording the weight in kilograms of any corals or sponges caught in the shrimp trawls. The Client has discussed the legislation with the Directorate of Fisheries and WWF, but at the surveillance audit there was no clear agreement on the level of compliance with and enforcement of this regulation. No analysis of data on interactions was provided at the surveillance audit. The audit team concluded that discussions had taken place between the Client and relevant stakeholders, but that the first year milestone had not been met.
Status of condition	Behind target
Progress on Condition [Year 2]	At this surveillance audit, the Client reported significant progress in relation to collection of data on interactions of fishing operations with VME habitats. The Client undertook a survey of over 60 fishermen to evaluate recent interactions and potential likelihood of future interactions with corals and sponges. There were no reports of any catches of either corals or sponges in recent years in established fishing areas. As such, regulation J-128-2011 (requiring that catches of more than 30 kg corals or 400 kg of sponges must be reported and move-on rules apply) had not been triggered, and this was confirmed by the Directorate of Fisheries. Shrimp vessels do occasionally fish in 'new' areas outside the established areas, but the survey of over 60 fishermen reported no interactions with sponges and only a single report of a catch of corals. There is a requirement to record any interactions with Vulnerable Marine Ecosystems (VMEs) by recording the weight in kilograms of any corals or sponges caught in the shrimp trawls. The Directorate of Fisheries report that only two cases have been reported: 7 kg of unspecified corals in 2011 and 20 kg of unspecified corals in 2013. The Client has also met with IMR to discuss the collection of bottom habitat key species by the coastal reference fleet, and IMR has already instructed its participating boats to start collecting such information from autumn 2018. The Client has also been developing a species identification guide to be distributed to all skippers to create awareness and aid recording of VME, ETP and non-commercial bycatch species. The audit team were presented with a draft of this identification guide during the surveillance audit. In conclusion there is evidence that fishing operations only rarely interact with vulnerable habitats and there are not significant amounts of data to conduct a meaningful analysis. Whilst there is a requirement to record the weight in kilograms of any corals or sponges caught in the shrimp trawls, it is not clear that this is always done. For example, it would appear that the report from a fisherman that corals had been caught in a 'new' area does not appear to have been recorded on official log books. The audit team concluded that progress against the condition was on target but that forthcoming milestones should be revised as follows: **Annual surveillance 3:** Provide all skippers with species identification guides for the wheelhouse to ensure that VME species are correctly identified and recorded. Continue to collect data on interactions between fishing operations and VME habitats, through ensuring that skippers record all catches of VME species, and provide an analysis of collected data to determine whether significant impacts are likely. **Annual surveillance 4:** Continue to collect data on interactions between fishing operations and VME habitats, through ensuring that skippers record all catches of VME species, provide an analysis of collected data to determine whether significant impacts are likely, and provide evidence that procedures for monitoring, recording and analysing all interactions with VME habitats in every fishing haul have been fully implemented.
Status of condition	On target

Progress in relation to recommendations.

Recommendation 1. The assessment team **recommends** the client to liaise with research scientists and gear technologists in the framework of the NORDEN project. This would better ensure that the project is carried out on a practical basis in a way that fishers could easily implement any desirable technical gear modifications to significantly reduce the capture of small shrimp. The clients could also offer assistance with gear trials on their vessels.

Progress: The Client continues to liaise scientists researching gear selectivity. A project at SLU in Sweden has shown increased selectivity when using a mesh size of 47 mm instead of the standard 35 mm, the Norwegian Directorate of Fisheries has been working with Norwegian, Danish and Swedish fishermen to trial more selective gear, IMR has been evaluating trawls with a shortened lead which creates a steeper angle of the trawl, and pilot studies with a new grid that have been developed by Fiskeriföreningen Norden have also shown great promise. On 1 April 2017 new legislation was introduced in Norway which prohibits the sorting of the catch on board except for one initial sort which will separate out the largest shrimps to be boiled on board. No sorting of the remaining catch is permitted, so that in theory no discarding of small shrimps can take place. Trials have also been undertaken using a grid with the incorporation into the standard grid of a 10cm high slot at the lower end which increases retention of valuable Nephrops bycatch but does not significantly increase catches of bycatch fish species. A lower end grid may also reduce the catch of small shrimp.

Recommendation 2. The assessment team **recommends** that further research is undertaken to resolve the differences in fishing mortality generated by the length-based and surplus production assessment models.

Progress: This recommendation was closed at the first surveillance audit.

Recommendation 3. The assessment team **recommends** that the use of a sorting grid should be mandatory within the 4 nm limit.

Progress: The Ministry and Directorate of Fisheries reported that the use of a sorting grid will become mandatory within the 4nm limit on 1 January 2019. The recommendation can therefore be closed.

Recommendation 4. The assessment team **recommends** therefore that systems are put in place to ensure that all ETP species are recorded on log books irrespective of whether they are landed or discarded and that the captures of all ETP species are mapped.

Progress: The Client reported that a species identification guide has been developed and will be distributed to all skippers to create awareness and aid recording of ETP species as well as VME and non-commercial bycatch species. The audit team were presented with a draft of this identification guide during the surveillance audit.

5 CONCLUSION

The fishery continues to be within the scope of the MSC fisheries standard (MSC FCR v2.0 § 7.4) according to the following determinations (MSC FCR v2.0 § 7.4):

- The target species is a fish (crustacean) and the fishery does not use poisons or explosives;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- The client or client group does not include an entity that has been successfully prosecuted for a forced labour violation in the last 2 years;
- The fishery has mechanisms for resolving disputes and disputes do not overwhelm the fishery;
- The fishery is not enhanced or based on an introduced species.

The audit team concluded that the Norway Skagerrak and Norwegian Deep cold water prawn fishery should remain certified (Table 16).

The main findings by the surveillance team were:

- The most recent stock assessment concluded that stock biomass has continued to be below $MSYB_{trigger}$ and fishing mortality has recently exceeded F_{MSY}. The updated stock assessment and ICES advice for 2019 shows that SSB should increase by 1 January 2019 and fishing mortality should be significantly below F_{MSY} in 2018 assuming that the full TAC for 2018 is taken and not exceeded;

- EU/Norway consultations have agreed the implementation of a Long Term Management Strategy (LTMS) including a harvest control rule (HCR) as from 1 January 2019;

- Fishing strategy, fishing gears and fishing grounds are to all practical purposes unchanged compared to previous years. VMS data confirm that there is no significant overlap of shrimp fishing activity with sensitive habitats;

- The key management regulations are unchanged, although additional measures for protection of sensitive habitats have been introduced, the use of a sorting grid within the 4nm baseline will become mandatory from 1 January 2019, and new regulations regarding real time closures (RTCs) and move-on rules have been agreed by EU/Norway consultations to cover vessels from all nations;

- Control and Enforcement activities and strategies were unchanged;

- CoC conditions are unchanged;

- 4 of the original 5 conditions have now been closed, but an additional condition on PI 1.2.1 harvest strategy has been raised.

Table 16 Conclusion

Fishery	Status of certification	Comment
Norway Skagerrak and Norwegian Deep Cold Water Prawn	**Certified**	**The assessment team concludes that the MSC Certificate for this fishery shall remain active, subject to the agreed annual surveillance schedule and progress on the remaining conditions.**

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Appendix 1. Re-scoring evaluation tables

Table 17. Original Evaluation Table for PI 1.2.1

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place
	Justification	The harvest strategy for the shrimp stock in the Skagerrak and Norwegian Deep is underpinned by annual agreements between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak and Kattegat as defined by the Framework Agreement between the EU and Norway Council Regulation ((EEC) 2214/80 of 27 June 1980), and by the Common Fisheries Policy (CFP) of the European Union in accordance with the basic fisheries regulation (EC. 2371/2002). In Norway responsibility for fisheries management, legislation and policy lies with the Ministry of Trade, Industry and Fisheries. The fundamental principle for the Norwegian management of living marine resources is the principle of sustainable use based on the best available scientific advice. Implementation of the CFP at a national level is carried out through the individual Member States. The stock management objective for the whole Skagerrak and Norwegian Deep shrimp fishery is to maintain the fishery within agreed limits based on annual stock assessments. The harvest strategy includes restrictions on fishing effort through limited entry, annual quotas (TACs), technical measures for the shrimp fishery (mesh sizes, by-catch rules) as set out in EU Regulation 850/1998, a minimum landing size of 7 cm total length in Norway, a prohibition on high-grading, which is the practice of discarding small to medium size low value shrimp and replacing with larger, higher value shrimp, and the mandatory use of by-catch reduction devices. A selective grid became mandatory in all shrimp fisheries in the Skagerrak in 2013, although currently grids are not mandatory within the 4 nautical mile zone in Norwegian waters, and grids became mandatory in the North Sea area of the fishery in 2015. Most vessels fishing in the North Sea have voluntarily used grids before they became mandatory, and most Norwegian vessels use grids all the time as they fish both within and outside the 4 nm baseline. There are ongoing discussions regarding the introduction of grids within the 4nm baseline of Norwegian waters, but no regulation has yet been introduced. There are strict monitoring requirements for shrimp vessels in all the national fleets through log books and electronic recording, all larger vessels must carry VMS, and vessels must also report when they intend to enter or leave the coastal states' waters and may have to await inspection before commencing fishing or leaving a coastal state's waters. All elements of the harvest strategy work together to ensure that the exploitation rate is consistent with maintaining stock biomass at levels reflected in the target and limit reference points and that juvenile shrimps and by-catch species are afforded protection. The assessment of the status of the stock in relation to reference points ensures that the harvest strategy can be responsive to the state of the stock. TACs, levels of fishing effort and technical conservation measures can all implicitly be modified in response to changes in the state of the stock. However there is no formal management plan agreed between Norway, Sweden and Denmark within which a harvest strategy has been designed to meet the management objectives, and there is no clear statement of how the strategy is modified in response to stock changes. Norway is currently leading the development of a shrimp management plan in the Skagerrak and Norwegian Deep working alongside their EU counterparts in Denmark and Sweden and in conjunction with Norwegian scientists at IMR in Bergen. The management plan is not expected to be implemented until 2015/2016, and until then it cannot be concluded that the harvest strategy is designed to achieve stock management objectives and the SG100 is not met therefore.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
b	**Guidepost**	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	Y	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place
	Justification	The Guidelines to the MSC Certification Requirements v1.3 (GCB2.5.2) state that "… the harvest strategy shall be appropriate to achieving the management objectives expressed in the target and limit reference points" and (GCB2.5.4) that "this PI scores the overall performance of the harvest strategy, particularly the way that the different elements work together to keep the stock at levels consistent with reference points." The most recent stock assessment has concluded that despite recent declines, stock biomass has been above Btrigger throughout the history of the fishery and is likely to remain so under the current harvest strategy, and indeed is currently above Bmsy. It can be concluded therefore that the harvest strategy is achieving its objectives. In recent years TACs have often been set at levels higher than those recommended by ICES, but in practice in most years the TAC has not been taken up fully, and landings have been below the TAC advised by ICES. In 2014, landings did not exceed the TAC, but total catches including estimated discards did exceed the TAC. The agreed TAC for 2016 includes discards, and so total catches are not expected to exceed the TAC. There is a rigorous monitoring programme in place including monitoring of fishing activity through the VMS system, accurate detailed recording of landings and completion of log books and electronic reporting of catches by vessels, and all these elements appear to be working effectively. Cross checks of fishing activity recorded on the VMS system and electronic recording of catches and landings data in the various fleets did not identify any discrepancies. Vessel inspections confirm that there is compliance with management regulations. There was no evidence of high-grading occurring in the Danish fishery, although there is some evidence that high-grading does occur within the Swedish fishing fleet, and that the prohibition is not effectively enforced in Sweden, for which a condition was raised against PI 3.2.3 in the Swedish fishery assessment. In Norway quota restrictions are likely to provide an incentive for high-grading, and it is likely therefore that high-grading does occur. Although there is evidence that the harvest strategy is achieving its overall objectives, some stakeholders expressed concern about the level of discarding of small shrimps either because the shrimp are smaller than the commercial size of 15 mm CL (6cm total length) or through high-grading. There is particular concern about discarding of small shrimp in the Swedish fishery, and to a lesser extent in the Norwegian fishery, exemplified by the higher proportions of the total catch that are landed in Sweden and Norway as high value large shrimp boiled on board in comparison with similar data for the Danish fleet. Discard rates in the Danish fleet based on observer data were estimated at between 2 and 8% of the total catch in 2008-2013, but increased to 18% in 2014. In the Swedish fishery discard rates are between 12 and 31%. However the Swedish TAC is only 14% of the overall TAC, and the overall estimated discard rate by weight for the three fleets combined was 12% in 2012 and 10% in 2013 and 19% in 2014, although there is some uncertainty surrounding these estimates particularly for the Norwegian fleet. Whilst this level of discarding is not hindering the harvest strategy from achieving its overall objective, and the discard rate is taken into account by ICES when providing TAC advice, the harvest strategy could be improved by reducing the discard rate of small shrimps. In 2015 Norway has introduced new legislation including real-time closures (RTCs) when encountering areas of high densities of small shrimp (two closures have already occurred demonstrating the effectiveness of the measure), and increasing the minimum landing size to 7cm total length.. A multi-agency project, the NORDEN project, is currently researching methods of reducing the catch of small shrimps. Initial results are very encouraging; experimental fishing using a mesh size of 47mm instead of the standard 35 mm mesh shows a significant reduction in the capture of small shrimp, particularly in the "lus" (very small) category. The assessment team **recommends** the client to liaise with research scientists and gear technologists in the framework of the NORDEN project. This would better ensure that the project is carried out on a practical basis in a way that fishers could easily implement any desirable technical gear modifications to significantly reduce the capture of small shrimp. The clients could also offer assistance with gear trials on their vessels. Despite some concerns raised by stakeholders about the discarding of small shrimps noted above, the assessment team considers that the harvest strategy is achieving the overall management objectives of ensuring that the stock is maintained at levels consistent with reference points, and that the SG80 is met therefore. The harvest strategy has not been fully tested through, for example, a management strategy evaluation (MSE), and so SG100 is not met.

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		
	Justification	There is an effective monitoring system in place for all fleets including Norwegian vessels exploiting the *Pandalus* stock, incorporating VMS on the larger vessels, log books, detailed recording of landings and inspection of vessels. There is also an annual stock survey carried out by Norway which provides estimates of stock biomass, recruitment and spawning biomass. All these elements of the monitoring system contribute to an assessment of the effectiveness of the harvest strategy, and provide evidence that the harvest strategy is maintaining stocks above MSY Btrigger.		
d	**Guidepost**			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			N
	Justification	Elements of the harvest strategy may be reviewed and modified on a regular basis, but there is no formal integrated fisheries management plan with agreed periodic reviews.		
e	**Guidepost**	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		Council Regulation (EC) No. 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. MSC Certification Requirements v1.3 MSC Guidance on Certification Requirements v1.3		

PI 1.2.1	There is a robust and precautionary harvest strategy in place	
	Ulmestrand, M., Munch-Petersen, S., Søvik, G. and Eigaard, O. 2014. The Northern shrimp (*Pandalus borealis*) Stock in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa East). NAFO SCR Doc. 14/65.	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		

Table 18. New Evaluation Table for PI 1.2.1

PI 1.2.1		**There is a robust and precautionary harvest strategy in place**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The harvest strategy is expected to achieve stock management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving management objectives reflected in the target and limit reference points.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
	Met?	Y	Y	Y

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The harvest strategy for the shrimp stock in the Skagerrak and Norwegian Deep is underpinned by annual agreements between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak and Kattegat as defined by the Framework Agreement between the EU and Norway Council Regulation ((EEC) 2214/80 of 27 June 1980), and by the Common Fisheries Policy (CFP) of the European Union in accordance with the basic fisheries regulation (EC. 2371/2002). In Norway responsibility for fisheries management, legislation and policy lies with the Ministry of Trade, Industry and Fisheries. The fundamental principle for the Norwegian management of living marine resources is the principle of sustainable use based on the best available scientific advice. Implementation of the CFP at a national level is carried out through the individual Member States. The stock management objective for the whole Skagerrak and Norwegian Deep shrimp fishery is to maintain the fishery within agreed limits based on annual stock assessments. The harvest strategy includes restrictions on fishing effort through limited entry, annual quotas (TACs), technical measures for the shrimp fishery (mesh sizes, by-catch rules) as set out in EU Regulation 850/1998, a minimum landing size of 6.5 cm total length (previously 7 cm) in Norway, a prohibition on high-grading, which is the practice of discarding small to medium size low value shrimp and replacing with larger, higher value shrimp, and the mandatory use of by-catch reduction devices. A selective grid became mandatory in all shrimp fisheries in the Skagerrak and Norwegian Deep in 2013 and 2015 respectively, and will become mandatory within the 4 nautical mile zone in Norwegian waters on 1 January 2019. There are strict monitoring requirements for shrimp vessels in all the national fleets through log books and electronic recording, all larger vessels must carry VMS, and vessels must also report when they intend to enter or leave the coastal states' waters and may have to await inspection before commencing fishing or leaving a coastal state's waters. All elements of the harvest strategy work together to ensure that the exploitation rate is consistent with maintaining stock biomass at levels reflected in the target and limit reference points and that juvenile shrimps and by-catch species are afforded protection. The assessment of the status of the stock in relation to reference points ensures that the harvest strategy can be responsive to the state of the stock. TACs, levels of fishing effort and technical conservation measures can all implicitly be modified in response to changes in the state of the stock. Over the last few years, the EU and Norway have been working towards the implementation of a management plan and have on two occasions requested advice from ICES on various proposals including formal harvest control rules. These discussions and negotiations have resulted in the agreement between the EU and Norway on a Long Term Management Strategy (LTMS) for the fishery which formalises the approach taken by ICES in recent years to setting TACs within an MSY framework. SG100 is met.		
b	**Guidepost**	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	Y	N	N

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	The key element of the current harvest strategy is that annual TACs should be set in line with an MSY framework where the TAC is based on fishing at F_{MSY} when the stock biomass is above MSY $B_{trigger}$, but setting a TAC based on lower values of F when stock biomass drops below MSY $B_{trigger}$. This strategy has been in place since 2014 and was formally incorporated in the Long Term Management Strategy (LTMS) agreed by the EU and Norway in 2018. The LTMS is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of fishing mortality and MSY $B_{trigger}$ that provides the highest yield without exceeding the 5% probability level of the biomass falling below B_{lim} over a 30 year period. The harvest strategy therefore has been evaluated in theory and is therefore likely to work in practice. The SG60 is met. The most recent stock assessment has concluded that after an initial recovery period following the decline observed from 2008 to 2012, stock biomass has now declined to below MSY $B_{trigger}$. Previously TACs had not always been set in line with ICES advice, but in the last two to three years the stock has declined despite TACs being set within the MSY framework. The assessment shows that F has exceeded F_{MSY} in most recent years, and therefore it seems likely that the TAC has been set too high. This can be explained by recent changes in the stock assessment methodology. Previous stock assessments have used a stock-production model which gave a more optimistic outlook on stock status than the newly-implemented length-based model, and TACs were set in line with the best available scientific advice at the time. In addition new data on discard rates in the Norwegian fleet suggest that the overall discard rate in the fishery assumed in the assessment in recent years may have been an underestimate of the true level. Although other elements of the harvest strategy such as reducing the discarding of small non-commercial-sized prawns and reducing the incentives for high-grading appear to be working, the key element of setting the TACs within an MSY framework does not appear to have worked in the last 2-3 years, and so SG80 is not met. Following the revised assessment of stock status from the new length-based model and with new information on discard rates, the harvest strategy is expected to work in future, but the assessment team notes that the TAC set by the EU-Norway consultations for 2018 was 8,900 tonnes which is 3.8% higher than the TAC advised by ICES, and therefore the current harvest strategy is not being fully adhered to. In addition Norway has announced carry forward of 'unused' quota from 2016 to 2017 and from 2017 to 2018 despite the overall TAC being exceeded in some recent years, and SSB being below MSYBtrigger. Such 'banking' of quota will not be permitted under the LTMS if the estimate of SSB is below MSY Btrigger. The TAC for 2019 will be the first to be covered by the new LTMS, so it is expected that in future TACs will not exceed the ICES advice.		
c	**Guidepost**	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Y		

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
	Justification	There is an effective monitoring system in place for all fleets including Norwegian vessels exploiting the *Pandalus* stock, incorporating VMS on the larger vessels, log books, detailed recording of landings and inspection of vessels. There is also an annual stock survey carried out by Norway which provides estimates of stock biomass, recruitment and spawning biomass. All these elements of the monitoring system contribute to an assessment of the effectiveness of the harvest strategy, and provide evidence that the harvest strategy is maintaining stocks above MSY Btrigger.		
d	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Y
	Justification	All elements of the harvest strategy have been reviewed and modified on a regular basis e.g. mechanisms for reducing catch of small shrimps and bycatch species, methods for assessing stock status, reference points, harvest control rules, quota allocation mechanisms etc. Following detailed advice from ICES, these reviews of the harvest strategy have culminated in the adoption of the Long Term Management Strategy (LTMS) by the EU/Norway consultations in 2018. SG100 is met.		
e	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	Not relevant	Not relevant	Not relevant
	Justification			
References		Council Regulation (EC) No. 2371/2002 on the conservation and sustainable exploitation of fisheries resources under the Common Fisheries Policy.. MSC Certification Requirements v1.3 MSC Guidance on Certification Requirements v1.3 EU/Norway 2017b. Agreed record of Fisheries Consultations between Norway and the European Union on the regulation of fisheries in Skagerrak and Kattegat for 2018, Bergen, 1 December 2017. EU/Norway 2018. Agreed record of Fisheries Consultations between the European Union and Norway for 2018, Skagen, April 2018. ICES 2018a. Northern shrimp (*Pandalus borealis*) in Divisions 3a and 4a East (Skagerrak and Kattegat and northern North Sea in the Norwegian Deep). ICES advice on fishing opportunities, catch and effort 2018. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/pra.27.3a4a.pdf NAFO/ICES. 2017. NAFO/ICES *Pandalus* Assessment Group Meeting, 27		

PI 1.2.1	There is a robust and precautionary harvest strategy in place
	September to 3 October 2017. ICES CM 2017/ACOM:09. (Revised in March 2018 to incorporate 2018 assessment of the Pandalus stock in Skagerrak and Norwegian Deep.) http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/NIPAG/scs17-17%20NIPAG%20Rpt%202017.pdf Ulmestrand, M., Bergenius, M., Eigaard, O., Søvik, G. and Munch-Petersen, S. 2016. The Northern shrimp (*Pandalus borealis*) Stock in Skagerrak and the Norwegian Deep (ICES Divisions IIIa and IVa East). NAFO SCR Doc. 16/056.
OVERALL PERFORMANCE INDICATOR SCORE:	**70**
CONDITION NUMBER (if relevant):	**6**

Table 19. Original evaluation table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	N	
	Justification	Although there are no formally defined harvest control rules, the fishery is managed through a series of regulations including TACs, effort limitation and technical conservation measures, and it is generally understood that these regulations can be changed in order to reduce the exploitation rate if limit reference points are approached. In particular, TACs are reviewed annually and have been reduced significantly in recent years in response to declines in stock biomass. Whilst it is generally understood that fishery regulations can be changed in order to reduce the exploitation rate if limit reference points are approached, there are no explicit harvest control rules in place which define what management action will be invoked if the stock biomass declines to levels close to Btrigger or Blim, or if fishing mortality increases to levels close to Flim. In recent years TACs have been changed in line with declining stock biomass, but it cannot be concluded that TACs have always been set fully in line with ICES advice. In 2015, the EU/Norway consultations agreed a TAC in line with ICES advice including a provision for taking discards into account. In 2014, ICES advice was that catches of up to 14,800 tonnes in 2015 would ensure that F remained below Fmsy and stock biomass remained above Bmsy, but due to uncertainties within the assessment model and alternative model estimates of stock biomass and fishing mortality, ICES advised that total catches should be no more than 10,900 tonnes. Assuming that discard rates do not change from the average of the last three years, this implies landings of no more than 9,777 tonnes. At the meeting in December 2014 between the EU and Norway on the regulation of fisheries in the North Sea and the Skagerrak, the Norwegian and EU delegations accepted the ICES advice and set a TAC of 10,900 tonnes. The TAC represents landings and not total catch, so the TAC was set at a slightly higher level than the ICES advice. In 2013, ICES advice was that there were some uncertainties in the assessment process and that catches in 2014 should not therefore exceed 6000 tonnes. The Norwegian and EU delegations took note of the ICES advice, but agreed to a rollover of the 2013 TAC of 9500 tonnes. Whilst a TAC of 9500 tonnes would still have been consistent with managing the stock within an MSY Framework, the TAC decision in 2014 exemplifies the lack of a well-defined harvest control rule which links ICES advice based on the most recent stock assessment with changes in TAC. Whilst it is generally understood that the TAC is modified in relation to changes in stock biomass and therefore the fishery meets the SG60, if future TACs were set at levels significantly contrary to ICES advice, then the assessment team considers that the SG60 would no longer be met. As the SG80 is not met, a condition is raised.		

PI 1.2.2		There are well defined and effective harvest control rules in place		
b	Guidepost		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		N	N
	Justification	The key implicit harvest control rule that has been selected is the revision of the TAC in response to changes in stock status. ICES advice in 2013 and 2014 considered the major uncertainties underlying the assessment model's estimate of stock status and consequently advised TACs lower than the level that is fully consistent with the MSY approach. In addition, ICES advises a TAC for both total catch and landings that takes the discard rate into account. The annual EU and Norway negotiations on the regulation of fisheries in the North Sea and the Skagerrak consider the annual ICES advice but have not always set TACs in line with the ICES advice and therefore the selection of the HCR could not therefore be considered to have taken into account the main uncertainties in the assessment or any uncertainties in the estimation of discard rates. The SG80 is not met therefore.		
c	Guidepost	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	Annual assessments of the status of the stock provide evidence that the management tools in place are appropriate to this fishery and over a long time scale appear to have been effective in controlling the level of exploitation. In some years the TAC has been set above that advised by ICES, and until the ICES advice is formally taken into account within an explicit harvest control rule, the SG100 will not be met.		
References		Hvingel, C. 2015. The 2015 assessment of the North Sea / Skagerrak shrimp stock using a Bayesian surplus production model. NAFO SCR Doc. 15/59. ICES, 2015d. Northern shrimp (*Pandalus borealis*) in Divisions IIIa West and IVa East (Skagerrak, Norrthern North Sea in the Norwegian Deep). ICES Advice 2015 Book 6. NAFO/ICES, 2015. NAFO/ICES Pandalus Assessment Group Meeting, 9-16 September 2015, Northwest Atlantic Fisheries Centre, St. John's, Newfoundland, Canada. ICES CM 2015/ACOM:14. Agreed Record of Conclusion of Fisheries Consultations between the European Union and Norway on the Regulation of Fisheries in Skagerrak and Kattegat in 2014. London, March 2014. 8pp Agreed Record of Conclusion of Fisheries Consultations between the European Union and Norway on the Regulation of Fisheries in Skagerrak and Kattegat in 2015. Clonakilty, December 2014. 8pp.		
OVERALL PERFORMANCE INDICATOR SCORE:				**65**

PI 1.2.2	There are well defined and effective harvest control rules in place	
CONDITION NUMBER (if relevant):		**1**

Table 20. New evaluation table for PI 1.2.2

PI 1.2.2		There are well defined and effective harvest control rules in place		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Generally understood harvest rules are in place that are consistent with the harvest strategy and which act to reduce the exploitation rate as limit reference points are approached.	Well defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.	
	Met?	Y	Y	
	Justification	The key harvest control rule is that annual TACs should be set in line with an MSY framework where the TAC is based on fishing at F_{MSY} when the stock biomass is above MSY $B_{trigger}$, but setting a TAC based on lower values of F when stock biomass drops below MSY $B_{trigger}$ as follows: $F = F_{MSY} \times (SSB/ MSY\ B_{trigger})$ The HCR ensures that the exploitation rate is reduced if the stock biomass drops below MSY $B_{trigger}$, and that in the long term fishing at F_{MSY} is expected to keep the stock fluctuating around MSY. This strategy has been in place since 2014 and was formally incorporated in the Long Term Management Strategy (LTMS) agreed by the EU and Norway in 2018. An additional HCR is that within Norwegian waters, there is a system of real–time closures (RTCs) in the *Pandalus* fishery. If the catch consists of more than 15% undersized (<6.5 cm total length) prawns, that area is closed for 14 days and if the catch consists of more than 10% undersized prawns the vessel must move to another area. EU/Norway consultations have agreed to extend the concept of RTCs across all national fleets from July 2019. The HCR is similar to that already in place in Norway except that the fishery will be closed when the catch consists of more than 20% undersized (<6.5 cm total length) shrimps. It is clear that well-defined HCRs are in place and will ensure that exploitation rates are reduced as limit reference points are approached. SG80 is met.		
b	**Guidepost**		The selection of the harvest control rules takes into account the main uncertainties.	The design of the harvest control rules takes into account a wide range of uncertainties.
	Met?		Y	N

PI 1.2.2		There are well defined and effective harvest control rules in place		
	Justification	The LTMS which explicitly incorporates a harvest control rule whereby annual TACs are set within an MSY framework is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of fishing mortality and MSY $B_{trigger}$ that provides the highest yield without exceeding the 5% probability level of the biomass falling below B_{lim} over a 30 year period. In addition the HCR allows the carrying forward or borrowing of 10% of the TAC to or from the following year, and the addition of the banking/borrowing option requires that the F_{TARGET} set within the HCR should be reduced in order for the probability of the SSB falling below B_{lim} not to increase above 5% in any 30-year period. The setting of the TACs also takes into account variations in recruitment by basing the TAC on the geometric mean of the last 10 years' recruitment indices. Annual variations in discard rates are also taken into account. SG80 is met. The HCRs do not appear to take into account a wide range of uncertainties, in particular they do not take into account varying rates of predation and so do not take account of the ecological role of the stock. SG100 is not met.		
c	**Guidepost**	There is some evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules.
	Met?	Y	Y	N
	Justification	The setting of TACs based on fishing at F_{MSY} (or lower if the stock biomass is below MSY $B_{trigger}$) is an appropriate and effective way of achieving exploitation levels required under the HCRs. Such an approach has been demonstrated to be successful in a wide range of fisheries assessed within ICES and in this fishery up until 2016. Although the most recent assessment showed that F had exceeded F_{MSY} in 2016 and 2017, this was due to incorrect assessment of stock status using a previous stock assessment model, which resulted in the setting of TACs that were too high, and due to higher discard rates in the Norwegian fleet than had been previously assumed. A condition has already been raised against PI 1.2.1b in relation to this issue, and the use of the new reference points based on the length-based assessment model and new estimates of discard rate in the fishery should ensure that appropriate exploitation rates are achieved. Norway introduced a system of real–time closures (RTCs) in the *Pandalus* fishery if the catch of undersized (<6.5cm total length) prawns exceeds threshold levels. Under this new system, the Norwegian Directorate of Fisheries closed areas for prawn fishing numerous times in 2016 and 2017 in the Norwegian economic zone south of 62° N, demonstrating that the tools are likely to be effective in reducing exploitation levels for small undersized prawns. A similar system of RTCs will be introduced across all national fleets in 2019. SG80 is met. There needs to be further evidence from the next few years' assessments that F has indeed been controlled as required under the HCRs for SG100 to be met.		
References		EU/Norway 2017b. Agreed record of Fisheries Consultations between Norway and the European Union on the regulation of fisheries in Skagerrak and Kattegat for 2018, Bergen, 1 December 2017. EU/Norway 2018. Agreed record of Fisheries Consultations between the European Union and Norway for 2018, Skagen, April 2018. ICES 2018. Northern shrimp (*Pandalus borealis*) in Divisions 3a and 4a East (Skagerrak and Kattegat and northern North Sea in the Norwegian Deep). ICES advice on fishing opportunities, catch and effort 2018. http://www.ices.dk/sites/pub/Publication%20Reports/Advice/2018/2018/pra.27.		

PI 1.2.2	There are well defined and effective harvest control rules in place	
	3a4a.pdf NAFO/ICES. 2017. NAFO/ICES *Pandalus* Assessment Group Meeting, 27 September to 3 October 2017. ICES CM 2017/ACOM:09. (Revised in March 2018 to incorporate 2018 assessment of the Pandalus stock in Skagerrak and Norwegian Deep.) http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2017/NIPAG/scs17-17%20NIPAG%20Rpt%202017.pdf	
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**(1)**

Table 21. Original evaluation table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	Qualitative information is available on the amount of main by-catch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main by-catch species taken by the fishery.	Accurate and verifiable information is available on the catch of all by-catch species and the consequences for the status of affected populations.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
	Justification	There is a prohibition of discarding in the Norwegian fishery, although there may still be some discarding of non-commercial species and small individuals of commercial species. There is no formal observer programme in Norway, so quantitative information on all bycatch species is not available directly from Norwegian vessels. However quantitative information on all bycatch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with the trawl and grid and trawl with grid and tunnel, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. Norwegian vessels are permitted to fish inside the 4nm baseline using a trawl without a grid, but there are no comparable data from Danish or Swedish vessels from the same area. Many Norwegian vessels use a grid when fishing both inside and outside the 4nm limit of the Norwegian coastline, so even if some bycatch species constitute more than 5% of the total catch for some fishing trips, these fishing trips will account for only a small proportion of the total fishing trips. Based on information for the Danish and Swedish observer programmes in the same area as the Norwegian fishery, the relatively small proportion of fishing trips which use a standard trawl without a grid, and that the prohibition of discarding in Norway is likely to at least reduce the overall level of discarding in the fishery, the assessment team concluded that there were no main bycatch species for the Norwegian Pandalus fishery as a whole. It cannot be concluded that catch information is accurate for all by-catch species, as it is difficult to find information on non-commercial species and to ascertain the status of affected populations. The SG100 is not met therefore.		
b	Guidepost	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. The assessment team considers that information should be sufficient to estimate outcome status for most by-catch species, but not enough to do so quantitatively for all by-catch species with a high degree of certainty. The SG100 is not met therefore.		
c	Guidepost	Information is adequate to support measures to manage by-catch.	Information is adequate to support a partial strategy to manage main by-catch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		**Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch**		
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. There are measures in place for managing and minimizing by-catch including the mandatory use of a sorting grid (except within 4nm of the Norwegian coastline), limits on fishing activity through the setting of an annual TAC and individual vessel quotas, a prohibition on discarding, maximum bycatch limits and real time closures and these measures are considered to constitute a strategy to manage by-catch species. Fishing gear used in the shrimp fishery and the catch compositions may be the subject of inspection by the Coastguard in each country. The Norwegian Coastguard conducted a total of 41 inspections of vessels fishing for shrimp in the North Sea and Skagerrak, and the regional branch of the Norwegian Directorate of Fisheries carried out 19 inspections of shrimp vessels between January 2014 and April 2015 (Modulf Overvik, Directorate of Fisheries, pers. comm.). There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from Norwegian vessels. However quantitative information on all by-catch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. The sorting grid is not mandatory within the 4 nm baseline, and there is anecdotal evidence from stakeholders that there is significant bycatch within the component of the shrimp fleet that fishes inside the baseline. There is no quantitative information on bycatch within the baseline, and the assessment team considers therefore that there is not sufficient information to support a strategy to manage all by-catch species, and so the SG100 is not met.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main by-catch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of by-catch data is conducted in sufficient detail to assess ongoing mortalities to all by-catch species.
	Met?		N	N

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch
	Justification	There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from the Norwegian fleet. However quantitative information on all by-catch species is recorded under the EU Data Collection Framework by on-board observers on Danish and Swedish vessels fishing in the same area with the same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. These data feed into ICES assessments which can be used therefore to assess whether there has been any increase in risk level posed by the shrimp fishery for bycatch species. Monitoring is not conducted in sufficient detail (low level of sampling of discards) in the Danish and Swedish fisheries to assess ongoing mortalities to all by-catch species. Whilst there is a prohibition on discarding in Norway and therefore all bycatch species should be landed, discarding still occurs in the Norwegian shrimp fleet. Information on total catch composition from the Danish and Swedish vessels fishing in both the Skagerrak and Norwegian Deep provides an upper limit to the amount of bycatch species taken by the fishery in the trawls with grid and trawls with grid and tunnel, but there is a lack of information on the bycatch of small inshore vessels fishing within the 4nm baseline where a grid is not mandatory. The SG80 is not met therefore and a condition is raised to ensure that evidence is provided on the amount of bycatch taken in the Norwegian fishery inside the 4nm baseline.
References		DTU Aqua observer programme data 2009-2014. SLU Observer programme data 2011-2013
OVERALL PERFORMANCE INDICATOR SCORE:		**75**
CONDITION NUMBER (if relevant):		**2**

Table 22. New evaluation table for PI 2.2.3

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	Qualitative information is available on the amount of main by-catch species taken by the fishery.	Qualitative information and some quantitative information are available on the amount of main by-catch species taken by the fishery.	Accurate and verifiable information is available on the catch of all by-catch species and the consequences for the status of affected populations.
	Met?	Y	Y	N

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch		
	Justification	There is a prohibition of discarding in the Norwegian fishery, although there may still be some discarding of non-commercial species and small individuals of commercial species. There is no formal observer programme in Norway, so quantitative information on all bycatch species is not available directly from Norwegian vessels. However quantitative information on all bycatch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with the trawl and grid and trawl with grid and tunnel, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. Previously Norwegian vessels were permitted to fish inside the 4nm baseline using a trawl without a grid, but as from 1 January 2019 the use of a grid will be mandatory within the 4nm baseline, and so all vessels in the Norwegian fleet will have to use a grid. Based on information for the Danish and Swedish observer programmes in the same area as the Norwegian fishery, the relatively small proportion of fishing trips which were previously permitted to fish using a standard trawl without a grid, and that the prohibition of discarding in Norway is likely to at least reduce the overall level of discarding in the fishery, the assessment team concluded that there were no main bycatch species for the Norwegian Pandalus fishery as a whole. It cannot be concluded that catch information is accurate for all by-catch species, as it is difficult to find information on non-commercial species and to ascertain the status of affected populations. The SG100 is not met therefore.		
b	**Guidepost**	Information is adequate to broadly understand outcome status with respect to biologically based limits	Information is sufficient to estimate outcome status with respect to biologically based limits.	Information is sufficient to quantitatively estimate outcome status with respect to biologically based limits with a high degree of certainty.
	Met?	Y	Y	N
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. The assessment team considers that information should be sufficient to estimate outcome status for most by-catch species, but not enough to do so quantitatively for all by-catch species with a high degree of certainty. The SG100 is not met therefore.		
c	**Guidepost**	Information is adequate to support measures to manage by-catch.	Information is adequate to support a partial strategy to manage main by-catch species.	Information is adequate to support a strategy to manage retained species, and evaluate with a high degree of certainty whether the strategy is achieving its objective.
	Met?	Y	Y	N

PI 2.2.3		**Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch**		
	Justification	There were no main by-catch species identified for either the Skagerrak or Norwegian Deep areas of the fishery. There are measures in place for managing and minimizing by-catch including the mandatory use of a sorting grid (except previously within 4nm of the Norwegian coastline), limits on fishing activity through the setting of an annual TAC and individual vessel quotas, a prohibition on discarding, maximum bycatch limits and real time closures and these measures are considered to constitute a strategy to manage by-catch species. Fishing gear used in the shrimp fishery and the catch compositions may be the subject of inspection by the Coastguard in each country. The Norwegian Coastguard conducted a total of 41 inspections of vessels fishing for shrimp in the North Sea and Skagerrak, and the regional branch of the Norwegian Directorate of Fisheries carried out 19 inspections of shrimp vessels between January 2014 and April 2015 (Modulf Overvik, Directorate of Fisheries, pers. comm.). There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from Norwegian vessels. However quantitative information on all by-catch species is recorded by on-board observers on Danish and Swedish vessels fishing in the same area with same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. The SG80 is met. The sorting grid has not previously been mandatory within the 4 nm baseline, but will become mandatory on 1 January 2019. As there is no quantitative information on bycatch directly from the Norwegian vessels, the assessment team considers that there is not sufficient information to support a strategy to manage all by-catch species, or to evaluate with a high degree of certainty whether the strategy is achieving its objective. The SG100 is not met.		
d	**Guidepost**		Sufficient data continue to be collected to detect any increase in risk to main by-catch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	Monitoring of by-catch data is conducted in sufficient detail to assess ongoing mortalities to all by-catch species.
	Met?		Y	N

PI 2.2.3		Information on the nature and the amount of by-catch is adequate to determine the risk posed by the fishery and the effectiveness of the strategy to manage by-catch
	Justification	There is no formal observer programme in Norway, so quantitative information on all by-catch species is not available directly from the Norwegian fleet. However quantitative information on all by-catch species is recorded under the EU Data Collection Framework by on-board observers on Danish and Swedish vessels fishing in the same area with the same gear, and as there is no discard ban for Danish and Swedish vessels, the discard rates on the Danish and Swedish vessels provides an upper limit for the amount of bycatch species taken by the Norwegian fishery. These data feed into ICES assessments which can be used therefore to assess whether there has been any increase in risk level posed by the shrimp fishery for bycatch species. Monitoring is not conducted in sufficient detail (low level of sampling of discards) in the Danish and Swedish fisheries to assess ongoing mortalities to all by-catch species. Whilst there is a prohibition on discarding in Norway and therefore all bycatch species should be landed, discarding still occurs in the Norwegian shrimp fleet. Information on total catch composition from the Danish and Swedish vessels fishing in both the Skagerrak and Norwegian Deep provides an upper limit to the amount of bycatch species taken by the fishery in the trawls with grid and trawls with grid and tunnel. Previously there was a lack of information on the bycatch of small inshore vessels fishing within the 4nm baseline where a grid was not previously mandatory. However as from 1 January the sorting grid will be mandatory on all Norwegian vessels irrespective of where fishing activity takes place, and therefore the SG80 is met.
References		DTU Aqua observer programme data 2009-2014. SLU Observer programme data 2011-2013
OVERALL PERFORMANCE INDICATOR SCORE:		**80**
CONDITION NUMBER (if relevant):		**(2)**

Table 23. Original evaluation table for PI 2.4.1

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Guidepost	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	N	N

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Justification	Bottom trawl gears are known to impact on habitat structure and function, and areas with biotic habitats generated by aggregations or colonial growth of single species are particularly vulnerable. Maerl and seagrass beds are also considered to be vulnerable to the effects of trawling gears. Habitat-generating species are represented by a wide range of taxonomic groups, e.g. *Porifera*, *Polychaeta*, *Cnidaria*, *Mollusca* and *Bryozoa* (e.g., reviews in Løkkeborg, 2005; Kaiser and de Groot, 2000; Moore and Jennings, 2000, Collie et al., 2000). Reduced impact of bottom trawling on the seabed can be achieved by minimizing the impacted area and by the reduction of the pressure of the gear components on the bottom. The shrimp trawl used in the Norwegian fishery is relatively light in comparison with other trawls and is therefore expected to impact significantly less on habitat features. VMS data of the shrimp fleet demonstrates that most of the fishing activity is confined to soft seabed sediments such as mud and sandy mud in the Skagerrak. There are a number of Natura2000 sites designated in the Skagerrak in particular the Skagens glen and the Bratten, and the OSPAR Commission lists a number of sensitive habitats that can be found in the Skagerrak. These include coral gardens, deep sea sponge aggregations, Zostera beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities but shrimp trawling is unlikely to occur in the more complex habitats because the Norwegian shrimp vessels do not use rockhopper gear, and fishermen will actively avoid any area where the gear might become entangled. Experimental and modelling studies show that the impacts of trawling are generally greatest in areas of low levels of natural disturbance, and small in areas of high natural disturbance (e.g. Hiddink et al., 2006). Demersal trawling has a significant initial effect on muddy and sandy-mud habitats, but these effects have been shown to be short lived with an apparent long-term, positive, post-trawl disturbance response (Kaiser et al, 2006). This positive response may represent an increase in the abundance of smaller bodied fauna, but a possible overall decrease in biomass (Jennings et al, 2001, Duplisea et al., 2002). In dynamic sandy sediments, recovery is likely to be faster since the associated communities are accustomed to higher levels of natural disturbance (Kaiser et al., 1998). Benthic macrofauna are most affected by trawling activity; whereas burrowing and other smaller seabed fauna are less vulnerable (Bergmann and Santbrink, 2000; Dinmore et al, 2004). The rates of recovery for benthic communities following intensive trawling disturbance may range from weeks to years with rates of recovery depending on rates of immigration, recruitment and growth (Schratzberger and Jennings, 2002). Slow-growing large biomass biota such as sponges and soft corals are known to take much longer to recover than biota with shorter life spans such as polychaetes (less than a year) (Kaiser et al., 2006). Under CR 27.10.7, the assessment team is required to score this PI according to the different scoring elements (habitats/VMEs) that comprise the habitat component potentially affected by the fishery. In scoring this PI, the assessment team considered five separate scoring elements (VME habitats) – coral gardens, deep sea sponge aggregations, *Zostera* beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities. In considering the potential impact of the fishery, the assessment team took into account the distribution of fishing activity as demonstrated by the data on distribution of fishing activity in Figure 15 and knowledge of the activity of small coastal vessels in relation to known distribution of the five VME habitats, the bio-regional distribution of habitat types, the irregular reproduction and slow growth rates of the vulnerable species with the consequent slow recovery rates, the nature of the fishing gear used, and the behaviour of fishermen in avoiding habitats which might damage the fishing gear. The distribution of fishing activity of Norwegian shrimp vessels as described by Figure 15 and knowledge of the activity of small coastal vessels confirms that the key Natura 2000 site in which Norwegian shrimp trawling occurs is the Bratten.

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
		There is also some fishing activity in the Skagens Gren area, but Norwegian vessels do not fish in the inshore areas of Koster and Varedofjorden and Gullmarsfjorden. Coral gardens. Horn corals which together form coral gardens have a fragile structure that makes them vulnerable to damage by fishing gear, and as such have been designated as a threatened habitat by OSPAR. Coral gardens have been extensively mapped within the Bratten Natura 2000 site and may also be found in the Kosterfjorden and Gullmarsfjorden. In addition to the high diversity of species observed in the Bratten, the area is also heavily fished by Danish and Swedish vessels and the broad-scale map of shrimp fishing activity (Figure 15) suggests that Norwegian shrimp fishing may occur in areas of the Bratten where coral gardens are present. However shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as coral gardens where the gear might become entangled. For the Bratten area, Figure 20 shows the known distribution of coral gardens and the proposed closed areas, and Figures 23 and 24 show that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas in which coral gardens are found. In addition to the evidence of avoidance of coral gardens by fishermen in the Bratten, coral gardens have been protected in the Skagens Gren Natura 2000 site since 2011, fishing is not permitted in the Kosterfjorden in the most sensitive environments, and additional regulations on shrimp fishing have been proposed in 2015, and fishing activity is very tightly controlled in the Gullmarsfjorden. Coral gardens are protected from potential damage by fishing gears in three Natura 2000 sites, and information on fishing activity in the Bratten area and on the known distribution of coral gardens in the Bratten provides evidence that the SG60 is met. However some species of horn corals are found only in Bratten, and full protection for these corals is not yet in place in the Bratten. The assessment team concluded therefore that the fishery cannot be considered to be highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and thus the fishery does not meet the SG80 for coral gardens. Deep sea sponge aggregations. Deep sea sponge aggregations are designated by OSPAR as threatened habitats. They are known to occur between water depths of 250-1300m (although they are also found in shallower waters such as the Kosterfjorden) and may be found on soft substrata or hard substrata, such as boulders and cobbles which may lie on sediment. Deep-sea sponges have similar habitat preferences to cold water corals, and hence are often found at the same location. Shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as deep sea sponge aggregations where the gear might become entangled. Deep sea sponge aggregations are found extensively in OSPAR region 1, but also in a number of areas in the eastern Skagerrak (OSPAR, 2010a). Their known occurrences in the Bratten area are shown in Figure 21 in relation to proposed closed areas which are designed to protect both sponges and coral gardens, and Figure 23 shows that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas which support deep sea sponge aggregations. Deep sea sponge aggregations are also found in the Kosterfjorden

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
		where fishing is not permitted in the most sensitive environments and additional regulations on shrimp fishing have been proposed in 2015. This protection of sponges in the Kosterfjorden, and along with information on fishing activity in the Bratten area and on the known distribution of deep sea sponges in the Bratten provides evidence that the SG60 is met. However the main location of sponges in the Skagerrak is in the Bratten, and full protection from potential damage by fishing gear in the Bratten is not yet in place, and so the assessment team concluded therefore that the fishery cannot be considered to be highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and thus the fishery does not meet the SG80 for deep sea sponge aggregations. *Zostera* beds. *Zostera* is generally found in depths up to 10m, and in southern Sweden it flourishes in stony and sandy bottoms in 2-4m depth. It is highly unlikely that there is significant overlap of Norwegian shrimp fishing activity with the bio-regional distribution of *Zostera* in coastal waters, and so the fishery is highly unlikely to cause serious or irreversible harm to *Zostera* habitat. SG80 is met therefore for this VME. *Lophelia pertusa* reefs. *Lophelia pertusa* is a cold water reef-forming coral widely distributed across the north-east Atlantic. Reefs occur from 200 to 2000m depth along the continental slope, but also in shallower waters in Norwegian fjords and along the Swedish west coast in the Skagerrak. *Lophelia* reefs provide complex structural habitat and are susceptible to damage by fishing gear. Whilst *Lophelia* are relatively widespread in OSPAR region 1, they are less common in region 2 but are found in the northernmost area of the Skagerrak close to the coast (Hall-Spencer and Stehfest, 2009). There is potential for some overlap of shrimp fishing activity with *Lophelia* reefs, but the fishing activity data suggests that Norwegian vessels fish to the south of the main concentration of reefs. In addition, experience in this fishery and other fisheries for *Pandalus borealis* suggest that fishermen will avoid areas of *Lophelia* reefs to ensure that the fishing gear does not become entangled. *Lophelia* reefs are protected in the Kosterfjorden. Although there is a very restricted distribution of *Lophelia* in the Skagerrak compared with other areas such as the Norwegian west coast, the assessment team considered that the fishery would be highly unlikely to cause serious or irreversible harm to *Lophelia* populations in the region. The fishery therefore scores 80 for this scoring element. Seapen and burrowing megafauna communities. Seapen and burrowing megafauna are found on plains of fine mud at water depths ranging from 15-200 m or more which is habitat that occurs extensively in sheltered basins of fjords and in deeper offshore waters. Seapen and burrowing megafauna communities (soft bottoms with large soft corals) have been identified by OSPAR as a special protective habitat which acts as a host for species such as the brittlestar *Asteronyx loveni*. The known distribution of these habitats within the Bratten is primarily within the proposed closed areas (Figure 22), in which there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) (Figure 23). Seapen and burrowing megafauna communities are also found in Kosterfjoreden and in areas off the southern Norwegian coast (Figure 18; OSPAR, 2010b) that do not overlap with current fishing activity. The assessment team concluded therefore that the risk of serious or irreversible damage from the shrimp fishery on this habitat type on a bio-regional basis was low and therefore the SG80 was met. Aggregated score – as three scoring elements meet the SG80, and two scoring elements do not meet the SG80, the overall score for PI 2.4.1 is 75.
References		Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331. Collie, J.S., Hall, S.J., Kaiser ,M.J., and Poiner, I.R. 2000. A quantitative analysis of fishing impacts on shelfsea benthos. Journal of Animal Ecology, 69: 785-798. Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. Duplisea, D. E., Jennings, S., Warr, K. J., and Dinmore, T. 2002. A size-based model of the impacts of bottom trawling on benthic community structure. Canadian Journal of Fisheries and Aquatic Science, 59: 1785–1795. Hall-Spencer, J.M. and Stehfest, K.M. 2009. Assessment of *Lophelia pertusia* reefs in the OSPAR region. OSPAR Background Document. Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E. and Piet, G.J. 2006. Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Science, 63: 721-736 Jennings, S., Dinmore, T.A., Duplisea, D.E., Warr, K.J., Lancaster, J.E., 2001. Trawling disturbance can modify benthic production processes. J. Animal Ecol. 70, 459-475. Kaiser, M.J., and De Groot, S.J. 2000. Effects of Fishing on non-target Species and Habitats. Blackwell, Oxford. Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. Kilnäs, M., 2013. Proposal for regulation of the fishery in the Bratten area. Report from the project "Sea meets the Land". Løkkeborg S. 2005. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO fisheries technical paper 472, 69 p. Moore, G., and Jennings, S. 2000. Commercial fishing: the wider ecological impacts. British Ecological Society, Blackwell Science, Cambridge. OSPAR Commission, 2010a. Background Document for Deep Sea Sponge Aggregations. OSPAR Commission, 2010b. Background Document for Seapens and Burrowing Megafauna Communities. Schratzberger, M., T.A. Dinmore and S. Jennings, 2002. Impacts of trawling on the diversity, biomass and structure of meiofauna assemblages. Mar. Biol. 140:83-93.
OVERALL PERFORMANCE INDICATOR SCORE:	**75**
CONDITION NUMBER (if relevant):	**3**

Table 24. New evaluation table for PI 2.4.1

PI 2.4.1		**The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function**		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	The fishery is unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	There is evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.
	Met?	Y	N	N

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Justification	(N.B. Figure numbers relate to figures in original certification report) Bottom trawl gears are known to impact on habitat structure and function, and areas with biotic habitats generated by aggregations or colonial growth of single species are particularly vulnerable. Maerl and seagrass beds are also considered to be vulnerable to the effects of trawling gears. Habitat-generating species are represented by a wide range of taxonomic groups, e.g. *Porifera*, *Polychaeta*, *Cnidaria*, *Mollusca* and *Bryozoa* (e.g., reviews in Løkkeborg, 2005; Kaiser and de Groot, 2000; Moore and Jennings, 2000, Collie et al., 2000). Reduced impact of bottom trawling on the seabed can be achieved by minimizing the impacted area and by the reduction of the pressure of the gear components on the bottom. The shrimp trawl used in the Norwegian fishery is relatively light in comparison with other trawls and is therefore expected to impact significantly less on habitat features. VMS data of the shrimp fleet demonstrates that most of the fishing activity is confined to soft seabed sediments such as mud and sandy mud in the Skagerrak. There are a number of Natura2000 sites designated in the Skagerrak in particular the Skagens glen and the Bratten, and the OSPAR Commission lists a number of sensitive habitats that can be found in the Skagerrak. These include coral gardens, deep sea sponge aggregations, Zostera beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities but shrimp trawling is unlikely to occur in the more complex habitats because the Norwegian shrimp vessels do not use rockhopper gear, and fishermen will actively avoid any area where the gear might become entangled. Experimental and modelling studies show that the impacts of trawling are generally greatest in areas of low levels of natural disturbance, and small in areas of high natural disturbance (e.g. Hiddink et al., 2006). Demersal trawling has a significant initial effect on muddy and sandy-mud habitats, but these effects have been shown to be short lived with an apparent long-term, positive, post-trawl disturbance response (Kaiser et al, 2006). This positive response may represent an increase in the abundance of smaller bodied fauna, but a possible overall decrease in biomass (Jennings et al, 2001, Duplisea et al., 2002). In dynamic sandy sediments, recovery is likely to be faster since the associated communities are accustomed to higher levels of natural disturbance (Kaiser et al., 1998). Benthic macrofauna are most affected by trawling activity; whereas burrowing and other smaller seabed fauna are less vulnerable (Bergmann and Santbrink, 2000; Dinmore et al, 2004). The rates of recovery for benthic communities following intensive trawling disturbance may range from weeks to years with rates of recovery depending on rates of immigration, recruitment and growth (Schratzberger and Jennings, 2002). Slow-growing large biomass biota such as sponges and soft corals are known to take much longer to recover than biota with shorter life spans such as polychaetes (less than a year) (Kaiser et al., 2006). Under CR 27.10.7, the assessment team is required to score this PI according to the different scoring elements (habitats/VMEs) that comprise the habitat component potentially affected by the fishery. In scoring this PI, the assessment team considered five separate scoring elements (VME habitats) – coral gardens, deep sea sponge aggregations, *Zostera* beds, *Lophelia pertusa* reefs and seapen and burrowing megafauna communities. In considering the potential impact of the fishery, the assessment team took into account the distribution of fishing activity as demonstrated by the data on distribution of fishing activity in Figure 15 and knowledge of the activity of small coastal vessels in relation to known distribution of the five VME habitats, the bio-regional distribution of habitat types, the irregular reproduction and slow growth rates of the vulnerable species with the consequent slow recovery rates, the nature of the fishing gear used, and the behaviour of fishermen in avoiding habitats which might damage the fishing gear. The distribution of fishing activity of Norwegian shrimp vessels as described by Figure 15 and knowledge of the activity of small coastal vessels confirms that the key Natura 2000 site in which Norwegian shrimp trawling occurs is the Bratten.

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
		There is also some fishing activity in the Skagens Gren area, but Norwegian vessels do not fish in the inshore areas of Koster and Varedofjorden and Gullmarsfjorden. Coral gardens. Horn corals which together form coral gardens have a fragile structure that makes them vulnerable to damage by fishing gear, and as such have been designated as a threatened habitat by OSPAR. Coral gardens have been extensively mapped within the Bratten Natura 2000 site and may also be found in the Kosterfjorden and Gullmarsfjorden. In addition to the high diversity of species observed in the Bratten, the area is also heavily fished by Danish and Swedish vessels and the broad-scale map of shrimp fishing activity (Figure 15) suggests that Norwegian shrimp fishing may occur in areas of the Bratten where coral gardens are present. However shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as coral gardens where the gear might become entangled. For the Bratten area, Figure 20 shows the known distribution of coral gardens and the proposed closed areas, and Figures 23 and 24 show that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas in which coral gardens are found. In addition to the evidence of avoidance of coral gardens by fishermen in the Bratten, coral gardens have been protected in the Skagens Gren Natura 2000 site since 2011, fishing is not permitted in the Kosterfjorden in the most sensitive environments, and additional regulations on shrimp fishing have been proposed in 2015, and fishing activity is very tightly controlled in the Gullmarsfjorden. Coral gardens are protected from potential damage by fishing gears in three Natura 2000 sites, and information on fishing activity in the Bratten area and on the known distribution of coral gardens in the Bratten provides evidence that the SG60 is met. However some species of horn corals are found only in Bratten. In January 2017 new fishing regulations in Bratten were implemented through Commission delegated regulation (EU) 2017/118 of 5 September 2016 (EU, 2017). As a result of this regulation, 27% of the area will be protected and within that area all fishing gears will be prohibited. This will be controlled through mandatory use of AIS which clearly indicates the location of the fishing. With continuing evidence from VMS records that Norwegian shrimp vessels do not fish in the Kosterfjorden or the Gullmasfjorden, the assessment team concluded that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm, and the fishery meets the SG80 for coral gardens. Deep sea sponge aggregations. Deep sea sponge aggregations are designated by OSPAR as threatened habitats. They are known to occur between water depths of 250-1300m (although they are also found in shallower waters such as the Kosterfjorden) and may be found on soft substrata or hard substrata, such as boulders and cobbles which may lie on sediment. Deep-sea sponges have similar habitat preferences to cold water corals, and hence are often found at the same location. Shrimp fishermen use light-weight trawls and do not use rockhopper gear to target more complex habitats, and will therefore avoid areas such as deep sea sponge aggregations where the gear might become entangled. Deep sea sponge aggregations are found extensively in OSPAR region 1, but also in a number of areas in the eastern Skagerrak (OSPAR, 2010a). Their known occurrences in the Bratten area are shown in Figure 21 in relation to proposed closed areas which are designed to protect both sponges and coral gardens, and Figure 23 shows that there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) in those areas, from which we can conclude that fishermen will avoid areas which support deep sea sponge aggregations. Deep sea sponge aggregations are also found in the Kosterfjorden

PI 2.4.1		The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
		where fishing is not permitted in the most sensitive environments and additional regulations on shrimp fishing have been proposed in 2015. This protection of sponges in the Kosterfjorden, and along with information on fishing activity in the Bratten area and on the known distribution of deep sea sponges in the Bratten provides evidence that the SG60 is met. However the main location of sponges in the Skagerrak is in the Bratten. In January 2017 new fishing regulations in Bratten were implemented through Commission delegated regulation (EU) 2017/118 of 5 September 2016 (EU, 2017). The fishery therefore meets the SG80 for deep sea sponge aggregations. *Zostera* beds. *Zostera* is generally found in depths up to 10m, and in southern Sweden it flourishes in stony and sandy bottoms in 2-4m depth. It is highly unlikely that there is significant overlap of Norwegian shrimp fishing activity with the bio-regional distribution of *Zostera* in coastal waters, and so the fishery is highly unlikely to cause serious or irreversible harm to *Zostera* habitat. SG80 is met therefore for this VME. *Lophelia pertusa* reefs. *Lophelia pertusa* is a cold water reef-forming coral widely distributed across the north-east Atlantic. Reefs occur from 200 to 2000m depth along the continental slope, but also in shallower waters in Norwegian fjords and along the Swedish west coast in the Skagerrak. *Lophelia* reefs provide complex structural habitat and are susceptible to damage by fishing gear. Whilst *Lophelia* are relatively widespread in OSPAR region 1, they are less common in region 2 but are found in the northernmost area of the Skagerrak close to the coast (Hall-Spencer and Stehfest, 2009). There is potential for some overlap of shrimp fishing activity with *Lophelia* reefs, but the fishing activity data suggests that Norwegian vessels fish to the south of the main concentration of reefs. In addition, experience in this fishery and other fisheries for *Pandalus borealis* suggest that fishermen will avoid areas of *Lophelia* reefs to ensure that the fishing gear does not become entangled. *Lophelia* reefs are protected in the Kosterfjorden. Although there is a very restricted distribution of *Lophelia* in the Skagerrak compared with other areas such as the Norwegian west coast, the assessment team considered that the fishery would be highly unlikely to cause serious or irreversible harm to *Lophelia* populations in the region. The fishery therefore scores 80 for this scoring element. Seapen and burrowing megafauna communities. Seapen and burrowing megafauna are found on plains of fine mud at water depths ranging from 15-200 m or more which is habitat that occurs extensively in sheltered basins of fjords and in deeper offshore waters. Seapen and burrowing megafauna communities (soft bottoms with large soft corals) have been identified by OSPAR as a special protective habitat which acts as a host for species such as the brittlestar *Asteronyx loveni*. The known distribution of these habitats within the Bratten is primarily within the proposed closed areas (Figure 22), in which there is very little fishing activity by Danish and Swedish vessels (and by extrapolation, Norwegian vessels) (Figure 23). Seapen and burrowing megafauna communities are also found in Kosterfjoreden and in areas off the southern Norwegian coast (Figure 18; OSPAR, 2010b) that do not overlap with current fishing activity. The assessment team concluded therefore that the risk of serious or irreversible damage from the shrimp fishery on this habitat type on a bio-regional basis was low and therefore the SG80 was met. Aggregated score – Aggregated score – as all scoring elements meet the SG80, the overall score for PI 2.4.1 is 80.
References		Bergmann, M.J.N., van Santbrink, J.W., 2000. Mortality in megafaunal benthic populations caused by trawl fisheries on the Dutch continental shelf in the North Sea in 1994. ICES J. Mar. Sci. 57 (5) (5), 1321-1331.

PI 2.4.1	The fishery does not cause serious or irreversible harm to habitat structure, considered on a regional or bioregional basis, and function
	Collie, J.S., Hall, S.J., Kaiser ,M.J., and Poiner, I.R. 2000. A quantitative analysis of fishing impacts on shelfsea benthos. Journal of Animal Ecology, 69: 785-798. Dinmore, A., Duplisea, D.E., Rackham, B.D., Maxwell, D.L. and Jennings, S. 2004. Impact of a large-scale area closure on patterns of fishing disturbance and the consequences for benthic communities. ICES Journal of Marine Science, 60: 371–380. 2003. Duplisea, D. E., Jennings, S., Warr, K. J., and Dinmore, T. 2002. A size-based model of the impacts of bottom trawling on benthic community structure. Canadian Journal of Fisheries and Aquatic Science, 59: 1785–1795. Hall-Spencer, J.M. and Stehfest, K.M. 2009. Assessment of *Lophelia pertusia* reefs in the OSPAR region. OSPAR Background Document. Hiddink, J.G., Jennings, S., Kaiser, M.J., Queirós, A.M., Duplisea, D.E. and Piet, G.J. 2006. Cumulative impacts of seabed trawl disturbance on benthic biomass, production, and species richness in different habitats. Canadian Journal of Fisheries and Aquatic Science, 63: 721-736 Jennings, S., Dinmore, T.A., Duplisea, D.E., Warr, K.J., Lancaster, J.E., 2001. Trawling disturbance can modify benthic production processes. J. Animal Ecol. 70, 459-475. Kaiser, M.J., and De Groot, S.J. 2000. Effects of Fishing on non-target Species and Habitats. Blackwell, Oxford. Kaiser, M. J., Edwards, D. B., Armstrong, P. J., Radford, K., Lough, N. E. L., Flatt, R. P., and Jones, H. D. 1998 Changes in megafaunal benthic communities in different habitats after trawling disturbance. – ICES Journal of Marine Science, 55: 353–361. Kaiser, M.J., Clarke, K.R., Hinz, H., Austen, M.C.V., Somerfield, P.J., Karakassis, I. 2006. Marine Ecology Progress Series. Volume 311. Global analysis of response and recovery of benthic biota to fishing. Kilnäs, M., 2013. Proposal for regulation of the fishery in the Bratten area. Report from the project "Sea meets the Land". Løkkeborg S. 2005. Impacts of trawling and scallop dredging on benthic habitats and communities. FAO fisheries technical paper 472, 69 p. Moore, G., and Jennings, S. 2000. Commercial fishing: the wider ecological impacts. British Ecological Society, Blackwell Science, Cambridge. OSPAR Commission, 2010a. Background Document for Deep Sea Sponge Aggregations. OSPAR Commission, 2010b. Background Document for Seapens and Burrowing Megafauna Communities. Schratzberger, M., T.A. Dinmore and S. Jennings, 2002. Impacts of trawling on the diversity, biomass and structure of meiofauna assemblages. Mar. Biol. 140:83-93.
OVERALL PERFORMANCE INDICATOR SCORE:	**80**
CONDITION NUMBER (if relevant):	**(3)**

Table 25. Original evaluation table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N
	Justification	Based on the data on the position of trawl hauls from the electronic log books , most of the fishing effort of the Norwegian shrimp fleet takes place over soft seabed sediments such as mud and sandy mud. Skagerrak is a well-studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). The establishment in 2009 of the Kosterhavet National Park as the first marine national park in the Skagerrak demonstrated a key step forward in the management of marine habitat types. Within the National Park there is a ban on trawling in the most sensitive areas. There are a series of Natura2000 sites designated in the Skagerrak and coral reefs are protected in Skagens gren and Gullmarsfjorden, where there are also tight restrictions on fishing activity. In addition to areas designated already, there are also a number of other proposals for conservation sites by NGOs. In the Väderöfjorden and Kosterhavets nationalpark (Kosterfjordens), and in the Gullmarsfjorden shrimp trawling is permitted but the fishery is closely regulated. The Bratten area is protected and in 2014 proposals for strong restrictions on fishing activity were drawn up by Sweden, Denmark and Norway in consultation with all interested parties. The proposals, which have been submitted to the Swedish Agency for Marine and Water Management (SwAM), include no fishing zones, reduced fishing effort, AIS on all vessels and no anchoring. The Bratten area is in the Swedish economic zone, but much of it is outside the 4nm baseline and so is managed under the Common Fisheries Policy of the European Union. Implementation of new regulations will therefore require EU ratification. In addition to the habitat designations, the application of the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems is enshrined within the EU CFP, and there are a suite of measures in place, such as catch quotas, effort limitation and gear restrictions which limit the impact of the gear on non-target species and the environment. The absence of fishing in some areas of the distribution of the five key VMEs can be considered to be a measure that manages the impact on habitat, and fishermen will also try to avoid ground where the fishing gear will get snagged. In addition regulation J-128-2011 requires that "collisions" between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges) must be reported and move-on rules apply. All of these measures can be considered to contribute to a partial strategy for managing the impact of the fishery on the five vulnerable habitat types. The SG80 is met therefore for all scoring elements. In the absence of closure of all VME hotspots, a full strategy is not in place and so the SG100 is not met for any of the scoring elements.		

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	N	N
	Justification	There is an objective basis for confidence that a partial strategy for managing the impact on habitat types that includes limitations on fishing effort through catch limits, the absence of fishing in many areas of the distribution of VMEs, the avoidance of VME habitats by fishermen to safeguard their fishing gear and the closure to fishing of the key VME hotspots will work as it will minimise the potential interaction of fishing with VME habitats. For *Lophelia* reefs and *Zostera* beds which are primarily found in the Skagerrak in shallower waters which are covered by the restriction on fishing in the most vulnerable areas, there is therefore an objective basis for confidence that the partial strategy will work and so the SG80 is met. For coral gardens, deep sea sponge aggregations and seapen and burrowing megafauna VMEs, fishing restrictions in some of the most vulnerable areas, e.g. the Bratten, are not yet fully in place and so the SG80 is not met. The SG80 is not met therefore for all scoring elements, and so a condition is raised		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	There are a large number of Natura2000 sites designated in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden, Gullmarsfjorden). The establishment of these protected areas, current regulations protecting the most sensitive habitats, and the ongoing introduction of new regulations, the suite of management measures that regulate the level of fishing and the avoidance of rough ground by fishermen are all measures that are in place and provide evidence that the partial strategy is being implemented successfully. The SG80 is met therefore for all scoring elements. A full strategy is not currently in place so the SG100 is not met for all scoring elements.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	There is only a partial strategy rather than a full strategy in place, and therefore the SG100 is not met.		

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
References	http://natura2000.eea.europa.eu/# www.ospar.org www.searchmesh.ne	
OVERALL PERFORMANCE INDICATOR SCORE:		**75**
CONDITION NUMBER (if relevant):		**4**

Table 26. New evaluation table for PI 2.4.2

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
Scoring Issue		SG 60	SG 80	SG 100
a	**Guidepost**	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of the fishery on habitat types.
	Met?	Y	Y	N

PI 2.4.2		There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types		
	Justification	Based on the data on the position of trawl hauls from the electronic log books , most of the fishing effort of the Norwegian shrimp fleet takes place over soft seabed sediments such as mud and sandy mud. Skagerrak is a well-studied area and its sensitive, vulnerable or protected habitats and species are identified and designated by the Natura Directive (http://natura2000.eea.europa.eu/#), the OSPAR Commission (www.ospar.org) and the Mapping European Seabed Habitats portal (www.searchmesh.net). The establishment in 2009 of the Kosterhavet National Park as the first marine national park in the Skagerrak demonstrated a key step forward in the management of marine habitat types. Within the National Park there is a ban on trawling in the most sensitive areas. There are a series of Natura2000 sites designated in the Skagerrak and coral reefs are protected in Skagens gren and Gullmarsfjorden, where there are also tight restrictions on fishing activity. In addition to areas designated already, there are also a number of other proposals for conservation sites by NGOs. In the Väderöfjorden and Kosterhavets nationalpark (Kosterfjordens), and in the Gullmarsfjorden shrimp trawling is permitted but the fishery is closely regulated. The Bratten area is protected and in January 2017 new fishing regulations in Bratten were implemented through Commission delegated regulation (EU) 2017/118 of 5 September 2016 (EU, 2017). As a result of this regulation, 27% of the area will be protected and within that area all fishing gears will be prohibited. This will be controlled through mandatory use of AIS which clearly indicates the location of the fishing. In addition to the habitat designations, the application of the precautionary approach in taking measures to minimise the impact of fishing activities on marine ecosystems is enshrined within the EU CFP, and there are a suite of measures in place, such as catch quotas, effort limitation and gear restrictions which limit the impact of the gear on non-target species and the environment. The absence of fishing in some areas of the distribution of the five key VMEs can be considered to be a measure that manages the impact on habitat, and fishermen will also try to avoid ground where the fishing gear will get snagged. In addition regulation J-128-2011 requires that "collisions" between fishing gear and corals and sponges (defined by 60 kg corals or 800 kg of sponges) must be reported and move-on rules apply. All of these measures can be considered to contribute to a partial strategy for managing the impact of the fishery on the five vulnerable habitat types. The SG80 is met therefore for all scoring elements. In the absence of closure of all VME hotspots, a full strategy is not in place and so the SG100 is not met for any of the scoring elements.		
b	**Guidepost**	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar fisheries/habitats).	There is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.	Testing supports high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.
	Met?	Y	Y	N

PI 2.4.2		**There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types**		
	Justification	There is an objective basis for confidence that a partial strategy for managing the impact on habitat types that includes limitations on fishing effort through catch limits, the absence of fishing in many areas of the distribution of VMEs, the avoidance of VME habitats by fishermen to safeguard their fishing gear and the closure to fishing of the key VME hotspots will work as it will minimise the potential interaction of fishing with VME habitats. For *Lophelia* reefs and *Zostera* beds which are primarily found in the Skagerrak in shallower waters which are covered by the restriction on fishing in the most vulnerable areas, there is therefore an objective basis for confidence that the partial strategy will work and so the SG80 is met. For coral gardens, deep sea sponge aggregations and seapen and burrowing megafauna VMEs, there are now fishing restrictions in the most vulnerable area following the implementation of the new EU regulations prohibiting fishing in 27% of the Bratten. As VMS data show that the Norwegian fleet does not fish in any of the other sensitive areas, and actively avoids fishing in areas with corals and sponges to minimise damage to trawls, there is therefore an objective basis for confidence that the partial strategy will work for these habitats and so the SG80 is met.		
c	**Guidepost**		There is some evidence that the partial strategy is being implemented successfully.	There is clear evidence that the strategy is being implemented successfully.
	Met?		Y	N
	Justification	There are a large number of Natura2000 sites designated in the Skagerrak (such as Skagens Gren, Bratten, Kosterfjorden, Gullmarsfjorden). The establishment of these protected areas, current regulations protecting the most sensitive habitats, and the ongoing introduction of new regulations, the suite of management measures that regulate the level of fishing and the avoidance of rough ground by fishermen are all measures that are in place and provide evidence that the partial strategy is being implemented successfully. The SG80 is met therefore for all scoring elements. A full strategy is not currently in place so the SG100 is not met for all scoring elements.		
d	**Guidepost**			There is some evidence that the strategy is achieving its objective.
	Met?			N
	Justification	There is only a partial strategy rather than a full strategy in place, and therefore the SG100 is not met.		
References		http://natura2000.eea.europa.eu/# www.ospar.org www.searchmesh.ne		
OVERALL PERFORMANCE INDICATOR SCORE:				**80**

PI 2.4.2	There is a strategy in place that is designed to ensure the fishery does not pose a risk of serious or irreversible harm to habitat types	
CONDITION NUMBER (if relevant):		**(4)**

New conditions

Table 27. Condition 6

Performance Indicator(s) & Score(s)	Insert relevant PI number(s)	Insert relevant scoring issue/ scoring guidepost text	Score
	1.2.1 There is a robust and precautionary harvest strategy in place	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	**70**
Rationale	The key element of the current harvest strategy is that annual TACs should be set in line with an MSY framework where the TAC is based on fishing at F_{MSY} when the stock biomass is above MSY $B_{trigger}$, but setting a TAC based on lower values of F when stock biomass drops below MSY $B_{trigger}$. This strategy has been in place since 2014 and was formally incorporated in the Long Term Management Strategy (LTMS) agreed by the EU and Norway in 2018. The LTMS is based upon a Management Strategy Evaluation (MSE) undertaken by ICES to evaluate the combination of fishing mortality and MSY $B_{trigger}$ that provides the highest yield without exceeding the 5% probability level of the biomass falling below B_{lim} over a 30 year period. The harvest strategy therefore has been evaluated in theory and is therefore likely to work in practice. The SG60 is met. The most recent stock assessment has concluded that after an initial recovery period following the decline observed from 2008 to 2012, stock biomass has now declined to below MSY $B_{trigger}$. Previously TACs had not always been set in line with ICES advice, but in the last two to three years the stock has declined despite TACs being set within the MSY framework. The assessment shows that F has exceeded F_{MSY} in most recent years, and therefore it seems likely that the TAC has been set too high. This can be explained by recent changes in the stock assessment methodology. Previous stock assessments have used a stock-production model which gave a more optimistic outlook on stock status than the newly-implemented length-based model, and TACs were set in line with the best available scientific advice at the time. In addition new data on discard rates in the Norwegian fleet suggest that the overall discard rate in the fishery assumed in the assessment in recent years may have been an underestimate of the true level. Although other elements of the harvest strategy such as reducing the discarding of small non-commercial-sized prawns and reducing the incentives for high-grading appear to be working, the key element of setting the TACs within an MSY framework does not appear to have worked in the last 2-3 years, and so SG80 is not met. Following the revised assessment of stock status from the new length-based model and with new information on discard rates, the harvest strategy is expected to work in future, but the assessment team notes that the TAC set by the EU-Norway consultations for 2018 was		

	8,900 tonnes which is 3.8% higher than the TAC advised by ICES, and therefore the current harvest strategy is not being fully adhered to. In addition Norway has announced carry forward of 'unused' quota from 2016 to 2017 and from 2017 to 2018 despite the overall TAC being exceeded in some recent years, and SSB being below MSYBtrigger. Such 'banking' of quota will not be permitted under the LTMS if the estimate of SSB is below MSY Btrigger. The TAC for 2019 will be the first to be covered by the new LTMS, so it is expected that in future TACs will not exceed the ICES advice.
Condition	By the first annual surveillance of the recertification provide evidence that the harvest strategy is achieving its objectives.
Milestones	**Annual surveillance 3**: Provide evidence that TACs are being set in line with the LTMS and that observed F is below the F_{MSY} or F_{TARGET}. **Annual surveillance 4:** Provide evidence that TACs continue to be set in line with the LTMS, that observed F continues to be below the F_{MSY} or F_{TARGET} and provide some initial evidence that the harvest strategy is achieving its objectives. **Annual surveillance 1 of recertification**: Provide evidence that TACs continue to be set in line with the LTMS, that observed F continues to be below the F_{MSY} or F_{TARGET} and provide clear evidence that the harvest strategy is achieving its objectives.
Client action plan	**Annual surveillance 3**: NFA will provide evidence that the TAC for 2019 is set in line with the LTMS and that observed F is below the F_{MSY} or F_{TARGET}. **Annual surveillance 4:** NFA will provide evidence that TACs continue to be set in line with the LTMS, that observed F continues to be below the F_{MSY} or F_{TARGET} and provide some initial evidence that the harvest strategy is achieving its objectives. **Annual surveillance 1 of recertification**: NFA will provide evidence that TACs continue to be set in line with the LTMS, that observed F continues to be below the F_{MSY} or F_{TARGET} and provide clear evidence that the harvest strategy is now achieving its objectives.
Consultation on condition	NFA will continue to liaise with scientists at IMR and within the wider ICES community and will continue to work with the Ministry to ensure that TACs are set in line with the LTMS.

Appendix 2. Stakeholder submissions

No stakeholder submissions were received which had any significant impact on scoring, rationales or conditions.

Appendix 3. Additional detail on conditions/ actions/ results

N/A

Appendix 4. Revised Surveillance Program (if necessary)

There are no proposed revisions to the surveillance program.

Appendix 5. List of member vessels

Registration no.	Vessel name
A0056A	Astrid Ann
H0060B	Santos
H00660B	Bølgen
H0098B	Stokkøy
H0185AV	Skipsholmen
H0313AV	Caprice
H0322AV	Mersey
N0060H	Vestskjær
R0001RB	Havsol
R0003ES	Guldringnes
R0005S	Sangis
R0006SK	Sønnavind
R0007SK	Martor
R0009SK	Teodor
R0012B	Jarstein
R0012SO	Optimist
R0014K	Athena
R0018K	Ingar
R0020B	Vågholm
R0024B	Vågan
R0029B	Liten
R0030S	Vassøybuen
R0033K	Veiflu
R0039K	Fjordtrål
R0040K	Elvira
R0049K	Waarøy
R0050B	Varholm
R0052K	Fjordtrål
R0060ST	Trio
R0062ES	Tangen
R0077SK	Vestavind
R0087K	Skårholm
R0088K	Marvi
R0111K	Rima
R0168K	Strand
R0344K	Toya
SF0277V	Fhavfluna
VA0017F	Hidraskjær
VA0020S	Lillevig
VA0033K	Sigjo
VA0041K	Monsun

VA0044F	Holly
VA0095K	Piraja
VA196K	Horisont III
VA0330S	Hellevig I
A0002F	Skippy
A0005AS	Trygg
AA0001G	Smart
A0007F	Borøy
AA0004G	Hovland
AA0005A	TEIS
AA0005G	VÅGAN
AA0007G	Kvaløy
AA0007L	FARMANN
AA0010A	Emely sør
AA0015T	Moby Dick
AA0017L	NEBB
AA0018G	Hebron
AA0022T	Sjøgutt
AA0024G	Sagato
AA0026T	Grepan Junior
AA0029R	Nils Erik
AA0032G	OLIVIA
AA0032R	Ero
AA0040A	Omega
AA0050T	Teistholm
AA0055G	Astor
AA0056A	Astrid Ann
AA0059A	Havfruen II
AA0061G	Villfugl
AA0066R	Jano
AA0076A	Frøken Wahlberg
AA0096A	Siri
M0008A	TORMO
M0028G	Myntevik
M0033K	Pauline
Ø0001H	Sjøliv
Ø0001RD	SJØPRINS
Ø0001S	Camo
Ø0002R	Årviken
Ø0002RD	SAGA
Ø0003M	Ringskjær
O0005O	Pelikan
Ø0008H	Victhor
O0009O	FJORDGUTT

Ø0010F	Baluba
Ø0010H	Eli R
Ø0010RD	Silje
O0013O	LUNA
Ø0014F	Vigdis
O0017O	VENDEL
Ø0019F	SVANESUND
Ø0019H	Henriette
Ø0022F	ELLEN
Ø0022H	Stangholm
Ø0023H	Veronika
Ø0024H	Helene
Ø0028F	Villand
Ø0028H	Strandgutt
Ø0029H	SAMSON
Ø0030H	Spjærøy
Ø0036H	Hera
Ø0039H	Luro
Ø0044H	Kikki
Ø0045H	Odden
Ø0047H	ASMALØ
Ø0048H	Tennskjær
Ø0049H	Aqualon
Ø0050H	Sonbas Senior
Ø0072H	Nikita
Ø0082H	Bodil
Ø0086H	Øyskjær
Ø0088H	Mikki
Ø0235H	Topsy
Ø0264H	Torglimt
R0005K	HOLM
SF0277V	Havfluna
TK0002BL	Mostein
TK0005BL	TORNADO
TK0011K	Risøy
TK0011P	Brusen
TK0016BL	LILLEØY
TK0019BL	Danholm
TK0030BL	Silje Kristina
TK0031BL	Vibeke
TK0044BL	Skarsund
TK0055BL	ANNY
TK0059BL	Lunik
TK0099BL	Juventus

V0001HS	Vikingen
V0001L	Brenning
V0001N	ÅRØ
V0001TM	Tristein
V0002TM	Mir
V0003N	LINDHOLMEN
V0003S	Stigar
V0004BR	JENNY SOFIE
V0004L	Ulsvaag
V0005S	Nani B
V0006S	Buerøy
V0008L	Zita
V0009S	Sjøbris
V0011S	Cilius
V0014TM	RØSSESUND
V0015TM	LINNEA
V0016S	Veni Activ
V0020N	Sandøsund
V0020TM	Flo
V0039L	Ulagutten
V0040L	Flamingo
V0046L	Oterøy
V0066N	Astor 1
VA0002F	LIPTON BJØRNSON
VA0003F	Linn
VA0004M	VALLØY
VA0006K	AMALO
VA0007LS	Marie Emilie
VA0009S	Neptun
VA0012LD	Agathe
VA0014F	Merethe
VA0015S	Hellevig
VA0016K	FANCY
VA0018F	Daniana
VA0018S	TEMPO
VA0019F	Athena 2
VA0020F	HAVSUND
VA0022K	SJØVIK
VA0023S	Pilot
VA0024K	Ludvig
VA0026K	Pluto
VA0026M	Ternen
VA0040S	Tomine
VA0042S	Havlys

VA0043S	NYTRAAL
VA0044M	Rosenvoll
VA0047M	Lillegutt
VA0049K	VESLA
VA0059S	OFTENESFISK
V0007N	Orion
VA0068S	BRIS
VA0071M	Brattholm
VA0096K	PONNY
VA0116K	MALENA
VA0135K	Ringskjær Sør
VA0170M	EIGENES
VA0196K	Horisont III
VA0200K	AGANTHYR
VA0233S	UDVAAR II
VA0269K	Betzy
VA0330S	HELLEVIG 1
H0010O	Bønes
H0017B	Klipton
H0052B	Luna
H0061B	Bølgen
H0085B	Bergblom
H0088B	Havleik
H0145AV	Tor
H0226B	Line
SF0054V	Atina
H0064B	Havøy
SF0001FL	Fjordglans
H0223AV	Amelia
AA0002T	Borøy
AA0004A	Roughboy
AA0006A	Hanne
AA0007A	Farmann
AA0015R	Luro
AA0018L	Vibeke
AA0034A	Omega
H0059AV	SKÅR JR
O0003O	LUNA
O0004O	Leik
O0006O	Fjordgutt
O0029O	SJØFUGLEN
R0008SK	Vestavind
TK0008BL	BUELAND
TK0014BL	Havlys

TK0015BL	Fjordbuen
TK0042BL	Nytrål
TK0042K	Skomring
V0001T	Sjøglimt
V0002L	Sjøgutt
V0002S	Linnea
V0006BR	Hauken
V0016TM	Lillegutt
V0029S	Vesla
VA0002S	Hunter
VA0003K	Musti
VA0004S	Udvaar
VA0010S	MARINO
VA0011LD	EL MARINO
VA0042K	Setho
VA0077S	PILOT
VA0083F	Ramona
VA0142K	Svåholm
VA0200K	Ann Louise
VA0264K	Betzy
Ø0007H	Eli R
Ø0019R	Aqualon
H0183AV	Eikholmen
HM0424	Westbank
M0042A	Klondyke
N0009H	Spitsbergen
N0065VV	Spitsbergen
R0004K	BUØY
R0004S	B.vassøy
R0005ES	Fiskebøen
R0009U	Guldringnes
R0011K	Fjordtrål
R0013ES	Caprice
R0014ES	Suderøy
R0014SK	Hastverk
R0015H	Boffen
R0018K	Ikato
R0018SO	Optimist
R0020K	Molinergutt
R0020ST	Teis
R0022SK	Mersey
R0023SK	Elin
R0041K	Veafisk
R0050K	Quo Vadis

R0059ES	Øyestein
R0059K	Fjordtrål
R0062ES	Tråsavik
R0066K	Elvira
R0076K	Lom
R0077ES	Skårholm
R0077K	Skårholm
R0082ES	Tråsavik
R0110K	Fløsund
R0132K	Erly
R0183K	Norli
R0233K	Sæviktrål
R0258K	Myntevik
R0784K	Silvervåg
H0145AV	Munin
M0008VD	Harald Jr.
M0100HØ	Ringbas
SF0046B	Sjøbrem
Registration no.	Vessel name

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