

**Marine Stewardship Council (MSC) Expedited Audit Report UoA
5 - Whiting**

SFSAG Northern Demersal Stocks

On behalf of

Scottish Fisheries Sustainable Accreditation

Prepared by

Control Union Pesca Ltd

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Contents

CONTENTS	1
QA	2
GLOSSARY	1
1 EXECUTIVE SUMMARY	2
2 REPORT DETAILS	3
2.1 Surveillance information.....	3
3 BACKGROUND	5
3.1 Version details.....	5
3.2 Unit(s) of Assessment (UoA)	5
3.3 Vessel list.....	8
3.4 Principle 1.....	9
3.4.1 Stock Assessment.....	9
3.4.2 Reference Points	9
3.4.3 Stock Status.....	9
3.4.4 Principle 1 overall conclusion.....	10
3.5 Principle 2.....	11
3.5.1 Principle 2 overall conclusion.....	11
3.6 Principle 3.....	11
3.6.1 Principle 3 overall conclusion.....	11
3.7 Traceability.....	11
4 RESULTS	12
4.1 Surveillance results overview	12
4.1.1 Total Allowable Catch (TAC) and Catch Data	12
4.1.2 Summary of conditions	12
4.1.3 Recommendations	14
4.2 Conditions	14
4.3 Client action plan	16
4.4 Rescoring Performance Indicators.....	17
4.5 Principle level scores.....	40
5 REFERENCES	42
6 APPENDICES	43
APPENDIX 1 EVALUATION PROCESSES AND TECHNIQUES	44
Appendix 1.1 Site visits	44
Appendix 1.2 Stakeholder participation	44
APPENDIX 2 STAKEHOLDER INPUT	46

APPENDIX 3	REVISED SURVEILLANCE PROGRAM.....	47
APPENDIX 4	HARMONISED FISHERY ASSESSMENTS	48

QA

Role	Signature and date
Originator:	Hugh Jones 05/09/2019
Reviewer:	Henry Ernst 06/09/2019
Approver:	Toru Tsuzaki 19/09/2019

Glossary

Acronym	Definition
ACOM	ICES Advisory Committee
CFP	Common Fisheries Policy
CPUE	Catch Per Unit Effort
EEZ	Exclusive Economic Zone
E-log	Electronic logbook
F	Fishing mortality
FCR	Fisheries Certification Requirements (MSC scheme document)
FMAC	Fisheries Management and Conservation Group
GITAG	Gear Innovation and Technology Advisory Group
HCR	Harvest Control Rule
IBTS	International Bottom Trawl Surveys
ICES	International Council for the Exploration of the Sea
ICJ	International Court of Justice
IPI	Inseparable or Practicably Inseparable (stocks)
IUU	Illegal, Unreported, Unregulated
LO	Landing Obligation
M	Natural mortality
MCS	Monitoring Control and Surveillance
MMO	Marine Management Organisation
MSY	Maximum Sustainable Yield
NSAC	North Sea Advisory Council
PA	Precautionary Approach
PCR	Public Certification Report
PI	Performance indicator
PO	Producer Organisation
PRI	Point of Recruitment Impairment
SFF	Scottish Fishermen's Federation
SFO	Scottish Fishermen's Organisation
SG	Scoring Guidepost
SSB	Spawning Stock Biomass
SWFPA	Scottish White Fish Producers Association
STECF	Scientific, Technical and Economic Committee for Fisheries
TAC	Total Allowable Catch
TRP	Target Reference Point
UoA	Unit of Assessment

1 Executive Summary

This report is an expedited audit of the SFSAG Northern Demersal Stocks fishery - North Sea whiting Unit of Assessment undertaken by CU Pesca against the MSC standard (v1.3) and Process (V2.1).

The fishery was certified as sustainable on the 25th October 2010 under the name Scottish White Fish Producers Association (SWFPA) - North Sea Haddock. It was renamed SFSAG North Sea Haddock and underwent reassessment and was recertified on 17th May 2016. A scope extension on the fishery was completed on 3rd June 2018 with four additional UoAs added and the name changed to SFSAG Northern Demersal Stocks including UoA 5 for North Sea whiting. This is an expedited audit of Principle 1 for that UoA. This audit was conducted against FCP 2.1 of the MSC standard with V1.3 scoring and using GCR 2.3. The off-site audit was carried out on the 2nd August 2019 by Hugh Jones (Team Leader) and Robin Cook (Principle 1).

The expedited audit considered Principle 1 and finds that UoA 5 - North Sea whiting of SFSAG Northern Demersal Stocks fishery cannot maintain their MSC certificate. The failure is based on failing PI 1.1.2 (Stock Rebuilding) and PI 1.2.1 (Harvest Strategy).

Following consideration of all stakeholders' inputs and new information provided by the client and the relevant stock assessments the fishery assessment team concludes that the fishery can no longer remain certified against the MSC standard and hence the UoA is suspended.

2 Report Details

2.1 Surveillance information

1	Fishery name	
	Scottish Fisheries Sustainable Accreditation Group (SFSAG) Northern Demersal stocks (UoA 5 – whiting)	
2	Surveillance level and type	
	<p>Expedited audit of Principle 1.</p> <p>Following the publication of ICES advice for North Sea whiting published by ICES 28th June 2019. CU Pesca reviewed the information presented and as per as per FCP2.1 - 7.29.1 concluded that an “expedited audit” is required for this fishery as the new information may cause a major change in the status of Principle 1. This audit will examine whether there is any change in the perceived status of the stock with respect to the scoring of Principle 1 of this fishery.</p>	
3	Surveillance number	
	1st Surveillance	
	2nd Surveillance	
	3rd Surveillance	
	4th Surveillance	
	Other (expedited etc)	X
4	Proposed team leader	
	Name	Dr Hugh Jones
	Areas of responsibility	Team Leader
	Competency criteria (Annex PC)	Dr Jones has a PhD in Ecotoxicology and strong background in marine research including publications and reports on ecotoxicology, environmental risk assessments and fisheries research. Prior to joining CU Pesca he was employed as a fisheries scientist in the development of an empirical harvest strategy for commercial abalone fisheries and fisheries assessments of estuarine bivalves. This included work on population metrics (recruitment, growth), harvest dynamics (catch rates, market selectivity), and the use of fine scale geospatial techniques as performance measures to assess stock sustainability. Dr Jones has completed the required Fishery Team Leader MSC training modules for the new V2.01 Fisheries Certification and V2.1 process requirement
	Conflict of interest in relation to this fishery	CU Pesca have reviewed Dr Jone’s information and found no conflict of interest.
	On-site or off-site	It is proposed that Dr Jones will act as team leader for this audit and will be responsible for bringing together the work.

	CV	Available on request
5	Proposed team members	
	Name	Dr Robin Cook
	Areas of responsibility	Principle 1
	Competency criteria (Annex PC)	<p>Dr Cook meets the following requirements in Table PC3: 1. Fish stock assessment and Table PC3 2. Fish stock biology / ecology. In a career spanning over 40 years, Robin has gained experience with the following stock assessment techniques: Bayesian age structured assessment models, Bayesian state-space models applied to demersal stocks that include marine mammal predation interactions, Surplus production modelling of mixed species, Extended Survivors Analysis (XSA), Time Series Analysis (TSA), Stock Synthesis, BAM, ADAPT, SAM and related methods. 30 plus years' experience working with the biology and population dynamics of the target or species with similar biology: Robin is an expert in demersal fisheries population dynamics. His expertise has focused on North Atlantic systems, in particular the North Sea gadoid populations.</p> <p>Based on the information above and Dr Cook's CV, CU Pesca are confident Dr Cook meets the requirements of Table PC3 for 1. Fish stock assessment and 2. Fish stock biology / ecology.</p>
	Conflict of interest in relation to this fishery	CU Pesca have reviewed Dr Cook's information and found no conflict of interest.
	On-site or off-site	Off-site
	CV	Available on request
6	Audit/review time and location	
	Off-site. The expedited audit consisted of an off-site audit in the week 29 th July 2019, based on publicly available stock assessment and management materials. Email contact was available for both assessors and the client and conference facilities were utilised as required.	
7	Assessment and review activities	
	<p>During the audit, CU Pesca communicated with the client and any relevant stakeholders and used any available up to date information to assess and review;</p> <ul style="list-style-type: none"> • Any changes to the scientific base of information such as stock assessments and its impact on Principle 1 scoring. • A review of the current conditions on Principle 1 for UoA 5 • Any other significant changes in the fishery 	

3 Background

3.1 Version details

Table 1. Fisheries programme documents versions

Document	Version number
MSC Fisheries Certification Process	Version 2.1
MSC Fisheries Standard	Version 1.3
MSC General Certification Requirements	Version 2.3
MSC Reporting Template	Version 2.01

3.2 Unit(s) of Assessment (UoA)

CU Pesca confirms that the fishery under audit remains within in the scope of the MSC Fisheries Standard (7.4 of the MSC Fisheries Certification Process v2.1):

- The target species is not an amphibian, reptile, bird or mammal;
- 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 or child labour violation in the last 2 years;
- The fishery has in place a mechanism for resolving disputes, and disputes do not overwhelm the fishery;
- The fishery is not an enhanced fishery as per the MSC FCP 7.4.6; and
- The fishery is not an introduced species-based fishery as per the MSC FCP 7.4.7.

CU Pesca confirms that the client group has submitted the completed 'Certificate Holder Forced and Child Labour Policies, Practices and Measures Template' prior to the start of this assessment.

There are 5 UoAs within the Northern Demersal Certificate however only UoA 5 -whiting is under assessment in this expedited audit the other 4 UoAs are referred to purely for reference to the entire certificate.

The current Unit of Assessment (UoA) for this expedited audit is UoA 5 and is given in Table 2. The four other UoAs within the fishery certificate but not active in this expedited audit are given in Table 3.

Table 2. Unit of Assessment (UoA)
UoA 5 - WHG

Species	Whiting (<i>Merlangius merlangus</i>)
Geographical range	Subarea 4 and subdivision 2a
Method of capture	Single Nephrops trawl Twin Nephrops trawl Demersal trawl Twin demersal trawl Danish seine Pair seine-trawl Pair trawl
Stock	ICES - Whiting (<i>Merlangius merlangus</i>) in Subarea 4 and Division 7.d (North Sea and eastern English Channel)
Management Systems	Legal: EC Common Fisheries Policy; EU-Norway Agreement; National legislation Enforcement: 'Marine Scotland Compliance' & Royal Navy, and 'Norwegian authorities' with 'Norwegian Directorate of Fisheries and Norwegian Coast Guard'. Science: Marine Scotland Science/ ICES
Client group	Scottish Fisheries Sustainable Accreditation Group (SFSAG) member vessels
Other eligible fishers	None

Table 3. Units of Assessment not active in this expedited audit.
UoA 1 - HAD

Species	Haddock (<i>Melanogrammus aeglefinus</i>)
Geographical range	Subarea 4, Division 6.a, 2a and Subdivision 3.a.20 (North Sea, West of Scotland, Skagerrak)
Method of capture	Single Nephrops trawl Twin Nephrops trawl Demersal trawl Twin demersal trawl Danish seine Pair seine-trawl Pair trawl
Stock	ICES - Haddock (<i>Melanogrammus aeglefinus</i>) in Subarea 4, Division 6.a, and Subdivision 3.a.20 (North Sea, West of Scotland, Skagerrak)
Management Systems	Legal: EC Common Fisheries Policy; EU-Norway Agreement; National legislation Enforcement: 'Marine Scotland Compliance' & Royal Navy, and 'Norwegian authorities' with 'Norwegian Directorate of Fisheries and Norwegian Coast Guard'. Science: Marine Scotland Science/ ICES
Client group	Scottish Fisheries Sustainable Accreditation Group (SFSAG) member vessels
Other eligible fishers	None

UoA 2 - POK

Species	Saithe (<i>Pollachius virens</i>)
Geographical range	Subareas 4 and 6 subdivision 2a and Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)
Method of capture	Single Nephrops trawl Twin Nephrops trawl Demersal trawl Twin demersal trawl Danish seine Pair seine-trawl Pair trawl
Stock	ICES - Saithe (<i>Pollachius virens</i>) in Subareas 4 and 6 and Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)
Management Systems	Legal: EC Common Fisheries Policy; EU-Norway Agreement; National legislation Enforcement: 'Marine Scotland Compliance' & Royal Navy, and 'Norwegian authorities' with 'Norwegian Directorate of Fisheries and Norwegian Coast Guard'. Science: Marine Scotland Science/ ICES
Client group	Scottish Fisheries Sustainable Accreditation Group (SFSAG) member vessels
Other eligible fishers	None

UoA 3 - PLE

Species	Plaice (<i>Pleuronectes platessa</i>)
Geographical range	Subarea 4 (North Sea) and subdivision 3.a and 2a
Method of capture	Single Nephrops trawl Twin Nephrops trawl Demersal trawl Twin demersal trawl Danish seine Pair seine-trawl Pair trawl
Stock	ICES – Plaice (<i>Pleuronectes platessa</i>) Subarea 4 (North Sea) and subdivision 3.a.20 (Skagerrak)
Management Systems	Legal: EC Common Fisheries Policy; EU-Norway Agreement; National legislation Enforcement: 'Marine Scotland Compliance' & Royal Navy, and 'Norwegian authorities' with 'Norwegian Directorate of Fisheries and Norwegian Coast Guard'. Science: Marine Scotland Science/ ICES
Client group	Scottish Fisheries Sustainable Accreditation Group (SFSAG) member vessels
Other eligible fishers	None

UoA 4 - HKE

Species	Hake (<i>Merluccius merluccius</i>)
Geographical range	Subareas 4, 6a and subdivisions 2a and 3a.
Method of capture	Single Nephrops trawl Twin Nephrops trawl Demersal trawl Twin demersal trawl Danish seine Pair seine-trawl Pair trawl
Stock	ICES - Hake (<i>Merluccius merluccius</i>) in Subareas 4, 6, and 7 and divisions 3.a, 8.a–b, and 8.d, Northern stock (Greater North Sea, Celtic Seas, and the northern Bay of Biscay)
Management Systems	Legal: EC Common Fisheries Policy; EU-Norway Agreement; National legislation Enforcement: ‘Marine Scotland Compliance’ & Royal Navy, and ‘Norwegian authorities’ with ‘Norwegian Directorate of Fisheries and Norwegian Coast Guard’. Science: Marine Scotland Science/ ICES
Client group	Scottish Fisheries Sustainable Accreditation Group (SFSAG) member vessels
Other eligible fishers	None

3.3 Vessel list

Current list is available at <http://scottishfsag.org/wp-content/uploads/2017/07/MSC-Saithe-and-haddock-Master-250717xlsx.pdf>

3.4 Principle 1

3.4.1 Stock Assessment

The assessment has shifted from an XSA (Shepherd 1999) assessment model in 2017 to a SAM (state based assessment model) in 2018 (ICES 2018) with alternative assessments run for comparison at the benchmark workshop. Within the SAM model due to survey data uncertainties in years prior to 1983 the model only considers these indices after 1983 (ICES 2018). New natural mortality values were tested at an inter-benchmark in 2016 (ICES 2016). A further benchmark in 2018 resulted in a rescaling of spawning stock biomass and revision of recruitment age (ICES 2018) (Figure 1).

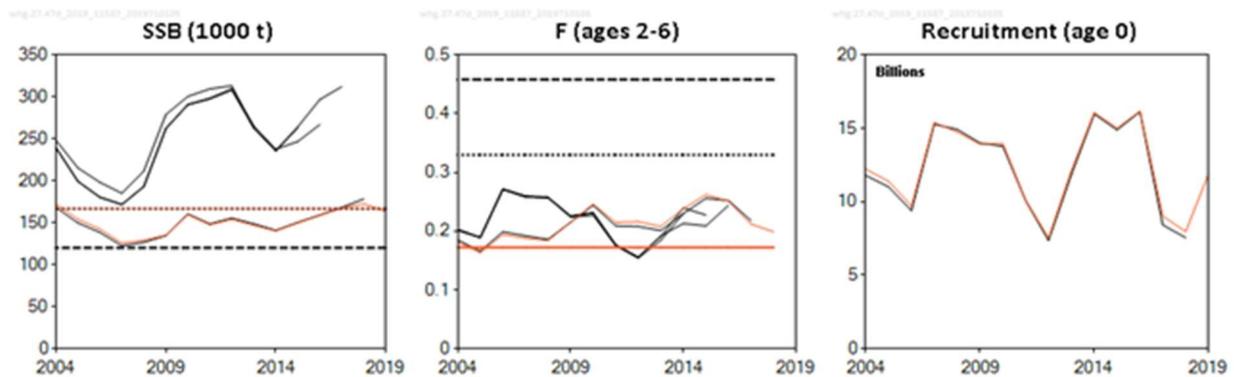


Figure 1. Whiting in Subarea 4 and Division 7.d. Historical assessment results. The stock was benchmarked in 2018, which resulted in a downward rescaling of the SSB and a revision of the recruitment age. In all figures the most recent model estimates are shown by the red line. SSB (left) shows B_{lim} as the dashed black line and $B_{pa} / MSYB_{trigger}$ as dotted red and black line. F (centre) shows F_{MSY} solid red line, F_{pa} dotted black line and F_{lim} Dashed black line. Source: ICES (2019b).

3.4.2 Reference Points

B_{lim} (proxy for Point of Recruitment Impairment PRI) is based on the lowest observed value in 2007 (119,970 t) from a time series starting in 1978. It is used as the basis to estimate B_{pa} (where $MSYB_{trigger} = B_{pa}$) taking into account uncertainty in B_{lim} ($B_{pa} = 1.4 * B_{lim}$) 166,708 t. F_{MSY} is calculated using a stochastic simulation with the constraint that the probability of the biomass falling below B_{lim} is less than 0.05 (ICES 2018). In this case because fishing at F_{MSY} is expected to exceed this probability, the reference point value of F_{MSY} is capped at $F_{p0.05}$ and is equal to 0.172 (ICES 2019b).

The recent management strategy evaluations (MSE) found that the ICES MSY advice rule with current F_{MSY} and $MSYB_{trigger}$ were not to be precautionary (probability of $SSB < B_{lim}$ higher than 5 %) under the assumptions of those simulations (ICES 2019a). This can be explained by technical differences in the evaluation approach used for the MSE compared to the standard approach used to estimate MSY reference points. ICES note that further investigation is now required to establish if the current reference points need to be re-defined but for the interim period ICES will continue to use the current reference points for advice.

3.4.3 Stock Status

Spawning-stock biomass (SSB) has fluctuated around $MSYB_{trigger}$ since the mid-1980s and is just below it in 2019 (Figure 2, Figure 3). Fishing mortality (F) has been above F_{MSY} throughout the time-series, apart from 2005. Recruitment (R) has been fluctuating without trend, but the last two year classes are below average (Figure 2).

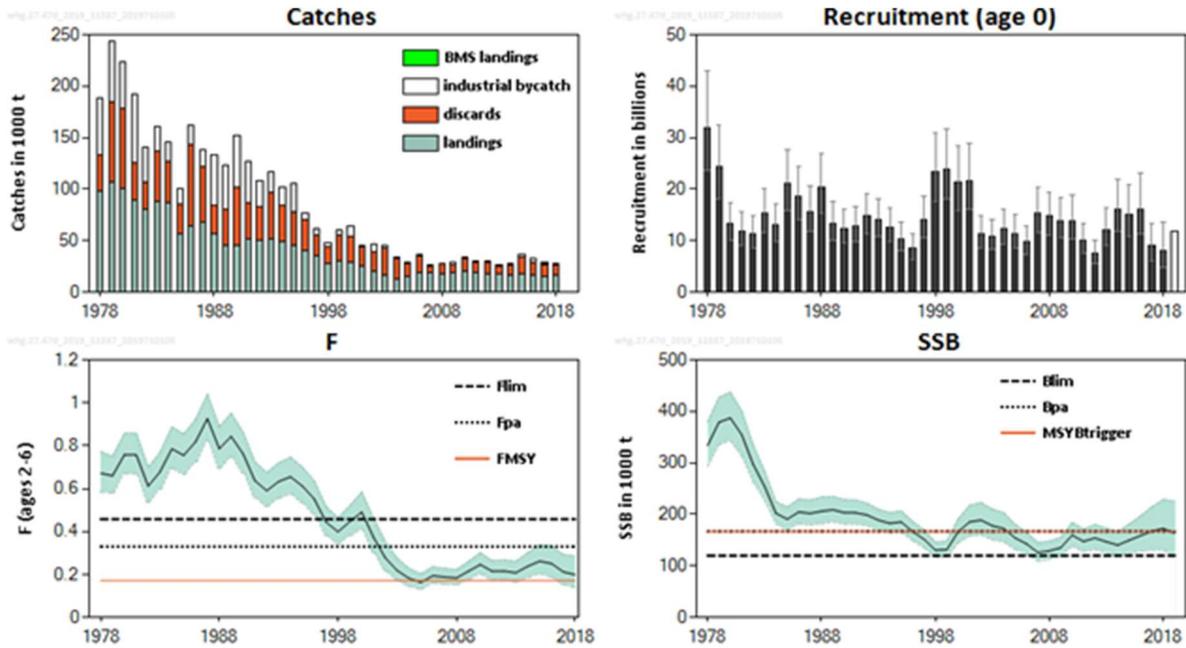


Figure 2. Whiting in Subarea 4 and Division 7.d. Summary of the stock assessment. Shaded areas (F, SSB) and error bars (R) indicate 95% confidence intervals. Assumed recruitment is unshaded. Source: ICES (2019b).

	Fishing pressure				Stock size					
	2016	2017	2018		2017	2018	2019			
Maximum sustainable yield	F_{MSY}	✘	✘	✘	Above	MSY $B_{trigger}$	✔	✔	✘	Below trigger
Precautionary approach	F_{pa}	✔	✔	✔	Harvested sustainably	B_{pa}	✔	✔	⚠	Increased risk
Management plan	F_{MGT}	—	—	—	Not applicable	B_{MGT}	—	—	—	Not applicable

Figure 3. Whiting in Subarea 4 and Division 7.d. State of the stock and fishery relative to reference points. Source: ICES (2019b).

3.4.4 Principle 1 overall conclusion

Principle 1 is rescored for all PIs in section 4.4.

3.5 Principle 2

Not reviewed in this audit

3.5.1 Principle 2 overall conclusion

NA

3.6 Principle 3

Not reviewed in this audit

3.6.1 Principle 3 overall conclusion

NA

3.7 Traceability

Not reviewed in this audit

4 Results

4.1 Surveillance results overview

4.1.1 Total Allowable Catch (TAC) and Catch Data

The TAC and catch data for UoA 5 are shown in Table 4.

Table 4. TAC and Catch Data for WHG for UoA 5.

TAC	Year	2018	Amount	22,057 t
UoA share of TAC	Year	2018	Amount	14,876 t
UoC share of total TAC	Year	2018	Amount	98 %
Total green weight catch by UoC	Year (most recent)	2018	Amount	10,580 t
	Year (second most recent)	2017	Amount	9,036 t

4.1.2 Summary of conditions

Table 5. Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Status	PI original score	PI revised score
1	It needs to be clear that direct effects of the fishery are highly unlikely to create unacceptable impacts on starry ray and common skate.	PI 2.3.1	OPEN	75	NA
2	There should be an objective basis for confidence that the strategy for common skate and starry ray will work, based on information directly about the fishery and/or the species involved.	PI 2.3.2	OPEN	75	NA
3	There needs to be sufficient information available such that the impact of this fishery on common skate can be quantitatively estimated, and hence it can be determined whether the fishery may be a threat to the recovery of the common skate complex. This requires, as a minimum, a fleet-wide estimate of bycatch of common skate, as well as some basis by which population-level trends can be evaluated (noting that ICES considers that existing data are insufficient for this purpose).	PI 2.3.3	OPEN	75	NA
4	UoA 5 (whiting) Evaluate and adopt a new harvest strategy that is responsive to the state of the stock and provide evidence that it is achieving its management objectives.	PI 1.2.1	OPEN	70	<60
5	UoA 3 (plaice) Develop and adopt well-defined harvest control rules that are consistent with the harvest strategy and ensure that exploitation rates are reduced as	PI 1.2.2	OPEN	75	NA

Condition number	Condition	Performance Indicator (PI)	Status	PI original score	PI revised score
	limit reference points are approached. The HCR should be contained within a new management plan.				
6	UoA 4 (hake) Develop and adopt well-defined harvest control rules that are consistent with the harvest strategy and ensure that exploitation rates are reduced as limit reference points are approached. The HCR should be contained within a new management plan.	PI 1.2.2	OPEN	75	NA
7	UoA 5 (whiting) The fishery must provide evidence indicating that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.	PI 1.2.2	OPEN	65	NA
8	UoA 1, 2 and 4 (haddock, saithe and hake) By year 4 the partial strategy for W. Scotland cod must be demonstrably effective at achieving recovery and rebuilding of the stock to appropriate and realistic rebuilding target levels defined by the relevant stock model.	PI 2.1.1	OPEN	75	NA
9	UoA 1, 2 and 4 (haddock, saithe and hake) By year 4 there needs to be an objective basis for confidence that the strategy for rebuilding the W. Scotland cod stock will work, based on information about the stock and/or fishery.	PI 2.1.2	OPEN	75	NA
10	UoA 1, 2 and 4 (haddock, saithe and hake) The fishery should show that it is highly unlikely to reduce structure and function of burrowed mud with seapen habitat on the west coast (as defined by records of the tall seapen <i>Funiculina quadrangularis</i>) to a point where there would be serious or irreversible harm. Serious or irreversible harm is defined as a reduction in habitat distribution of 20% or more relative to baseline (currently-defined) levels.	PI 2.4.1	OPEN	75	NA
11	UoA 1, 2 and 4 (haddock, saithe and hake) The fishery should show that there is an objective basis for confidence that the partial strategy in place for seapens (<i>Funiculina quadrangularis</i>) on the W. coast is likely to work, in terms of achieving outcome score 80 or above for 2.4.1.	PI 2.4.2	OPEN	75	NA
12	UoA 5 (whiting) Evaluate and adopt new reference points that are precautionary and considered appropriate for the stock.	PI 1.1.2	OPEN	90	75

4.1.3 Recommendations

None

4.2 Conditions

Only conditions 4 and 7 which apply to Principle 1 of UoA 5 were reviewed at the expedited audit and therefore only those conditions appear below. In addition, a new condition 12 is added to the certificate.

Table 6. Condition 4.

Performance Indicator	PI 1.2.1
Score	70
Justification	<p>Scoring issue 1.2.1b (SG80) The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</p> <p>UoA 5 (whiting)</p> <p>The EU-Norway agreement aims to fish the stock at or below $F=0.15$. F has reduced from 0.69 in 1990 and fluctuated around 0.2 since 2002 showing that the strategy is likely to work and SG60 is met. ICES revised its estimates of natural mortality and this has changed reference points. ICES evaluated the EU-Norway plan with the revised M values as not consistent with the Precautionary Approach unless the plan reduced F when the projected biomass fell below B_{pa} and therefore SG80 is not met. ICES (2016) advise that further management strategies should be evaluated in view of the uncertainties surrounding the assessment.</p>
Condition	Evaluate and adopt a new harvest strategy that is responsive to the state of the stock and provide evidence that it is achieving its management objectives.
Milestones	<p>Meeting this condition will require the client to encourage the EU and Norway to obtain advice from ICES on an appropriate harvest strategy and control rule for the revised reference points. Managers will need to agree a management plan based on this advice. The anticipated milestones are set out below:</p> <p>Year 1: Evidence that the client is working with ICES, the UK authorities, and the EU to obtain relevant scientific advice on which to base a management plan. Score: 70</p> <p>Year 2: Evidence that a new management plan has been developed and tested. Score: 70</p> <p>Year 3: Evidence that the plan has been implemented. Likely resulting PI score SG 80.</p>
Consultation on condition	Marine Scotland letter of support evidenced in the expedited assessment (Jones et al. 2018).
Progress on Condition (Year 1)	See rationale in Scoring table 4. PI 1.2.1 – Harvest strategy
Status	Behind target and now <60. This condition is non-binding.

Table 7. Condition 7.

Performance Indicator	PI 1.2.2
Score	70
Justification	<p><u>Scoring issue 1.2.2c (SG80)</u> Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>UoA 5 (Whiting)</p> <p>The main tools for controlling exploitation are catch limits and restrictions on fleet capacity. In addition, there are minimum mesh sizes for the principal fleets (TR1) of 120mm. During the period when the EU-Norway management plan was in operation the fishing mortality was reduced from 0.69 to approximately 0.2. This shows the tools had some success during that period. In the most recent years the management plan has been made obsolete by the revision of the natural mortality values and reference points so there is insufficient evidence available to evaluate SG80 or SG100 until further stock assessments have been carried out.</p>
Condition	The fishery must provide evidence indicating that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rule.
Milestones	<p>Meeting this condition will require that Condition 3 is achieved and that there is progress towards reducing F towards this strategy. The anticipated milestones are set out below:</p> <p>Year 3: Evidence that the plan in Condition 3 has been implemented. Likely resulting PI score: 65</p> <p>Year 4: Evidence from stock assessment that F is at or below the FMSY reference point. Likely resulting PI score: 80</p>
Consultation on condition	Marine Scotland letter of support evidenced in the expedited assessment (Jones et al. 2018).
Progress on Condition (Year 1)	There is no milestone at Year 1 however an updated rationale is provided in Scoring table 5. PI 1.2.2 – Harvest control rules and tools
Status	On target
Additional information	The condition is now non-binding as the UoA is no longer in conformity with the MSC standard

Table 8. Condition 12.

Performance Indicator	PI 1.1.2
Score	75
Justification	<p><u>Scoring issue 1.1.3a (SG80)</u> Reference points are appropriate for the stock and can be estimated.</p> <p>The reference points are based on the ICES definition of the Precautionary Approach and their interpretation of MSY. B_{lim} is based on the lowest observed value in 2007 from a time series starting in 1978. It is used as the basis to estimate B_{pa} ($MSY_{trigger}$) taking into account uncertainty in B_{lim} ($B_{pa} = 1.4 * B_{lim}$). F_{MSY} is calculated using a stochastic simulation with the constraint that the probability of the biomass falling below B_{lim} is less than 0.05 (ICES 2018). The reference points can be estimated but their validity has been questioned by ICES and are not considered appropriate for the stock at present (ICES 2019a).</p>
Condition	Evaluate and adopt new reference points that are precautionary and considered appropriate for the stock.
Milestones	<p>Meeting this condition will require the client to encourage the EU and Norway to assist ICES in evaluating reference points. The anticipated milestones are set out below:</p> <p>Year 1: The client will provide a written report showing that the client is working with ICES, the UK authorities, and the EU to refine reference points which are precautionary. Score: 70</p> <p>Year 2: The client will provide evidence showing that a new reference points has been developed and tested. Score: 70</p> <p>Year 4: The client will provide evidence showing the reference points has been implemented and are precautionary for the stock. Likely resulting PI score SG 80.</p>
Consultation on condition	None required see additional information
Progress on Condition (Year 1)	New at this audit
Status	New
Additional information	The condition is non-binding as the UoA no longer in conformity with the MSC standard

4.3 Client action plan

As per GCR 7.4.3e - The client must provide a documented corrective action plan for addressing the cause of suspension, which is acceptable to the CAB as being able to address the cause(s) for suspension, within 90 days from the date the Notice of Suspension is published on the MSC website.

4.4 Rescoring Performance Indicators

Initial rationales provided in the expedited assessment for this UoA (Jones et al. 2018) are shown in GREY text where they have been updated.

Scoring table 1. PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing			
Scoring Issue	SG 60	SG 80	SG 100	
a	Stock status relative to recruitment impairment			
	Guidedpost	It is likely that the stock is above the point where recruitment would be impaired.	It is highly likely that the stock is above the point where recruitment would be impaired.	There is a high degree of certainty that the stock is above the point where recruitment would be impaired.
	Met?	Yes	Yes	Yes
Rationale				
<p>The stock assessment covers the period from 1978 onwards. With this time series there is little or no evidence that recruitment is related to SSB over the range observed or that there is a systematic time trend in recruitment. The current SSB is above B_{lim} and close to $MSY_{trigger}$ so SG60 is met. The lower 5% bound for the estimate of the 2019 SSB (118,359 t) is at B_{lim} which may be considered a proxy for the point of recruitment impairment, so SG80 is met. There is no indication of recruitment impairment for the wide range of SSB and recruitment values since 1978 (Figure 4). In addition, assuming a lognormal distribution, the probability that the current SSB (163,406 t) exceeds B_{lim} of 119,970 t is 0.98 (98 %) so SG100 is met.</p> <p>This is an increase in score.</p>				

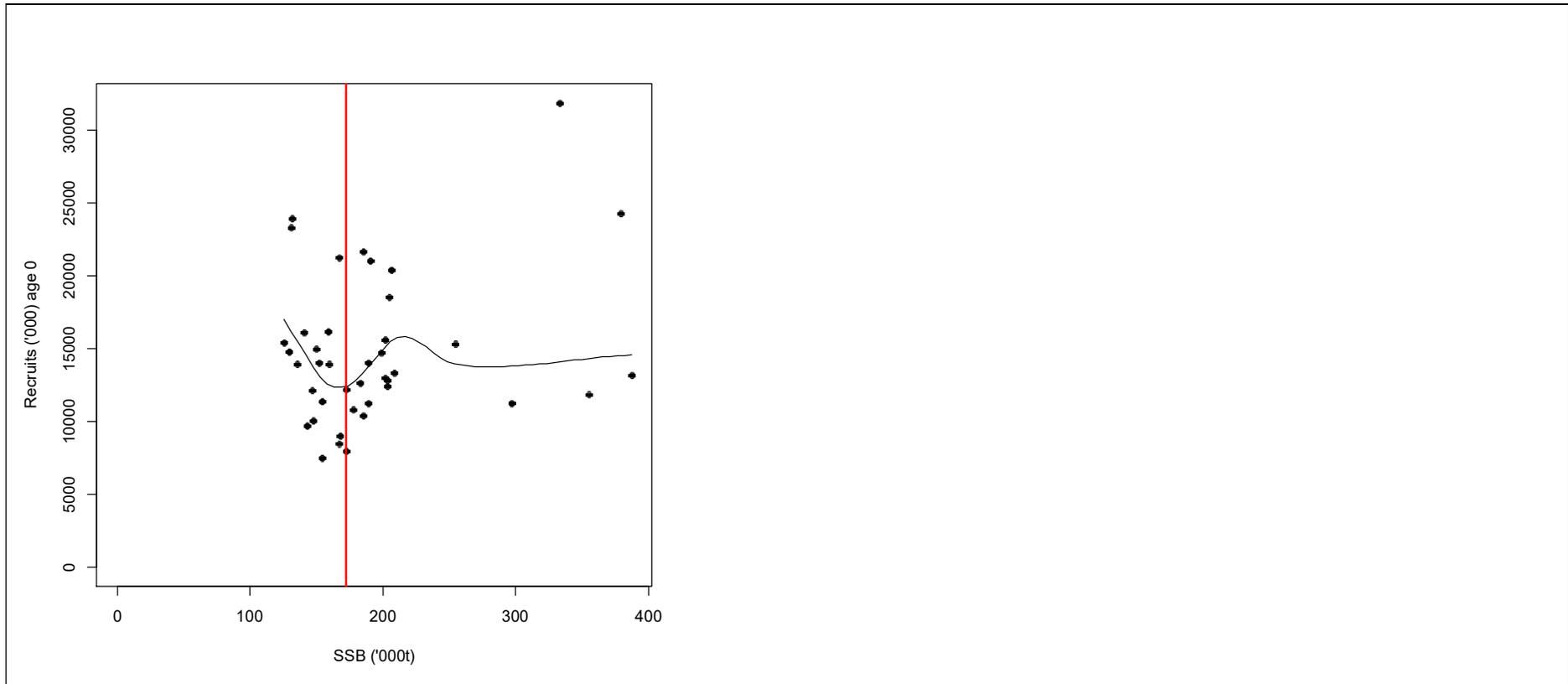


Figure 4. Whiting stock-recruitment data plotted with a loess smoother to indicate the change in mean recruitment with SSB. Red line indicates the current SSB.

Whiting - The stock assessment covers the period from 1990 onwards and only provides a limited time series of stock and recruitment values (ICES 2017r). Previously ICES used data from 1963 onwards when recruitment was much higher (Cook & Armstrong 1986). With the current time series there is little or no evidence that recruitment is related to SSB. The current SSB is above Blim and MSYBtrigger so SG60 is met. Assuming a CV of 0.3 in the estimate of current SSB, there is a 93 % probability that the biomass is above Blim which may be considered a proxy for the point of recruitment impairment, so SG80 is met. However, there is insufficient information to conclude that the stock is above the point of recruitment impairment which a high degree of certainty given the short time series of observations so SG100 is not met.

b	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)
----------	----------------------------------------------------------------------------

	Guide post		The stock is at or fluctuating around its target reference point.	There is a high degree of certainty that the stock has been fluctuating around its target reference point, or has been above its target reference point, over recent years.
	Met?		No	No
Rationale				
<p>The stock shows an overall increase in SSB since the lowest value in 2007. ICES considers the stock to be harvested sustainably as F is below F_{pa}, and the SSB is at full reproductive potential as the SSB has been fluctuating around $MSYB_{trigger}$ (ICES 2019b) since 2000. F_{MSY} as calculated by ICES is 0.392 (Table 6.7 in ICES (2018)) which corresponds to a B_{MSY} value of ~140,000 t. ICES considers fishing at the F_{MSY} value to have a probability of exceeding B_{lim} greater than 0.05. It therefore set a maximum value of F for the Harvest Control Rule (HCR) at a value that has a 5 % probability of SSB falling below B_{lim}, i.e. $F_{p05} = 0.172$. The estimate of the 2019 SSB is 163 kt and is slightly below the median equilibrium SSB at F_{p05}. This indicates that the stock is fluctuating with a biomass consistent with MSY since for this stock B_{MSY} is less than B_{pa}.</p> <p>Although the stock appears consistent with MSY, there is a greater than 5 % risk of falling below B_{lim} since the current $F = 0.19$ (15 % above F_{p05}) and the SSB has not remained above $MSYB_{trigger}$. ICES has advised that the current management reference points are not precautionary ((ICES 2019a)) and therefore the current stock status is unclear, hence SG80 is not met.</p> <p>This is a decrease in score.</p> <p>There is no target biomass and $MSYB_{trigger}$ serves as a limit reference point. The stock should achieve B_{MSY} if fished at F_{MSY}. Currently the SSB is above $MSYB_{trigger}$ and has been above this value for most of the period since 1990 (ICES 2017b). F_{MSY} as defined by ICES corresponds to the F that gives a 5 % probability of falling below B_{lim}. The median equilibrium SSB as this value of $F = 0.15$ is 233,000 t (ICES 2016). All the values of SSB from 2009 onwards are above this value. The generation time for whiting (assuming $M \sim 0.6$ and maturation at age 2) is 3.7 years so the stock has been above the expected median biomass for more than 2 generations. ICES calculated median equilibrium virgin biomass to be 283,000 t (ICES 2016) which means that current biomass (ca 300,000 t) is close to unexploited levels. It is therefore fluctuating at a biomass value consistent with MSY and meets SG100.</p>				
References				
ICES 2019. ICES Advice 2019 http://ices.dk/sites/pub/Publication%20Reports/Advice/2019/2019/whg.27.47d.pdf				
ICES 2018. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA 2018). ICES CM 2018/ACOM:33				
ICES. 2019a. EU and Norway request concerning the long-term management strategy of cod, saithe, and whiting, and of North Sea autumn-spawning herring. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, sr.2019.06, https://doi.org/10.17895/ices.advice.4895 .				
Stock status relative to reference points				
	Type of reference point	Value of reference point	Current stock status relative to reference point	

Reference point used in scoring stock relative to PRI (S1a)	B _{lim}	119,970 t	163,406/B _{lim} =1.36
Reference point used in scoring stock relative to MSY (S1b)	MSYBtrigger (Bpa)	166,708 t	163,406/Bpa=0.98
	F _{MSY} (unconstrained)	0.392	0.199/F _{MSY} =0.51
	Fp0.5 (ICES adopted F _{MSY})	0.172	0.199/Fp0.5=1.16
Overall Performance Indicator score		70	
Condition number (if relevant)		See PI 1.1.3	

Scoring table 2. PI 1.1.2 – Reference Points

PI 1.1.2		Limit and target reference points are appropriate for the stock		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Generic limit and target reference points are based on justifiable and reasonable practice appropriate for the species category.	Reference points are appropriate for the stock and can be estimated.	
	Met?	Yes	No	
<p>Rationale</p> <p>The reference points are based on the ICES definition of the Precautionary Approach and their interpretation of MSY. B_{lim} is based on the lowest observed value in 2007 from a time series starting in 1978. It is used as the basis to estimate B_{pa} (MSYBtrigger) taking into account uncertainty in B_{lim} ($B_{pa} = 1.4 * B_{lim}$). F_{MSY} is calculated using a stochastic simulation with the constraint that the probability of the biomass falling below B_{lim} is less than 0.05 (ICES 2018). These are justifiable and reasonable practices for this species type SG60 met. Despite that the reference points can be estimated their validity has been questioned by ICES and are not considered appropriate for the stock at present (ICES 2019a). SG80 not met.</p> <p>This a decrease in scoring.</p> <p>The reference points are based on the ICES definition of the Precautionary Approach and their interpretation of MSY. B_{lim} is based on the lowest observed value since 1990 but does not consider data prior to this. It is used as the basis to estimate B_{pa} taking into account uncertainty in B_{lim}. F_{MSY} is calculated using a constraint that the probability of the biomass falling below B_{lim} is less than 0.05. The reference points can be estimated and are appropriate for the stock so SG80 is met</p>				
b	Guide post		The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.	The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity following consideration of precautionary issues.
	Met?		Yes	Yes
<p>Rationale</p> <p>The relationship between stock and recruitment is unclear (see Figure 4) with little evidence of reduced recruitment at the lowest observed stock sizes. B_{pa} is in effect the principal biomass limit reference point and takes into account the uncertainty in the estimate of B_{lim}. It is based on the lowest biomass observed since 1978 (in 2007).</p>				

Recruitment since 2000 has typically been lower than the earlier period but does not show any relationship with SSB. B_{pa} (=MSYBtrigger) takes into account uncertainty in B_{lim} so meets SG100.

No change in scoring.

The relationship between stock and recruitment is unclear (see Figure 4) with little evidence of reduced recruitment at the lowest observed stock sizes. B_{pa} is in effect the principal biomass limit reference point and takes into account the uncertainty in the estimate of B_{lim} . It is based on the lowest biomass observed since 1978 (in 2007).

Recruitment since 2000 has typically been lower than the earlier period but does not show any relationship with SSB. B_{pa} (=MSYBtrigger) takes into account uncertainty in B_{lim} so meets SG100.

c	Guide post		The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.	The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome, or a higher level, and takes into account relevant precautionary issues such as the ecological role of the stock with a high degree of certainty.
	Met?		Yes	No

Rationale

There is no target biomass reference point used by ICES or managers. F_{MSY} is an upper limit on F . It is assumed that fishing at F_{MSY} will result in the biomass fluctuating around a biomass consistent with MSY. F_{MSY} is calculated within a stochastic simulation using a hockey stick recruitment function. The calculation takes into account assessment error and advice error. It also excludes F values that result in more than a 5 % probability of falling below B_{lim} . (ICES 2018). Hence SG80 is met. However, the current reference points are not considered precautionary and, in addition, the ecological role of the stock is not explicitly considered so SG100 is not met.

No change in score but rationale amended.

There is no biomass target reference point used by ICES or managers except that management is intended to avoid B_{lim} with high probability. F_{MSY} is an upper limit on F . It is assumed that fishing at F_{MSY} will result in the biomass fluctuating around a biomass consistent with MSY. F_{MSY} is calculated within a stochastic simulation using a hockey stick recruitment function. The calculation takes into account assessment error and advice error. It also excludes F values that result in more than a 5 % probability of falling below B_{lim} (ICES 2016). However, the ecological role of the stock is not explicitly considered so SG100 is not met.

d	Guide post		For key low trophic level stocks, the target reference point takes into account the ecological role of the stock.	
	Met?		NA	

Rationale

NA	
References	
ICES 2018. Report of the Benchmark Workshop on North Sea Stocks (WKNSEA 2018). ICES CM 2018/ACOM:33 ICES. 2019a. EU and Norway request concerning the long-term management strategy of cod, saithe, and whiting, and of North Sea autumn-spawning herring. In Report of the ICES Advisory Committee, 2019. ICES Advice 2019, sr.2019.06, https://doi.org/10.17895/ices.advice.4895 .	
Overall Performance Indicator score	75
Condition number (if relevant)	12 non-binding

Scoring table 3. PI 1.1.3 – Stock rebuilding

PI 1.1.2		Where the stock is depleted, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Guide post	Where stocks are depleted rebuilding strategies, which have a reasonable expectation of success, are in place.		Where stocks are depleted, strategies are demonstrated to be rebuilding stocks continuously and there is strong evidence that rebuilding will be complete within the specified timeframe.
	Met?	Yes		No
Rationale				
It is somewhat unclear whether the stock is depleted. At present the SSB is slightly below MSYBtrigger and F is slightly above the target F_{MSY} . The current HCR is designed to maintain the stock above MSYBtrigger ($=B_{pa}$) (the target reference point of the stock however this is not the target reference point prescribed by MSC which is equal to B_{MSY}). The SSB has fluctuated around the MSYBtrigger level for many years with no long term trend. It has not remained above MSYBtrigger, however. Therefore although the stock is not depleted according to ICES, the MSC standard CB2.4.1.1a is not met and the stock must be considered depleted in this context. Management has been successful in reducing fishing mortality from ~ 0.5 in the 1990s to around 0.2 since 2003, slightly above the target level of 0.172, hence there is a reasonable chance of success in stock recovery and SG60 is met. Despite the relatively low levels of F and stability in the SSB, there is no indication at present of sustained increase in the biomass and SG100 is not met.				
b	Guide post	A rebuilding timeframe is specified for the depleted stock that is the shorter of 30 years or 3 times its generation time. For cases where 3 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	A rebuilding timeframe is specified for the depleted stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.	The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.
	Met?	No	No	No
Rationale				

There is no stock rebuilding timeframe specified for the stock. Rebuilding is dependent on the application of the agreed HCR which at present has maintained the stock close to MSYBtrigger. The current reference points are estimated to be inconsistent with the precautionary approach and it is therefore problematic to identify appropriate conditions for stock rebuilding. SG60 not met				
C	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within a specified timeframe.	There is evidence that they are rebuilding stocks, or it is highly likely based on simulation modelling or previous performance that they will be able to rebuild the stock within a specified timeframe.	
	Met?	Yes	No	
Rationale				
Annual stock assessments are undertaken by ICES (ICES 2019b) that provide updates on the current fishing mortality rate and SSB. These assessments appear to be consistent in recent years and track the long term stock trends. This monitoring is capable of determining if stock rebuilding is occurring and SG60 is met. As it is unclear whether the current stock is depleted (ICES 2019a), or indeed the extent of any depletion; there is no evidence of stock rebuilding or what is required to rebuild the stock.				
References				
(ICES 2016) (ICES, 2019a) (ICES 2019b)				
Overall Performance Indicator score			<60	
Condition number (if relevant)			N/A	

Scoring table 4. PI 1.2.1 – Harvest strategy

PI 1.2.1		There is a robust and precautionary harvest strategy in place		
Scoring Issue		SG 60	SG 80	SG 100
a	Harvest strategy design			
	Guide post	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?	Yes	Yes	Yes
Rationale				
<p>MSC defines a harvest strategy as ‘the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a Management Plan (MP) or an MP (implicit) and be tested by MSE’ (MSC – MSCI Vocabulary v1.1).</p> <p>The harvest strategy is to fish to stock at or below F_{MSY}. This is achieved through a variety of management tools that include TACs, minimum mesh size regulations, restrictions on discarding, technical measures to reduce industrial bycatch and measures to limit fleet capacity through licensing systems. Reference points have been calculated for the stock corresponding to F with a low (5%) probability of falling below B_{lim}. Annual stock assessments provide an estimate of stock status relative to reference points and advice is given on a catch limit that corresponds to the harvest strategy. There is an implicit harvest control rule that reduces fishing mortality when the SSB falls below B_{pa}. An area on the East coast of the UK is closed to industrial fishing that limits the bycatch of whiting in the Norway pout fisheries. Hence SG100 is met.</p> <p>No change in scoring.</p> <p>The harvest strategy is to fish to stock at or below F_{MSY}. Reference points have been calculated for the stock corresponding to F with a low (5 %) probability of falling below B_{lim}. Annual stock assessments provide an estimate of stock status relative to reference points and advice is given on a catch limit that corresponds to the harvest strategy. There is an implicit harvest control rule that reduces fishing mortality when the SSB falls below B_{pa}. The implicit harvest control rule, which is used for advice, takes into account the major sources of uncertainty (ICES 2016) and is designed to achieve stock management objectives. Hence SG100 is met.</p>				
b	Harvest strategy evaluation			

	Guide post	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?	No	No	No
Rationale				
<p>An EU multiannual management plan (MAP) has been agreed by the EU for this stock (EU, 2018). This plan is not adopted by Norway; thus, it is not used as the basis of the advice for this shared stock. ICES was requested by the EC to provide advice based on the MSY approach and to include the MAP as a catch option. However, the current assessment shows that the fishing mortality has typically been above F_{MSY} and that the biomass is not consistent above $MSYB_{trigger}$ and there is thus evidence that the strategy is not working. SG60 is not met</p> <p>Decrease in score</p> <p>The EU-Norway agreement aims to fish the stock at or below $F = 0.15$. F has reduced from 0.69 in 1990 and fluctuated around 0.2 since 2002 showing that the strategy is likely to work and SG60 is met. ICES revised its estimates of natural mortality and this has changed reference points. ICES evaluated the EU-Norway plan with the revised M values not consistent with the Precautionary Approach unless the plan reduced F when the projected biomass fell below B_{pa} and therefore SG80 is not met. ICES (2016) advise that further management strategies should be evaluated in view of the uncertainties surrounding the assessment.</p>				
c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		
Rationale				
<p>A comprehensive evaluation of the annual stock assessment methodology was investigated in 2016 and 2018 (ICES 2016) which resulted in a new configuration of the assessment model. Data on catches and surveys are added each year to the annual assessment which is able to determine stock status in relation to reference points. Landings are monitored and at-sea observer programmes monitor the catch of small fish and discards that are not landed.</p>				

No change in score.				
A comprehensive evaluation of the annual stock assessment methodology was investigated in 2016 (ICES 2016) which resulted in a new configuration of the assessment model. Data on catches and surveys are added each year to the annual assessment which is able to determine stock status in relation to reference points.				
d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			Yes
Rationale				
The harvest strategy was reviewed in 2016 (ICES 2016). ICES within this report has indicated that a further review should take place to consider alternative strategies. EU-Norway have requested an evaluation of multiple management strategies that are currently under consideration (ICES, 2019a).				
No change in score				
The harvest strategy was reviewed in 2016 (ICES 2016). ICES within this report has indicated that a further review should take place to consider alternative strategies.				
e	Shark finning			
	Guide post	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?	NA	NA	NA
Rationale				
Scoring Issue need not be scored if sharks are not a target species.				
References				
(ICES 2016) (ICES, 2019a).				
Overall Performance Indicator score		<60		

Condition number (if relevant)	Existing condition 4 now non-binding
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Scoring table 5. PI 1.2.2 – Harvest control rules and tools

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guide post	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?	Yes	No	
Rationale				
<p>Advice provided by ICES is based on standard HCR that reduces fishing mortality when the SSB falls below B_{pa}. The rule assumes $F=0.172$ is the maximum fishing mortality rate. Hence SG60 is met. The earlier EU-Norway management plan uses $F=0.15$ but does not reduce F when biomass falls below B_{pa} (ICES 2013b). Following a revision of the M values used in the assessment ICES evaluated the plan as not consistent with the Precautionary Approach (ICES 2017b). The EU has agreed a MAP that covers the stock but is not agreed with Norway and both parties requested that ICES provide advice on the basis of MSY, hence SG60 is met. However, in view of the uncertainty in the reference points the HCR is not well-defined and hence SG80 is not met.</p> <p>No change</p> <p>Advice provided by ICES is based on standard HCR that reduces fishing mortality when the SSB falls below B_{pa}. The rule assumes $F = 0.15$ is the maximum fishing mortality rate. Hence SG60 is met. The EU-Norway management plan uses the same F but does not reduce F when biomass falls below B_{pa} (ICES 2013b). Following a revision of the M values used in the assessment ICES evaluated the plan as not consistent with the Precautionary Approach (ICES 2017b). Hence SG80 is not met.</p>				
b	HCRs robustness to uncertainty			
	Guide post		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?		Yes	No

Rationale

The HCR used for advice is based on a generic rule that reduces F in response to the SSB falling below B_{pa} . B_{pa} is an estimate of the lowest observed SSB taking into account measurement error in B_{lim} . F_{MSY} takes into account recruitment variability, and the probability of falling below B_{pa} when accounting for assessment and advice error (ICES 2016). Hence a range of sources of uncertainty are considered and SG80 is met. Uncertainties in the reference points, however, mean that some uncertainty remains to be considered and SG100 is not met

Reduced score

The HCR used for advice is based on a generic rule that reduces F in response to the SSB falling below B_{pa} . B_{pa} is an estimate the lowest observed SSB taking into account measurement error. F_{MSY} takes into account recruitment variability, and the probability of falling below B_{pa} when accounting for assessment and advice error (ICES 2016). Hence a wide range of sources of uncertainty are considered and SG100 is met.

c	HCRs evaluation			
	Guide post	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?	Yes	No	No

Rationale

The main tools for controlling exploitation are catch limits and restrictions on fleet capacity. In addition there are minimum mesh sizes for the principal fleets (TR1) of 100 mm. During the period when the EU-Norway management plan was in operation the fishing mortality was reduced from 0.69 to approximately 0.2. This shows the tools had some success during that period and SG60 is met. In the most recent years the management plan has been made obsolete by the revision of the natural mortality values and reference points so there is insufficient evidence available to evaluate SG80 or SG100 until further stock assessments have been carried out, reference points are agreed and HCR's revised if necessary.

For all UoAs, the procedure of topping up the TAC to allow compliance with the Landing Obligation may undermine the control of catches unless there is adequate enforcement of the landing obligation. There is insufficient data at present to evaluate this issue, but currently the quantities involved in top ups are small.

No change in score

The main tools for controlling exploitation are catch limits and restrictions on fleet capacity. In addition there are minimum mesh sizes for the principal fleets (TR1) of 100 mm. During the period when the EU-Norway management plan was in operation the fishing mortality was reduced from 0.69 to approximately 0.2. This shows the tools had

some success during that period. In the most recent years the management plan has been made obsolete by the revision of the natural mortality values and reference points so there is insufficient evidence available to evaluate SG80 or SG100 until further stock assessments have been carried out.

For all UoAs, the procedure of topping up the TAC to allow compliance with the Landing Obligation may undermine the control of catches unless there is adequate enforcement of the landing obligation. There is insufficient data at present to evaluate this issue, but currently the quantities involved in top ups are small.

References

(ICES 2013b), (ICES 2017b)

Overall Performance Indicator score

65

Condition number (if relevant)

Existing Condition 7 now non-binding

Scoring table 6. PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guide post	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
	Met?	Yes	Yes	Yes
Rationale				
No change to score or rationale.				
<p>A comprehensive range of information is available for the stock and is reviewed in the 2013 ICES benchmark assessment. There is information on stock identity, age composition data by fleet for landings and discards, research vessels surveys and fleet effort data. A range of other scientific surveys are carried out into the hydrography and oceanography of the area by ICES affiliated laboratories. Much of the data from these surveys is held by ICES in Copenhagen. In 1981 and 1991 comprehensive sampling of fish stomach samples was used to estimate predation on whiting (and other principal fish species). Data collected by the Sea Mammal Research Unit at St Andrews University provides periodic estimates of whiting consumed by grey and harbour seals in the North Sea and West of Scotland (Hammond & Wilson 2016).</p>				
b	Monitoring			
	Guide post	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and fishery removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information

				[data] and the robustness of assessment and management to this uncertainty.
	Met?	Yes	Yes	Yes
Rationale				
<p>Landings are recorded monthly and discards monitored on a quarterly basis. Research vessel surveys monitoring stock abundance are conducted at least twice annually. Both the catch data and survey data are subject to high sampling levels as required by the EU regulations on data collection (EU 2008). The assessment methodology (SAM) takes account of the observation errors in the data in an appropriate way (Shepherd 1999). The robustness of the assessment was reviewed in 2018 (ICES 2016). SG100 is met.</p> <p>Updated rationale but no score change.</p> <p>Landings are recorded monthly and discards monitored on a quarterly basis. Research vessel surveys monitoring stock abundance are conducted at least twice annually. Both the catch data and survey data are subject to high sampling levels as required by the EU regulations on data collection (EU 2008). The assessment methodology takes account of the observation errors in the survey data in an appropriate way (Shepherd 1999). The robustness of the assessment was reviewed in 2016 (ICES 2016). SG100 is met.</p>				
c	Comprehensiveness of information			
	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		Yes	
Rationale				
<p>Data collected account for the vast majority of the removals by the fishery. In addition discards are routinely monitored by at-sea observers in both targeted fisheries and fisheries for Nephrops (TR2). Data on industrial bycatch are available. ICES notes that despite the Landing Obligation BMS landings are low and that discarding still occurs. These fish are nevertheless monitored through at-sea observer programmes and are included in the assessment, SG80 is met.</p> <p>Updated rationale but no change to score</p> <p>Data collected account for the vast majority of the removals by the fishery. Discards are routinely monitored by at-sea observers in both targeted fisheries and fisheries for Nephrops (TR2). Data on industrial bycatch are available. SG80 is met.</p>				
References				

(Shepherd 1999; Hammond & Wilson 2016)

Nielsen, A. and Berg, C. W. (2014). Estimation of time-varying selectivity in stock assessments using state-space models, Fisheries Research, 158, 96–101.

Overall Performance Indicator score	100
Condition number (if relevant)	N/A

Scoring table 7. PI 1.2.4 – Assessment of stock status

PI 1.2.4		There is an adequate assessment of the stock status		
Scoring Issue		SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration			
	Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment is appropriate for the stock and for the harvest control rule and takes into account the major features relevant to the biology of the species and the nature of the fishery.
	Met?		Yes	Yes
<p>Rationale</p> <p>The assessment model is a state-space approach that describes the age structure of the stock and fishery dynamics by year (Nielsen and Berg, 2014). It considers observation error in the surveys and catch data and process error in fishing mortality. It has been subjected to a benchmark review (ICES 2018). Current SSB and fishing mortality are estimated which are used in the HCR to provide short-term harvest advice. The assessment takes into account the relevant components of the fishery with the inclusion of catches by the human consumption fleets, industrial bycatch and discards. The relevant biology is taken into account that includes age of maturity, growth and natural mortality. The latter is estimated from a North Sea multispecies model that estimates predation effects. Overall SG100 is met.</p> <p>Updated rationale but no score change.</p> <p>The assessment model is a regression approach that describes the age-specific stock and fishery dynamics by year (Shepherd 1999). It considers observation error only in the surveys. It has been subjected to a benchmark review (ICES 2016; ICES 2013a). Current SSB and fishing mortality are estimated which are used in the HCR to provide short-term harvest advice. The assessment takes into account the relevant components of the fishery with the inclusion of catches by the human consumption fleets, industrial bycatch and discards. The relevant biology is taken into account that includes age of maturity, growth and natural mortality. The latter is estimated from a North Sea multispecies models that estimates predation effects. Overall SG100 is met.</p>				
b	Assessment approach			

	Guide post	The assessment estimates stock status relative to reference points.		
	Met?	Yes		
Rationale				
No change in rationale.				
Current SSB and fishing mortality are estimated on an annual basis relative to SSB and fishing mortality reference points hence SG60 is met.				
c	Uncertainty in the assessment			
	Guide post	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	Yes	Yes	Yes
Rationale				
<p>The observation uncertainties included in the assessment are associated with the two ITBS indices, and the catch data and these are accounted for in the assessment. Model uncertainty is investigated using retrospective analysis and an alternative model (SURBAR). The impact of these uncertainties has been evaluated and their implications examined and reported as part of the assessment. Model fits and retrospective analyses do not indicate significant structural issues. The SI is met at SG80. The estimates of F_{MSY} and B_{pa} take into account the uncertainty in the assessment so it can be said that status in relation to reference point is considered in a probabilistic way, so SG 100 is met as the uncertainties are already accounted for in the MSE.</p> <p>Updated rationale but no score change</p> <p>The observation uncertainties included in the assessment are associated with the two ITBS indices, and the catch data are treated a fixed and error free. Model uncertainty is investigated using retrospective analysis and an alternative model (SURBAR). The impact of these uncertainties has been evaluated and their implications examined and reported as part of the assessment. Model fits and retrospective analyses do not indicate significant structural issues. The SI is met at SG80.</p> <p>While the XSA model is potentially able to evaluate SSB relative to the biological reference points in a probabilistic manner, this is not a routine part of the annual assessment. However, the estimates of F_{MSY} and B_{pa} take into account the uncertainty in the assessment so it can be said that status in relation to reference point is considered in a probabilistic way, so SG 100 is met as the uncertainties are already accounted for in the MSE.</p>				

d	Evaluation of assessment			
	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			Yes
<p>Rationale</p> <p>The assessment model was tested by ICES in 2016 (ICES (2016) and was further tested at the benchmark assessment (ICES 2013a) where a range of alternative models were explored. These included state-space models and survey only approaches. SG100 is met.</p> <p>Updated rationale but no score change.</p> <p>The assessment was tested at the benchmark assessment (ICES 2013a) where a range of alternative models were explored. These included state-space models and survey only approaches. The model was further tested in ICES (2016). SG100 is met.</p>				
e	Peer review of assessment			
	Guide post		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		Yes	Yes
<p>Rationale</p> <p>The WGNSSK reports are subjected to an internal audit process which forms the first level of review. These reports are then reviewed by ACOM who are ultimately responsible for the official ICES advice. This forms the second level of review. Before the advice is implemented in the form of TACs, the EC may ask its own advisory group, STECF to review the ACOM report, which represents the third level of review. Periodically, ICES will organise a benchmark review to consider improvements to the assessment data and model, the latest of which occurred in 2018 and is subject to external review (ICES 2013a) hence SG100 is met.</p> <p>Updated rationale but no score change</p> <p>The WGNSSK reports are subjected to an internal audit process which forms the first level of review. These reports are then reviewed by ACOM who are ultimately responsible for the official ICES advice. This forms the second level of review. Before the advice is implemented in the form of TACs, the EC may ask its own advisory</p>				

group, STECF to review the ACOM report, which represents the third level of review. Periodically, ICES will organise a benchmark review to consider improvements to the assessment data and model, the latest of which occurred in 2013 and is subject to external review (ICES 2013a). This review was updated in 2016. SG100 is met.

References

(ICES 2013a; ICES 2017a; ICES 2018)

Overall Performance Indicator score

100

Condition number (if relevant)

N/A

4.5 Principle level scores

Table 9. Principle level scores. NOTE UoA's 1 to 4 not rescored at this audit and Principles 2 and 3 of UoA 5 not rescored at this audit.

Principle	UoA 1 - HAD	UoA 2 - POK	UoA 3 - PLE	UoA 4 - HKE	UoA 5 - WHG
Principle 1 – Target Species	92.4	95.0	93.8	92.5	<60
Principle 2 – Ecosystem	80.0	80.0	82.0	80.0	82.0
Principle 3 – Management System	94.6	94.6	94.6	96.5	94.6

Table 10. Performance Indicator scores.

Principle	Component	PI No.	Performance Indicator (PI)	UoA 1 - HAD	UoA 2 - POK	UoA 3 - PLE	UoA 4 - HKE	UoA 5 - WHG
One	Outcome	1.1.1	Stock status	90	90	100	100	70
		1.1.2	Reference points	90	90	90	90	75
		1.1.3	Stock rebuilding					<60
	Management	1.2.1	Harvest strategy	90	100	95	85	<60
		1.2.2	Harvest control rules & tools	85	100	75	75	65
		1.2.3	Information & monitoring	100	100	100	100	100
		1.2.4	Assessment of stock status	100	100	100	100	100
Two	Retained species	2.1.1	Outcome	75	75	80	75	80
		2.1.2	Management	75	75	85	75	85
		2.1.3	Information	80	80	80	80	80
	Bycatch species	2.2.1	Outcome	80	80	80	80	80
		2.2.2	Management	80	80	80	80	80
		2.2.3	Information	80	80	80	80	80
	ETP species	2.3.1	Outcome	75	75	75	75	75
		2.3.2	Management	75	75	75	75	75
		2.3.3	Information	65	65	65	65	65
	Habitats	2.4.1	Outcome	75	75	80	75	80
		2.4.2	Management	75	75	75	75	75
		2.4.3	Information	80	80	80	80	80
	Ecosystem	2.5.1	Outcome	90	90	90	90	90
		2.5.2	Management	100	100	100	100	100
		2.5.3	Information	95	95	95	95	95

Principle	Component	PI No.	Performance Indicator (PI)	UoA 1 - HAD	UoA 2 - POK	UoA 3 - PLE	UoA 4 - HKE	UoA 5 - WHG
Three	Governance and policy	3.1.1	Legal & customary framework	85	85	85	100	85
		3.1.2	Consultation, roles & responsibilities	100	100	100	100	100
		3.1.3	Long term objectives	100	100	100	100	100
		3.1.4	Incentives for sustainable fishing	100	100	100	100	100
	Fishery specific management system	3.2.1	Fishery specific objectives	90	90	90	90	90
		3.2.2	Decision making processes	100	100	100	100	100
		3.2.3	Compliance & enforcement	95	95	95	95	95
		3.2.4	Research plan	90	90	90	90	90
		3.2.5	Management performance evaluation	90	90	90	90	90

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6 Appendices

Appendix 1 Evaluation processes and techniques

Appendix 1.1 Site visits

The fishery was certified as sustainable on the 25th October 2010 under the name Scottish White Fish Producers Association (SWFPA) - North Sea Haddock. It was renamed SFSAG North Sea Haddock and underwent reassessment and was recertified on 17th May 2016. A scope extension on the fishery was completed on 3rd June 2018 with 4 additional UoAs added and the name changed to SFSAG Northern Demersal Stocks including UoA 5 for North Sea whiting. This is an expedited audit of Principle 1 for UoA 5 North Sea whiting. This audit was conducted against FCP 2.1 of the MSC standard with V1.3 scoring and using GCR 2.3. The off-site audit was carried out on the 2nd August 2019 by Hugh Jones (Team Leader) and Robin Cook (Principle 1).

The audit was completed in line with FCP2.1 procedure for expedited audits. The site visit was eligible to be remote based on FCP 2.1 - 7.29.3 and that the fishery can meet the higher requirements for remote audit in Table G13 (FCP2.1). The purpose of the expedited audit was to review the scoring of Principle 1 against the scores published in the 2018 expedited audit report Jones & Cook (2018).

Ability to verify remotely	CAB evaluation
Client and stakeholder input	All registered stakeholders and the client have email addresses and correspond by email. Previous offsite audits have included stakeholder participation and there has never been a complaint to this method of audit.
Fishery reports	All ICES documentation is freely available online, these documents underpin Principle 1. All EU regulations are also available online.
Principle 1 data	All ICES documentation is freely available online, these documents underpin Principle 1. All EU regulations are also available online.
Management system	There is a high level of transparency in management from the EU and NOR, information on the fishery is widely and publicly available online. Any information provided on the fishery can be easily verified.
Vessels, gear or other physical aspect of the fishery	This audit concerns Principle 1 only and access to vessels is not required.

Appendix 1.2 Stakeholder participation

The Expedited Audit was announced on 26th July 2019 with stakeholders informed on the 29th July 2019. The individuals contacted during the site visit, their roles and type of consultation on the fishery are listed in Table 11.

Table 11. List of attendees at the off-site meeting.

Name	Position	Type of consultation
Jennifer Mouat	Consultant SFSAG	Phone interview – Latest catch information from SFSAG, opinions on stock assessment and stock status.
Mike Park	SFSAG chair	Phone interview – Latest catch information from SFSAG, opinions on

Name	Position	Type of consultation
		stock assessment and stock status. Availability of quota to SFSAG vessels.
Hugh Jones	Team Leader	phone
Robin Cook	Principle 1 expert	phone
Rhona Kent	WWF UK	Phone interview –Opinions on stock assessment and stock status. WWF have concern on the application of the landing obligation and consider there is need for at sea monitoring, though this was directed at the SFSAG cod certificate not the whiting UoA
Neil Campbell	Marine Scotland Science	Phone interview – MS perspective on stock assessment and stock status. Latest information on the landing obligation.
Jane Sandell	SFSAG Board	Phone interview – Latest catch information from SFSAG, opinions on stock assessment and stock status. Availability of quota to SFSAG vessels.

Appendix 2 Stakeholder Input

No written input received

Discussed at the site visit and of relevance to this certificate is the ongoing discussion on the Brexit situation.

There is some uncertainty in the future management of the stock in that post -31st October 2019 the UK may become an independent Coastal State which will need to build relationships with the EU and Norway over the management of stocks such as whiting. Jane Sandell commented that the industry had already taken the lead in this regard convening meetings with industry representatives in Denmark and Norway and that long term stock management strategies were being discussed.

Appendix 3 Revised Surveillance Program

Table 12. Fishery surveillance programme

Surveillance level	Year 3	Year 4
6	On-site	On-site

Table 13. Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
3	April 2017	November 2019	ICES November Advice will be available and the surveillance period will include the decisions of the EC council meetings in December 2019.

Table 14. Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale
3	On-site audit	2 auditors on-site	No change from PCR.

Appendix 4 Harmonised fishery assessments

Table 15. Overlapping fisheries

Fishery name	Certification status and date	Performance Indicators to harmonise
Joint demersal fisheries in the North Sea and adjacent waters https://fisheries.msc.org/en/fisheries/joint-demersal-fisheries-in-the-north-sea-and-adjacent-waters/@@view	In Assessment	Principle 1

Table 16. Overlapping fisheries

Supporting information	
Both the fishery in this audit and the Joint demersal assessment are audited by CU Pesca. Initiation of notification to expedite were discussed on 10/07/19 between Team Leaders.	
Was either FCP v2.1 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	No
Date of harmonisation meeting	05/09/19
If applicable, describe the meeting outcome	
Agreement found among teams	