

PUBLIC CERTIFICATION REPORT FOR THE

# Reassessment of the Greenland lumpfish fishery

**Report No.:** 2019-016, Rev. 4

**Date:** 04.02.2021

**Certificate code:** MSC-F-31198

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Fishery client	Sustainable Fisheries Greenland, C/o Grønlands Arbejdsgiverforening,
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#### Objective:

MSC Fishery reassessment of the Greenland lumpfish fishery.

The assessment report timeline is subject to a 6-month extension in accordance with Covid-19 Derogation of 27<sup>th</sup> March 2020.

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2	2020-03-31	Public Comment Draft Report	Hans Lassen, Tim Huntington, Rod Cappell, Sandhya Chaudhury	Sigrun Bekkevold
3	2020-11-12	Final Report	Hans Lassen, Tim Huntington, Rod Cappell, Sandhya Chaudhury	Jodi Bostrom
4	2021-02-04	Public Certification Report	Hans Lassen, Tim Huntington, Rod Cappell, Sandhya Chaudhury	Jodi Bostrom

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## 2 Glossary

### 2.1 Abbreviations & acronyms

ACOM	Advisory Committee on Management (ICES)
CITES	Convention on the International Trade in Endangered Species
EC	European Commission
ETP	Endangered, threatened and protected
FAM	Fisheries Assessment Methodology
FAO	Food and Agriculture Organization of the United Nations
GA	Grønlands Arbejdsgiverforening / Sulisitsisut
GFLK	Grønlands Fiskeri Licens Kontrol (MCS authorities in Greenland)
GINR	Greenland Institute for Natural Resources
Grl	Greenlandic
ICES	International Council for the Exploration of the Sea
IUCN	International Union for the Conservation of Nature
IWC	International Whaling Commission
KNAPK	Kallaallit Nunnaanni Aalisartut Piniartullu Kattuffiat [Greenland Fishers and Hunters organization]
LPUE	Landing per unit of effort
MCS	Monitoring, Control and Surveillance
MFHA	Ministry of Fishing, Hunting and Agriculture
MPA	Marine protected area
MSC	Marine Stewardship Council
NAFO	Northwest Atlantic Fisheries Organisation
NAMMCO	North Atlantic Marine Mammal Organization
NAPP	Fishers and Hunters Association of Nuuk, part of KNAPK
NWWG	(ICES) North West Working Group
OSPAR	The (OSPAR) Convention for the Protection of the marine Environment of the North- East Atlantic
PI	Performance indicator
PISG	Performance Indicator Scoring Guidepost
R.V	Research vessel
RBF	Risk Based Framework
SFG	Sustainable Fisheries Greenland
SG	Scoring Guidepost
TAC	Total Allowable Catch
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organization
UoC	Unit of Certification
VME	Vulnerable marine ecosystems

## 2.2 Stock assessment reference points

$B_0$	The (spawning) biomass expected if there had been no fishing (assuming recruitment as estimated through stock assessment).
$B_{lim}$	Spawning biomass limit reference point, sometimes used as a trigger within harvest control rules, or defined as the point below which recruitment is expected to be impaired or the stock dynamics are unknown
$B_{msy}$	Spawning Biomass at which the maximum sustainable yield is expected (sometimes expressed as $SB_{msy}$ )
$B_{targ}$	Spawning biomass target reference point
$F_{lim}$	Exploitation rate limit reference point, often taken as $F_{msy}$ based on UNFSA
$F_{msy}$	Fishing mortality rate associated with the achieving maximum sustainable yield
$F_{targ}$	Fishing mortality target reference point
MSY	Maximum Sustainable Yield

### 3 Executive summary

This report provides information on the reassessment of the Greenland Lumpfish fishery against Marine Stewardship Council (MSC) Fisheries Standard. The report is prepared by DNV GL for the client organization Sustainable Fisheries Greenland.

The assessment was carried out using MSC Fisheries Certification Process v2.1. For the assessment, the default assessment tree in Annex SA from the MSC Fisheries standard v2.01, without any changes, was used.

The assessment covers one UoA targeting lumpfish with gillnets. The Greenland lumpfish is indigenous to the Northwest Atlantic (Figure 1) and no enhancement takes place.

The assessment process was initiated by the announcement on the MSC web-side on the 12.08.2019.

A comprehensive programme of stakeholder consultations was carried out in September 2019 as part of this assessment, complemented by a full and thorough review of relevant literature and data sources. This fishery is, at present certified - Certificate number MSC-F-31198.

A rigorous assessment of the MSC Principles and Criteria was undertaken by the assessment team and detailed and fully referenced scoring rationales are provided through the assessment tree scoring tables provided in chapter 7-of this report.

This fishery has been subject to a 6- month extension in accordance with MSC Covid-19 Derogation of 27th March 2020. The new extended expiry of certificate nr MSC-F-31198 is 13<sup>th</sup> February 2021 and the new anniversary of the certificate will be 13<sup>th</sup> February which will be the trigger date for annual surveillance audits and reassessments.

In early June 2020 the assessment team came upon information that indicated that a quota increase for the recently concluded fishing season was effectuated mid-May 2020. The change in TAC was not a quota transfer, but the result of a quota increase that came into place during the season as a result of several factors. The magnitude of the increase was justified by looking at 2019 catch vs. TAC numbers and more fish than stated in the management were removed from the sea in 2020. The fishery was subjected to an evaluation of the need to trigger an expedited audit based on this information. For details please refer to appendix 9.11.

The Eligibility Date for this assessment is the 13<sup>th</sup> February 2021 which is also the scheduled date of recertification.

This assessment report timeline is subject to a 6-month extension in accordance with Covid-19 Derogation of 27th March 2020.



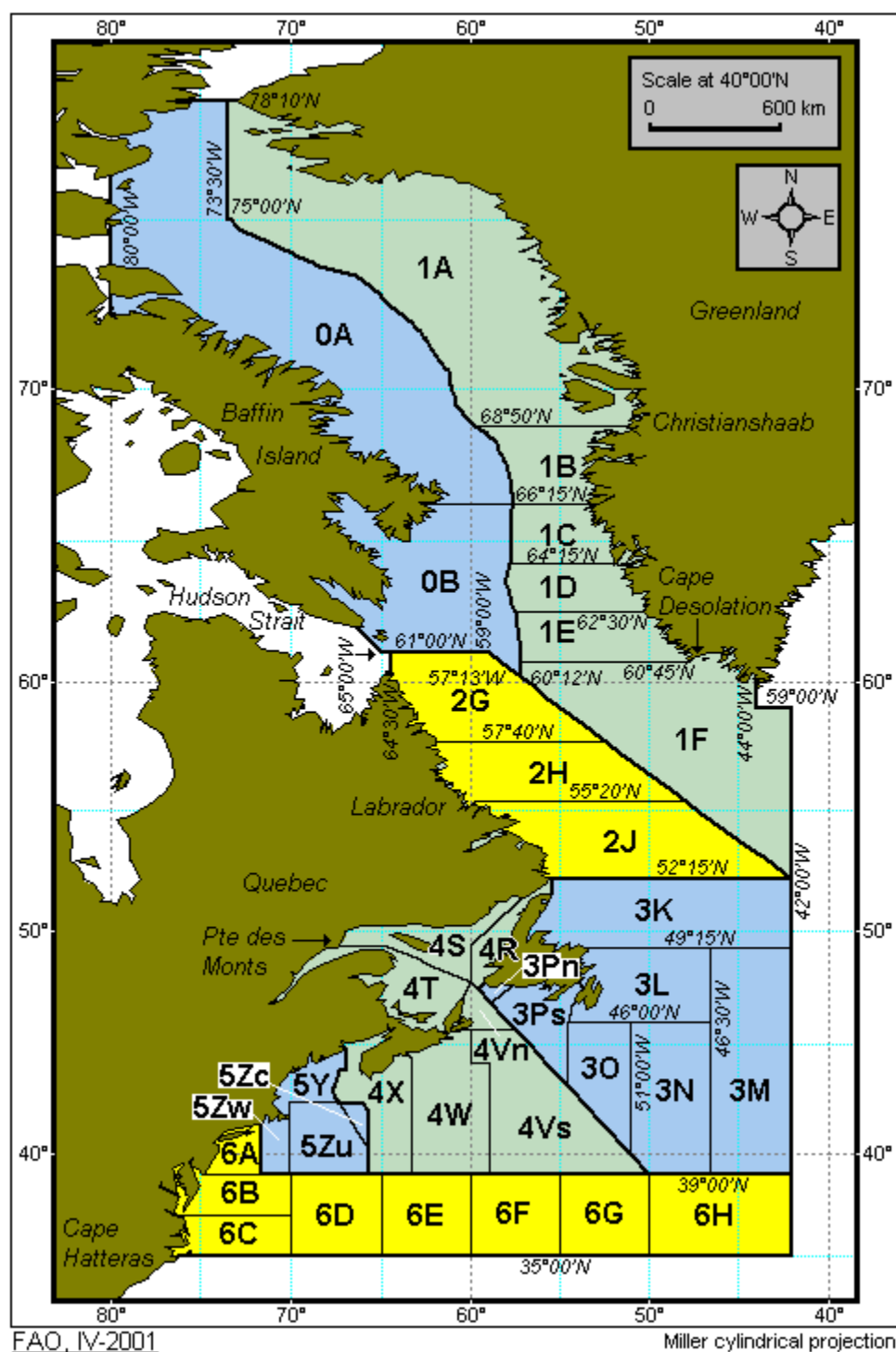


Figure 1 Greenland coast with NAFO divisions

### 3.1 Main strengths

**Table 1 Main strengths**

Principle	Performance Indicator	Comment
Principle 1	1.2.1	There is well-defined harvest strategy
	1.2.2	The HCR is well defined
Principle 2	2.1	Very low bycatch (<1%) from this fishery. All primary species are minor and in very small quantities.
	2.2	All in scope secondary species are minor and in very small quantities (<0.1% each).
	2.2.3	All catch must be retained and landed, so catch accounting is thorough.
	2.4.1	Fishery does not overlap with any major VMEs.
Principle 3	3.1.1	Comprehensive fisheries management system.
	3.1.2	Clear roles and extensive consultation through the Fisheries Council
	3.2.4	Regular review of management plan (now on version 3)

### 3.2 Main weaknesses

**Table 2 Main weaknesses**

Principle	Performance Indicator	Comment
Principle 1	1.1.1	The Msy and Blim reference points are built on proxies
Principle 2	2.2.3	Seabird bycatch not disaggregated by fishery type.
	2.3.3	Lack of data on rate and fate of Atlantic halibut discards
Principle 3	3.2.1	Limited coverage of P2 aspects in fishery specific objectives beyond bycatch rule.
	3.2.3	Over-reliance on self-reporting via sales notes

**Table 3 Assessment timeline**

Event	Date
Announcement of initial assessment:	12 <sup>th</sup> August 2019
Site visit and stakeholder consultations:	12 <sup>th</sup> & 13 <sup>th</sup> September 2019
Publication of Public comment draft report	02.04.2020
Publication of Final Report	16.11.2020
Publication of Public Certification Report	12.02.2021
Eligibility date:	13 <sup>th</sup> February 2021

### 3.3 Final Determination

The principle scores are summarised below:

**Table 4 Principle scores**

Principle	Score
Principle 1	84.2
Principle 2	83.7
Principle 3	89.4

The Greenland lumpfish fishery achieved a score of 80 or more for each of the three MSC Principles and did not score under 60 for any of the set MSC criteria.

The Greenland lumpfish fishery achieved a score of below 80 against 5 scoring indicators and was set 5 conditions and 3 recommendations for continuing certification that the client is required to address.

Based on the review, analysis and evaluation of available data for the fishery presented in this report, the assessment team did not identify any issues that prevent the fishery from continuing with the re-certification of the Greenland lumpfish fishery and the assessment team recommends the re-certification of the fishery.

## 4 Report details

### 4.1 Authorship and peer review details

#### 4.1.1 Assessment team

**Table 5 Assessment team**

<b>Name</b>	<b>Sandhya Chaudhury</b>
<b>Role</b>	Team leader & CoC responsible
<p><b>Qualifications:</b> SANDHYA CHAUDHURY is a Principal Specialist at DNV GL Business Assurance. She holds a Bachelor degree in Biological sciences and a MBA. Sandhya Chaudhury has been the Lead Auditor/Team Leader for various MSC Pre- and Full Assessments since 2005. She has participated in various MSC workshops introducing certification methodology for MSC Fisheries and Chain of Custody to workshop participants. She is well-versed in project management with proven ability to lead cross-disciplinary teams. Sandhya has auditor experience with other quality management standards since 2002 and industry experience since 1991.</p> <p>She meets the competence criteria in MSC Fisheries Certification process v2.1, and appropriate skills related to Chain of Custody requirements. She also has the knowledge of the country, language and local fishery. She is trained as a team leader, incl. traceability, according to CR v1.3; FCR v2.0 and FCP v2.1</p> <p>She has been Team Leader and traceability responsible for several MSC assessments and is a qualified MSC CoC auditor and technical reviewer and has also been responsible for both the Fisheries and CoC schemes. Sandhya has no conflicts of interest in relation to the fishery under assessment.</p>	
<b>Name</b>	<b>Hans Lassen</b>
<b>Role</b>	Principle 1 expert
<p><b>Qualifications:</b> Hans Lassen is an independent consultant with a M.Sc. degree from Copenhagen University and a B.Sc. from Copenhagen Business School. He is the author or co-author of more than 30 scientific papers in prime peer reviewed publications of fisheries related topics. He has more than 40 years' experience with fish stock assessment, formulating and communicating scientific advice for fisheries. He has worked on fish stock assessments, estimating catch composition issues in fisheries, he has worked on cetacean surveys and ecosystem modelling, topics relevant to PI 1 and PI 2, (PI 2), He was involved in all parts of the Greenland fisheries management system representing Greenland Fisheries Research institute, He has been a member of Danish delegations on fisheries negotiations, he has participated in quota allocation workshops, he took part in numerous consultation meetings with the fishing industry partly as scientific advisor and as head of advisory programme at ICES. He conducted regular meetings with RACs now ACs. and worked as consultant for EFCA on management issues, all relevant to PI 3. He chaired a group that contributed to the EC review of the MGP programme: provided input to the 2002 reform of the CFP and been a member of a similar group that reviewed the Danish fisheries management system. He has participated since 2009 as team member in more than 25 MSC assessments and surveillance audits of North Atlantic and Baltic Sea including shrimp, pelagic and demersal fisheries. He carries an MSC certificate as Team leader/Fisheries auditor for CR v1.3, FCR v2.0 and FCP v2.1. Furthermore, the certificate includes training as RBF assessor. Also, he carries a certificate as Team leader ISO 19011:2011. He has no conflicts of interest in relation to the fishery under assessment.</p>	
<b>Name</b>	<b>Tim Huntington</b>
<b>Role</b>	Principle 2 expert
<p><b>Qualifications:</b> Tim Huntington is a fisheries biologist with over 30 years' experience in the industry and related consulting. Tim holds a BSc (Hons) in Biological Sciences and a MSc in Applied Fish Biology. He has worked in capture fisheries and aquaculture in over 70 countries worldwide, with particular focus on Europe, the Middle East, Africa and Asia.</p> <p>Tim has specialized in promoting sustainability in fisheries and aquaculture and has worked on a number of fisheries development projects for the Global Environment Facility, FAO and other agencies. He has worked extensively with the MSC responsible fisheries programme, including pre-assessments, full assessments and chain of custody audits</p>	

for a number of certification bodies. Tim has participated both as lead auditor and team member for a number of UK, NW Atlantic, Indian Ocean and Pacific Ocean fisheries and specializes in contributing to the Principle 2 and Principle 3 elements. In addition to his work for certification bodies, Tim has also worked directly for MSC; contributing in studies on chain of custody methodologies, a review of environmental benefits of MSC certification, amongst other projects.

Tim meets the competence criteria and is a trained team member according to the MSC FCR v.2.0 & FCP v2.1 and has substantial and appropriate skills related to Principle 2 & Principle 3.

Tim has no conflicts of interest in relation to the fishery under assessment.

<b>Name</b>	<b>Rod Cappell</b>
<b>Role</b>	Principle 3 expert

**Qualifications:** Rod Cappell is Director with Poseidon based in Northern Ireland with over 20 years of experience in the maritime sector. Rod holds degrees in marine biology, marine resource development and a post-graduate qualification in environmental economics. He undertakes fisheries policy research and evaluation of management for the European Commission, the UN's FAO, national government and NGOs as well as the private sector.

Rod's MSC experience includes a variety of North Atlantic (Greenland, Iceland and European Member States) fin fish and shellfish fisheries with more than 20 main assessments completed. He continues to be involved in a number of Fishery Improvement Projects (FIPs) in Europe and Asia.

Rod is a trained team leader and member according to FCR 2.0 and FCP 2.1.

Rod has no conflicts of interest in relation to the fishery under assessment.

#### 4.1.2 Peer Reviewers

Peer reviewers used for this report were shortlisted by the MSC Peer Review college and listed on the MSC website. A summary CV for each is available in the Assessment downloads section of the fishery's entry on the MSC website.

## 4.2 Version details

**Table 6 Fisheries program documents versions**

Document	Version number
MSC Fisheries Certification Process	<b>Version 2.1</b>
MSC Fisheries Standard	<b>Version 2.01</b>
MSC General Certification Requirements	<b>Version 2.4.1</b>
Default Assessment Tree – MSC Fisheries Standard – Annex SA	<b>Version 2.01</b>
MSC Reporting Template	<b>Version 1.1</b>

## 5 Unit of Assessment and Certification and results overview

### 5.1 Unit of Assessment and Unit of Certification

#### 5.1.1 Unit of Assessment

The fishery is, to the knowledge of the assessment team, within the scope of the MSC Fisheries standard according to the following determinations:

- The target species is a fish 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 is not enhanced or based on an introduced species.
- The fishery has mechanisms for resolving disputes and disputes do not overwhelm the fishery.

The Unit of Assessment defines the full scope of what is being assessed and includes the Unit of Certification and any other eligible fishers.

The Unit of Assessment includes the target stock (s), the fishing method or gear type/s, vessel type/s and/or practices, and the fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including any other eligible fishers that are outside the Unit of Certification.

The Unit of Assessment for this fishery assessment is specified in Table 7.

**Table 7 Unit of Assessment (UoA)**

UoA 1	Description
Species	Lumpfish ( <i>Cyclopterus lumpus</i> )
Stock	West Greenland lumpfish
Geographical area	<b>Stock region:</b> Northwest Atlantic <b>Common name of the body of water:</b> West Greenland coastal waters <b>FAO area:</b> 21 <b>Local fisheries management area:</b> NAFO Subarea 1 (Divisions 1A, 1B, 1C, 1D, 1E and 1F), Greenland Fishing zone
Harvest method / gear	Gillnets
Client group	The client is Sustainable Fisheries Greenland and includes fishing by all fishermen holding a Greenland lumpfish fishing license and landing the catch to processors in Greenland that are members of Sustainable Fisheries Greenland as published on the MSC website.
Other eligible fishers	Any fishers holding a Greenland lumpfish fishing license landing the catch to processors that are members of Sustainable Fisheries Greenland as published on the MSC website. When landing to processors that are not member of SFG they are not eligible for certificate sharing.

### 5.1.2 Unit of Certification

The Unit of certification is the unit entitled to receive an MSC certificate.

The proposed Unit of Certification includes the target stock (s), the fishing method or gear type/s, vessel type/s and/or practices, the fishing fleets or groups of vessels or individual fishing operators pursuing that stock including those client group members initially intended to be covered by the certificate.

The MSC FCP v2.1 specifies that the Unit of Certification is defined as “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 proposed Unit of Certification is provided in Table 8.

**Table 8 Unit(s) of Certification (UoC)**

UoC 1	Description
Species	Lumpfish ( <i>Cyclopterus lumpus</i> )
Stock	West Greenland lumpfish
Geographical area	<b>Stock region:</b> Northwest Atlantic <b>Common name of the body of water:</b> West Greenland coastal waters <b>FAO area:</b> 21 <b>Local fisheries management area:</b> NAFO Subarea 1 (Divisions 1A, 1B, 1C, 1D, 1E and 1F), Greenland Fishing zone
Harvest method / gear	Gillnets
Client group	The client is Sustainable Fisheries Greenland and includes fishing by all fishermen holding a Greenland lumpfish fishing license and landing the catch to processors in Greenland that are members of Sustainable Fisheries Greenland as published on the MSC website.

## 5.2 Assessment results overview

### 5.2.1 Determination, formal conclusion and agreement

Based on the review, analysis and evaluation of available data for the fishery presented in this report, the assessment team did not identify any issues that prevent the fishery from continuing with the re-certification of the Greenland lumpfish fishery and the assessment team recommends the re-certification of the fishery.

The Technical Reviewer at DNV GL adheres to the recommendation of the assessment team and approves the certification of the Greenland lumpfish fishery for the client Sustainable fisheries Greenland, C/o Grønlands Arbejdsgiverforening.

### 5.2.2 Principle level scores

**Table 9 Principle level scores**

Principle	UoA 1
Principle 1 – Target species	<b>84.2</b>
Principle 2 – Ecosystem impacts	<b>83.7</b>
Principle 3 – Management system	<b>89.4</b>

### 5.2.3 Summary of conditions

There are no conditions set for Principle 1.

**Table 10 Summary of conditions**

Condition number	Condition	Performance Indicator (PI)	Related to previous condition?
1	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species and that they are implemented as appropriate.	2.2.2e	<b>No</b>
2	Quantitative information is available and adequate to (i) assess the impact of the UoA on main secondary 'out of scope' (e.g. bird and marine mammal) species with respect to status and and (ii) support a partial strategy to manage these main secondary species.	2.2.3a & c	<b>No</b>
3	There is evidence of a strategy in place that is expected to ensure the UoA does not hinder the recovery of the ETP species (long-tailed duck) and that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of this species and that they are implemented as appropriate.	2.3.2b & e	<b>No</b>



4	Quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species, in particular the long-tailed duck. It should also be adequate to measure trends and to support a strategy to manage impacts on this ETP species.	2.3.3a & b	No
5	<p>The monitoring, control and surveillance <b>system</b> is implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.</p> <p><b>The monitoring, control and surveillance system with regard to bycatch of non-target species does not clearly demonstrate that management measures, strategies and rules are enforced. There is no evidence that demonstrate that fishers comply with the management requirement of providing information for the effective management of the fishery.</b></p> <p>Provide evidence to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p>	3.2.3a&c	No

## 5.2.4 Recommendations

**Table 11 Summary of Recommendations**

Recommendation number	Recommendation	Performance indicator
1	The data available for stock assessment be supplemented with a record of directed effort e.g. the number of nets soaked and total fishing days	1.2.3b
2	The stock assessment approach be reviewed by external expert, e.g. published in a peer reviewed journal.	1.2.4e
3	The fishery is encouraged to retrieve all nets where possible at the end of the season to reduce the potential for the ghost fishing of abandoned, lost or discarded fishing gear.	2.5.2c

## 6 Traceability and eligibility

### 6.1 Eligibility date

Products from the certified fishery will continue to be eligible to be sold as MSC certified or bear the MSC ecolabel from 13<sup>th</sup> February 2021.

The eligibility date is the date of the re-certification of the fishery.

The traceability and segregation systems in the fishery will be implemented by the eligibility date.

### 6.2 Traceability within the fishery

There is a sufficiently effective system of tracking, tracing and segregation in the Greenland lumpfish fishery so as to ensure that all lumpfish products originating from the certified fishery and sold as certified could be identified prior to or at the point of landing.

There has been no change in the practice of the fleet since the original assessment (PCR dt. 13<sup>th</sup> August 2015) though the number of active fishermen has decreased.

The Greenland lumpfish fishery typically takes place using dinghies, as lumpfish spawns in shallow waters. The most common vessels measure 16-21 ft (4.9-6.4m) and the vessels are typically operated by 1-2 persons. Commercial fishing for lumpfish is subject to a licence issued by the Ministry of Fisheries, Hunting and Agriculture. Licences have to be applied for every year and state conditions for how many nets may be used per licence, the area in which fishing may take place, and the periods of time in which fishing is permitted in individual areas. Holders of lumpfish fishing licences fishing on a commercial scale are subject to reporting obligations. Vessels >9.4 m are obliged to keep logbook with information on vessel, fishing activity, catch and landing while vessels < 9.4m must have landing declarations. The UoC includes both reporting systems and both reporting systems enable traceability back to the certified fish/ fish products in the same manner. There is a landing obligation in Greenland, and all catch must be reported.

Dinghies typically carry 3-5 barrels for storage of lumpfish roe on board, each containing approx. 105 kg roe. Catches of lumpfish are easily distinguished from other catch based on physical appearances of the fish. Roe is extracted from fish on board the dinghy and stored in the barrels. Carcasses are most often cast overboard as they hinder the fishery by overloading the small dinghies and low landing prices present the fishermen with little incentive to retain them. Lumpfish roe is physically separated from other catch in barrels which are closed with clamps but not labelled on board the vessels.

Target species are processed as a normal catch, while species not eligible for sale are still reported upon landing as bycatch. Additionally, all bycatch must be reported to the Piniarneq reporting system.

Persons and companies fishing with vessels 9.4 meters or longer shall keep a logbook on each trip with information on the vessels, the fishing activity carried out, the catch and the landing of the catch. The logbook shall be submitted to the buyer at each landing, and signed copies are kept by both fishermen and buyers.

The client group fishes the entire catch. The fishery is an 'Olympic' fishery, with NAFO area based TACs that changes each year. Hence, the proportions shift, and with more than 500 fishermen, each catch can be of a very small proportion. All data on landed species are available in the landing information. The fishery is only conducted using 260 mm gill nets. All nets must be marked with information, so that the control (GFLK) at any time can contact the owner of the net. When landing the catch, it is the fishermen's obligation to report all catch (including bycatch). This information is digitalized by the buyers, who then transfer the information to GFLK on a weekly basis. GFLK quality checks the data, making it available to stock assessors and managers.

Persons and companies fishing with vessels less than 9.4 meters LOA (typical for the lumpfish fishery) do not submit logbooks. These vessels are required to report only through landing declarations. Reporting of landings of lumpfish is

mandatory at first-hand purchase of products. Persons and companies who land or sell to a buyer shall submit and sign a landing declaration containing specified details to the Government of Greenland. Information to be provided include fisherman's license number, fishing position, species and quantity caught and degree of processing. When landing seafood products, the buyers shall provide information to Greenland Fisheries License Control Authority (GFLK) in a form specified by GFLK, on a weekly basis. The buyer shall keep records of landings for at least three years. For the purposes of enforcement of national and international control rules, GFLK may designate specific ports where catches of certain seafood products from specified areas shall be landed.

### **6.2.1 Risk of fishing outside the unit of certification**

There is no risk of vessels fishing outside the unit of certification for this fishery. Fishing licences are issued for the West Greenland waters; area 1A-1F, identical to the geographical area included in the Unit of Certification. The fleet fishing for lumpfish within the Unit of Certification consists of smaller vessels that do not travel outside the inshore waters and fishing only takes place in the proximity of landing places. Fishermen are obligated to report on fishing field / fishing position in the logbook / landing declaration.

### **6.2.2 Risk of substitution**

There is no risk of substitution of certified with non-certified fish prior to or at landing.

- All lumpfish and/or lumpfish roe from fishermen holding a fishing licence are included in the UoC if the fishermen land catch to processors that are current members of Sustainable Fisheries Greenland as per list published on the MSC website.
- There is no landing in Greenland of lumpfish or lumpfish products fished outside of the Unit of Certification.
- There is then, per definition of the UoC, no risk of substitution of certified with non-certified fish at landing at Sustainable Fisheries Greenland members.

All eligible processors (members of Sustainable Fisheries Greenland) have to be certified according to the MSC Chain of custody standard prior to purchasing MSC certified lumpfish in order to sell their product as MSC certified products. Chain of Custody certification is a requirement for eligible processors for buying and selling MSC certified lumpfish and lumpfish products.

### **6.2.3 At-sea processing**

Once caught, the fish (the female) is cut open and the roe removed. The roe is placed in barrels containing approximately 105 kg each, which are transported to the landing site. In recent years, some bodies have been taken to shore to be frozen and sold at markets in the Far East. Details of species caught, and degree of processing is included in the logbook / Landing declaration. All harvested bycatch species are retained and landed. Roe is not extracted from any of these bycatch species. Segregation of bycatch species at landing is ensured as only the certified lumpfish females are cut open at sea while all other non-certified species are whole.

### **6.2.4 Transshipping**

There is no transshipment in this fishery.

### **6.2.5 Points of landing**

Although the Unit of Certification includes NAFO areas 1A-1F (Figure 1), fishing will only take place in areas within reasonable travel distance from landing places that will accept the products. The catch is landed directly at processors site and is not handled by any intermediary agents. Active buyers along the coast vary with market price. Landing sites are all members of SFG, who are processors. License for lumpfish fishing is verified and documented for each delivery at the landing sites in co-operation with staff at the landing sites.

The client maintains and provides DNV GL with a current list of members of Sustainable Fisheries Greenland eligible to use the fishery certificate. The list is published on the MSC website, and processors listed are the eligible points of

landing. All companies that are members of Sustainable Fisheries Greenland may not be active receivers of the products at all times.

The lumpfish products change ownership at the point of landing. Chain of Custody certification is required for eligible processors (members of Sustainable Fisheries Greenland) for buying and selling MSC certified lumpfish and lumpfish products.

**Table 12 Traceability within the fishery**

Factor	Description
<p>Will the fishery use gears that are not part of the Unit of Certification (UoC)?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip, on the same vessels, or during the same season;</li> <li>- How any risks are mitigated.</li> </ul>	<p>No, the fishery does not use gears that are not part of the UoC. All catch is taken exclusively with 260 mm gill net.</p>
<p>Will vessels in the UoC also fish outside the UoC geographic area?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If this may occur on the same trip;</li> <li>- How any risks are mitigated.</li> </ul>	<p>No, vessels in the UoC do not fish outside the UoC geographic area. All lumpfish are caught in the inshore West Greenland area.</p>
<p>Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.</p> <ul style="list-style-type: none"> <li>- Transport</li> <li>- Storage</li> <li>- Processing</li> <li>- Landing</li> <li>- Auction</li> </ul> <p>If Yes, please describe how any risks are mitigated.</p>	<p>No, the fishery client members do not handle both certified and non-certified products during any of the activities covered by this certificate. There are no landings of non-certified lumpfish roe from any fishery in Greenland.</p>
<p>Does transshipment occur within the fishery?</p> <p>If Yes, please describe:</p> <ul style="list-style-type: none"> <li>- If transshipment takes place at-sea, in port, or both;</li> <li>- If the transshipment vessel may handle product from outside the UoC;</li> <li>- How any risks are mitigated.</li> </ul>	<p>There is no transshipment within this fishery.</p>
<p>Are there any other risks of mixing or substitution between certified and non-certified fish?</p> <p>If Yes, please describe how any risks are mitigated.</p>	<p>No other risks of mixing or substitution between certified and non-certified fish have been identified.</p>

## 6.3 Eligibility to enter further chains of custody

Greenland lumpfish (*Cyclopterus lumpus*) products fished by fishermen holding a Greenland lumpfish fishing licence and landed to processors in Greenland that are current members of Sustainable Fisheries Greenland as per list published on the MSC website, are eligible to enter further certified chains of custody.

The client maintains and provides DNV GL with a current list of members of Sustainable Fisheries Greenland eligible to use the fishery certificate. The list is published on the MSC website, and processors listed are the eligible points of landing.

The lumpfish products change ownership at the point of landing. Chain of Custody certification is required for eligible processors (members of Sustainable Fisheries Greenland) for buying and selling MSC certified lumpfish and lumpfish products.

**Table 13 Eligibility to enter further chains of custody**

<b>Conclusion and determination</b>	Greenland lumpfish roe will be eligible to enter further certified chains of custody and be sold as MSC certified or carry the MSC ecolabel.
<b>List of parties, or category of parties, eligible to use the fishery certificate and sell product as MSC certified</b>	The current list of members, eligible to use the fishery certificate is published on the MSC website- General documents
<b>Point of intended change of ownership of product</b>	Point of change of ownership is at the point of landing which is the processors/members of SFG listed on the MSC website.
<b>List of eligible landing points (if relevant)</b>	As mentioned above, landing points are the processors who are the members of the client group. This list is available on the MSC website.
<b>Point from which subsequent Chain of Custody is required</b>	Subsequent chain of custody is required from the point of change of ownership i.e. from the processors at whose plants the roe is landed.

## 6.4 Eligibility of IPI stock(s) to enter further chains of custody

**Table 14 IPI (Inseparable or Practicably Inseparable) status**

Ref.	Clause/ Requirement	IPI- Y/N	Observation
FCP v2.1 7.5.8.1	The CAB shall only recognise stock(s) as being an IPI stock, where the inseparability arises because either:		
a	The non-target catch is practicably indistinguishable during normal fishing operations (i.e., the catch is from a stock of the same species or a closely related species)	N	Non- target catch is minimal as the target species catch is 99.8294% in 2017-2018- ref. Table 20.
b	When distinguishable, it is not commercially feasible to separate due to the practical operation of the fishery that would require significant modification to existing harvesting and processing methods.	N	Once caught, roe is removed from female lumpfish only and stored in barrels.

c	The total combined proportion of catches from the IPI stock(s) do not exceed 15% by weight of the total combined catches of target and IPI stock(s) for the UoA;	N	The total combined proportion of non-target species is <0.1%. Non target species are separated from the roe before landing
d	The stocks are not ETP species	N	None of the stocks are ETP species
e	The stocks are not certified separately	N	NA

The average lumpfish catch for 2017-2018 was 99.8294% - ref. Table 20. The product is Greenland lumpfish roe and there is no IPI stocks involved.

## 7 Scoring

The lumpfish fishery in Greenland is conducted in the spring along the Greenland west coast. The fishery peaks around mid-May. Prior to year 2000, reported roe landings were below 500 t, but in the last two decades landings have steadily increased, reaching the highest level in 2013 with 2 124 t. Since then, catches have generally decreased, now being around 1 000 t. Before 2015 the fishery was unregulated, but in 2015 a management plan was implemented, that operates with TAC and restricted number of fishing days. The West Coast is divided into seven management areas, with the onset of the fishery being area dependent due to a timely displaced onset of spawning. The majority of the fishery is conducted from small open boats (<6.5m) that operates with gill nets that typically fish for 24 hours. Due to the large mesh size (260mm) the nets are highly selective, and catch predominantly female lumpfish, which are much larger than males (Hedeholm et al. 2013). Upon capture, the roe is removed from the fish and stored in large barrels, before landed at land-based facilities. Hence, the number of fishes landed is not reported, but only the total amount of roe. The stock assessment uses two indicators 1) kg. roe pr. landing as is a proxy of landing per unit effort (LPUE) and can be used as a stock status indicator; 2) catch/LPUE as an indicator of the fishing intensity (effort) which is a proxy proportional to fishing mortality. Due to the size of the fishing vessels, there is an upper limit to the number of nets each boat can carry. All calculations in this assessment involving LPUE rest on this vital assumption; that each fisherman is assumed to be incapable of increasing fishing effort (nets) as a response to a decline in lumpfish abundance to maintain the same landings. To be able trace if the fishing intensity may change also the number of field codes fished ('Fiskefelter') and the number of active fishers are monitored. On this basis, the assessment team agrees with Pinngortitaleriffik (GINR) that a reasonable indication of stock status can be provided, although no survey is available. The commercial data available have been of varying quality, and data prior to 2010 have not been evaluated valid for assessment purposes as those landings often lack supporting information such as fisherman ID and location.

### 7.1 Principle scores

Table 15 Principle scores

Principle	Score
Principle 1 – Target species	84.2
Principle 2 – Ecosystem impacts	83.7
Principle 3 – Management system	89.4

## 7.2 Summary of Performance Indicator level score

**Table 16 Performance Indicator level scores**

Principle	Component	Weight		Performance Indicator (PI)	Weight	Score
One	Outcome	0,333	1.1.1	Stock status	1,000	80
	Management	0,667	1.2.1	Harvest strategy	0,250	95
			1.2.2	Harvest control rules & tools	0,250	90
			1.2.3	Information & monitoring	0,250	80
			1.2.4	Assessment of stock status	0,250	80
Two	Primary species	0,200	2.1.1	Outcome	0,333	100
			2.1.2	Management strategy	0,333	95
			2.1.3	Information/Monitoring	0,333	95
	Secondary species	0,200	2.2.1	Outcome	0,333	95
			2.2.2	Management strategy	0,333	65
			2.2.3	Information/Monitoring	0,333	65
	ETP species	0,200	2.3.1	Outcome	0,333	80
			2.3.2	Management strategy	0,333	65
			2.3.3	Information strategy	0,333	60
	Habitats	0,200	2.4.1	Outcome	0,333	100
			2.4.2	Management strategy	0,333	95
			2.4.3	Information	0,333	80
	Ecosystem	0,200	2.5.1	Outcome	0,333	80
			2.5.2	Management	0,333	85
			2.5.3	Information	0,333	95
Three	Governance and policy	0,500	3.1.1	Legal &/or customary framework	0,333	95
			3.1.2	Consultation, roles & responsibilities	0,333	100
			3.1.3	Long term objectives	0,333	90
	Fishery specific management system	0,500	3.2.1	Fishery specific objectives	0,250	90
			3.2.2	Decision making processes	0,250	85
			3.2.3	Compliance & enforcement	0,250	70
			3.2.4	Monitoring & management performance evaluation	0,250	90



## 7.3 Principle 1

### 7.3.1 Principle 1 background

Pinngortitaleriffik (Greenland Institute of Natural Resources) provides an annual stock assessment based on information from the commercial fishery. The key information is the catches- **Figure 2** and the catch per landing, **Figure 3**. This is supplemented an overview of the extent of the fishery and how this geographical extent may have changed, Table 17. The most recent stock assessment is

*Pinngortitaleriffik 2019 Assessment of lumpfish (Cyclopterus lumpus) in West Greenland based on commercial data 2010-2019. Greenland Institute of Natural Resources Nuuk, July 2019*

This stock assessment is linked to the Management Plan.

*Forvaltningsplan for stenbiderfiskeriet 2018 [Management Plan for the lumpfish fishery 2018] Naalakkersuisut Department for fishery, Hunting and agriculture. Version 3.0 2018*

**Table 17 West Greenland Lumpfish fishery 2012-2019. Number of field codes (statistical rectangles fished) and active fishermen by NAFO Division. Source Pinngortitaleriffik (2019)**

Number of field codes fished and active fishermen in each NAFO division and year.

Year	Field codes fished						Total	Number of fishermen						Total
	1A	1B	1C	1D	1E	1F		1A	1B	1C	1D	1E	1F	
2012	72	100	37	61	17	33	320	128	169	144	141	33	64	679
2013	48	83	24	94	19	34	302	77	181	85	172	33	69	617
2014	35	102	38	36	13	37	261	58	136	115	89	36	74	508
2015	21	77	33	58	15	31	235	45	135	113	114	35	66	508
2016	18	70	42	47	25	33	235	45	116	122	113	34	50	480
2017	17	51	40	61	14	43	226	42	90	115	111	29	65	452
2018	28	70	39	72	24	43	276	48	127	133	122	31	55	516
2019	23	66	47	55	19	37	247	48	126	123	92	28	60	477

The distribution of the fishery is along the entire coast, Figure 4.

The assessment of the status of the West Greenland lumpfish fishery was based on an RBF approach, Lassen et al (2015). The present evaluation viz-a-viz MSC FCR v2.01 is based on the stock assessment and management plan which has been developed and implemented during the first certification period 2015-2019. This is supplemented with increased knowledge on stock status and population dynamics represented by Garcia-Mayoral et al (2016), Hedeholm et al (2017) and Kennedy et al (2018).

### 7.3.2 Catch profiles

The catch is measured in roe (kg) with a conversion factor of 6.7 to fresh weight as only the roe is landed apart from small quantities of in particular male lumpfish. The TAC is formulated in kg roe and also the proxy for stock size LPUE is formulated as kg roe per landing - **Figure 3** shows the development of the fishery since 1988.

### 7.3.3 Total Allowable Catch (TAC) and catch data

Table 18 Total Allowable Catch (TAC) and catch data

TAC	Year	2019	Amount	1300 MT (Roe)
UoA share of TAC	Year	2019	Amount	1300 MT (Roe)
UoA share of total TAC	Year	2019	Amount	1300 MT (Roe)
Total green weight catch by UoC	Year (most recent)	2019	Amount	1095.8 MT (Roe)
Total green weight catch by UoC	Year (second most recent)	2018	Amount	1003.9 MT (Roe)

### 7.3.4 Stock Status, Management and Assessment

#### a. Stock status

During the first certification period (2015-2019) the stock indicator catch per landing, Figure 3 seems to be stabilised at a level lower than the target level around the Btrigger level. The current estimate is  $LPUE_{2019} = 167.2 \text{ kg roe/Landing}$

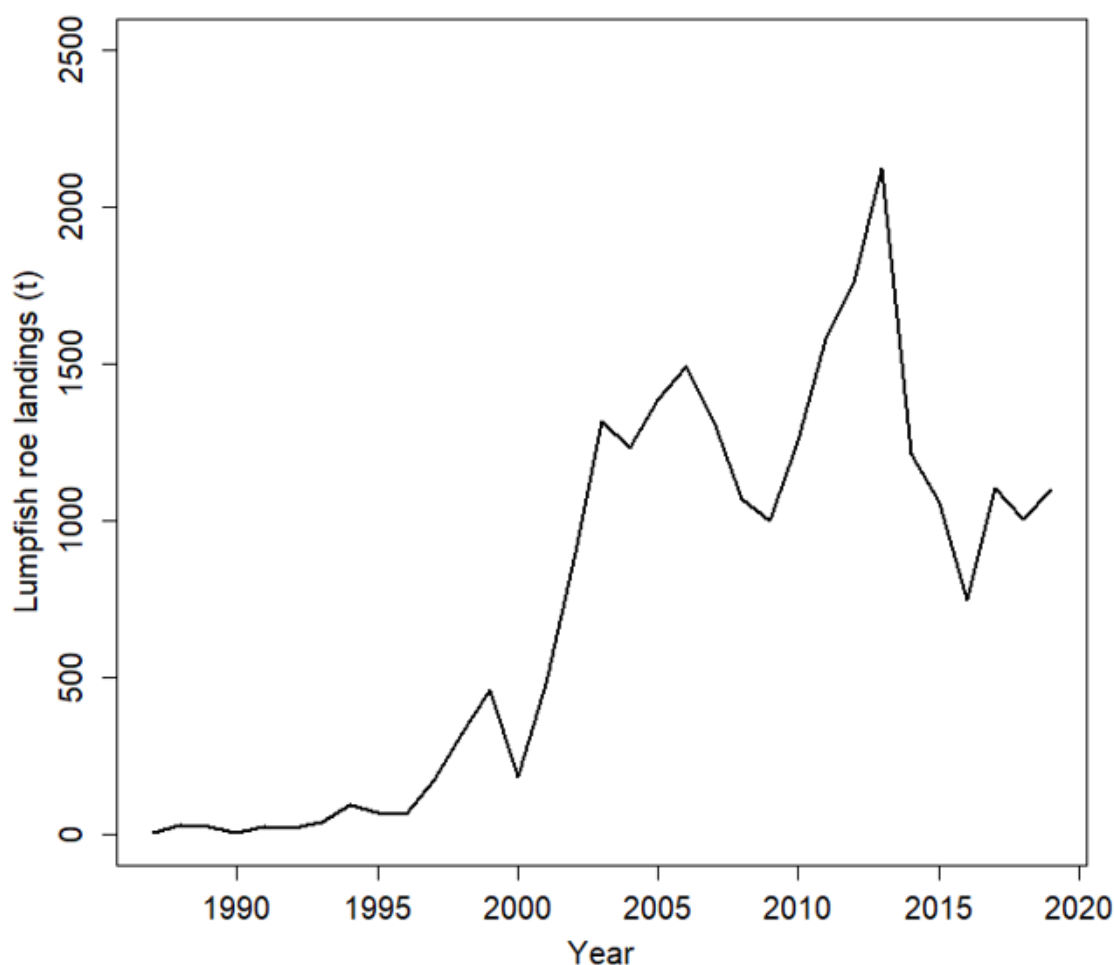
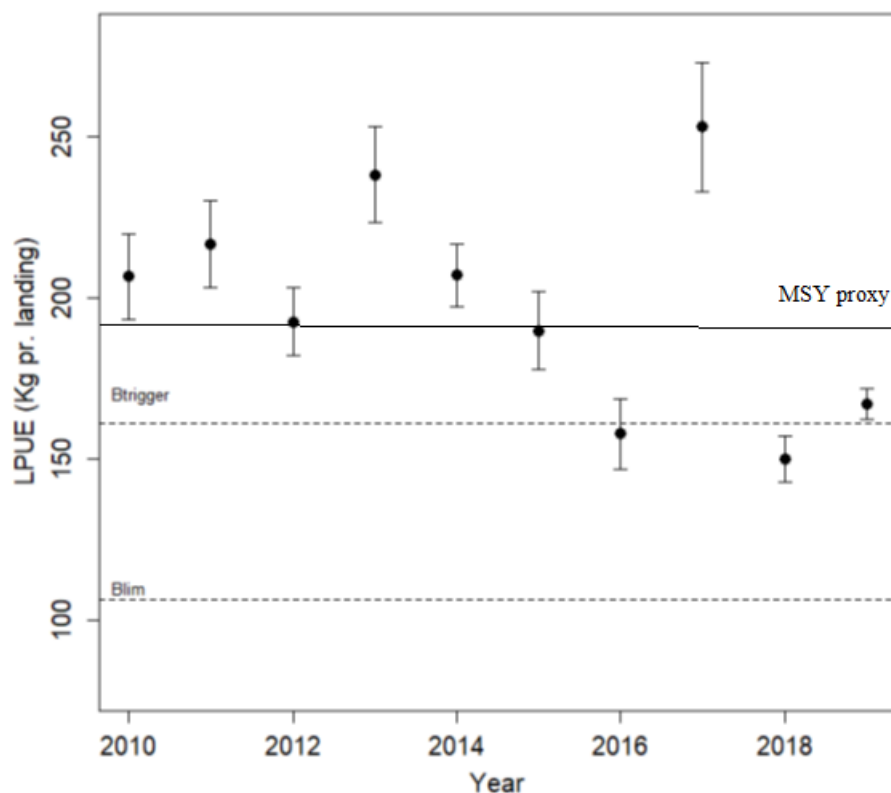


Figure 2 Lumpfish landings from West Greenland waters 1988-2019. Source: Hedeholm (2019) Figure 1



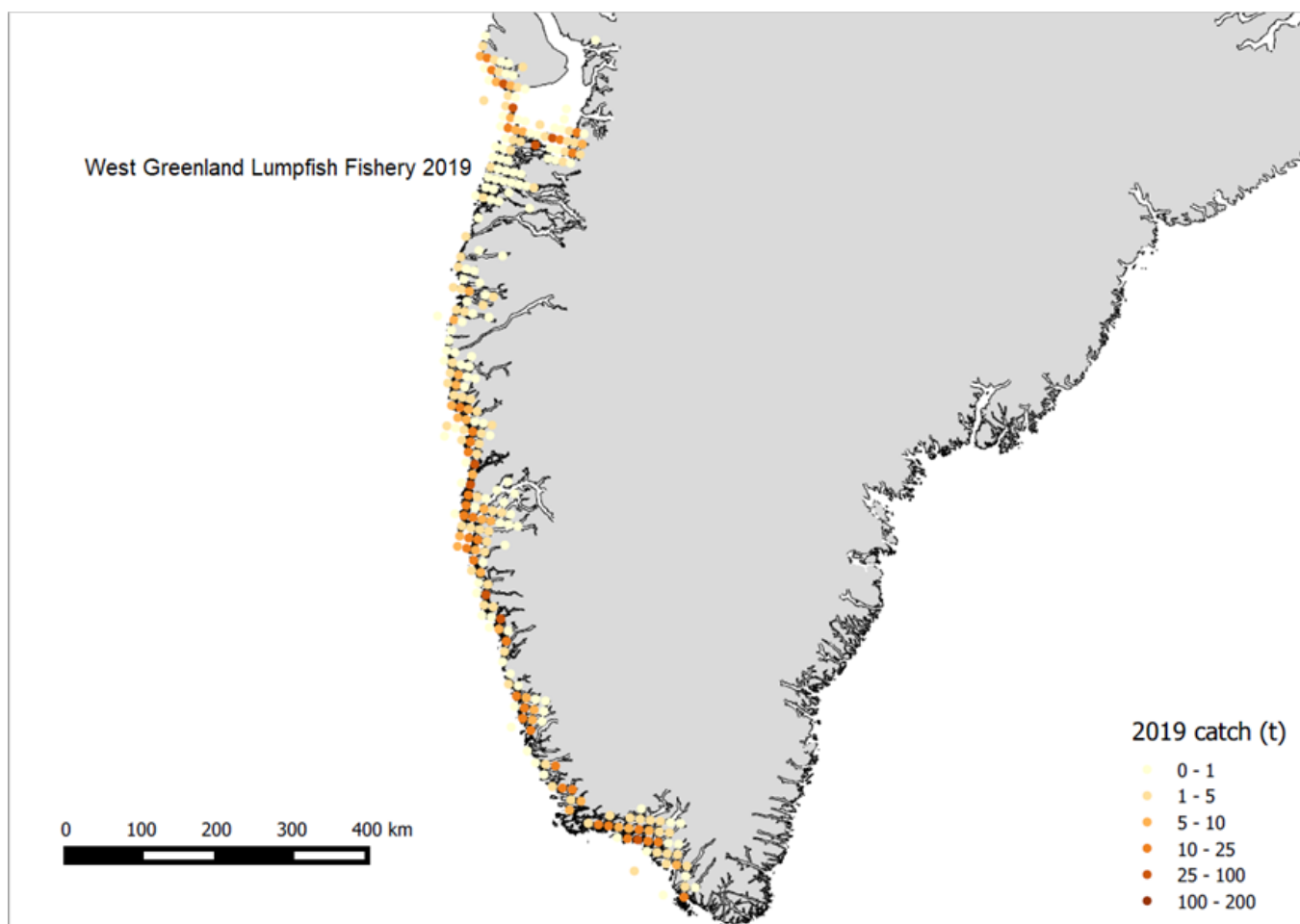
**Figure 3 LPUE (kg (roe) per landing 2010-2019. Source: Pinngortitaleriffik (2019) Figure 2**

The data are shown in Table 19.

**Table 19 West Greenland lumpfish. Standardised LPUE (kg/landing) and standard error 2010-2019**

Year	LPUE	Standard error
2010	206.5	13.4
2011	216.5	13.5
2012	192.5	10.6
2013	238.1	14.9
2014	206.9	9.6
2015	189.7	12.1
2016	157.9	10.9
2017	253.0	20.0
2018	150.0	7.2
2019	167.2	4.8

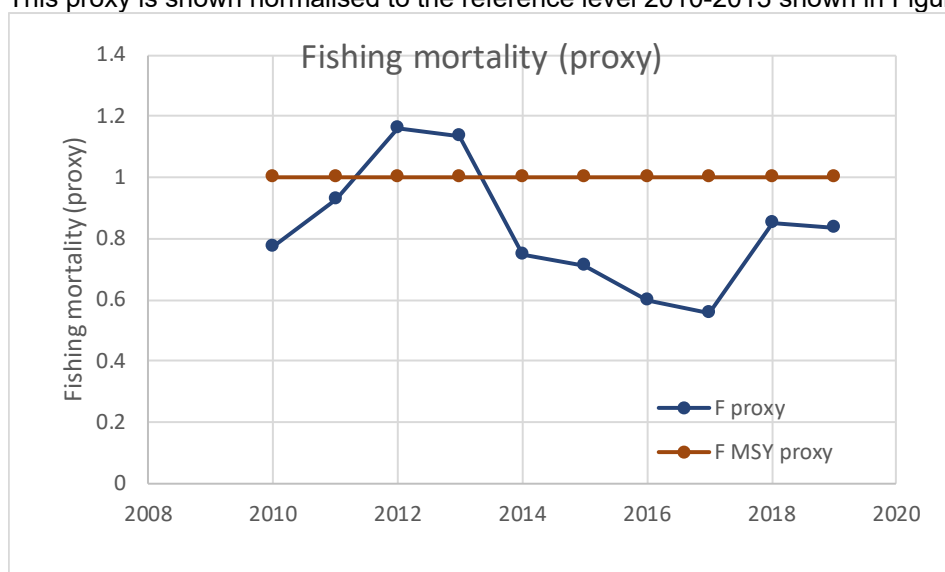
The overall LPUE increased by 11.4% from 2018 to 2019 (**Figure 2**). This was driven by an increase primarily in NAFO 1A. The other NAFO areas generally maintained the same LPUE level. NAFO 1D remained at a low level but is still the area with the largest catches (282 t, 25.7%).



**Figure 4 West Greenland lumpfish fishery 2019. Source GINR**

A proxy for the fishing mortality is Catch divided by Biomass which in the term of the lumpfish means Catch (roe) / LPUE (roe)

This proxy is shown normalised to the reference level 2010-2013 shown in Figure 5



**Figure 5 West Greenland lumpfish. Fishing mortality (proxy) 2010-2019 together with reference level = 1 (reference period 2010-2013)**

b. Reference points

Pinngortitaleriffik (2017) defined proxy reference points based on the LPUE indicator

- PRI reference point  $LPUE_{lim} = 106.5 \text{ kg roe/Landing}$
- Btrigger reference point  $LPUE_{trigger} = 161 \text{ kg roe/Landing}$

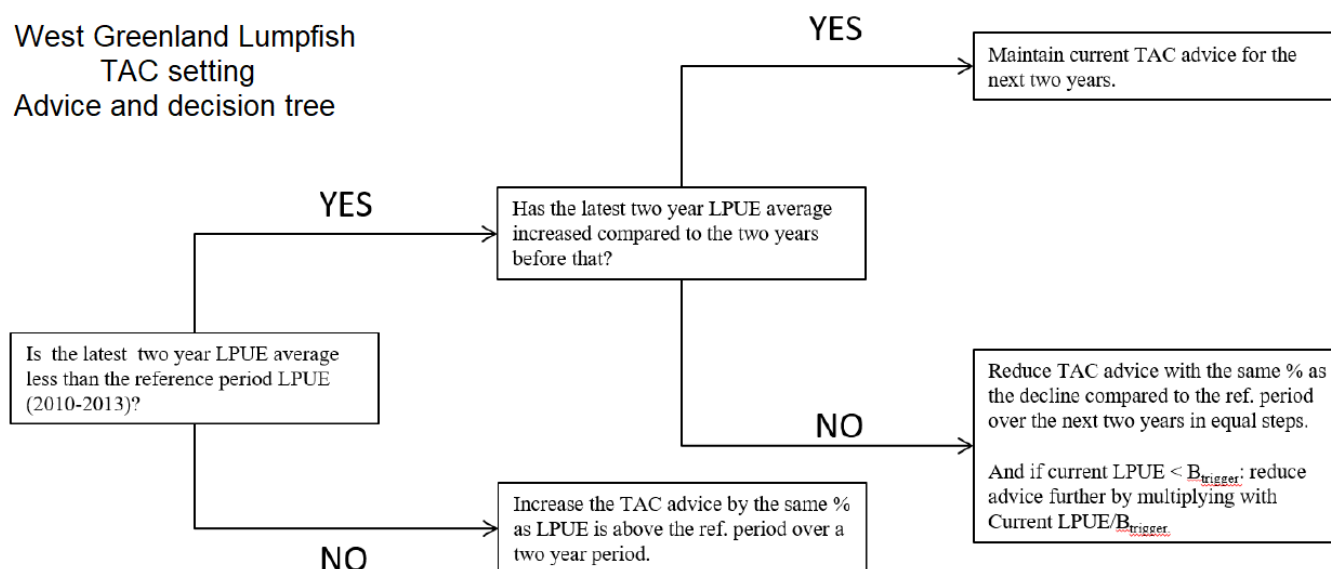
Further, the target for the fishery was set as the average Landing Per Unit Effort (LPUE) from 2010-2013, and this can be considered as a proxy for  $F_{msy}$  and this FMSY proxy = 1.0 is shown in Figure 5

Reference LPUE (corresponding to a TAC of 1500 t roe, average 2010-2013) = 213 kg/landing. This level is dependent on the year class strengths for the years which appear to be high. As there is no indicator of the year class strength the evaluation of the stock status via-a-viz MSY is based on the fishing mortality indicator

c. Stock Management

Stock management is specified in the Management Plan, the most recent is from 2018 and is version 3.0.

The harvest control rule is defined as shown in Figure 6.



**Figure 6 West Greenland Lumpfish. TAC setting. Advice and Decision tree. Source: Management Plan 2018 Version 3.0**

The Management Plan includes

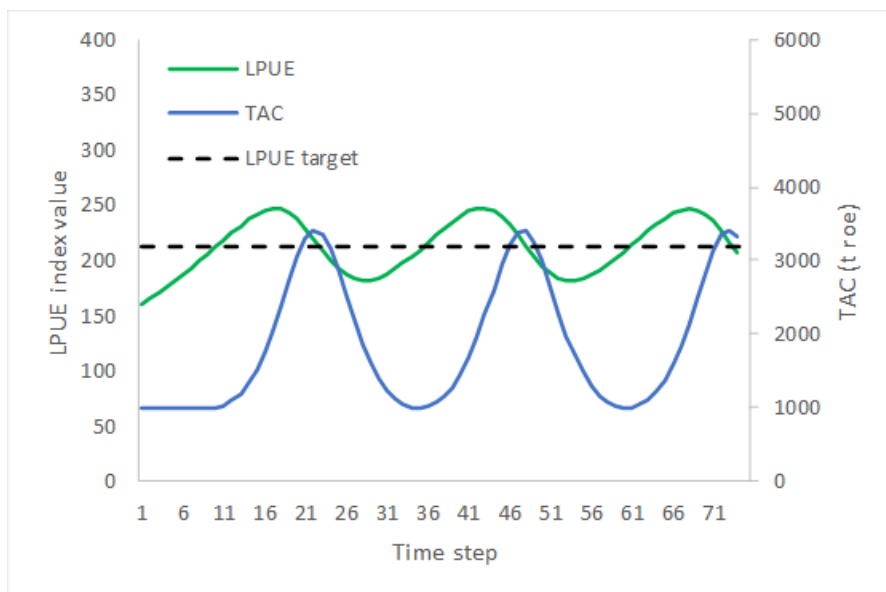
Advice is given for two years

The TAC is set annually

The advice is updated annually

The reference period is the target aimed at (LPUE = 213 kg/landing corresponding to a TAC = 1500 t toe)

The Harvest Control Rule behaviour was investigated by Pinngortitaleriffik (2019). The HCR will maintain the stock fluctuating around the MSY target at 213 kg/landing. This corresponds to a fishing mortality around 0.9 below the Fproxy MSY reference point at 1. The management plan attempts to maintain the fishing mortality below  $F_{MSY}$ .



**Figure 7 West Greenland Lumpfish. Behaviour of the Harvest Control Rule. Source: Pinngortitaleriffik (2019)**

d. Stock assessment

The stock assessment is based on data from the commercial fishery supplemented by information on the stock structure and general biological knowledge on the population dynamics of the species. Initially, a year and NAFO division specific LPUE (kg pr. landing) for each individual fisherman is calculated. The raw landing data are filtered to include only 'active' fishers' data. This LPUE is weighted by the share of the total catch in the respective NAFO division taken by the fisherman. All LPUE's from a NAFO area are summarized given a year and NAFO division specific LPUE. To get the LPUE estimate for the entire Greenland west coast, the NAFO division specific LPUE's are weighted by the total west coast landings. This procedure ensures that the fishermen and areas with the highest landings are given the highest weight in the assessment of the stock status.

The field code information is used to get an overview of the extent of the fishery in general, but also to calculate the extent of the fishery in each NAFO division. This is done by simply calculating the number of field codes fished in each year in each NAFO division.

Table 19 presents the time series for the LPUE for the entire West Greenland fishery and its standard errors. The standard error was unusual low in 2019 and for the scoring the average S.E. = 11.7 has been used.

### 7.3.5 Principle 1 Performance Indicator scores and rationales

#### 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			
	Guide post	It is <b>likely</b> that the stock is above the point where recruitment would be impaired (PRI).	It is <b>highly likely</b> that the stock is above the PRI.	There is a <b>high degree of certainty</b> that the stock is above the PRI.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The stock assessment uses two indicators 1) kg. roe pr. landing as is a proxy of landing per unit effort (LPUE) and can be used as a stock status indicator (FAO <http://www.fao.org/3/x5685e/x5685e04.htm>); 2) catch/LPUE as an indicator of the fishing intensity (effort) which is a proxy proportional to fishing mortality (op. cit.). The first indicator measures abundance while the second indicator measures fishing intensity. Due to the size of the fishing vessels, there is an upper limit to the number of nets each boat can carry. All calculations in this assessment involving LPUE rest on this vital assumption; that each fisherman is assumed to be incapable of increasing fishing effort (nets) as a response to a decline in lumpfish abundance to maintain the same landings. To be able trace if the fishing intensity may change also the number of field codes fished ('Fiskefelter') and the number of active fishers are monitored. On this basis, the assessment team agrees with Pinngortitaleriffik (GINR) that a reasonable indication of stock status can be provided, although no survey is available. The commercial data available have been of varying quality, and data prior to 2010 have not been evaluated valid for assessment purposes as those landings often lack supporting information such as fisherman ID and location.

The 2019 LPUE is 167.2 kg/landing. The average for the first certification period of 2015-2019 is 183 kg/landing but includes a very high observation in 2017. The evaluation is based on the 2019 observation and is precautionary. The average S.E. is used in the calculations.

Probability		Limit
0.05	High degree of certainty	148
0.1	Highly likely	152
0.2	Likely	157

Even the lowest of these is well above the Blim reference point. However, there are uncertainties associated with using a proxy as reference point and there are assumptions involved with the use of the LPUE as a stock indicator. The formal calculations are therefore not considered to be directly applicable.

The PRI reference point is based on the LPUE and is defined in Pinngortitaleriffik 2017. The estimate for 2019 is 167 kg roe/Landing well above the reference point at 106.5 kg roe/landing. **SG60 is met.**

The general level has over the available time series been well above the PRI reference point the current estimate is about 1.5 times the PRI reference point. **SG80 is met.**

However, because of uncertainties mentioned above, there is not a high degree of certainty that the stock is above the PRI reference point. **SG100 is not met.**

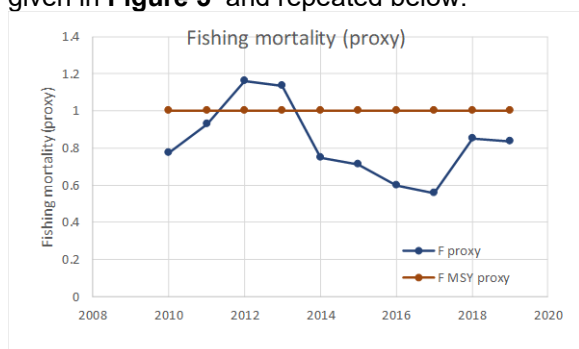
#### **b** Stock status in relation to achievement of Maximum Sustainable Yield (MSY)

	Guide post		The stock is at or fluctuating around a level consistent with MSY.	There is a <b>high degree of certainty</b> that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.
	Met?		<b>Yes</b>	<b>No</b>

#### Rationale

The time series available now includes data for a decade 2010-2019 incl.

The generation time for Greenland lumpfish is around 10 years. The average LPUE level 2010-2019 (201 kg roe/landing) is around the MSY indicator. However, the biomass indicator for 2010-2013 is influenced by the year class strength which appears to be high in those years and also the stock may still be in a phase where surplus biomass is fished, i.e. the system is not in equilibrium. For these reasons the evaluation is based on the F(proxy) given in **Figure 5** and repeated below.



The 2010-2013 F level is considered to be at an approximate  $F_{MSY}$  level. And therefore, the reference level to which the graph is normalised is the reference period 2010-2013 = 1. The F(proxy) has been below this reference level except for 2012 and 2013 and this indicates that the stock is fluctuating at or above MSY. **SG80 is met.**

However, the average LPUE (201 kg roe/landing) is below  $1.4 * B_{trigger} = 1.4 * 161 = 225$  kg roe/landing which would be an upper limit on the MSY level, but also below the reference level 2010-2013 (213 kg roe/landing). Also, the use of the proxy for fishing mortality is associated with uncertainty. There is no high degree of certainty that the stock has been fluctuating around MSY. **SG100 is not met.**

#### References

- <http://www.fao.org/3/x5685e/x5685e04.htm>
- Pinngortitaleriffik 2017
- Pinngortitaleriffik 2019
- DNV GL, 2015. Initial assessment of the Greenland lumpfish fishery. Public Certification Report for Sustainable Fisheries Greenland. DNV GL Report No.: 2014-018, Rev. 5 Certificate No.: F-DNV-165369 Date: 2015-08-13. Authors Lassen Hans, Lockwood Stephen, Cappell Rod, Meldre Pedersen Guro

#### 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 (SIa)	<i>LPUE (Blim)</i>	<i>106.5 kg roe/landing</i>	<i>LPUE (2019) = 167.2 kg roe/landing</i> <i>CI (2019) = [162:172]</i>
Reference point used in scoring stock relative to MSY (SIb)	<i>LPUE (Btrigger)</i> <i>MSY Proxy</i>	<i>161 kg roe/landing</i> <i>192 kg roe/landing</i>	
	<i>FMSY proxy [Catch/LPUE standardised to 2010-2013]</i>	<i>1</i>	<i>0.85</i>



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**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

**Overall Performance Indicator scores added from Client and Peer Review Draft Report**

Overall Performance Indicator score	80
Condition number (if relevant)	

### 7.3.6 PI 1.1.2 – Stock rebuilding

was scored in the ACDR but is not scored after stakeholder site meetings.

PI 1.1.2		Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue		SG 60	SG 80	SG 100
a	Rebuilding timeframes			
	Guide post	A rebuilding timeframe is specified for the stock that is the <b>shorter of 20 years or 2 times its generation time</b> . 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 <b>one generation time</b> for the stock.
	Met?	Yes		No
Rationale				

The management plan provides for a rebuilding framework should the stock fall below the LPUE (Btrigger) or LPUE (Blim) reference points. The generation time is not known precisely, there is no analytical assessment, but the age of maturity is assumed to be 3-4 years. There is no direct estimate of the natural mortality but also no major natural mortality has been identified suggesting a standard natural mortality around 0.2. On this basis the generation time is 8-10 years. A study presented to the assessment team (Hedeholm et al 2019) indicates that the current management plan will rebuild the stock within a single generation. **SG60 is met.**

The population dynamics of lumpfish is not known with great accuracy and the management plan does not specify a precise rebuilding time. **SG100 is not met**

Rebuilding evaluation				
b	Guide post	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is <b>evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .	There is <b>strong evidence</b> that the rebuilding strategies are rebuilding stocks, <b>or it is highly likely</b> based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the <b>specified timeframe</b> .
	Met?	Yes	Yes	No
Rationale				

The fisheries statistics and some sampling of the catches allow the determination of the efficiency of any rebuilding strategy, through monitoring of the LPUE and the extent of the fishery, no of 'fiskepladser'. Also, the overall effort in the form of the number of licenses is monitored. **SG60 is met.**

The stock seems stable at or slightly above the Btrigger level and hence there is no direct evidence of rebuilding. Hedeholm et al (2019) concludes based on a simulation study, that the management plan is effective in achieving the MSY target. The exploitation rate is kept under scrutiny through monitoring of the extent of the fishery, **SG80 is met.** The timeframe is not defined explicitly in the management plan and the simulation study (Hedeholm et al 2019) suggests that rebuilding is within a single generation. However, the length of the generation time is not known precisely, and the experience with rebuilding is limited based on the available data and there some doubt on the level of trust that can be associated to the simulation study, the biological population model is not verified based on irrefutable evidence. There is no strong direct evidence that the management plan is rebuilding the stock. **SG100 is**

not met.

#### References

- Management plan for West Greenland lumpfish
- Hedeholm et al (2019) Lumpfish stock development under the management plan
- Pinngortitaleriffik 2019. Assessment of lumpfish (cyclopterus lumpus) in West Greenland based on commercial data 2010-2019. Greenland institute of natural resources. Nuuk, July 2019.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	NA
Condition number (if relevant)	

## 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 <b>expected</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy <b>work together</b> towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is <b>designed</b> to achieve stock management objectives reflected in PI 1.1.1 SG80.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The management plan (adopted May 2014 and revised in 2017 and 2018) includes a harvest strategy and a harvest control rule that traces the development of the spawning stock, the elements of the HCR regulate the TAC in response to stock development. Reference points are defined that are expected to achieve stock management objectives reflected in PI 1.1.1 SG80 (i.e. MSY objectives as defined through Greenlandic legislation). **SG60 is met.**

The management plan is designed to achieve the stock management targets and the inherent reference points. The strategy is responsive to the state of the stock through the scientific advice on which the plan is based and the regulatory elements, TAC, minimum mesh size (260 mm) and the possibility to close certain areas all work together to achieve stock objectives consistent with PI 1.1.1 SG80. **SG80 is met.**

Stock objectives are achieved through adjusting the TAC in response to a stock size indicator that includes both the density of the stock biomass and the range of the fishery. The plan is designed to achieve stock management objectives reflected in PI 1.1.1 SG80. **SG100 is met.**

Harvest strategy evaluation				
b	Guide post	The harvest strategy is <b>likely</b> to work based on prior experience or plausible argument.	The harvest strategy may not have been fully <b>tested</b> but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been <b>fully evaluated</b> and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The harvest strategy is based on the management plan now version 3 (2018). This plan is based on a TAC supervised by GFLK and TAC setting based on scientific assessment (GINR) and review at the Fishery Council. Supplemented by technical regulations (260 mm minimum mesh size in nets). The TAC during most recent years has not been fully fished at least partly due to market conditions and available alternative and profitable fishery (Greenland halibut). The harvest strategy as based on scientific assessment is likely to work. **SG60 is met.**

Pinngortitaleriffik (2019) presents a theoretical study of the behaviour of the performance of the HCR. This study shows that the HCR is expected to deliver a stock varying around MSY levels. The experience with the management plan over the first certification period (2015-2019) indicates that the plan is achieving its objectives,  $F_{\text{proxy}} < 1$ . **SG80 is met.**

The harvest strategy has not been fully evaluated, Pinngortitaleriffik (2019) does not include a full simulation test of the HCR. **SG100 is not met.**

Is flattening out	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	Yes		

#### Rationale

The reporting system has been defined and been in place since 2008. Monitoring has further been strengthened since then. Data now includes landing statistics supplemented by information on fishing gear and fishing place. The stock assessment and the management plan are based on indicators of stock abundance on the spawning grounds (Total catch, total effort, LPUE (roe), area of fishing and length of fishing season), which are all monitored. Furthermore, limited length sampling is available. **SG 60 is met.**

d	Harvest strategy review			
	Guide post	The harvest strategy is periodically reviewed and improved as necessary.		
	Met?			Yes

#### Rationale

The harvest strategy is reviewed annually at the Fishery Council illustrated by the amendments introduced to the management plan. The Plan is now in its third version. **SG100 is met.**

e	Shark finning			
	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	NA	NA	NA

#### Rationale

Lumpfish is not a shark.

f	Review of alternative measures			
	Guide post	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	NA	NA	NA

#### Rationale

There is no unwanted by-catch of lumpfish in this fishery. Only mature lumpfish are seen on the fishing grounds. There is a significant difference in size between males and females, males being about 10 cm smaller than females. The mesh size chosen (260 mm) makes the selectivity of the male small. Also, males guard the nests with fish eggs and therefore do not move much around and are not encountering the nets. The small catch of males is landed, and some sold on local markets. The Scoring Issue is not applicable.

## References

- Pinngortitaleriffik 2019.
- Management Plan for West Greenland lumpfish
- GFLK statistics for 2015-2019

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

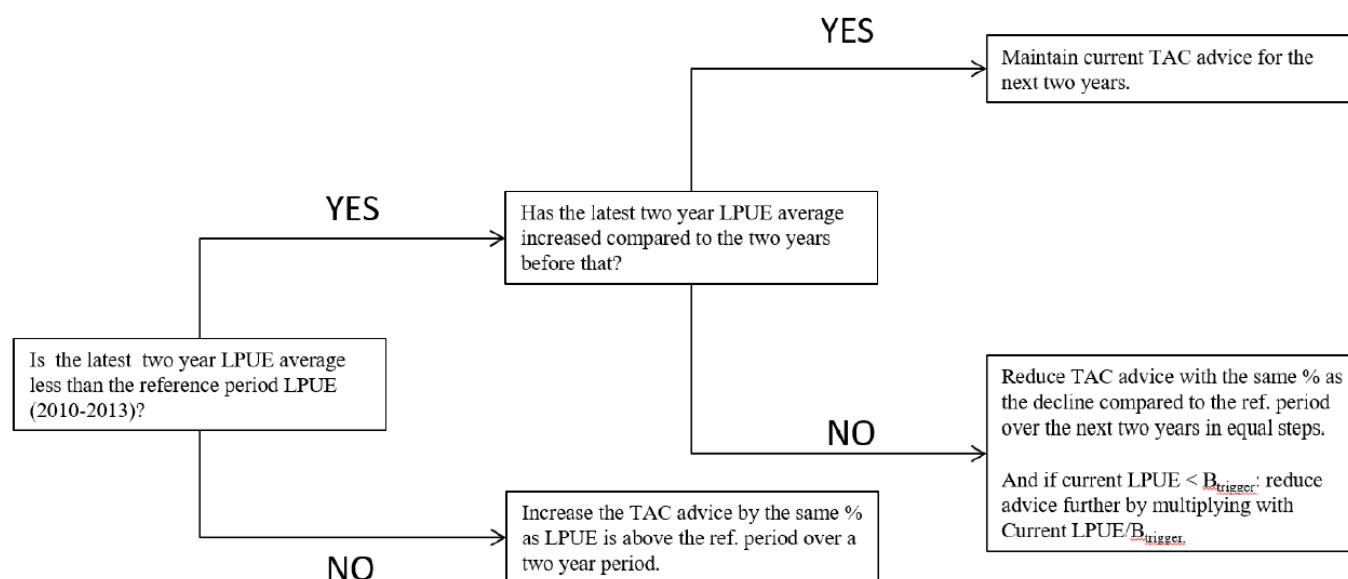
Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	

## 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	<b>Generally understood</b> HCRs are in place <b>or available</b> that are <b>expected</b> to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.	<b>Well defined</b> HCRs are <b>in place</b> that <b>ensure</b> that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock <b>fluctuating around</b> a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs.	The HCRs are expected to keep the stock <b>fluctuating at or above</b> a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, <b>most</b> of the time.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The Management plan includes a Harvest Control rule



The plan is confirmed by the Fishery Council as the basis for management of the West Greenland lumpfish fishery. The performance of the plan is investigated by Pinngortitaleriffik (2019). **SG60 is met.**

The Harvest control rule is well-defined and includes provision for reduction of the exploitation rate if the stock fall below the Btrigger reference points (well above Blim). The plan is by its definition and as illustrated Pinngortitaleriffik (2019) expected to keep the stock fluctuating around a proxy for MSY. **SG80 is met.**

The plan is designed to keep the stock fluctuating at the reference level (2010-2013) which is considered to be around or above MSY. **SG100 is met.**

HCRs robustness to uncertainty				
<b>b</b>	Guide post		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a <b>wide</b> range of uncertainties including the ecological role of the stock, and there is <b>evidence</b> that the HCRs are robust to the main uncertainties.
	Met?		<b>Yes</b>	<b>No</b>

#### Rationale

The harvest control rule focusses on stock development and takes into account the main uncertainties – setting the reference TAC at 90 % of the 2010-2013 average – which are on the stock evaluation. Furthermore, the assessment considers the validity of the LPUE as a stock indicator. Hence, the main uncertainties with the HCR include the use of data from the commercial fishery as stock indicators i.e. the LPUE and the extent of the fishery together with the estimated level of a sustainable exploitation pressure. The uncertainties in calculating the LCPUE relate to the effort calculation. The LPUE that is used in the HCR only includes the professional lumpfishers and therefore avoids LPUE variations that are related to a group of fishers with varying experience in lumpfish fishery and that are attracted dependent on alternative fishing opportunities and price variations. The assessment, Pinngortitaleriffik (2019), discusses the uncertainties in the assessment related to the effort calculation (LPUE) but has not quantified these main uncertainties. The uncertainty related to how well data from the commercial fishery reflects stock development is considered of less importance as gillnets are passive gears while the uncertainty in the target TAC reference point is reflected in the HCR that is therefore based on a conservative exploitation level (90% of the 2010-2013 exploitation level that is considered as sustainable). **SG80 is met.**

However, the HCR does not take the environmental impact into account. Furthermore, fortunately there is no evidence that the HCR has been challenged by providing gross misinformation but there is no strong evidence that the HCR is robust to the main uncertainties. **SG100 is not met.**

HCRs evaluation				
<b>c</b>	Guide post	There is <b>some evidence</b> that tools used <b>or available</b> to implement HCRs are appropriate and effective in controlling exploitation.	<b>Available evidence indicates</b> that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	<b>Evidence clearly shows</b> that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

#### Rationale

The tools include the range of measures available in the legislation TAC, technical measures, closed areas and closed seasons. These are all used in the management of West Greenland lumpfish 260 mm minimum mesh size, limited fishing season – also dictated that the fishery is for roe, closed areas).

The management plan has restricted exploitation; these restrictions are supplemented by market conditions. The development over the first certification period provides some evidence that the HCR is appropriate and effective in controlling exploitation. **SG60 is met.**

The exploitation level has been restricted under the management plan and the TAC and fishing seasons have been respected. **SG80 is met.**

The system has not been challenged and thus there is no clear evidence that the tools in use are effective. **SG100 is not met.**

#### References



- Pinngortitaleriffik 2019
- Management Plan for West Greenland lumpfish

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	90
Condition number (if relevant)	

### 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	<b>Some</b> relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	<b>Sufficient</b> relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A <b>comprehensive range</b> 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?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

#### Rationale

There is an implemented monitoring programme that provides the information required by the HCR. The HCR is based on catch and LPUE supported by an indicator for the extent of the fishery- the number of 'fiskefelter' exploited and the number of active fishers (Effort). There is sufficient relevant information to support the HCR as it is currently defined in terms of stock structure, productivity, fleet composition, catch and effort. **SG60 is met.**

The information is sufficient to support the Harvest Strategy. **The HCR has been operational for the first certification period. SG80 is met**

However, the management plan recognizes that more information on the stock structure, productivity and abundance should be collected. While additional information on the Atlantic lumpfish populations has become available Hedeholm et al (2017), Kennedy et al (2018), the level of information is not comprehensive. **SG100 is not met.**

Monitoring				
b	Guide post	Stock abundance and UoA removals are monitored and <b>at least one indicator</b> is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are <b>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</b> , and <b>one or more indicators</b> are available and monitored with sufficient frequency to support the harvest control rule.	<b>All information</b> 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 <b>uncertainties</b> in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

#### Rationale

The stock assessment is built on two indicators, catch and LPUE. The LPUE is supported by measures of geographical coverage of the fishery (no of 'fiskefelter') and of total effort (no of active fishers). The landings are under a discard ban and all removals are monitored. **SG60 is met.**

Greenland fisheries statistics programme and the control are well established. The accuracy of the catch and effort statistics is good. The coverage (all landings) is consistent with the HCR requirements. There are two indicators on stock status available (LPUE and catch/LPUE). **SG80 is met.**

The Greenland fisheries management system requires that all fishing days (each landing) is documented and there is good compliance with the requirement. Hence coverage of the fishery is 100%. The information required by the HCR is available at a coverage and frequency consistent with the HCR, There is a good understanding of the uncertainties in the data, but the robustness of the assessment and management to this uncertainty is not established although information is collected which each fishing year. **SG100 is not met.**

Comprehensiveness of information			
<b>C</b>	Guide post	There is good information on all other fishery removals from the stock.	
	Met?	Yes	
Rationale			

The only fishery on lumpfish of any significance in the West Greenland waters is the fishery under reassessment. The fisheries statistics is well established in Greenland. The system is very small and there are fisheries inspectors that visit the landing places. **SG80 is met.**

References
<ul style="list-style-type: none"> <li>Pinngortitalerrik 2019</li> </ul>

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	80
Condition number (if relevant)	

## 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
<b>a</b>	Appropriateness of assessment to stock under consideration			
	Guide post	The assessment is appropriate for the stock and for the harvest control rule.		The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

The assessment is based on a stock size indicator combined with an indicator for the geographical extent of the fishery. Furthermore, catch data supplement the evaluation. The assessment is appropriate for the stock and for the HCR. **SG80 is met.**

The assessment is based on an evaluation of the spawning biomass and does not include an account of growth and mortality. The fishery is only on the mature female component of the entire population. **SG100 is not met.**

Assessment approach				
<b>b</b>	Guide post	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	<b>Yes</b>	<b>Yes</b>	
Rationale				

The stock assessment uses two indicators 1) kg. roe pr. landing as is a proxy of landing per unit effort (LPUE) and can be used as a stock status indicator; 2) catch/LPUE as an indicator of the fishing intensity (effort) which is a proxy proportional to fishing mortality. The LPUE is associated with an MSY reference point based on analysis of the stock abundance and this reference point is converted into a proxy for FMSY standardised to the LPUE MSY reference point. The indicators are appropriate for lumpfish because the fishery is only on the spawning component leaving the issue with size selectivity of less importance, the length distribution remain fairly constant between years. The reference points are set based on an evaluation of the stock dynamics (Pinngortitaleriffik 2017)., There are defined reference points available, see PI 1.1.1. The assessment is evaluated relative to these reference points. **SG60 and SG80 is met.**

Uncertainty in the assessment				
<b>c</b>	Guide post	The assessment <b>identifies major sources</b> of uncertainty.	The assessment <b>takes uncertainty into account.</b>	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a <b>probabilistic</b> way.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The assessment Pinngortitaleriffik (2019) and annual assessment reports of earlier years consider the major uncertainties in the assessment, **SG60 is met.**

The reference points are introduced taken the uncertainties into account. Also, the evaluation based on averaging over two years, accounts for uncertainty. **SG80 is met.**

The observed LPUE is assessed together with the associated standard error. However, there is no probabilistic element in the evaluation and **SG100 is not met.**

Evaluation of assessment			
d	Guide post	The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.	
	Met?		No
Rationale			

The HCR has been tested and this includes the application of an assessment model. However, there is no formal testing of the robustness of the assessment model. The population model is basic (SPiCT). Without a better population dynamic model, simulation testing of the assessment model may be difficult or unconvincing. SPiCT is a stochastic surplus production model in continuous time (SPiCT), which in addition to stock dynamics also models the dynamics of the fisheries. This enables error in the catch process to be reflected in the uncertainty of estimated model parameters and management quantities. Benefits of the continuous-time state-space model formulation include the ability to provide estimates of exploitable biomass and fishing mortality at any point in time from data sampled at arbitrary and possibly irregular intervals. See Pedersen M. and Berg C. W. 2016 A stochastic surplus production model in continuous time. Fish and Fisheries. Wiley <https://doi.org/10.1111/faf.12174>  
**SG100 is not met.**

Peer review of assessment			
e	Guide post	The assessment of stock status is subject to peer review.	The assessment has been <b>internally and externally</b> peer reviewed.
	Met?	Yes	No
Rationale			

The assessment is subject to review internally at GINR and has been presented at the ICES Study Group on Atlantic lumpfish, see Garcia-Mayoral et al (2016) and Kennedy et al (2018). **SG80 is met.**

The peer review is only internal and without any formal external input. **SG100 is not met.**  
**See also recommendation 1.**

References	
<ul style="list-style-type: none"> <li>Garcia-Mayoral et al (2016)</li> <li>Kennedy et al (2017)</li> <li>Pinngortitaleriffik (2017)</li> </ul>	

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	

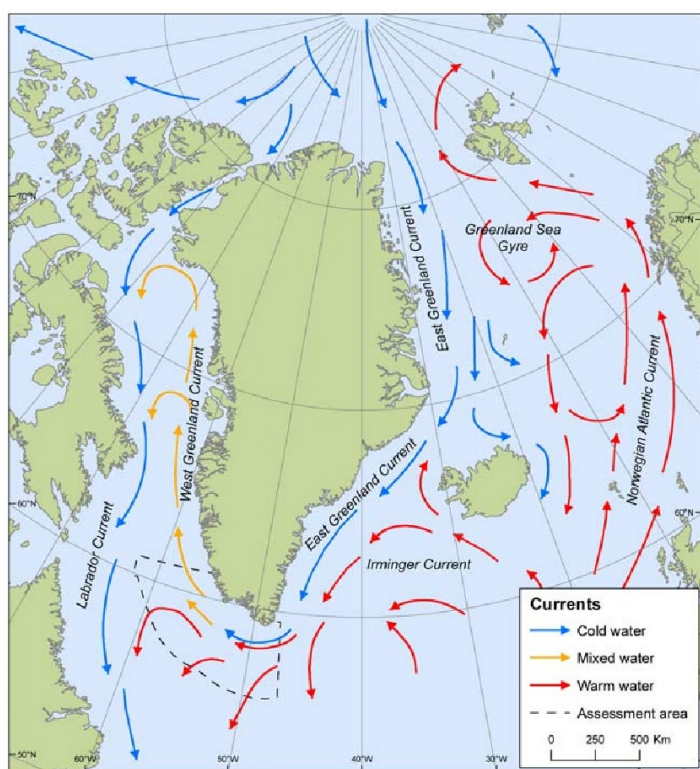
## 7.4 Principle 2

### 7.4.1 Principle 2 background

#### The Ecosystem

**Currents:** The West Greenland ecosystem is subarctic at Cape Farewell (60° N) and extends into the high Arctic at Ingfield Land (78° N); it is influenced by the cold polar water masses of the Arctic region and temperate water masses of the Atlantic Ocean (Buch et al., 2004)<sup>2</sup>. In the south, summer temperatures rarely fall below 5° C but there are inter-decadal variations under the influence of the North Atlantic Oscillation (NAO). In periods when sea temperature rises under the influence of the NAO, cod stocks of West Greenland tend to increase in abundance and decrease when there is a negative trend in sea temperatures (Buch et al., 2004<sup>1</sup>).

The surface waters around South and West Greenland are influenced by two major currents, a cold inshore surface-layer (0-150 m) East Greenland Current that flows south around Cape Farewell and then northwards along the West Greenland coast (Figure 8). Parallel to this but further offshore is the relatively warm Irminger Current, a northerly offshoot from the North Atlantic Drift. It is the strength of these two currents that determines the environmental conditions around south-east and West Greenland. As they round Cape Farewell, the Irminger Current subducts under the polar water to form the West Greenland Current (Dünweber & Frederiksen, 2012a<sup>2</sup>).



**Figure 8: Major sea surface currents around Greenland. Relatively warm Irminger Current water from the Atlantic that mixes with relatively cold polar water from the East Greenland Current before turning north to form the mixed-water West Greenland Current (Dünweber & Frederiksen, 2012).**

<sup>1</sup> Buch, E., S. A. Pedersen, and M. H. Ribergaard. (2004). Ecosystem variability in West Greenland waters. *Journal of the Northwest Atlantic Fishery Science* 34: 13–28. doi:10.2960/J.v34.m479. Available at [http://ocean.dmi.dk/staff/mhri/Docs/Buch\\_et\\_al\\_naf2004.pdf](http://ocean.dmi.dk/staff/mhri/Docs/Buch_et_al_naf2004.pdf)

<sup>2</sup> Dünweber, M. & Frederiksen, M. (2012a). Physical Environment. In *South Greenland: A Strategic Environmental Impact Assessment of hydrocarbon activities in the Greenland sector of the Labrador Sea and the southeast Davis Strait* (Morten Frederiksen, M., Boertmann, D., Ugarte, F. & Mosbech, A. eds) pp 24 – 33. Danish Centre for Environment and Energy, Aarhus University, Denmark. Available at <http://www2.dmu.dk/pub/sr23.pdf>

The West Greenland Current component loses its momentum along the West Greenland coast and current patterns tend to follow the bathymetry along the coast but around 64° N the current patterns are influenced by the steep continental slope and banks that deflect the coastal currents westwards, towards Canada, and generate instabilities in the current flow.

The inflow of polar water is strongest during spring and early summer (May–July) and the inflow of relatively warm Atlantic water to the West Greenland Current is strongest during autumn and winter, which explains why the area between 58° N and 67° N is usually ice free during the winter (Dünweber & Frederiksen, 2012). Years where the East Greenland and Irminger Current are strong will often be warm years (Buch, 2000<sup>3</sup>). During the past two decades there has been a tendency towards increased water temperatures and reduced ice cover during winters, which may be due in part to a change in the index of the North Atlantic Oscillation (NAO).

### Primary productivity

The waters off West Greenland are characterised by low phytoplankton species diversity although primary production is relatively high. The time of the onset of the spring phytoplankton bloom varies between years depending on many factors, not the least of which are the strengths of the East Greenland and Irminger Currents, but usually commences off SW Greenland in April (Dünweber & Frederiksen, 2012b<sup>4</sup>).

Zooplankton provides the principal pathway for energy transfer from phytoplankton to consumers at higher trophic levels, including lumpfish, seabirds such as the little auk (*Alle alle*) and whales. Although there is a variety of calanoid copepods, they are dominated (in biomass) by the larger calanoid species. These are particularly by the large species *Calanus finmarchicus*. This species is particularly important to many higher trophic levels in Arctic marine ecosystems as they rely on lipids that are accumulated in *Calanus* to establish fat reserves for the winter (Lee *et al.* 2006<sup>5</sup>, Falk-Petersen *et al.* 2009<sup>6</sup>).

Larger zooplankton (>1 cm) include both herbivores such as krill (*Euphausiidae*) and copepod predators such as hyperiid amphipods but larvae of fish and shrimp are also important components of the plankton community. Cod larvae, in particular, show increased survival with a positive trend in stock recruitment and adult stock biomass in periods of relatively warmer sea temperatures compared with cooler periods (Buch *et al.*, 2004).

### Benthos

Benthic flora are confined to a relatively narrow photic zone extending from the inter-tidal zone to approximately 40 m depth but, inevitably, benthic fauna are more widespread and are found at all depths and on or in all types of substrata (Boertmann *et al.*, 2009<sup>7</sup>). The benthic fauna is often species rich with more than 100 spp. m<sup>2</sup> often found in undisturbed soft sediments (Sejr *et al.*, 2010<sup>8</sup>; Blicher, 2010<sup>9</sup>). Three benthic species are fished commercially in Greenland waters. The scallop *Chlamys islandica* and the snow crab *Chionoecetes opilio* live directly on the sea floor, whereas the northern shrimp *Pandalus borealis* is found closely associated with but not necessarily on the bottom. All three tend to be distributed in water deeper than is occupied by spawning lumpfish.

<sup>3</sup> Buch, E. (2000). A monograph on the physical oceanography of the Greenland waters. Danish Meteorological Institute (DMI) Scientific Report 00-12, 405 pp.

<sup>4</sup> Dünweber, M. & Frederiksen, M. (2012b). Phytoplankton. In South Greenland: A Strategic Environmental Impact Assessment of hydrocarbon activities in the Greenland sector of the Labrador Sea and the southeast Davis Strait (Morten Frederiksen, M., Boertmann, D., Ugarte, F. & Mosbech, A. eds) pp 24 – 33. Danish Centre for Environment and Energy, Aarhus University, Denmark. Available at <http://www2.dmu.dk/pub/sr23.pdf>

<sup>5</sup> Lee, R.F., Hagen, W. & Kattner, G. (2006). Lipid storage in marine zooplankton. Marine Ecology Progress Series 307, 273–306.

<sup>6</sup> Falk-Petersen, S., Mayzaud, P., Kattner, G. & Sargent, J. 2009. Lipids and life strategy of Arctic *Calanus*. Marine Biology Research 5, 18–39.

<sup>7</sup> Boertmann, D., Mosbech, A., Schiedek, D. & Johansen, K. (Eds) (2009). The Eastern Baffin Bay: a preliminary strategic environmental impact assessment of hydrocarbon activities in the KANUMAS West area. Technical report no. 720; National Environmental Research Institute, Aarhus University, Denmark. <http://www.dmu.dk/Pub/FR720.pdf>

<sup>8</sup> Sejr, M., Włodarska-Kowalczyk, M., Legeżyńska, J. & Blicher, M. (2010). Macrobenthic species composition and diversity in the Godthaabsfjord system, SW Greenland. Polar Biology 33, 421–431.

<sup>9</sup> Blicher, M.E., (2010). Structure and Function of Marine Macrozoobenthos in Greenland – and link to environmental drivers. PhD Thesis, University of Copenhagen published by Greenland Institute of Natural Resources, Nuuk.



Relative to the length of the Greenland coast, there have been few benthic surveys, but one specific benthic habitat has been studied in detail: columns of ikaite tufa (Garcia, 2007<sup>10</sup>) found at shallow depths along a 2 km stretch in the Ikka Fjord (61° 11' N, 48° 02' W). The ecological importance of these features and the potential vulnerability to fishing have been fully recognised by Greenlandic scientists and government agencies and the area in which they are found has been closed to fishing since 2010 (G-gov, 2010<sup>11</sup>).

More generally, on soft substrata, the benthic fauna is dominated by polychaetes (Sejr *et al.* 2010) but also *Pennatulacea* (sea pens; Jørgensen & Tedndal, 2013), neither of which overlap with lumpfish spawning habitat. More generally, there is little detailed information due to difficulties in sampling (Blicher & Sejr, 2012<sup>12</sup>) but the Greenland Institute of Natural Resources (GINR) is gradually extending its survey areas to intertidal and littoral waters to increase knowledge in this area.

In common with comparable sub-Arctic environments (Garcia, 2007), it might be anticipated that some areas of West Greenland will support and be characterised by extensive and diverse sponge gardens (*ostur*). However, although such areas have been identified off East Greenland (albeit at depths greater than those at which lumpfish spawn), hitherto, such areas have not been found off West Greenland and, similarly, no beds of coralline red algae (*maerl*) *Lithothamnion* spp. have been identified within the lumpfish spawning areas (Steingrímsson, Fosså, Tendal, & Ragnarsson, 2007<sup>13</sup>), with more recent work (Jørgensbye & Halfar, 2017<sup>14</sup>; Schoenrock *et al.*, 2018<sup>15</sup>) suggesting that coralline red algae crusts are only present in waters 25 – 75 m deep, just outside the range of most lumpfish fisheries.

## Fish

All fish, both commercial and non-commercial species, must be retained, landed and recorded, i.e. there is a statutory total discard ban for fish in Greenlandic waters. The one exception to this rule is that Atlantic halibut should be returned to sea alive whenever possible.

A variety of mostly demersal commercial fish species are found throughout the assessment area. Among the more important are cod *Gadus morhua*, Atlantic halibut *Hippoglossus hippoglossus*, Greenland halibut *Reinhardtius hippoglossoides*, salmon *Salmo salar*, wolffishes *Anarhichas lupus* and *A. minor*, redfish *Sebastes* spp., capelin *Mallotus villosus* as well as the lumpfish but there are relatively few dominant species (Pedersen & Kannevorff, 1995<sup>16</sup>; Pedersen & Zeller, 2001<sup>17</sup>; ICES, 2019<sup>18</sup>). Over 270 species of fish have been identified from Greenland waters (GINR<sup>19</sup>) but the number characteristic of coastal waters is relatively small (Pedersen & Kannevorff, 1995; Pedersen & Zeller, 2001; Boertmann *et al.*, 2009) and only six are taken in measurable quantities in the lumpfish gillnets Table 20. The vast majority are relatively small species, unlikely to be retained in a lumpfish gillnet but such

<sup>10</sup> Garcia, E. G. (Ed.) (2007a). Bottom Trawling and Scallop Dredging in the Arctic: Impacts of fishing on non-target species, vulnerable habitats and cultural heritage. TemaNord 2006:529. Nordic Council of Ministers, Copenhagen. Available at <http://www.diva-portal.org/smash/get/diva2:702602/FULLTEXT01.pdf>

<sup>11</sup> G-gov (2010). Selvstyrets bekendtgørelse nr. 4 af 12. April 2010 om fredning af et område ved Ivittuut og Kangilinniguit. Grønlands Selvstyre, den 12. April 2010

<sup>12</sup> Blicher, M. & Sejr, M. (2012). Benthos. In South Greenland: A Strategic Environmental Impact Assessment of hydrocarbon activities in the Greenland sector of the Labrador Sea and the southeast Davis Strait (Frederiksen, M., Boertmann, D., Ugarte, F. & Mosbech, A. eds) pp 24 –33. Danish Centre for Environment and Energy, Aarhus University, Denmark. Available at <http://www2.dmu.dk/pub/sr23.pdf>

<sup>13</sup> Steingrímsson, S.Á., Fosså, J.H., Tendal, O.S. & Ragnarsson, S.Á. (2007). Vulnerable habitats in Arctic waters. In Garcia, E. G. (Ed.) 2007a. Bottom Trawling and Scallop Dredging in the Arctic: Impacts of fishing on non-target species, vulnerable habitats and cultural heritage. TemaNord 2006:529. Nordic Council of Ministers, Copenhagen. Available at <http://www.diva-portal.org/smash/get/diva2:702602/FULLTEXT01.pdf>

<sup>14</sup> Jørgensbye, H., & J. Halfar (2017). Overview of coralline red algal crusts and rhodolith beds (Corallinales, Rhodophyta) and their possible ecological importance in Greenland. *Polar Biol* (2017) 40:517–531 DOI 10.1007/s00300-016-1975-1

<sup>15</sup> Schoenrock, K., J. Vad, A. Muth, D. Pearce, B. Rea, E. Schofield & N. Kameno (2018). Biodiversity of Kelp Forests and Coralline Algae Habitats in Southwestern Greenland. *Diversity* 2018, 10, 117; doi:10.3390/d10040117

<sup>16</sup> Pedersen, S.A. & Kannevorff, P. (1995). Fish on the West Greenland shrimp grounds, 1988–1992. *ICES Journal of Marine Science* 52: 165–182.

<sup>17</sup> Pedersen, S.A., & Zeller, D. (2001). A mass balance model for the West Greenland marine ecosystem. In Fisheries Impacts on North Atlantic Ecosystems: Models and Analyses (Guenette, S., Christensen, V. & Pauly, D. eds). Fisheries Centre Research Reports, 9: 111-127. Available at <http://www.seaaroundus.org/report/impactmodels/Greenland.pdf>

<sup>18</sup> : ICES (2019). Cod (*Gadus morhua*) in NAFO Subarea 1, inshore (West Greenland cod). In Report of the ICES Advisory Committee, 2019. *ICES Advice* 2019, cod.21.1, <https://doi.org/10.17895/ices.advice.4732>

<sup>19</sup> See <http://www.natur.gl/index.php?id=863&L=3>

few as may be caught must also be retained and reported. The total quantities of non-target fish caught are trivial (<0.05%) relative to the lumpfish catch. This includes a small (<1 tonne) annual catch of Atlantic halibut which although not protected in Greenland, should be released if alive (most Atlantic halibut bycatch in lumpfish gillnets is dead). Everything is landed for commercial use (99.96%) or private use (0.01%) with the balance (0.03%) of non-target fish.

**Table 20 Catch composition of lumpfish-directed gill nets (2018)**

Species		Year		Avg. (of total catch)		Comment
Common name	Scientific name	2017	2018	tonnes	%	
Lumpfish	<i>Cyclopterus lumpus</i>	7,482.509	6,764.398	7,123.453	99.8294%	Target species
Wolffishes spp.	<i>Anarhichas</i> spp.	4.499	11.352	7.926	0.1111%	Mainly spotted with some Atlantic
Atlantic cod	<i>Gadus morhua</i>	0.988	5.119	3.053	0.0428%	
Atlantic halibut	<i>Hippoglossus hippoglossus</i>	0.840	0.823	0.832	0.0117%	
Greenland halibut	<i>Hippoglossoides reinhardtus</i>	0.176	0.431	0.304	0.0043%	
Spotted wolffish	<i>Anarhichas minor</i>	-	0.039	0.039	0.0005%	
Northern wolffish	<i>Anarhichas denticulatus</i>	-	0.036	0.036	0.0005%	
Atlantic wolffish	<i>Anarhichas lupus</i>	-	0.012	0.012	0.0002%	
Redfish spp.	<i>Sebastes</i> spp.	0.016	0.002	0.009	0.0001%	Mainly golden with some beaked
Queen crab	<i>Chionoecetes opilio</i>	-	0.003	0.003	0.0000%	
Greenland cod	<i>Gadus ogac</i>	0.002	-	0.001	0.0000%	
<b>Grand Total</b>		<b>7,489.0</b>	<b>6,782.2</b>	<b>7,135.6</b>	<b>100.00%</b>	

Source: GFLK

## Seabirds

As with fish, seabirds are a marine resource that is assessed and hunted for human consumption. The professional hunters (which include the professional fishermen) must be licensed and the collection of eggs and hunting of birds are subject to quota (daily bag limits), area and seasonal regulation and restrictions (HuntRegs, 2013<sup>20</sup>). Since 2002, seabirds taken as fishery bycatch cannot be offered for sale, but since 2004 they must be reported as fishery bycatch.

Seabirds are numerous in the assessment area and constitute an important link the marine ecosystem. Many species such as gannet (*Morus bassanus*) and guillemots or murre ( *Uria* spp.) are primarily fish consumers preying on pelagic species such as capelin and sandeels as well as polar cod, while other, smaller species such as little auk (*Alle alle*) prey on the larger planktonic organisms and a third group feed mainly on benthic organisms, e.g. the eider ducks (*Somateria* spp.). The general distribution of the more abundant species and whether they are spring–autumn migrants, summer, winter or permanent residents in Greenland and whether or not they breed in south-west Greenland has been summarised by Boertmann et al. (2007<sup>21</sup>, 2009).

<sup>20</sup> HuntRegs, 2013. Hunting dates and seasons. Piniarneq 2013; Department of Natural Resources, Nuuk.

<sup>21</sup> Boertmann, D., Clausen, D.S. & Frederiksen, M. 2007. Seabirds. In Garcia, E. G. (Ed.) 2007a. Bottom Trawling and Scallop Dredging in the Arctic: Impacts of fishing on non-target species, vulnerable habitats and cultural heritage. TemaNord 2006:529. Nordic Council of Ministers, Copenhagen. Available at <http://www.diva-portal.org/smash/get/diva2:702602/FULLTEXT01.pdf>

The most common sea bird species caught in gill nets (for all target species, e.g. (cod, halibut, lumpfish, seal) are common eider ducks (*Somateria mollissima*) (63%) and common guillemots (31%), with king eiders (*Somateria spectabilis*) consisting less than 5% (see **Table 21**). The long-tailed duck (*Clangula hyemalis*) was also detected in a recent survey (discussed further overleaf).

The seabird populations are monitored annually by GINR according to a predetermined schedule that forms part of their rolling five-year research plan. Not every bird colony is monitored (the country is too large: coastline <44,000 km; Vahl & Kleeman, 2015<sup>22</sup>), and individual species are not monitored every year, but the more important (indicator) species, such as common eider, are monitored more frequently than other species (GINR formal consultation meeting).

Bird bycatch data is not disaggregated by fishery, so it is important to try to understand the contribution of the lumpfish fishery to the overall gillnet bird mortality. As noted above the king eider (*S. spectabilis*) are less common (though still taken occasionally in lumpfish gill nets). Approximately 60% (see **Figure 9**) of the total recorded seabirds taken in gillnet fisheries are taken during the lumpfish season (March–June) and for the purposes of this assessment, it is assumed that all of these birds are taken in lumpfish nets (i.e. the worst-case interpretation of the data) although many, particularly guillemots, are taken in the (offshore) fisheries (F.R. Merkell; 2011; Lassen *et al*, 2015<sup>23</sup>).

**Table 21 Seabird bycatch by all gillnets e.g. cod, halibut, lumpfish, seal (2016)**

Location	2016					2017					2018				
	Common eider	Common guillemot	King eider	Other	Total	Common eider	Common guillemot	King eider	Other	Total	Common eider	Common guillemot	King eider	Other	Total
Disko	212	79	92	5	388	75	14	11	-	100	177	52	-		229
Midt Grønland	2,043	524	99	26	2,692	1,361	563	251	-	2,175	999	50	145		1,194
Nord Grønland	236	122	65	25	448	37	20	3	-	60		1			1
Syd Grønland	832	903	8	-	1,743	571	469	52	-	1,092	365	-	12		377
Øst Grønland	77	54		-	131	-	-	-	-	-		-			-
Outside region		30		-	30	-	-	-	-	-		-			-
<b>Total</b>	<b>3,400</b>	<b>1,712</b>	<b>264</b>	<b>56</b>	<b>5,432</b>	<b>2,044</b>	<b>1,066</b>	<b>317</b>	<b>-</b>	<b>3,427</b>	<b>1,541</b>	<b>103</b>	<b>157</b>	<b>-</b>	<b>1,801</b>

Source: Piniarneq database

Lassen *et al* (2015) show data from 2011 – 2013 that 8% of the total number of birds from gillnets are estimated as being taken in lumpfish nets. It cannot be overlooked, however, that the number of guillemots reported as lumpfish bycatch are almost certainly overestimated as Merkel (2011) found that these birds are rarely taken in this fishery but, by the same token, the number of eiders taken is possibly an under-estimate, not least due to the shortcomings in the annual reporting protocols (Merkel, 2011).

Birdlife International (Rory Crawford, pers. comm., 11 September 2019) have noted an apparent level of under-reporting of bird bycatch in the lumpfish fishery. They point to the results of Christensen *et al* (2019<sup>24</sup>) that reported the 16 common eider duck were observed to be caught during a time-limited observer project that covered five boats over nine trips and 182 nets in the Nuuk area over 12 April – 23 May 2019. Using lumpfish roe-related CPUE data, they extrapolated the figures to estimate that this would be the equivalent of around 2,186 common eider ducks in

<sup>22</sup> Vahl, B & Kleemann, N., (Eds). (2014). Greenland in Figures 2015. Statistics Greenland, Nuuk

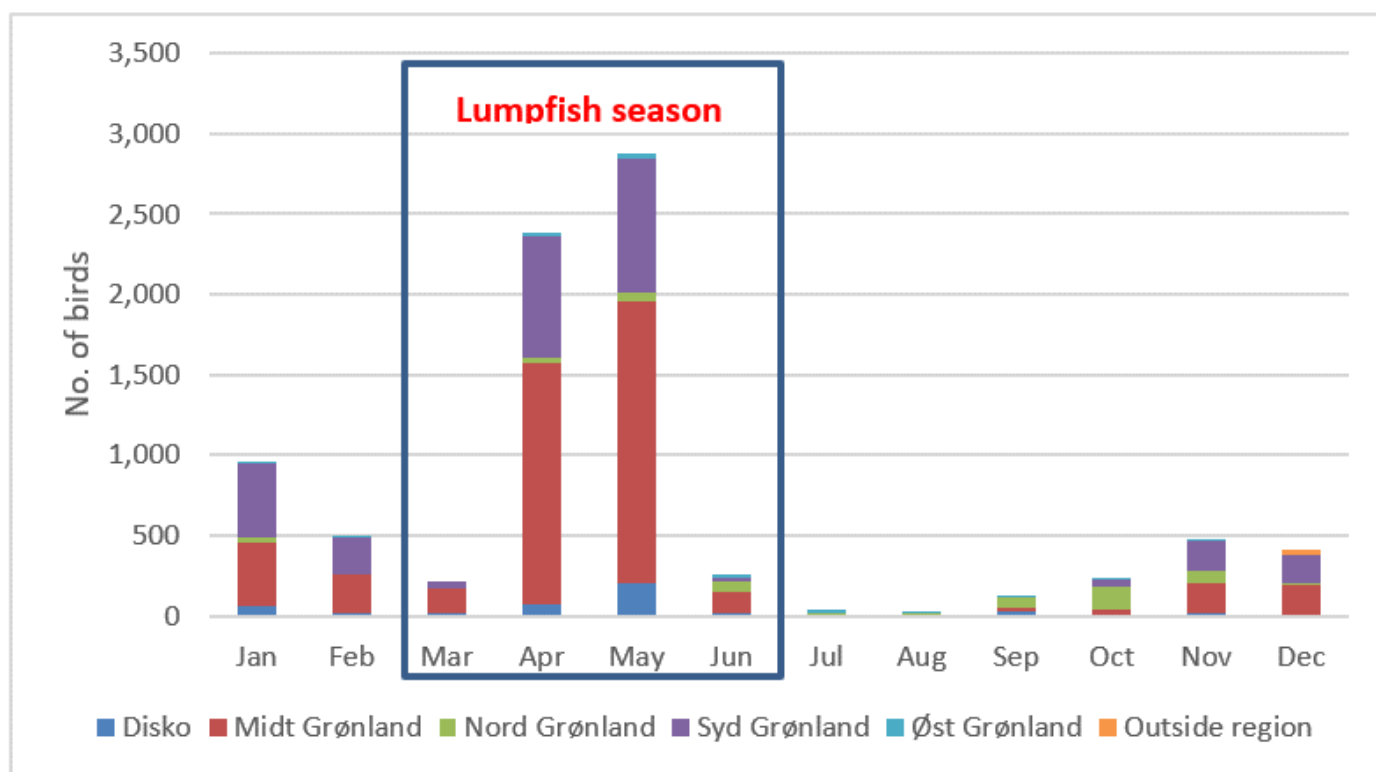
<sup>23</sup> Lassen, H., S. Lockwood, R. Cappell & G. M. Pedersen (2015). Full Assessment Report. Public Certification Report - Initial assessment of the Greenland lumpfish fishery. DNV. 313 pp.

<sup>24</sup> Christensen, H. T., F. Merkel, R. Hedeholm & lumpfish fishermen in Godthåbsfjorden, Nuuk (2019). Bycatch in the lumpfish (*Cyclopterus lumpus*) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute of Natural Resources, July 2019. 12 pp.

the Nuuk area (approx. 25% of total lumpfish fishing effort) over the full fishing season, appreciably less than the 88 common eiders reported by GFLK records in 2019. This demonstrates that the weakness of the current self-reporting system (mainly via the processors on landing of the roe at the factories), even considering the uncertainty associated with catch rates and the relatively low coverage of the fishery in the sampled area (~3%).

**Common eider duck:** In the 1980s and '90s it was clear that the common eider population in SW Greenland, and other Arctic areas, were suffering a serious decline relative to historic abundance estimates. Although the picture continues to vary across the Arctic, positive trends have been identified, *inter alia*, in SW Greenland where the common eider population is “now recovering with improved harvest management [comment – which includes fisheries management measures] as a likely contributing factor” (Ganter & Gaston, 2013<sup>25</sup>; GINR, 2018<sup>26</sup>). A survey of common eider undertaken by F. R. Merkel and reported to GINR shows that there has been a three to four- fold increase in eider abundance over the past 10–15 years. On the basis of the most recent of these annual surveys, Merkel estimates that the common eider population has increased from the depleted state of the 1990s to 800,000, “possibly even 1 million birds” (F.R. Merkel – reported via Lassen *et al*, 2015). Some of the improved management recognised by Ganter and Gaston (2013) has been compulsory (e.g. each boat’s season limited to a fixed number of fishing days: 47 fishing days agreed in 2014 and reduced to 44 days in 2018) set following total allowable catch calculation by GINR; increased powers for the enforcement agency to confiscate nets found to be fishing illegally (e.g. out of season; within closed areas; when quota has been taken) – while others include voluntary change in fishing practice, such as the move away from fjord areas where eiders tend to congregate and avoiding areas with mussels beds that also attract the eiders. Ministry of Fishing, Hunting and Agriculture (MFHA) and GFLK staff also advise lumpfish fishers not to start fishing until the main migration towards Canada has taken place.

**Figure 9: Bird bycatch (all species) by month for all gillnet fisheries (2016 – 2017)**



Source: LULI database. Note that Oct -Dec 2017 data are missing

<sup>25</sup> Ganter, B. & Gaston, A. 2014. The Arctic Biodiversity Assessment: Chap. 4 – Birds. CAFF, Akureyri, Iceland

<sup>26</sup> GINR (2018). Population status for seabird species potentially affected by by-catch in lumpfish fishery. 10 August 2018.

The number of common eider (*Somateria mollissima*) nests is an index of total abundance) at sites surveyed regularly by the Greenland Institute of Natural Resources (GINR) (F.R.Merkel, unpublished report to GINR). As mentioned above, one of the voluntary changes in fishing practice has been a move from fjords to coastal waters. Before 2010, lumpfish gillnets were set with one end at land and were limited to very shallow water. Under these conditions, gulls and similar surface-feeding seabirds were vulnerable to capture. At the same time, the lumpfish fishery was carried out in the fjords among some of the most intense breeding and roosting sites. When seabird–lumpfish fishery interactions were assessed by Merkel (2011<sup>27</sup>) he found that not only were a wide variety of birds affected but for some species more birds were probably taken than were reported and fewer individuals of other species. Merkel attributed this partly to the annual report-form procedures and partly to inaccurate fishery or species identification. It is also likely that birds legally taken for home consumption may not be reported.

Overall, Merkel (2011) concluded that (2003–2008) the lumpfish gillnet catch of eiders “is indeed of conservation concern”. In recent years, however, there has been a change in practice to set the nets further offshore in waters >5 m deep. The reasons for this are uncertain but they may include enhanced catch rates offshore in May, when the fishery is most intense, rather than within the confines of the fjords in March and April when more fishing used to occur.) Consequently, surface-feeding birds are no longer as vulnerable to capture but diving birds continue to be at risk. Merkel (formal consultation meeting, as reported in Lassen et al, 2015) believes that the decrease in the reported annual number of eiders killed since 2003– 2008 (i.e. c. 4,000 eiders 2011–13, cf. c. 6,000 eiders 2003–2008) is probably a function of these change in fishing practice, including the change in distribution from a fjordic to a more open-water fishery, and the prohibition on sale of seabird fishery bycatch. In addition, there has been a significant increase in the eider population over the past decade (Merkel, 2009; 2011; GINR 2018<sup>28</sup>). Nonetheless, the c. 4,000 eiders reported is considerably fewer than an annual bycatch of c. 21,500 eiders if it assumed that Merkel's (2011) estimate of 1.8 eiders per tonne of lumpfish caught (mean) 2011–2013. This figure would equate to almost 50% the total number of eiders taken by hunting and as bycatch. It is assumed, however, that this is an extreme case possibility, not least because it makes no allowance for changes in management and fishery practice that Merkel (formal consultation meeting) have contributed to an increased eider population. Even if these total figures (i.e. c. 24,000 eider by hunting and c.21,500 lumpfish fishery bycatch) are correct, they represent no more than c. 6% of the current population of 800,000+ eiders (F.R. Merkel – Lassen *et al*, 2015), a level of mortality that is currently not having an adverse effect on population growth and recovery.

The recent study by Christensen *et al* (2019) reported the 16 common eider duck were observed to be caught during a time-limited observer project that covered five boats over nine trips and 182 nets in the Nuuk area over 12 April – 23 May 2019. Using lumpfish roe related CPUE data, they extrapolated the futures to estimate that this would been the equivalent of around 2,186 common eider ducks in the Nuuk area (approx. 25% of total lumpfish fishing effort) over the full fishing season.

An impact assessment of the bycatch of eiders in the lumpfish fishery has not been undertaken to date, although sufficient data probably now exists to make this possible (F.R. Merkel, pers. comm., 12 September 2019). However, for the Greenland breeding population, it appears that the current growth capacity of the eider population can compensate for the negative impact of bycatch and the current levels of other mortality sources (e.g. hunting). Having said that, it should be emphasized that the potential negative impact of bycatch will also affect the Canadian breeding population of eiders, as these birds also winter in Southwest Greenland. In one area of Canada, an increase has been documented for the common eider population over the past two decades, but in most areas' population trends are unknown (GINR, 2018).

**King eider duck.** Approximately 15-20% of the eiders caught as bycatch in the lumpfish fishery are king eiders. These birds are all from the Canadian breeding population, for which we only have poor information about population trends. To a large degree, king eiders are distributed more offshore compared to common eiders, which is why they are less common as bycatch in the lumpfish gillnets. However, there is a small overlap in the coastal areas, where both eider species are at risk. Consequently, efforts made towards reducing the bycatch level of common eider will also benefit the king eider.

<sup>27</sup> Merkel, F.R. 2011. Gillnet bycatch of seabirds in Southwest Greenland, 2003–2008. Technical Report No. 85, Pinngortitaleriffik, Greenland Institute of Natural Resources

<sup>28</sup> GINR, 2018. Monitoring and population trend for common eider in West Greenland.



**Common guillemots.** Whilst the common guillemot (*U. aalge*) has high levels of mortality in coastal gill nets as a whole (e.g. not just the lumpfish fishery), it is noted that it is a relatively rare winter migrant limited to the southern coast of Greenland (Boertmann, 2007, 2009) and thus less accessible to the lumpfish gillnet fishery. Merkel (2011) found that the guillemots are more vulnerable to capture in the offshore winter (cod, halibut) and seal (F.R. Merkel – pers. comm.) gillnet fisheries than they are to the inshore spring lumpfish fishery. Christensen *et al* (2019) did not detect any common guillemots in their survey results, and it is not mentioned as a potential lumpfish gillnet species in GINR’s assessment of the ‘Population status for seabird species potentially affected by by-catch in lumpfish fishery (GINR, 2018). It is therefore not considered further in this assessment.

**Brünnich’s guillemot / Thick-billed murre.** Brünnich’s guillemot (*U. lomvia*) may historically have been reported as lumpfish bycatch but, in an intensive study of seabird bycatch in gillnet fisheries, Merkel (2011) showed that virtually no Brünnich’s guillemot (which comprise virtually all of the guillemot bycatch) are taken in this fishery. This was also subject to a condition in the 2015 assessment (Lassen *et al*, 2015) and was closed out in 2017 (Lassen & Chaudhury, 2017<sup>29</sup>; GINR, 2018) where it was demonstrated that the lumpfish fishery does not present a risk to this bird species (the reports of Brünnich’s guillemot/ at the full assessment on-site interviews in 2015 are found to be mis-reporting from hunting).

### Marine mammals

As with fish, marine mammals are a resource that is assessed and hunted for human consumption. The professional hunters must be licensed; all seals and cetaceans are subject to quota, area and seasonal regulation and restrictions (HuntRegs, 2013). Marine mammals taken as fishery bycatch must be reported and can be offered for sale.

Many of the large toothed and baleen whales are seen in the waters off West Greenland but they are rarely seen in the shallow inshore waters that form the lumpfish spawning ground. The same is also the case for the small toothed whales although dolphins are only seen in small numbers in the warmer offshore waters off southern Greenland, well away from the lumpfish spawning grounds. As the name implies, it is usual to find the harbour porpoise (*Phocoena phocoena*) in inshore waters, but this is not the case off West Greenland. Although they are found in the southern Davis Strait and have been tracked by GINR (<http://www.natur.gl/index.php?id=1212&L=3>), not only do they stay offshore beyond the spawning lumpfish distribution but they tend not to arrive until very late in the lumpfish spawning season (Lassen *et al*, 2015). Consequently, there have been no reported catches of porpoise in the lumpfish fishery, even though they are subject to commercial hunting (Table 22) and are a permitted fishery bycatch for sale.

As with the cetaceans, there are several seal species that frequent the waters around Greenland at some stage of their life history but only two are found in the inshore waters of the lumpfish spawning grounds during the spawning season, the harp seal (*Pagophilus groenlandicus*) and ringed sea (*Phoca hispida*). Both of these species are reported in small numbers as bycatch in gillnet fisheries (Table 22). The hooded seal and harbour seals are considered as ETPs (see next section).

**Table 22: Cetacean and pinniped status and mortality (2016)**

Group	Species	Red List Status		2016		2017	2018	2019
		IUCN	GL	Total killed	From gillnets (%)	Lumpfish gillnets only		
<b>Cetacean</b>	Harbour porpoise	LC	LC	2,191	14 (0.6%)	0	0	0
<b>Pinniped</b>	Harp seals (adults)	LC	LC	44,897	87 (0.2%)	12	1	0
	Harp seals (pups)				246 (0.5%)			
	Ringed seal	LC	LC	38,858	39 (0.1%)	5	62	47
	Hooded seal	VU	VU	1,443	2 (0.1%)	0	0	0
	Harbour seal	LC	CE	4	0 (0.0%)	0	0	0

Source: 2016 Total killed; Statbank Greenland; from gillnets Piniarneq; 2017 – 2019 GFLK

<sup>29</sup> Lassen, H., & S. Chaudhury (2017). Surveillance No. 3 - Report for the Greenland Lumpfish fishery. DNV Report No.: 2018-017, Rev. 2

## Endangered, Protect or Threatened (ETP)

Under the auspices of Denmark (the signatory sovereign state), Greenland has observer status and is an active participant and supporter of a wide range of international organisations, commissions and conventions that aim to monitor and safeguard the long-term wellbeing of ETP species; e.g. CITES, ICES, IUCN, NAFO, NAMMCO, OSPAR. Under most North Atlantic jurisdictions, and in compliance with various convention requirements, the majority of seabirds, marine mammals and even some of the large elasmobranchs are scheduled under either national or international legislation as endangered, threatened or protected species. Many of these species are to be found more or less regularly in Greenlandic waters but they do not receive the same level of protection as elsewhere. This is in recognition that all living marine resources have been vital to the survival of indigenous Greenlandic populations and continue to be central to both their diet and culture. Greenland has recognised dispensations to continue hunting many of these species, as well as dispensations to continue trading in some pinniped products.

Four species are *initially* considered as ETPs in this fishery:

1. Atlantic halibut (*Hippoglossus hippoglossus*)
2. Hooded seal (*Cystophora cristata*)
3. Harbour seal (*Phoca vitulina*)
4. Long-tailed duck (*Clangula hyemalis*)

**Atlantic halibut:** The Atlantic halibut stock at West Greenland is not subject to annual stock assessment but it is assumed to be in a depleted state, although North Atlantic stocks currently may be recovering<sup>30</sup> and a re-evaluation of stock status across the North Atlantic is desirable. Consequently, there are specific conservation measures in place to optimise stock recovery. In addition, the very marginal overlap in the distribution of Atlantic halibut with spawning lumpfish ensures that there is minimal interaction between the halibut and the lumpfish gillnet fishery, with concomitant small catches (< 1 tonne in 2016), the small annual catch of this species from this fishery are highly unlikely to have unacceptable effects on this ETP species. For this reason, it is no longer considered in this assessment.

**Hooded seal:** the distribution and numbers (from 2013 for the West Atlantic and 2005 for East Atlantic) of hooded seals is shown in **Figure 10**. In 1918, the last great catch of more than 20,000 hooded seals was landed and, since then, catches have been relatively modest, probably because the population has been kept at a low level. In the early 1980s, various management measures were put into place that reduced the commercial catch. Since 1993, there has been a ban in Canada on the commercial use of skin from hooded seals and Canadian catches in the last decade have been modest, i.e. a few hundred. The Greenland catch of hooded seals has in recent years been between 4,000 and 6,000, with 1,443 reported in 2016. The total catch is thus about 1% of the stock, and with this relatively modest catch, one must assume that this population of hooded seal will increase in numbers.

Since 2016, when four hooded seals were reported to have been caught in all gillnets, no further captures have been reported. For this reason, it is no longer considered in this assessment.

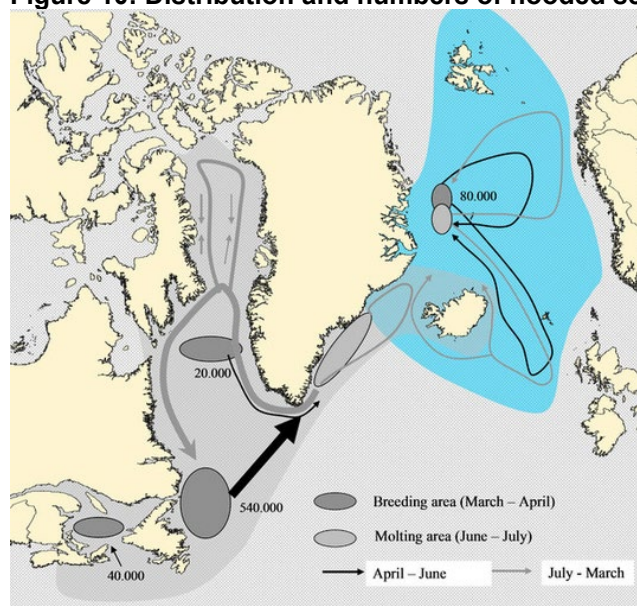
**Harbour seal:** the harbour seal is a temperate-water species that has never been very abundant in Greenland and is currently considered as critically endangered by the Greenland Red List<sup>31</sup>. There were c. 3,000 harbour seals in Greenland in the 1950s. Catches from commercial hunting declined from the 1950s and the seals also disappeared from most of the known breeding locations. The GINR know of five locations where small groups of seals (5-40 individuals) regularly gather (**see Figure 11**) and it is assumed that more small units exist and as yet undiscovered. The now greatly reduced population is, however, not likely to number more than a few hundred seals. Consequently, since 1 December 2010 the harbour seal in Greenland has been completely protected against hunting. Like any other species of seal, the harbour seal is vulnerable to capture in gillnets but the harbour seal does not arrive to pup and moult (along southern shores) in Greenland until late May or early June, by which time the lumpfish fishery in the area has finished.

There have been no reported catches of harbour seals in lumpfish gillnets (GINR, pers. comm.). For this reason, it is no longer considered in this assessment.

<sup>30</sup> Trzcinski, K., and D. Bowen (2016). The recovery of Atlantic halibut: a large, long-lived, and exploited marine predator. ICES Journal of Marine Science (2016), 73(4), 1104–1114. doi:10.1093/icesjms/fsv266

<sup>31</sup> See <http://www.natur.gl/en/birds-and-mammals/marine-mammals/harbour-seal/>

**Figure 10: Distribution and numbers of hooded seals**



Source: <http://www.natur.gl/en/birds-and-mammals/marine-mammals/hooded-seal/>

**Figure 11 Three core breeding & moulting areas for harbour seals in Western Greenland**



Source: Aqqalu Rosing-Asvid, GINR (pers. Comm., 13 Sept. 2019)



**Long-tailed duck (*Clangula hyemalis*):** The winter population of long-tailed ducks in Southwest Greenland was significantly smaller in 2017 (41,572 birds; 95% CI: 31,396 – 55,241) compared to 1999 (94,399 birds; 95% CI: 66,960 – 133,087). However, the overall distribution of the birds was the same, with a continuous occurrence south of 65°N in the near-shore coastal waters and outermost regions of the fjords (Merkel et al, 2019<sup>32</sup>). North of 65°N, long-tailed ducks gradually became less frequent (see Figure 12). The large decline in abundance of long-tailed ducks in the coastal survey area from 1999 to 2017 probably represents a real decline in the size of the winter population. However, the origins of the wintering birds in Southwest Greenland are to some extent unknown. Ringing recoveries and tracking studies demonstrate that parts of the breeding populations in Greenland and Iceland are contributing (Mosbech et al. 2011<sup>33</sup>). Both of these breeding populations are rather small and probably can explain only minor abundance changes in the wintering area. At this point, the contribution from the larger breeding population in Canada is unclear, but here the breeding numbers seem to be declining (Merkel et al, 2019<sup>34</sup>).

A recent study by Christensen *et al* (2019) reported two long-tailed duck were observed to be caught during a time-limited observer project that covered five boats over nine trips and 182 nets in the Nuuk area over 12 April – 23 May 2019. The Greenland and Iceland breeding populations are included in Column 1, Table 1 of the African-Eurasian Migratory Waterbird Agreement (AEWA), and is thus considered as endangered, threatened or protected (ETP) species. Whilst considered as 'Least concern in the current (2018) Greenland Red List, the listing concludes that "*The species is classified as 'vulnerable' (VU) on the International Red List (IUCN), due to declining stocks in both North America and Europe. Compared with the result mentioned above of a census of the winter stock in West Greenland, this raises some concern and the stock in Greenland should therefore be monitored*". Given the above, we still consider the long-tailed duck to be an ETP.

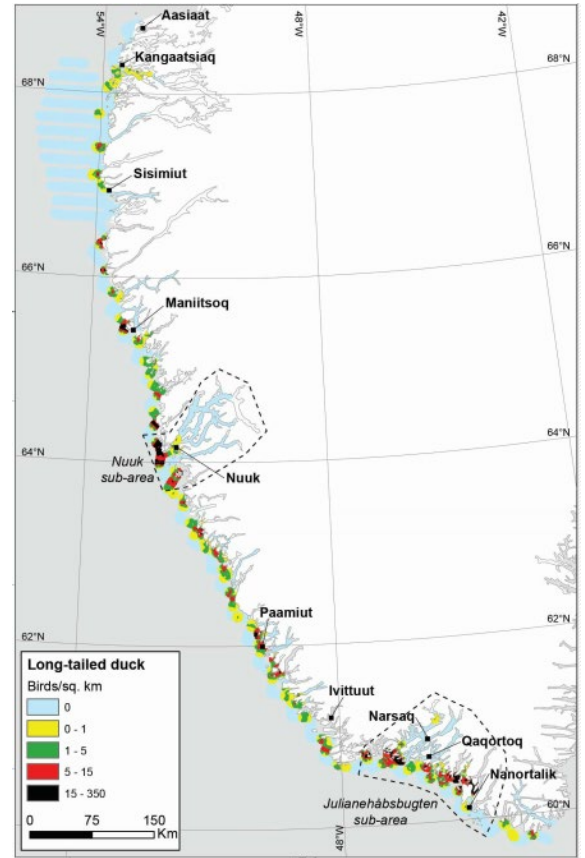
<sup>32</sup> Merkel, Flemming & Johansen, Kasper & Nielsen, Rasmus & Petersen, Ib & Sterup, Jacob & Mosbech, Anders (2019). Wintering seabirds in south-west Greenland, 2017. Polar Research. 38. 10.33265/polar.v38.3462.

<sup>33</sup> Mosbech A., Johansen K., Bjerrum M. & Sonne C. 2011. Satellite tracking of long-tailed ducks from Myggbukta. In D. Boertmann & A. Mosbech (eds.): The western Greenland Sea, a strategic environmental impact assessment of hydrocarbon activities. Pp. 98-99: Scientific Report No. 22 from DCE - Danish Centre for Environment and Energy, Aarhus University.

<sup>34</sup> Merkel, Flemming & Johansen, Kasper & Nielsen, Rasmus & Petersen, Ib & Sterup, Jacob & Mosbech, Anders (2019). Wintering seabirds in south-west Greenland, 2017. Polar Research. 38. 10.33265/polar.v38.3462.

**Figure 12 Distribution of long-tailed duck in an aerial winter survey in 2017**

**Source:** Merkel, Flemming & Johansen, Kasper & Nielsen, Rasmus & Petersen, Ib & Sterup, Jacob & Mosbech, Anders (2019). Wintering seabirds in south-west Greenland, 2017. Polar Research. 38. 10.33265/polar.v38.3462.



## Habitats

Gillnets operated in shallow coastal waters have an extremely low environmental footprint (Huse *et al.*, 2002<sup>35</sup>), particularly so in this case as stones are used in preference to fluked anchors, which are more likely to become fast and cause seabed disturbance. The nets are fished as a vertical panel and, in general, it is only the footrope that will come into contact with the seabed. Adverse environmental effects of gillnets are possible if the gear drifts under the influence of strong currents but is most likely to occur during hauling. This can be as a result of abrasion as the gear is dragged across turf communities, by meshes closing around higher profile biota and nipping them off or simply getting hooked onto fragile upright organisms and breaking them. Generally speaking, the most vulnerable species, e.g. seapens (*Pennatulacea*) on soft sediments and coral species in deeper water do not occur in the shallow inshore habitats occupied by spawning lumpfish. Even where such adverse effects occur, they do not necessarily happen with every haul and where they do occur, it is in the nature of the fishery that they will be highly localised, i.e. over a scale of 10s of metres rather than widespread.

Some lumpfish gillnets are left in the water after the 44-day season ends, either deliberately abandoned or for some reason not retrieved. These are usually recovered by GFLK, usually containing lumpfish, cod, wolffish and on one occasion, a dead ringed seal (GFLK, pers. comm., 12 Sept. 2019).

One other potential impact is the discard of female lumpfish carcasses after the roe has been removed. Unlike in Iceland where the roe is extracted on land, in Western Greenland the fishers land the fish into the boats and move into a more sheltered areas in the middle of the fjord to remove the roe and discard the remained of the fish. SFG have estimated that in 2019 around 2,925 mt lumpfish carcasses were discarded against 1,095 mt roe landed (SFG, pers. comm., 12 sept 2019).

## Scoring Elements

This new assessment is under FCR Version 2 which treats non-target species bycatch in a different way. Based on preliminary information we have allocated bycatch species against the following components.

**Table 23 Scoring elements**

Component	Scoring elements	Designation	Data-deficient
P1	Lump sucker ( <i>Cyclopterus lumpus</i> )	99.83% of catch volume	No
Primary	Greenland halibut ( <i>Hippoglossoides reinhardtus</i> )	Minor (<0.01% of catch)	No
	Atlantic cod ( <i>Gadus morhua</i> )	Minor (<0.01% of catch)	No
Secondary	Wolffishes spp. ( <i>Anarhichas</i> spp)	Minor (<0.01% of catch)	No
	Atlantic halibut ( <i>Hippoglossus hippoglossus</i> )	Minor (<0.01% of catch)	No
	Common eider duck ( <i>Somateria mollissima</i> )	Out of scope (Main)	No
	King eider duck ( <i>Somateria spectabilis</i> )	Out of scope (Main)	No
	Harp seals ( <i>Pagophilus groenlandicus</i> )	Out of scope (Main)	No

<sup>35</sup> Huse I., Aanonsen, S., Ellingsen, H., Engås, A., Furevik, D., Graham, N., Isaksen, B., Jørgensen, T., Løkkeborg, S., Nøttestad, L. & Soldal, A.V. (2002). A desk-study of diverse methods of fishing when considered in perspective of responsible fishing, and the effect on the ecosystem caused by fishing activity. IMR: Bergen, Norway.



	Ringed seals ( <i>Pusa hispida</i> )	Out of scope (Main)	No
	Harbour porpoise ( <i>Phocoena phocoena</i> )	Out of scope (Main)	No
ETP	Long-tailed duck ( <i>Clangula hyemalis</i> )	IUCN VU (Global) AEWA T1C1	No

## 7.4.2 Principle 2 Performance Indicator scores and rationales

### P I 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Main primary species stock status			
	Guide post	<p>Main primary species are <b>likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are <b>expected</b> to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are <b>highly likely</b> to be above the PRI.</p> <p>OR</p> <p>If the species is below the PRI, there is either <b>evidence of recovery</b> or a demonstrably effective strategy in place <b>between all MSC UoAs which categorise this species as main</b>, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main primary species are above the PRI <b>and are</b> fluctuating around a level consistent with MSY.</p>
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

There are no main primary species, so this **meets SG 100**

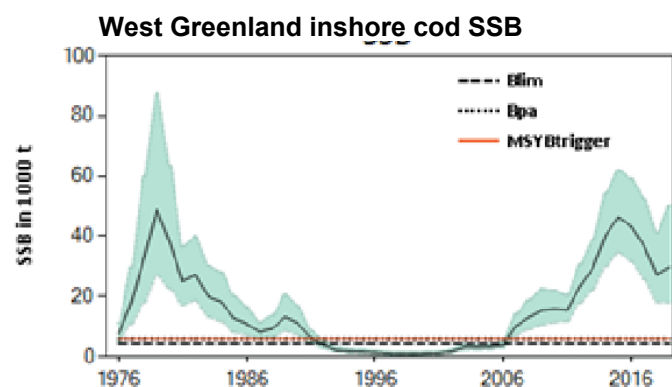
<b>b</b>	Minor primary species stock status			
	Guide post	<p>Minor primary species are highly likely to be above the PRI.</p> <p>OR</p> <p>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.</p>		
	Met?			<b>Yes</b>
Rationale				

There are two minor secondary species, both with < 0.01% of the total catch volume: **Greenland halibut** (*Hippoglossoides reinhardtus*) and **Atlantic cod** (*Gadus morhua*).

The **Greenland halibut** (*Hippoglossoides reinhardtus*) represents less than 0.01% of the total catch volume and less than a tonne per annum. Greenland halibut in the NAFO 1A is mainly targeted with bottom trawls, longlines and gillnets. These gears select adult fish with large body size and do not retain recruits or small sized fish. The stocks are believed to recruit from the Subarea 0+ 1 offshore spawning stock (in the Davis Strait) and there is little migration

between each of the separate inshore populations and offshore stocks in SA 0 and 1. (NAFO, 2018). The combined Div. 0A-South + Divs. 1CD biomass index remains above  $B_{lim}$ . The index was relatively stable until 2014 then increased between 2014 and 2016. The decline observed in 2017 is a result of a decline in the 0A-South survey biomass. Recruitment has been increasing in recent years, and in 2017 was one of the highest in the time series (NAFO, 2018b). The NAFO Scientific Council advises that there is a low risk of Greenland halibut in Subarea 0 + 1A (offshore) and 1B-F being below  $B_{lim}$  if the TAC for 2019 and 2020 does not exceed 36,370 t. Given the commercial importance of this stock, and the consequential focus of science-based management, it is highly likely (e.g.  $\Rightarrow 80\%$ ) that this stock is highly likely to be above PRI and **meets SG 100**.

**Atlantic cod (*Gadus morhua*):** The spawning-stock biomass (SSB) of West Greenland inshore cod in NAFO subarea 1 is above  $MSY B_{trigger}$  and has steeply declined since 2015.



Fishing mortality ( $F$ ) has been stable in recent years, well above  $F_{MSY}$ . Recent recruitment has gradually decreased from a decade of high values and is currently close to historically low levels. ICES assesses the spawning stock size (29,776 t) is well above  $MSY B_{trigger}$  (5,983 t),  $B_{pa}$  (5,983 t), and  $B_{lim}$  (4,346 t). Despite the recent low recruitment levels, given the current SSB level (nearly 7 x  $B_{lim}$ ) this species is highly likely to be above biologically based limits and **meets SG 100**.

## References

- NAFO (2018a). Greenland halibut in Division 1A inshore. Advice June 2018 for 2019-2020. SC 01 – 14 June 2018. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL1Ainshore.pdf>
- NAFO (2018b). Greenland halibut in SA 0 + Div. 1A Offshore and Div. 1B-1F Advice June 2018 for 2019 and 2020. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL01aoff.pdf>
- ICES (2019). Cod (*Gadus morhua*) in NAFO Subarea 1, inshore (West Greenland cod). ICES Advice on fishing opportunities, catch and effort. Greenland Seas and Icelandic Waters ecoregions. Published 13 June 2019.

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	$\geq 80$
Information gap indicator	Information sufficient to score PI

## Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	

## PI 2.1.2 – Primary species management strategy

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are <b>measures</b> in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI.	There is a <b>partial strategy</b> in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI.	There is a <b>strategy</b> in place for the UoA for managing main and minor primary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

As there are no primary main species caught in this fishery, **SG 60 and SG 80 are met**.

This fishery targets female lumpfish exclusively for their roe. Only the roe is landed, although all other bycatch must be landed (with the exception of live Atlantic halibut which must be released) and accounted for. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. This, combined with a large mesh-size (260 mm), represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise non-target bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict the bycatch to a minimum possible, **again meeting SG 80**.

However, there are no specific mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts and thus **does not meet SG 100**.

Management strategy evaluation				
b	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

As stated in 2.1.2(a) above, there is a partial strategy to maintain or to not hinder rebuilding of primary species in this fishery. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus meeting **SG 60**.

Objective confidence is provided in that total bycatch levels have remained <0.5% of the total catch over 2017 – 2019, with primary minor species averaging <0.02% in total over the same period, thus meeting **SG 80**.

Given the level of empirical data supporting primary species bycatch levels in this specific fishery, there is a high confidence that this partial strategy will work thus meeting **SG 100**.

Management strategy implementation				
<b>C</b>	Guide post		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully</b> and is <b>achieving its overall objective as set out in scoring issue (a)</b> .
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that the fishery is yielding >99.5% target species e.g. female spawning lumpfish, thus **meeting SG 80**.

There is clear evidence that the partial strategy is maintaining or not hindering the rebuilding of primary species (Atlantic cod and Greenland halibut) in that their total bycatch has averaged <0.02% in total over the 2017 - 2019, thus **meeting SG 100**.

Shark finning				
<b>d</b>	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

#### Rationale

There is no history of shark finning in Greenlandic fisheries and no market or marketing for shark fins has ever been developed. Shark finning is prohibited by NAFO Contracting Parties (Art. 12, NAFO, 2019). The Greenland shark is not found in these inshore, coastal fisheries. **This is therefore not applicable.**

Review of alternative measures				
<b>e</b>	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

#### Rationale

There are no main primary species.

Given that the catch of primary minor species (Greenland halibut & Atlantic cod) are so low (<0.01% each), no alternative measures to reduce primary species bycatch are warranted, and therefore **not applicable**.



## References

- NAFO (2018a). Greenland halibut in Division 1A inshore. Advice June 2018 for 2019-2020. SC 01 – 14 June 2018. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL1Ainshore.pdf>
- NAFO (2018b). Greenland halibut in SA 0 + Div. 1A Offshore and Div. 1B-1F Advice June 2018 for 2019 and 2020. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL01aoff.pdf>
- NAFO (2019). Conservation and Enforcement Measures, 2019. Serial No. N6901 NAFO/COM Doc. 19-01. <https://www.nafo.int/Portals/0/PDFs/COM/2019/comdoc19-01.pdf>

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	95
Condition number (if relevant)	

## PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information adequacy for assessment of impact on main primary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b> <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is <b>adequate to assess</b> the impact of the UoA on the main primary species with respect to status.  <b>OR</b> <b>If RBF is used to score PI 2.1.1 for the UoA:</b> Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main primary species with respect to status.
	Met?	Yes	Yes	Yes
Rationale				

There are no primary main species caught in this fishery. This therefore scores 100 by default.

<b>b</b>	Information adequacy for assessment of impact on minor primary species			
	Guide post	Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.		
	Met?			<b>Yes</b>
Rationale				

All fish, both commercial and non-commercial species, must be retained, landed, recorded and reported to GFLK; i.e. there is a statutory total discard ban for fish in Greenlandic waters.

Given that this catch reporting system for finfish is well-established and there are no incentives for this fishery to mis- or under-report the minimal bycatch of non-target, primary species, this **meets SG 100**.

<b>c</b>	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> primary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> primary species and evaluate with a <b>high degree of certainty</b> whether the strategy is achieving its objective.

	Met?	Yes	Yes	No
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#### Rationale

All fish, both commercial and non-commercial species, must be retained, landed and recorded, i.e. there is a statutory total discard ban for fish in Greenlandic waters. Landing records are highly accurate, and the volume of Greenland halibut being caught and landed is very low. This is an essentially inshore fishery with a high degree of scrutiny, including from other fishers. There is no incentive to discard fish, esp. in this highly selective fishery (non-target bycatch is <0.02% of total catch weight).

As there are no primary main species caught in this fishery, **SG 60 and SG 80 are met.**

Whilst there is a partial strategy to manage both main and minor primary species, there is not a full strategy, and therefore this does **not meet SG 100.**

#### References

- NAFO (2018a). Greenland halibut in Division 1A inshore. Advice June 2018 for 2019-2020. SC 01 – 14 June 2018. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL1Ainshore.pdf>
- NAFO (2018b). Greenland halibut in SA 0 + Div. 1A Offshore and Div. 1B-1F Advice June 2018 for 2019 and 2020. <https://www.nafo.int/Portals/0/PDFs/Advice/2018/GHL01aoff.pdf>

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	95
Condition number (if relevant)	

## PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are <b>likely</b> to be above biologically based limits.  OR  If below biologically based limits, there are <b>measures</b> in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are <b>highly likely</b> to be above biologically based limits.  OR  If below biologically based limits, there is either <b>evidence of recovery</b> or a <b>demonstrably effective partial strategy</b> in place such that the UoA does not hinder recovery and rebuilding. AND Where catches of a main secondary species outside of biological limits are <b>considerable</b> , there is either <b>evidence of recovery</b> or a, <b>demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species</b> , to ensure that they collectively do not hinder recovery and rebuilding.	There is a <b>high degree of certainty</b> that main secondary species are above biologically based limits.
		Met?	Yes	Yes
	Rationale			

There are two sets of secondary species in this fishery as follows (see **Table 23**):

- In scope species:**

- Wolffishes spp. (*Anarhichas* spp) Minor (<0.01% of catch)
- Atlantic halibut (*Hippoglossus hippoglossus*) Minor (<0.01% of catch)

- Out of scope species:**

- Common eider duck (*Somateria mollissima*) Main (Birds)
- King eider duck (*Somateria spectabilis*) Main (Birds)
- Harp seals (*Pagophilus groenlandicus*) Main (Marine mammals)
- Ringed seals (*Pusa hispida*) Main (Marine mammals)
- Harbour porpoise (*Phocoena phocoena*) Main (Marine mammals)

The five *main* (out of scope) species are examined overleaf as individual scoring elements. The *minor* (in scope) species elements are examined separately in 2.2.1 (b).

## Out of scope species (main)

There are five 'out of scope' species, including two sea birds (common eider duck *Somateria mollissima* and king eider duck *S. spectabilis*) and three marine mammals (harp seals *Pagophilus groenlandicus*, ringed seals *Pusa hispida* and the harbour porpoise *Phocoena phocoena*). All are considered as main secondary species.

**Common eider duck *Somateria mollissima*:** The lumpfish fishery overlaps with two main populations of common eider duck, the Canadian and Greenland breeding populations, with the latter having sub-populations in NW and SW Greenland (these being treated as a single scoring element here). The NW Greenland breeding sub-population, which is the largest in Western Greenland, has shown a clear increase since 2001, with the trends / status of the SW Greenland sub-population less certain (F. Merkel, pers. comm., 12 Sept 2019). Overall the Greenland breeding population has benefited from the reduction in hunting, the major human threat, since 2001, with monitored colonies quadrupling in size since then. Given the continued increase in population, despite over 7,500 common eiders being killed through hunting in 2018, it is high likely ( $\Rightarrow 70\%$ ) that common eider ducks are above biologically based limits, thus **meeting both SG 60 and SG 80**. However, due to the continued high (albeit reduced) hunting pressure, this cannot be said with a high degree of certainty, and thus **fails to meet SG 100**.

There is less information on the Canadian migrant population (the Hudson Bay Eider and Northern Common Eider sub-populations), but is probably more static, with sub-populations in some areas falling and others rising (Sea Duck Joint Venture, 2017; F. Merkel, pers. comm., 12 Sept. 2019). Population modelling in 2009 indicated that harvest in Atlantic Canada was sustainable, but a number of conditions could lead to slow declines (Gilliland *et al*, 2009). Based on localised studies reported in Sea Duck Joint, it is high likely ( $\Rightarrow 70\%$ ) that common eider ducks are above biologically-based limits, thus **meeting both SG 60 and SG 80**. However, this cannot be said with a high degree of certainty, and thus **fails to meet SG 100**.

**King eider duck *S. spectabilis*:** The global population is estimated to number c.800,000-900,000 individuals. The global population is estimated to number c.800,000-900,000 individuals. Around 264 king eider ducks were killed in 2016 by all Greenlandic gillnet fisheries (Birdland International, 2018). The king eider duck is considered as of 'Least Concern' in the Greenland 2018 Red List, is not included in the AEWA Table 1, Column A and is considered of 'Least concern' by the IUCN Red List. Based on that the species has undergone a small, statistically insignificant increase, over the last 40 years in North America, it is high likely ( $\Rightarrow 70\%$ ) that king eider ducks are above biologically based limits, thus **meeting both SG 60 and SG 80**. However, this cannot be said with a high degree of certainty, and thus **fails to meet SG 100**.

**Harp seals *Pagophilus groenlandicus*:** Harp seal populations have grown substantially since the 1980s as a result of reduced directed hunting and the most recent surveys, however, indicate that the strong increase has stopped, so that the population in the West Atlantic and in the White Sea are stabilizing around their present level, whereas the population in the Greenland Sea is still increasing (GINR, 2019<sup>36</sup>), although has recently tailed off, possibly due to declining birth rates (see Figure 13). The relative abundance of the harp seal is the subject of a specialist ICES Working Group (WGHARP) and the population in the Greenland sea was estimated using a population dynamics model that incorporates historical catch records, historical fecundity rates, and age specific proportions of mature females. Based on this modelling approach, which is supported by regular surveys and validation, as well as the recovery of the population since the 1970's, there is a high degree of certainty that harp seals are above biologically based limits thus **meeting SG 60, SG 80 and SG 100**.

<sup>36</sup> <http://www.natur.gl/en/birds-and-mammals/marine-mammals/harp-seal/> accessed 15 July 2019

## Harp seal Greenland population

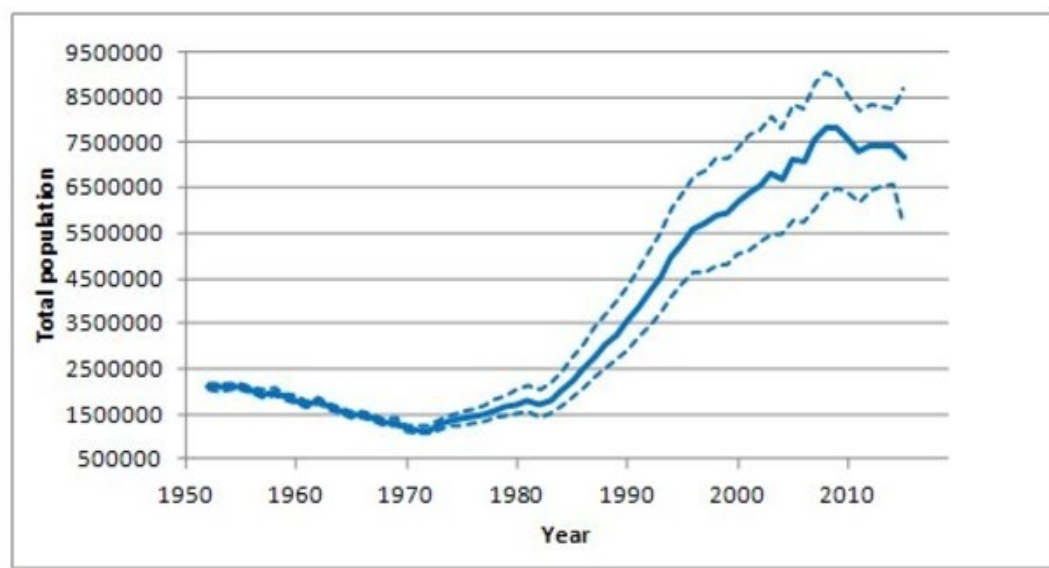


Figure 13 Harp Seal populations

**Ringed seals *Pusa hispida*:** Ringed seals have a circumpolar distribution and are found in almost all northern areas where winter ice regularly forms. Ringed seals are divided into five sub-species of which the Arctic ringed seals (*Pusa hispida hispida*) are by far the largest group. It is uncertain how many ringed seals there are in total, but an educated guess of 6-7 million has been put forward (GINR, 2019<sup>37</sup>). Of these, approx. 1 million are of the subspecies *Pusa hispida ochotensis*, while the other three southern subspecies together only constitute in the region of 10,000 individuals. The density of Arctic ringed seals has not been estimated in its entire distribution area. The estimate of about 5 million Arctic ringed seals is thus partly based on extrapolation. The even distribution of ringed seals throughout the Arctic makes them much more robust against overexploitation compared with the seals that gather and breed concentrated in specific areas. Ringed seals not included in the Greenland Red List and are listed as 'Least concern' in the IUCN Red List. Based on available evidence e.g. Teilmann & Kepel (2014) that indicates that exploitation in Greenland is mainly directed towards the youngest age classes, whereas the adult, breeding animals are only caught in small numbers with the methods and hunting practices used to date, there is a high degree of certainty that ringed seals are above biologically based limits thus **meeting SG 60, SG 80 and SG 100**.

**Harbour porpoise *Phocoena phocoena*:** The global abundance of the harbour porpoise is at least about 700,000 individuals and IUCN classify it as Least Concern (Hamond et al, 2008). It is currently harvested in Greenland, with 2,191 killed in 2016, but with only 14 from all gillnet fisheries. The last survey of harbour porpoises in Greenland was conducted in 2015 in both West and East Greenlandic waters where abundance estimates from that survey were 83,321 harbour porpoises (cv= 0.34; 95% CI=43,377-160,047) in West Greenland and 1,642 (cv= 1.00; 95% CI= 318-8,464) in East Greenland (NAMMCO, 2016). Given the increasing population from the previous 2007 survey and reduced hunting mortality, there is a high degree of certainty that ringed seals are above biologically based limits thus **meeting SG 60, SG 80 and SG 100**.

### Minor secondary species stock status

**b**

Guide  
post

Minor secondary species are highly likely to be above biologically based limits.

OR

<sup>37</sup> <http://www.natur.gl/en/birds-and-mammals/marine-mammals/ringed-seal/>

		If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species	
	Met?		No
Rationale			

#### In scope species

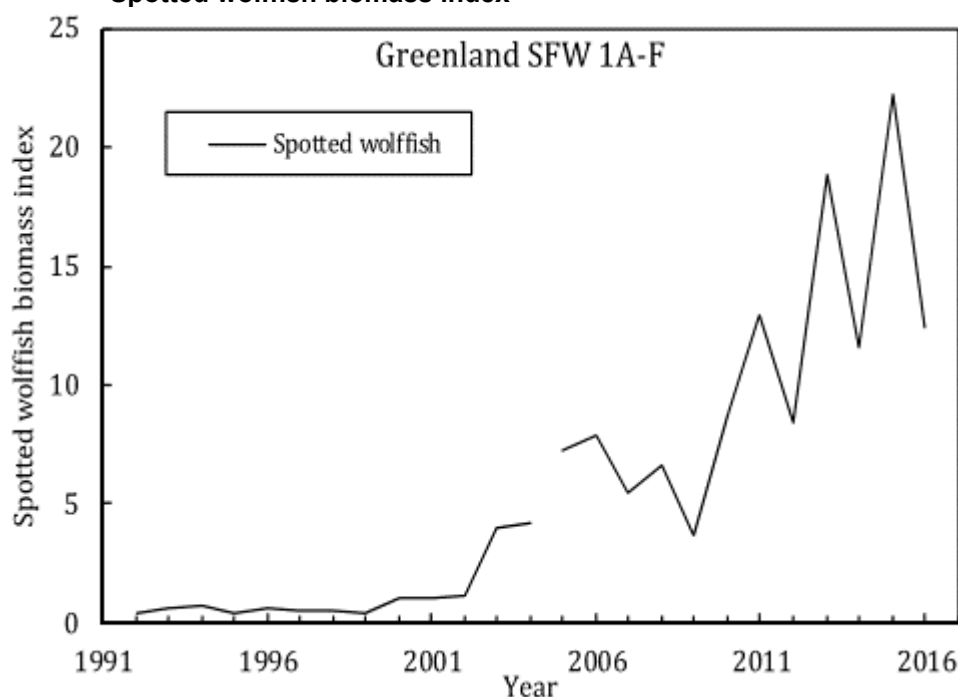
There are a number of minor 'in-scope' secondary species are caught in this fishery, these being three **wolffish** species, spotted wolffish *Anarhichas minor*, northern wolffish *A. denticulatus* and Atlantic wolffish *A. lupus* with around 0.11% of catch volume between them and **Atlantic halibut** (*Hippoglossus hippoglossus*) with less than 0.01% of catch volume (see Table 20 in main text).

**Wolffishes (*Anarhichas* spp.):** Wolffish are primarily taken in a directed longline fishery or as a bycatch in longline, gillnet or trawl fisheries. The proportions of Atlantic and spotted wolffish in the catches are unknown, but there is little doubt (NAFO, 2017) that spotted wolffish constitutes the majority of recent landings since the fishery takes place in the coastal areas and the fjords where spotted wolffish is known to be the dominating species. Furthermore, the majority of the Atlantic wolffish observed in surveys are smaller than normal commercial sizes, whereas spotted wolffish between 70 and 110 cm are plentiful.

*Atlantic wolffish* is known to be more connected to the offshore banks in South and West Greenland and is considered a single unit. The biomass indices of the EU-Germany survey are far below the initial values. At present the NAFO Scientific Council advises that there should be no directed fishery. Given the results of the recent EU-German surveys, it cannot be said that this species is highly likely to be above biologically based limits and therefore **fails to achieve SG 100**.

*Spotted wolffish* is found in all areas both inshore and offshore but is known to be the dominating species in the coastal regions and the fjords in South, West and North Greenland. It is presumed to be a single stock. There is no sign that the recent decrease in the landings was caused by a decrease in the stock. The average of the EU-Germany survey biomass index for the recent three years is near the same level as in the 1982-1984 period.

**Spotted wolffish biomass index**





Although reference points have not been established for this species, a qualitative evaluation of survey indices, length composition and historic fishery removals and a strong upward trend in the relative biomass index, suggests that this species is highly likely to be above biologically based limits and **achieves SG 100**.

**Atlantic halibut (*Hippoglossus hippoglossus*):** Around 600 kg of Atlantic halibut has been recorded as caught by the lumpfish fisheries annually over 2016 - 2019. During the non-spawning season, lumpfish are predominantly plankton-eating pelagic fishes whereas Atlantic halibut are deep-water pelage-demersal fish predators. During the lumpfish spawning season, these fish move inshore to much shallower water that is at the very margins of Atlantic halibut distributions. Consequently, the species rarely overlap in distribution and are unlikely to compete for food (with the possible exception of late larval – small juvenile halibut). With such divergent life-history traits, there is a high degree of confidence that there are no significant detrimental direct effects of the fishery on Atlantic halibut.

The Atlantic halibut stock at Greenland is not subject to annual stock assessment but it is assumed to be in a depleted state, although stocks may be recovering slowly (Trzcinski and Bowen, 2016). Given the very low bycatch rate (which must be discarded alive where possible) and indications of recovery in the adjacent Scotian Shelf and southern Grand Banks area, the combined effects of fisheries on the Atlantic halibut suggests that **SG 100 is met** (harmonised with the ISF Greenland Halibut assessment (Vottunarfóttun ehf, 2017). Management by EO 14 16 Sept 2011 Bycatch regs.

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## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought



### 2.2.1 Scoring (by element)

Secondary species	2.2.1	
	a	b
1. Common eider duck (Greenland pop)	80	
2. Common eider duck (Canada pop')	80	
3. King eider duck	80	
4. Harp seals	100	
5. Ringed seals	100	
6. Harbour porpoise	100	
7. Spotted wolfish		100
8. Atlantic wolfish		80
9. Atlantic halibut		100
<b>TOTALS</b>	<b>95</b>	

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>95</b>
Condition number (if relevant)	

## PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>partial strategy</b> in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery.	There is a <b>strategy</b> in place for the UoA for managing main and minor secondary species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

### Out of scope species (Main)

#### *Birds (Common eider and King Eider)*

This fishery targets female lumpfish exclusively for their roe. Only the roe is landed, although all other bycatch must be landed (including 'out of scope' species) and accounted for. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. Although not mandatory, fishers are encouraged to delay setting lumpfish gillnets until the main common eider migration has passed and to avoid setting in areas where sea ducks congregate e.g. around mussel beds. It is noted that whilst sea ducks are a welcome occasional addition to fisher' home consumption, they are not targeted as shot birds are preferred to those drowned in gillnets.

This, combined with a large mesh-size (260 mm) and a move to netting sites further offshore, represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise bird bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict bird bycatch to a minimum possible, thus **meeting both SG 60 and SG 80**.

However, there are no specific mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts and thus **does not meet SG 100**.

#### *Marine mammals*

This fishery targets female lumpfish exclusively for their roe. Only the roe is landed, although all other bycatch must be landed (including 'out of scope' species) and accounted for. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. This, combined with a large mesh-size (260 mm) and a move to netting sites further offshore, represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise marine mammal bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict marine mammal bycatch to a minimum possible, thus **meeting both SG 60 and SG 80**.

However, there are no specific mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts and thus **does not meet SG 100**.

## In scope species (Minor)

**Wolffishes (*Anarhichas* spp.):** This fishery targets female lumpfish exclusively for their roe. Only the roe is landed, although all other bycatch must be landed and accounted for. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. This, combined with a large mesh-size (260 mm), represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise non-target bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict the bycatch to a minimum possible, again **meeting SG 80**.

However, there are no specific mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts to wolffishes and thus **does not meet SG 100**.

**Atlantic halibut (*Hippoglossus hippoglossus*):** This fishery targets female lumpfish exclusively for their roe. It is noted that there is only a limited spatial overlap between the Atlantic halibut and this lumpfish fishery. Furthermore, live Atlantic halibut need to be released if possible, thus reducing any incentive to catch this species (although dead fish must be landed). In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. This, combined with a large mesh-size (260 mm), represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise non-target bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict Atlantic halibut bycatch to a minimum possible, again **meeting SG 80**. However, there are no specific mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts to Atlantic halibut and thus **does not meet SG 100**.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are considered <b>likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is <b>some objective basis for confidence</b> that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

**Birds:** As stated in 2.2.2(a) above, there is a partial strategy to maintain or to not hinder rebuilding of secondary species in this fishery. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus **meeting SG 60**.

Some objective confidence is provided in that the reported number of birds caught in all Greenland's gillnets is falling year on year (from 5,432 in 2016 to 1,801 in 2018, see **Table 21** thus **meeting SG 80**).

However, this has not been fully tested against the lumpfish fishery directly and is unable to support high confidence that the partial strategy will work, thus **failing to meet SG 100**.

**Marine mammals.** As stated in 2.2.2(a) above, there is a partial strategy to maintain or to not hinder rebuilding of secondary species in this fishery. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus **meeting SG 60**.

Some objective confidence is provided in that the reported number of marine mammals caught in all Greenland's gillnets is falling year on year (from 110,352 in 2016 to 69,390 in 2018 according to Statbank Greenland) and more importantly that the lumpfish fisheries take a fraction of this (c. 20 – 65 marine mammals a year according to Piniarneq), thus **meeting SG 80**.

However, this has not been fully tested against the lumpfish fishery directly and is unable to support high confidence that the partial strategy will work, thus **failing to meet SG 100**.

**Minor in-scope species (wolffishes & Atlantic halibut).** As stated in 2.2.2(a) above, there is a partial strategy to maintain or to not hinder rebuilding of secondary species in this fishery. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus **meeting SG 60**.

Some objective confidence is provided in that the reported number of wolffishes (<0.08% of total catch volume) and Atlantic halibut (<0.01% of total catch volume) caught in lumpfish nets, thus **meeting SG 80**. However, this has not been fully tested against the lumpfish fishery directly and is unable to support high confidence that the partial strategy will work, thus **failing to meet SG 100**.

Management strategy implementation			
C	Guide post	There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?	Yes	No

#### Rationale

**Birds:** There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that the fishery is yielding >99.5% target species e.g. female spawning lumpfish, thus **meeting SG 80**.

However, there is no clear evidence that the partial strategy for the lumpfish fishery *per se* is maintaining or is not hindering the rebuilding of common or king eider duck populations, therefore this **fails to meet SG 100**.

**Marine mammals:** There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that the fishery is yielding >99.5% target species e.g. female spawning lumpfish, thus **meeting SG 80**.

However, there is no clear evidence that the partial strategy for the lumpfish fishery *per se* is maintaining or is not hindering the rebuilding of marine mammal populations, therefore this **fails to meet SG 100**.

**In scope minor species (Wolffishes & Atlantic halibut):** There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that the fishery is yielding >99.5% target species e.g. female spawning lumpfish, thus **meeting SG 80**.

The clear evidence that the partial strategy for the lumpfish fishery *per se* is maintaining or is not hindering the rebuilding of wolffish nor Atlantic halibut populations, therefore this **fails to meet SG 100**.

Shark finning				
d	Guide post	It is <b>likely</b> that shark finning is not taking place.	It is <b>highly likely</b> that shark finning is not taking place.	There is a <b>high degree of certainty</b> that shark finning is not taking place.
	Met?	NA	NA	NA

#### Rationale

There is no history of shark finning in Greenlandic fisheries and no market or marketing for shark fins has ever been developed. Shark finning is prohibited by NAFO Contracting Parties (Art. 12, NAFO, 2019). The Greenland shark is not found in these inshore, coastal fisheries. **This is therefore not applicable.**

## Review of alternative measures to minimise mortality of unwanted catch

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of main secondary species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted</b> catch of all secondary species, and they are implemented, as appropriate.
	Met?	Yes	No	No

### Rationale

**Birds & marine mammals:** birds and marine mammals are mainly an unwanted catch, although it some might be taken to meet fisher subsistence needs, which is entirely legal so long as it is reported and not sold. As such it is not targeted and considered a nuisance (KNAPK, pers. comm., 13 Sept 2019). GFLK data on bird and mammal bycatch is reported and is reviewed on an annual basis by MFHA, and there has been the periodic consideration of alternative measures to reduce the incidence of bird and sea mammal bycatch in the lumpfish fishery by GINR and others, thus **meeting SG 60**.

However, there is no evidence of any regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate, and thus therefore **fails to meet SG 80**.

**In scope minor species (Wolffishes & Atlantic halibut):** *Wolffishes* are not unwanted e.g. is landed and sold, so is **not applicable**.

*Atlantic halibut* is unwanted in that it must be released alive when possible, or landed when dead, as is the case in most lumpfish gillnets. As a minor species this **meets SG 80**, but as there is no biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of Atlantic halibut, this **fails to meet SG 100**.

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought

## 2.2.2 Scoring by element

Secondary species	2.2.2				
	a	b	c	e	All
1. Common eider duck (Greenland pop)	80	80	80	60	75
2. Common eider duck (Canada pop')	80	80	80	60	75
3. King eider duck	80	80	80	60	75
4. Harp seals	80	80	80	60	75
5. Ringed seals	80	80	80	60	75
6. Harbour porpoise	80	80	80	60	75
7. Spotted wolffish	80	80	80		80
8. Atlantic wolffish	80	80	80		80
9. Atlantic halibut	80	80	80	80	80
<b>TOTALS</b>					<b>65</b>

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>65</b>
Condition number (if relevant)	<b>1</b>

## PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information adequacy for assessment of impacts on main secondary species			
	Guide post	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status.	Quantitative information is available and <b>adequate to assess with a high degree of certainty</b> the impact of the UoA on main secondary species with respect to status.
		OR	OR	
		<b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	<b>If RBF is used to score PI 2.2.1 for the UoA:</b>  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

### Out of scope species (main)

**Birds:** the number of seabirds caught by gillnets is well recorded, although is not disaggregated according to target fishery e.g. lumpfish, cod or seal in the *Piniarneq*, but can be disaggregated from GLFK's self-assessment data. All professional hunters, which include fishermen, must be licensed; fishery management measures are part of the total package of Hunting Regulations. A condition of the licence is *inter alia* that all fish, birds and mammals must be retained and reported to *Piniarneq*, but seabirds taken as fishery bycatch are reported separately on an annual basis to GFLK and these cannot be offered for sale.

Thus, there is some quantitative information available on the amount of main bycatch species taken in the fishery **meeting SG 60**.

Whilst this quantitative data is available, there are indications that this could be a considerable under-estimate (see Christensen *et al*, 2019) and therefore it is not considered adequate to assess the impact of the lumpfish fishery on all secondary main bird species and **fails to meet SG 80**.

**Marine mammals:** the capture of all marine mammals must be recorded and reported, and these data are also forward to NAMMCO (all species) and ICES (harp and ringed seals). Whilst it is probable that few, if any, seals once caught are discarded, the numbers caught cannot be verified and is possible that some are discarded. With a new online reporting system ([www.sullissivik.gl](http://www.sullissivik.gl)) taken in use by 2013, by-catches of seals and small cetaceans were no longer required to be reported as catches as in the paper reporting scheme *Piniarneq*. However, the majority of full-time hunters still used the paper reporting scheme *Piniarneq* up until 2017, when another online system ([www.aalipi.gl](http://www.aalipi.gl)) now made online reporting mandatory.

Thus, there is some quantitative information available on the amount of main bycatch species taken in the fishery **meeting SG 60**. This is adequate to assess the impact of the UoA on marine mammal species with respect to status and therefore **meets SG 80**. However, due to the lack of independent observer data, this cannot be considered adequate to assess this with a high degree of certainty, and thus fails to **meet SG 100**. **Overall these two elements meet SG 70**.

Information adequacy for assessment of impacts on minor secondary species				
<b>b</b>	Guide post			
	Met?			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. <b>Yes</b>
Rationale				

**In scope minor species (Wolffishes & Atlantic halibut):**

**Wolffishes:** As all finfish catches are landed and recorded, there is some quantitative information is available and is adequate to assess the impact of the UoA on wolffish with respect to status. This is not always at species level (e.g. maybe aggregated to 'wolffishes') but is adequate to estimate the impact of the UoA on these three wolffish species with respect to status and thus **meets SG 100**.

**Atlantic halibut:** This species must be released alive where possible, but as any dead fish must be landed and recorded, there is some quantitative information is available and is adequate to assess the impact of the UoA on Atlantic halibut with respect to status. This is adequate to estimate the impact of the UoA on Atlantic halibut with respect to status and thus **meets SG 100**.

**Overall these two elements meet SG 100.**

Information adequacy for management strategy				
<b>c</b>	Guide post	Information is adequate to support <b>measures</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>partial strategy</b> to manage <b>main</b> secondary species.	Information is adequate to support a <b>strategy</b> to manage <b>all</b> secondary species, and <b>evaluate</b> with a <b>high degree of certainty</b> whether the strategy is <b>achieving its objective</b> .
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

**Out of scope species (all main)**

There is a long time series of bird and marine mammal mortality from hunting in general, as well as bycatch from fisheries through the *Piniarneq* system, and since 2010 through the GFLK self-reporting system (for fisheries bycatch). This information has been adequate to detect seasonal and annual changes in bycatch levels down to species level, and to understand inter-annual trends in relative abundance. This has been sufficient to support measures e.g. season opening / closing times, to manage these out of scope secondary main species, thus **meeting SG 60**. Whilst quantitative data is available, there are indications that this could be a considerable under-estimate (see Christensen *et al*, 2019) and therefore it is not considered adequate to support a partial strategy to manage secondary main bird species and **fails to meet SG 80**.

**In scope minor species (Wolffishes & Atlantic halibut):**

As these are minor species, **SG 60 and SG 80 are met**. However as only a partial management strategy has been developed (see 2.2.2(a)) and it is not possible to evaluate this with a high degree of certainty that it is achieving its objective, **SG 100 is not met**.



## References

- Birdlife International 2018. *Somateria spectabilis*. The IUCN Red List of Threatened Species 2018: e.T22680409A132526730. <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22680409A132526730.en>. Downloaded on 15 July 2019.
- Hammond, P.S., Bearzi, G., Bjørge, A., Forney, K., Karczmarski, L., Kasuya, T., Perrin, W.F., Scott, M.D., Wang, J.Y., Wells, R.S. & Wilson, B. 2008. *Phocoena phocoena*. The IUCN Red List of Threatened Species 2008: e.T17027A6734992. <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T17027A6734992.en>. Downloaded on 15 July 2019.
- ICES (2019). Cod (*Gadus morhua*) in NAFO Subarea 1, inshore (West Greenland cod). ICES Advice on fishing opportunities, catch and effort. Greenland Seas and Icelandic Waters ecoregions. Published 13 June 2019.
- NAFO (2017). Wolffish in Subarea 1 Advice June 2017 for 2018-2020. SC 01-15 June 2017.
- North Atlantic Marine Mammal Commission (2016) NAMMCO Annual Report 2016. North Atlantic Marine Mammal Commission, Tromsø, Norway, 363 pp.
- Christensen, H. T., F. Merkel, R. Hedeolm & lumpfish fishermen in Godthåbsfjorden, Nuuk (2019). Bycatch in the lumpfish (*Cyclopterus lumpus*) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute of Natural Resources, July 2019. 12 pp.

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought

### 2.2.3 Scoring (by element)

Secondary species	2.2.3			
	a	b	c	All
1. Common eider duck (Greenland pop)	60		60	60
2. Common eider duck (Canada pop')	60		60	60
3. King eider duck	60		60	60
4. Harp seals	80		60	70
5. Ringed seals	80		60	70
6. Harbour porpoise	80		60	70
7. Spotted wolffish		100	80	90
8. Atlantic wolffish		100	80	90
9. Atlantic halibut		100	80	90
<b>TOTALS</b>				<b>65</b>

### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	65
Condition number (if relevant)	2

## PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guide post	Where national and/or international requirements set limits for ETP species, the <b>effects of the UoA</b> on the population/ stock are known and <b>likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, the <b>combined effects of the MSC UoAs</b> on the population /stock are known and <b>highly likely</b> to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a <b>high degree of certainty</b> that the <b>combined effects of the MSC UoAs</b> are within these limits.
	Met?	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
Rationale				

There is only one ETP species being considered in this assessment (see **Table 23**):

- **Long-tailed duck (*Clangula hyemalis*):** Iceland & Greenland breeding populations included in Table 1, Column 1 of AEWA.

There are no other MSC Units of Assessments (UoAs) within the region that might have an impact on these two, essentially coastal species.

**Long-tailed duck:** There are no national and/or international requirements set limits for this species, so this is not scored under 2.3.1 (a).

Direct effects				
<b>b</b>	Guide post	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Direct effects of the UoA are <b>highly likely</b> to not <b>hinder recovery</b> of ETP species.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental direct effects</b> of the UoA on ETP species.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The long-tailed duck has a circumpolar distribution and breeds throughout Alaska, northern Canada, Greenland, Iceland, Svalbard, Fennoscandia, the Kola Peninsula and Siberia. The species nests both in mountainous regions and in lowlands, often far from the coast. The long-tailed duck breeds on the tundra, usually near freshwater ponds and lakes. Outside the breeding season long-tailed ducks stay mainly in coastal waters where they show considerable variation in habitat use and dive to various depths. In Greenland they occur entirely in near-shore coastal waters of SW Greenland, becoming less frequent north of Nuuk and rare north of Søndre Strømfjord and alongside the common and king eiders, thick-billed murre and black guillemot are the most widespread and numerous coastal seabirds in Greenland (Merkel et al, 1999). Merkel *et al* (2019) noted from an aerial winter survey in 2017 that the winter population of long-tailed ducks in Southwest Greenland was significantly smaller in 2017 (41,572 birds; 95% CI: 31,396 – 55,241) compared to 1999 (94,399 birds; 95% CI: 66,960 – 133,087). However, the overall distribution of the birds was the same, with a continuous occurrence south of 65°N in the near-shore coastal waters and outermost regions of the fjords. North of 65°N, long-tailed ducks gradually became less frequent.

Long-tailed ducks do not appear in the Piniarneq data (2016 – 2018). GINR report that “Occasionally ...long-tailed ducks .... also are reported as bycatch in fisheries. Except for the fulmars, these species may also occur in the lumpfish fishery, but in very small numbers. Assuming that the magnitude of reported bycatch is reasonably accurate, the GINR expects that the potential negative population impact is insignificant for these species. However, information about their population trends are either poor or entirely absent” (GINR, 2018). Christensen *et al* (2019), reported two long-tailed duck were observed to be caught during a time-limited observer project that covered five boats over nine trips and 182 nets in the Nuuk area over 12 April – 23 May 2019, suggesting that this species is being caught by the fishery, albeit in relatively low numbers.

The long-tailed duck is included on the 2018 Greenland Red List as not threatened and of least concern. This is based upon national level threat assessments, into which GINR have a major input, thus **meeting SG 60**.

Given the low numbers of birds reported and observed to be caught in the lumpfish nets compared to the overall population, this **meets SG 80**.

However, due to the possible under-reporting of bird bycatch in this fishery, this cannot be stated with a high degree of certainty, and thus **does not meet SG 100**.

Indirect effects				
<b>C</b>	Guide post		Indirect effects have been considered for the UoA and are thought to be <b>highly likely</b> to not create unacceptable impacts.	There is a <b>high degree of confidence</b> that there are no <b>significant detrimental indirect effects</b> of the UoA on ETP species.
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

Due to the small-scale and short (6 week) duration of the fishery, indirect effects are likely to very limited (F. Merkel, pers. comm., 19 Sept. 2019). One possible impact might be that the fishery reduces the availability of lumpfish eggs which might form part of the long-tailed duck diet. This has not been studied in depth, but lumpfish eggs only occur occasionally (e.g. <1% of occurrences) in common eider ducks (Merkel *et al*, 2007) which have a similar feeding strategy. Based on this **SG 80 is met**.

However, this subject has not been studied in detail, and thus it cannot be said that there is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on the long-tailed duck, and this **fails to meet SG 100**.

## References

- GINR (2018). Population status for seabird species potentially affected by by-catch in lumpfish fishery. 10 August 2018.
- Christensen, H. T., F. Merkel, R. Hedeholm & lumpfish fishermen in Godthåbsfjorden, Nuuk (2019). Bycatch in the lumpfish (*Cyclopterus lumpus*) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute of Natural Resources, July 2019. 12 pp.
- Merkel, Flemming & Johansen, Kasper & Nielsen, Rasmus & Petersen, Ib & Sterup, Jacob & Mosbech, Anders (2019). Wintering seabirds in south-west Greenland, 2017. Polar Research. 38. 10.33265/polar.v38.3462.

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	More information sought

## Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>80</b>
Condition number (if relevant)	

## PI 2.3.2 – ETP species management strategy

Harbour seals are scored under 2.3.2a as there is national legislation for this species.

Long-tailed duck is scored under 2.3.2b as there is no national / international legislation for this species.

PI 2.3.2		The UoA has in place precautionary management strategies designed to: <ul style="list-style-type: none"> <li>- meet national and international requirements;</li> <li>- ensure the UoA does not hinder recovery of ETP species.</li> </ul> Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guide post	There are <b>measures</b> in place that minimise the UoA-related mortality of ETP species and are expected to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be <b>highly likely to achieve</b> national and international requirements for the protection of ETP species.	There is a <b>comprehensive strategy</b> in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to <b>achieve above</b> national and international requirements for the protection of ETP species.
	Met?	NA	NA	NA
Rationale				

Not applicable

Management strategy in place (alternative)				
b	Guide post	There are <b>measures</b> in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>strategy</b> in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a <b>comprehensive strategy</b> in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
	Met?	Yes	No	No
Rationale				

This fishery targets female lumpfish exclusively for their roe. Only the roe is landed, although all other bycatch must be landed (including 'out of scope' species) and accounted for. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. Although not mandatory, fishers are encouraged to delay setting lumpfish gillnets until the main sea duck migration has passed and to avoid setting in areas where sea ducks congregate e.g. around mussel beds. It is noted that whilst sea ducks are a welcome occasional addition to fisher's home consumption, they are not targeted as shot birds are preferred to those drowned in gillnets.

This, combined with a large mesh-size (260 mm) and a move to netting sites further offshore, represents a cohesive arrangement comprises a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise bird bycatch and are an important part of the lumpfish management plan. As such it represents a partial strategy to restrict bird bycatch to a minimum possible, thus **meeting SG 60**.

However, there are no specific mechanisms for ensuring the lumpfish fisheries do not catch long-tailed ducks, this does not represent a full strategy, and thus **does not meet SG 80**.

Management strategy evaluation				
<b>C</b>	Guide post	The measures are <b>considered likely</b> to work, based on <b>plausible argument</b> (e.g., general experience, theory or comparison with similar fisheries/species).	There is an <b>objective basis for confidence</b> that the measures/strategy will work, based on <b>information</b> directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a <b>quantitative analysis</b> supports <b>high confidence</b> that the strategy will work.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

As stated in 2.3.2(b) above, there is a partial strategy to maintain or to not hinder rebuilding of long-tailed duck in this fishery. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus **meeting SG 60**.

Whilst this quantitative data is available, there are indications that this could be a considerable under-estimate (see Christensen *et al*, 2019) and there is insufficient confidence that the measures/strategy will work and **fails to meet SG 80**.

Management strategy implementation				
<b>d</b>	Guide post		There is some <b>evidence</b> that the measures/strategy is being implemented successfully.	There is <b>clear evidence</b> that the strategy/comprehensive strategy is being implemented successfully and <b>is achieving its objective as set out in scoring issue (a) or (b)</b> .
	Met?		<b>Yes</b>	<b>No</b>
Rationale				

There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that long-tailed ducks are seldom reported as bycatch, thus **meeting SG 80**.

However, as low levels of long-tailed duck bycatch have been observed, there is no clear evidence that the partial strategy for the lumpfish fishery *per se* is maintaining or is not hindering the rebuilding of long-tailed duck populations, therefore this **fails to meet SG 100**.

## Review of alternative measures to minimize mortality of ETP species

e	Guide post	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a <b>biennial</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>

### Rationale

Birds and marine mammals are mainly an unwanted catch, although it some might be taken to meet fisher subsistence needs, which is entirely legal so long as it is reported and not sold. As such it is not targeted and considered a nuisance (KNAPK, pers. comm., 13 Sept 2019). GFLK data on bird and mammal bycatch is reported and is reviewed on an annual basis by MFHA, and there has been the periodic consideration of alternative measures to reduce the incidence of bird and sea mammal bycatch in the lumpfish fishery by GINR and others, thus **meeting SG 60**.

However, there is no evidence of any regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate, and thus therefore **fails to meet SG 80**.

### References

- GINR (2018). Population status for seabird species potentially affected by by-catch in lumpfish fishery. 10 August 2018.
- Christensen, H. T., F. Merkel, R. Hedeholm & lumpfish fishermen in Godthåbsfjorden, Nuuk (2019). Bycatch in the lumpfish (*Cyclopterus lumpus*) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute of Natural Resources, July 2019. 12 pp.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>60-79</b>
Information gap indicator	<b>More information sought</b>

### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>65</b>
Condition number (if relevant)	<b>3</b>

## PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including:		
		<ul style="list-style-type: none"> <li>- Information for the development of the management strategy;</li> <li>- Information to assess the effectiveness of the management strategy; and</li> <li>- Information to determine the outcome status of ETP species</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.	Some quantitative information is <b>adequate to assess</b> the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.  <b>OR</b> <b>If RBF is used to score PI 2.3.1 for the UoA:</b> Some quantitative information is <b>adequate to assess productivity and susceptibility</b> attributes for ETP species.	Quantitative information is available to assess with a high degree of certainty the <b>magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status</b> of ETP species.
	Met?	Yes	No	No
Rationale				

The number of seabirds caught by gillnets is well recorded, although is not disaggregated according to target fishery e.g. lumpfish, cod or seal in the *Piniarneq*, but can be disaggregated from GLFK's self-assessment data. All professional hunters, which include fishermen, must be licensed; fishery management measures are part of the total package of Hunting Regulations. A condition of the licence is *inter alia* that all birds and mammals must be retained and reported to *Piniarneq*, but seabirds taken as fishery bycatch are reported separately on an annual basis to GFLK and these cannot be offered for sale. Thus, there is some quantitative information available on the amount of long-tailed duck taken in the fishery **meeting SG 60**.

Whilst this quantitative data is available, there are indications that this could be a considerable under-estimate (see Christensen *et al*, 2019) and therefore it is not considered adequate to assess the impact of the lumpfish fishery on long-tail duck populations and **fails to meet SG 80**.

b	Information adequacy for management strategy			
	Guide post	Information is adequate to support <b>measures</b> to manage the impacts on ETP species.	Information is adequate to measure trends and support a <b>strategy</b> to manage impacts on ETP species.	Information is adequate to support a <b>comprehensive strategy</b> to manage impacts, minimize mortality and injury of ETP species, and evaluate with a <b>high degree of certainty</b> whether a strategy is achieving its objectives.
	Met?	Yes	No	No



## Rationale

There is a long time series of bird mortality from hunting in general, as well as fisheries through the *Piniarneq* system, and since 2010 through the GFLK self-reporting system (for fisheries bycatch). This information has been adequate to detect seasonal and annual changes in bycatch levels down to species level, and to understand inter-annual trends in relative abundance. This has been sufficient to support measures e.g. season opening / closing times, to manage these out of scope secondary main species, thus **meeting SG 60**.

Whilst quantitative data is available, there are indications that this could be a considerable under-estimate (see Christensen *et al*, 2019) and therefore it is not considered adequate to support a strategy to manage long-tailed duck and **fails to meet SG 80**.

## References

- GINR (2018). Population status for seabird species potentially affected by by-catch in lumpfish fishery. 10 August 2018.
- Christensen, H. T., F. Merkel, R. Hedeholm & lumpfish fishermen in Godthåbsfjorden, Nuuk (2019). Bycatch in the lumpfish (*Cyclopterus lumpus*) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute of Natural Resources, July 2019. 12 pp.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	60
Condition number (if relevant)	4

## PI 2.4.1 – Habitats outcome

PI 2.4.1		The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The fishing area is characterised by a mosaic of deep channels and basins dominated by muddy sediments, many of which are fed by glacial sedimentation and outlets from fjords, and shallow banks and shelf with a mix of more complex habitats. Muddy sediments are more prevalent in the northerly colder areas; and rocky and sandy sediment in the more southerly areas.

The lumpfish fishery is carried out exclusively with gillnets with a minimum legal mesh size of 260 mm. They are fished from open boats, typically 5–6.5 m in length with relatively low-powered outboard (80 – 150 kW) engines and a usual crew of two. There are two methods for setting the nets; in the past they were set to run diagonally from the coast with only one buoy in the water at the seaward end of the net. Current practice is to set the nets between two buoys a bit further out in the fjords or off the coast. The nets are anchored by stones of a certain size with the relatively heavy foot rope running along the bottom; each panel of netting floats more or less vertically between the footrope and headrope. The fishery cannot take place in areas where there are strong tidal flows, particularly over spring tides, as these lay the nets flat and prevent them from fishing effectively; nor can the fishery take place if there is ice cover. The nets are regularly hauled, cleaned and replaced if damaged due to the physical conditions on the fishing grounds or passing ice floes.

Gillnets operated in shallow coastal waters have an extremely low environmental footprint (Huse *et al.*, 2002), particularly so in this case as stones are used in preference to fluked anchors, which are more likely to become fast and cause seabed disturbance. The nets are fished as a vertical panel and, in general, it is only the footrope that will come into contact with the seabed. Adverse environmental effects of gillnets are possible if the gear drifts under the influence of strong currents but is most likely to occur during hauling. This can be as a result of abrasion as the gear is dragged across turf communities, by meshes closing around higher profile biota and nipping them off or simply getting hooked onto fragile upright organisms and breaking them. Even where such adverse effects occur, they do not necessarily happen with every haul and where they do occur, it is in the nature of the fishery that they will be highly localised, i.e. over a scale of 10s of metres rather than widespread. Consequently, the fishery is highly unlikely to reduce commonly-encountered habitat structure and function to a point where there would be serious or irreversible harm but in the absence of site-specific studies, conclusions must be inferred from studies elsewhere, rather than from direct evidence, hence the reduced score.

The footprint of the fishery is around 12 km<sup>2</sup> at any one time during the fishing season. This represents less than 0.1% of West Greenland's inshore (3 nm) fishing zone. It is also only in the water for six weeks of the year (c. 12%). As such it is highly unlikely to have an impact on the structure and function of these commonly encountered habitats, thus **meeting both SG 60 and SG 80**.

Given that most lumpfish netting sites are in high energy, exposed and shallow waters, and that these gillnets are static gears with limited pressure on the substrate, **SG 100 is met**.

### VME habitat status

<b>b</b>	Guide post	The UoA is <b>unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is <b>highly unlikely</b> to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

### Rationale

Generally speaking, the most vulnerable species, e.g. sea pens (*Pennatulacea*) on soft sediments and coral species in deeper water do not occur in the shallow inshore habitats occupied by spawning lumpfish. The Ikaite Tufa columns are in an area protected from any form of fishing.

Since no VMEs are found in these dynamic inshore areas, this scoring issue is **not applicable**.

### Minor habitat status

<b>c</b>	Guide post	There is <b>evidence</b> that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm.		
	Met?			<b>Yes</b>

### Rationale

Gillnets operated in shallow coastal waters have an extremely low environmental footprint (Huse et al., 2002), particularly so in this case as stones are used in preference to fluked anchors, which are more likely to become fast and cause seabed disturbance. The nets are fished as a vertical panel and, in general, it is only the footrope that will come into contact with the seabed. Adverse environmental effects of gillnets are possible if the gear drifts under the influence of strong currents but is most likely to occur during hauling. This can be as a result of abrasion as the gear is dragged across turf communities, by meshes closing around higher profile biota and nipping them off or simply getting hooked onto fragile upright organisms and breaking them. Even where such adverse effects occur, they do not necessarily happen with every haul and where they do occur, it is in the nature of the fishery that they will be highly localised, i.e. over a scale of 10s of metres rather than widespread.

The footprint of the fishery is around 12 km<sup>2</sup> at any one time during the fishing season. This represents less than 0.1% of West Greenland's inshore (3 nm) fishing zone. The fishing gear is also only in the water for six weeks of the year (c. 12%). As such it is highly unlikely to have an impact on the structure and function of minor habitats, thus **meeting both SG 60 and SG 80**.

Given that most lumpfish netting sites are in high energy, exposed and shallow waters, and that these gillnets are static gears with limited pressure on the substrate, **SG 100 is met**.

### References

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought

**Overall Performance Indicator scores added from Client and Peer Review Draft Report**

Overall Performance Indicator score	100
Condition number (if relevant)	

## PI 2.4.2 – Habitats management strategy

PI 2.4.2		There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a <b>partial strategy</b> in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a <b>strategy</b> in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

### Rationale

The strategy for ensuring that fishing does not pose a risk of serious or irreversible harm (species populations or) to habitat types is set out in the Law of Greenland Parliament nr. 6, 8th of June 1994, which requires *inter alia* the sustainable use of the living resources in and around Greenland as well as protecting the environment and securing the biological diversity. To this end, the law also requires that GINR undertakes such research and monitoring as is necessary to provide reliable and robust advice necessary to meet the national strategy. GINR maintains a wide range of relevant research programmes, not least with R.V. Sanna and presents summaries of its findings in its annual reports and through peer-reviewed journals and submissions to international working groups (e.g. ICES, NAMMCO, NAFO).

The offshore trawl surveys have now been extended to include inshore scientific gillnet surveys and intertidal and littoral benthic studies, including habitat mapping (Blicher, 2010; Fredriksen et al., 2012; Gougeon et al, 2017) although these are at an early stage. The strategy includes the identification and designation of a variety of national and international (e.g. Ramsar) nature conservation areas (Jensen & Christensen, 2003; Boertmann et al., 2009; Frederiksen et al., 2012) where these are deemed advisable or necessary. This national strategy is reiterated as part of the Nordic Council of Ministers. The principle of environmental management for sustainable use of living resources is one where it is implicit that any perceived significant risk to, e.g., habitat types will result in appropriate action to mitigate the risk. Indeed, the legislation states that fishery effects must not be "unacceptable" but this falls short of an explicit strategy for managing environmental effects of this specific fishery.

Given the static nature of the gear, its limited footprint (see 2.4.1 above) and the short fishing season, no specific measures nor partial strategy are required, thus **meeting SG 60** and **SG 80** respectively.

As with other fisheries in Greenland there is a wider strategy to protect vulnerable habitat, such as the Ikaite columns in Ikka fjord in SW Greenland, which is closed to fishing. This **meets SG 100**.

Management strategy evaluation				
<b>b</b>	Guide post	The measures are <b>considered likely</b> to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	There is some <b>objective basis for confidence</b> that the measures/partial strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/strategy will work, based on <b>information directly about the UoA and/or habitats</b> involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

### Rationale

The general strategy that is encapsulated in Greenland law is in common with other Nordic countries (Rasch et al., 2012) and with most countries bordering the North Atlantic. This approach has been shown to be effective in

safeguarding vulnerable and marine habitats. In many areas, e.g. the Barents Sea, the Norwegian strategy has been tested (e.g. through the MAREANO programme and the annual Barents Sea ecosystem surveys) but implementation of the national strategy in detail across all waters is still at an early stage in Greenland and has yet to be subject to critical review in Greenland. Various management measures exist such as spatial and temporal closures, move-on rules in the event of impacting VMEs and **SG 60 is met**.

These have been implemented successfully in inshore waters in Western Greenland (e.g. in Ikka fjord). This is a static gear fishery, with a limited spatial and temporal footprint. Together these provide some confidence that the *de facto* strategy will work, thus **meeting SG 80**.

However, they have not been fully tested and thus **fail to meet SG 100**.

Management strategy implementation				
<b>C</b>	Guide post		There is <b>some quantitative evidence</b> that the measures/partial strategy is being implemented successfully.	There is <b>clear quantitative evidence</b> that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

The strategy requires the GINR to identify sensitive and vulnerable (marine) habitats and advise government on what protection measures are appropriate and necessary to ensure that fishery effects are not unacceptable. Evidence that GINR is fulfilling this requirement and that its advice is being accepted is provided by, for example, the 11 Ramsar sites around the coast of Greenland, the two marine protected areas (MPA), the largest of which is part of the Greenland National Park, itself a UNESCO World Heritage Site and various species protection measures (e.g. no sale of fishery bycatch birds, release of live halibut). Whether or not more MPA are advisable or necessary is currently uncertain but this does not reduce the evidence that the strategy *per se* is being implemented successfully, thus **meeting SG 80**.

Given further evidence that the lumpfish fishery uses an acknowledged low impact gear, is restricted in terms of its scale and restricted seasonal operation, together with the requirement to remove fishing gear once the season closes (with abandoned fishing gear being removed by GFLK), these combine to provide clear quantitative evidence that the overall strategy is being implemented successfully to manage the impact of all MSC UoAs / non-MSC fisheries on habitats, this **meets SG 100**

Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs				
<b>d</b>	Guide post	There is <b>qualitative evidence</b> that the UoA complies with its management requirements to protect VMEs.	There is <b>some quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.	There is <b>clear quantitative evidence</b> that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant.
	Met?	<b>NA</b>	<b>NA</b>	<b>NA</b>

#### Rationale

No VMEs so not scored.

#### References

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- GINR peer-reviewed papers: <http://www.natur.gl/en/publications/scientific-papers/>
- GINR scientific surveys: <http://www.natur.gl/gl/ornigulluni-suliaqarneq-2014/>
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#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	95
Condition number (if relevant)	

## PI 2.4.3 – Habitats information

PI 2.4.3		Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat		
Scoring Issue		SG 60	SG 80	SG 100
a	Information quality			
	Guide post	<p>The types and distribution of the main habitats are <b>broadly understood</b>.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>The nature, distribution and <b>vulnerability</b> of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.</p> <p><b>OR</b></p> <p><b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
		Met?	Yes	Yes

### Rationale

There is an extensive and growing body of information built up over the years from fishermen's knowledge of the distribution of benthic (e.g. scallop) and demersal (e.g. flatfish) species, natural resource (e.g. Boertmann et al., 2009; Frederiksen et al., 2012) and research surveys (Blicher, 2010; Yesson et al., 2015; Gougeon et al., 2017; Blicher & Hammeken Arboe, 2017). Together, these provide the scientific and administrative agencies of Greenland with a broad overview of habitat types and their range. This established, broad overview is being added to by relatively new GINR research projects looking in greater detail at intertidal and littoral surveys that include, *inter alia*, seabed photography. Together this **meets SG 60**.

Among these habitats, coral and similar upright, fragile communities are arguably among the most vulnerable to fishing and their distribution has been looked at in greater detail (Seaman & Buchardt, 2006; Sejr et al., 2010; Jørgensen, 2013; Høgslund et al., 2014). The majority, if not all of these particularly sensitive habitats occur beyond the range of the lumpfish gillnet fishery, either in deeper water, such as corals, or over soft sedimentary seabed, such as sea pens. The exception may be the ikaite tufa columns in Ikka Fjord, but the visual status of these features suggests that there is little interaction with fishing gear (they are in a protected area) and Seaman & Buchardt (2006) did not identify fishing as a specific cause for concern. This therefore **meets SG 80**.

However Western Greenland does not have a comprehensive seabed habitat mapping programme such as is found in other Nordic countries, e.g. Norway ([www.mareano.no](http://www.mareano.no)) and Iceland ([www.iceage-project.org](http://www.iceage-project.org)) and it cannot be said that the distribution of all inshore habitats is known over their range, with particular attention to the occurrence of vulnerable habitats, therefore **SG 100 is not met**.

Information adequacy for assessment of impacts				
b	Guide post	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction	The physical impacts of the gear on all habitats have been quantified fully.



	overlap of habitat with fishing gear.  OR  <b>If CSA is used to score PI 2.4.1 for the UoA:</b> Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	and on the timing and location of use of the fishing gear.  OR  <b>If CSA is used to score PI 2.4.1 for the UoA:</b> Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
Met?	Yes	Yes	No

#### Rationale

The effect of gillnets on mud or sand substrata is generally accepted as being negligible (Huse *et al.*, 2002). On more rocky substrata there is the risk of abrasion of turf communities and breaking of fragile upright organisms, particularly during hauling, but this is well understood, thus **meeting SG 60**.

The location, spatial extent and timing of the lumpfish fishery is well known, despite the lack of VMS in this small, inshore fleet, thus meeting SG 80. However, largely due to its use of a low impact gear in a high energy inshore marine environment over low spatial and temporal periods means that the physical impacts of the gear on all habitats have not been quantified fully, thus **failing to meet SG 100**.

Monitoring			
<b>C</b>	Guide post	Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
Met?		Yes	No

#### Rationale

There are regular annual surveys undertaken by GINR around Greenland that collect data appropriate 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). This, combined with the well-known locations and limited seasonal operations of the lumpfish gillnet fishery, suggests that **SG 80 is met**.

However, there are no detailed habitat monitoring in lumpfish fishing locations, so **SG 100 is not met**.

#### References

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#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	80
Condition number (if relevant)	

## PI 2.5.1 – Ecosystem outcome

PI 2.5.1		The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
a	Ecosystem status			
	Guide post	The UoA is <b>unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is <b>highly unlikely</b> to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is <b>evidence</b> that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The ecosystem throughout Greenland is kept under regular formal review (Rasch et al., 2012; Josefson, 2013; Christensen & Topp-Jørgensen (eds.), 2016). The fishery is undertaken with a single, highly selective (large mesh) gear over a relatively short season. It is a very clean fishery with few non-target fish taken and the numbers of birds and marine mammals taken are a small percentage of the total numbers taken by the licensed hunting (Kleeman, 2018). NAFO is also moving towards an ecosystem-based approach to fisheries, including developing Ecosystem Summary Sheets (ESS) for each NAFO ecosystem. These ESSs are tentatively scheduled to be updated every 3-5 years, constituting a tool for strategic assessment, advice, and planning. The structure of ESSs distinguishes between ecological features and management measures, aligning the summary information with the general principles adopted by NAFO in the chapter III of its convention (NAFO, 2018).

Given the small, scale, limited spatial area and temporal period of the fishery, the only element that might be impacted is the trophic structure of the sea floor where the carcasses of the female lumpfish have been discarded following the removal of their roe. This tends to take place in the more sheltered, but generally deep (>100m) fjord areas, where up to 500 kg of fish may be discarded over a 24 – 48- hour period by a single fisher. Given the relatively very low biomass of discarded fish compared to the wider fjordic ecosystem this means it is unlikely to disrupt the underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, thus **meeting SG 60**. If one also considers that this only takes place six weeks a year (12% of the year) and that no ecosystems disruptions, temporary or otherwise have been recorded from this activity, this is considered highly unlikely, thus **meeting SG 80**. However, this has never been tested nor empirical evidence provided, so **does not meet SG 100**.

### References

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**Draft scoring range and information gap indicator added at Announcement Comment Draft Report**

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

**Overall Performance Indicator scores added from Client and Peer Review Draft Report**

Overall Performance Indicator score	80
Condition number (if relevant)	

## PI 2.5.2 – Ecosystem management strategy

PI 2.5.2		There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Management strategy in place			
	Guide post	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the UoA on key elements of the ecosystem.	There is a <b>partial strategy</b> in place, if necessary, which takes into account <b>available information and is expected to restrain impacts</b> of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a <b>strategy</b> that consists of a <b>plan</b> , in place which contains measures to <b>address all main impacts of the UoA</b> on the ecosystem, and at least some of these measures are in place.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

### Rationale

Greenland has always had a dependence on the living resources from the sea for the survival of its inhabitants. This dependence is recognised explicitly in Greenlandic legislation that sets out its strategy to manage these resources, fish, birds and mammals, in a way that ensures long-term sustainability and, no less explicitly, in a way that does not result in unacceptable environmental effects. Support for this strategy is shown through the rolling five-year plan that GINR has to prepare and submit for approval to its management board, and through the board, to parliament. The relevant sections of this plan are implemented through the annual resource surveys undertaken by GINR and the national five-year (terrestrial and marine) ecosystem monitoring programme, specifically the Greenland Ecosystem Monitoring Strategy (GEMS) 2017-2021 (Christensen & Topp-Jørgensen (eds.), 2016).

This fishery targets female lumpfish exclusively for their roe. In order to target females spawning adults, this inshore fishery is of a short duration (currently 44 days), with opening / closing dates staggered to ensure that mainly mature female spawning fish are targeted in a specifically licensed fishery. This, combined with a large mesh-size (260 mm) static gillnet, represents a cohesive arrangement comprising a number of measures to limit the impact of this small-scale fishery. As such it represents a partial strategy to restrain the ecosystem impact of the fishery to a minimum level possible, thus **meeting both SG 60 and SG 80**.

This said, given the spatial, temporal and low impact nature of the UoA, there is no specific plan in place to address all main impacts of the UoA on the ecosystem and this **does not meet SG 100**.

Management strategy evaluation				
<b>b</b>	Guide post	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).	There is <b>some objective basis for confidence</b> that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.	<b>Testing</b> supports <b>high confidence</b> that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

### Rationale

The strategy for managing the fishery is based on the knowledge that it is a clean fishery (i.e. very few non-target species caught) with minimal effect on the marine environment or sensitive marine habitats. So long as this continues to be the case and there is no detectable increase in risk or adverse effects it can reasonably be assumed that the

measures will continue to work. GINR data on seabird and marine mammal bycatch seem to show stable or declining levels of bycatch.

As stated in 2.5.2(a) above, there is a partial strategy to which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem. This consists of a number of measures e.g. a short (44 day), staggered season open only to licensed fishers using large-mesh fixed gillnets targeted specifically at spawning female lumpfish that based on previous experience of time-limited, highly selective fisheries is likely to work, thus **meeting SG 60**.

Objective confidence is provided in that the spatial / temporal limits are fully observed, and any gear removed from the water after the fishery closes, thus **meeting SG 80**.

This said, given the spatial, temporal and low impact nature of the UoA, there has been no testing that his partial strategy works, and this does **not meet SG 100**.

Management strategy implementation			
C	Guide post	There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is <b>clear evidence</b> that the partial strategy/strategy is being <b>implemented successfully and is achieving its objective as set out in scoring issue (a)</b> .
	Met?	Yes	Yes
Rationale			

There is some evidence that the partial strategy is being implemented successfully in that the limited fishing season is being carefully observed and that the license-limited fishery is yielding >99.5% target species e.g. female spawning lumpfish within its allocated quota, thus **meeting SG 80**.

There is clear evidence that the partial strategy is being implemented successfully e.g. the fishery opens and closes on time, the TAC limits are carefully observed, gear is removed from the water after the limited season and the fishery remains productive, despite fishing the same sites year after year, thus **meeting SG 100**.

## References

- Christensen, T.R. & Topp-Jørgensen, E. (eds.) (2016). Greenland Ecosystem Monitoring Strategy 2017-2021. DCE – Danish Centre for Environment and Energy, Aarhus University. 44 pp
- Topp-Jørgensen, E., Arndal, M.F. & Christensen, T.R. (eds.) (2019). Greenland Ecosystem Monitoring Strategy 2017-2021. – Mid-term status evaluation 2019. DCE – Danish Centre for Environment and Energy, Aarhus University. 76 pp.
- NAFO (2018). Report of the 11th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WG-ESA). NAFO Headquarters, Dartmouth, Canada, 13 - 22 November 2018 Serial No N6900 NAFO SCS Doc. 18/23

## Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	60-79
Information gap indicator	More information sought e.g. recent marine ecosystem status report.

## Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	85
Condition number (if relevant)	

## PI 2.5.3 – Ecosystem information

PI 2.5.3		There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Information quality			
	Guide post	Information is adequate to <b>identify</b> the key elements of the ecosystem.	Information is adequate to <b>broadly understand</b> the key elements of the ecosystem.	
	Met?	<b>Yes</b>	<b>Yes</b>	

### Rationale

Information has been gathered over many years by a variety of scientific organisations, not just from Greenland (GINR) but also neighbouring countries and those with an historical interest in fishing in Greenland's waters. This information is adequate to broadly understand key elements of the ecosystem and has provided the basis for developing a mass-balance model for Greenland waters (Pedersen & Zeller, 2001), work that is ongoing within GINR.

The MarineBasis program collects physical, chemical and biological data from the Greenland coastal zone, primarily at the two main field stations: Nuuk in low-arctic Southwest Greenland and Zackenberg in high-arctic Northeast Greenland. The MarineBasis programme delivers baseline data that allows us to identify long-term trends in key parameters such as sea ice coverage, water temperature, salinity, CO<sub>2</sub> uptake, nutrient concentrations, sinking flux, phytoplankton biomass and primary production, species composition of phytoplankton and zooplankton, macroalgal growth and the counting of marine mammals and seabirds (Nuuk). Data from the program is used by several international work groups under the Arctic Council such as CBMP, AMAP and CAFF.

With the increasing focus on the impacts of climate change and global warming on Greenland's ice sheet and related marine oceanography / ecology, the key elements of the coastal marine ecosystem have been identified (**meeting SG 60**) and are broadly understood, thus **meeting SG 80**.

Investigation of UoA impacts				
<b>b</b>	Guide post	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but <b>have not been investigated</b> in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and <b>some have been investigated in detail</b> .	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and <b>have been investigated in detail</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

### Rationale

The main effects of the lumpfish fishery on key elements of the ecosystem can be inferred, not least from the fact that the gear has a very light environmental footprint and the catch of non-target species is very low relative to what is taken by other fisheries and hunting and thus **meets SG 60**. These have been investigated in some detail e.g. through mass balance modelling (Pedersen, S. A. & Zeller., D. 2001) and this therefore **meets SG 80**.

However, it cannot be said that the main interactions are well understood and have been investigated in detail, thus failing to **meet SG 100**.

Understanding of component functions			
<b>c</b>	Guide post	The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of



		Habitats) in the ecosystem are <b>known</b> .	these components in the ecosystem are <b>understood</b> .
	Met?	<b>Yes</b>	<b>Yes</b>

#### Rationale

The main functions of the components (i.e., target, bycatch, retained and ETP species, and habitats) in the ecosystem are known and have been studied in this and similar environments (e.g. Pedersen & Zeller, 2001; Zellet *et al.*, 2001; Olsen *et al.*, 2007), thus **meeting SG 80**.

The main impacts of the lumpfish gillnet fishery have been identified (e.g. impact on female spawning lumpfish, interactions with sea ducks and marine mammals, and the impacts of this static gear on the dynamic inshore habitats), and this **meets SG 100**.

Information relevance				
<b>d</b>	Guide post		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components <b>and elements</b> to allow the main consequences for the ecosystem to be inferred.
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

Populations of fish, seabirds and marine mammals around Greenland are subject to monitoring and research; their respective vulnerabilities to anthropogenic pressures, including fisheries are understood or can be inferred. The catches of fish, seabirds and marine mammals from the lumpfish fishery are documented and notwithstanding the weaknesses in non-target bycatch data collection (see 2.2.3 & 2.3.3), can be shown to be small relative to the directed fisheries and licensed hunting for these species. Based on this information, and that the fishery is such a minor part of the total exploitation, the main consequences of the fishery on the ecosystem can be inferred, thus **meeting SG 80**.

The small size of the fishery, its close proximity to shore and its restricted spatial and temporal nature, combined with a good understanding of how these sub-Arctic / Arctic marine ecosystems function allows the impact of the fishery on the main ecosystem *components* (e.g. g. impact on female spawning lumpfish, interactions with sea ducks and marine mammals, and the impacts of this static gear on the dynamic inshore habitats) and their ecosystem *elements* (e.g. trophic interactions) to be inferred, thus **meeting SG 100**.

Monitoring				
<b>e</b>	Guide post		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

Populations of fish, seabirds and marine mammals around Greenland are subject to monitoring and research; their respective vulnerabilities to anthropogenic pressures, including fisheries are understood or can be inferred. The catches of fish, seabirds and marine mammals from the lumpfish fishery are documented and can be shown to be small relative to the directed fisheries and licensed hunting for these species.

The nature of the UoA, in particular its spatial extent and limited seasonal duration, plus its impacts on birds and marine mammals is adequate to detect any inter-annual change in risk from the fishery, thus **meeting SG 80**. Given the small scale of the fishery and its use of a static fishing gear suggests that sufficient information exists to develop a full ecosystem strategy, should this be required, thus **meeting SG 100**.



## References

- Christensen, T.R. & Topp-Jørgensen, E. (eds.) (2016). Greenland Ecosystem Monitoring Strategy 2017-2021. DCE – Danish Centre for Environment and Energy, Aarhus University. 44 pp
- <https://gcrc.gl/research-projects/greenland-ecosystem-monitoring-marinebasis-nuuk/>List any references here, including hyperlinks to publicly available documents.
- Kleeman, N (Ed). Greenland in Figures 2018. 15th revised edition, May 2018. Published by Statistics Greenland. <http://www.stat.gl/publ/kl/GF/2018/pdf/Greenland%20in%20Figures%202018.pdf>
- Olsen, E., Gjørø, H., Røttingen, I., Dommasnes, A., Fossum, P. & Sandberg, P. 2007. The Norwegian ecosystem-based management plan for the Barents Sea. ICES Journal of Marine Science 64: 599–602
- Pedersen, S. A. & Zeller, D. 2001. A mass balance model for the West Greenland marine ecosystem. In: Fisheries impacts on North Atlantic Ecosystems: Models and Analyses (Guenette, S., Christensen, V. & Pauly, D. eds). Fisheries Centre Research Reports 9 (4).
- Stiansen, J.E., Korneev, O., Titov, O., Arneberg, P. (Eds.), Filin, A., Hansen, J.R., Høines, Å., Marasaev, S. (Eds) 2009. Joint Norwegian-Russian environmental status 2008. Report on the Barents Sea Ecosystem. Part II – Complete report. IMR/PINRO Joint Report Series, 2009(3).
- Zeller, D., Watson, R. & Pauly, P. 2001. Fisheries Impacts on North Atlantic Ecosystems: Catch, Effort and National/Regional Data Sets Fisheries Center Research Report 9 (3).

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	95
Condition number (if relevant)	

## 7.5 Principle 3

### 7.5.1 Principle 3 background

#### General management framework

The West Greenland lumpfish fishery operates within a single jurisdiction entirely within Greenlandic waters in the 'inshore' or 3 nautical mile zone of Greenland's west coast.

As a former Danish colony, Greenland achieved the status of a county (Danish: amt = county) in 1955 and reached a certain degree of autonomy (Danish: hjemmestyre – home rule government) in 1979. Greenland left the European Union in 1985 after a referendum with its' autonomy from Denmark further expanded in 2009 (Danish: selvstyre = self-government).

Greenland is represented in a number of international organisations by Denmark. These include United Nations Convention on Law of the Sea, UNCLOS; the North Atlantic Fisheries Organisation, NAFO; Convention on the International Trade in Endangered Species, CITES; and the International Whaling Commission, IWC.

The legal framework for the management of Greenland's fisheries resources is provided primarily by Landsting Act No. 18 of 31 October 1996 on Fisheries (the 'Fisheries Act'). The Fisheries Act has been amended 13 times since 1996<sup>38</sup>. There have been numerous attempts at wider reform of the Act with several new drafts proposed, but ultimately rejected by stakeholders, such is the importance of fishing to Greenland's economy and concern over the socio-economic impact of proposed changes. The Government's coalition parties agreed in October 2018 that they will deliver a complete revised fisheries law through the establishment of the Fisheries Commission in 2019. There are 12 members (similar to the Fisheries Council) of the Commission that is tasked with making proposals for the revision of the Fisheries Act and for a sectoral plan. A reporting deadline is set for June 2020, after which time a seminar to present and discuss the report is expected. The intention is for the government to present a bill to parliament by the end of 2020.

Overall **objectives** of the fisheries policy, which the Commission must work to [unofficial translation]:

- Largest possible, long-term socio-economic benefits of fishing on a sustainable basis.
- The forthcoming fisheries legislation and other relevant initiatives must create coherent, stable framework conditions that reduce uncertainty and hence create an attractive investment climate for the benefit of further development of the industry. This in order to make it possible to provide security for investments and promote an effective fisheries sector, so that the profession without public financial support can maintain and renew a modern fishing fleet and up-to-date land-based processing plants.

Overall **principles** of the fisheries policy that the Commission must work to [unofficial translation] include the:

- A biologically sustainable exploitation of fishery resources to ensure reproduction and optimal utilization
- Appropriate output limitation (TAC and quotas) and input limitation in the form of capacity regulation in each type of fishing to create a stable and lasting balance between the fishing fleet's capacity and its fishing opportunities over a longer period.
- Conditions should, where appropriate, be adapted to facilitate access for new entrants.
- Fishery control must be equipped with the necessary regulatory framework and tools to deliver effective control.

The Fisheries Commission has an extensive remit including, but not limited to, exploring the social, economic, legal and administrative implications of the following:

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<sup>38</sup> Danish translation and overview of amendments is available at <http://lovgivning.gl/da-DK/Lov?rid={633775EA-C4B9-401C-99D6-892817ED86B1}>

**Framework for resource utilization:** propose revisions to how annual TACs are determined and allocated (including possible auction of quota). Division of the coast into management areas. Re-assess coastal/offshore management boundaries in shrimp fishery. Strengthening fisheries control.

**Ownership and quota conditions and access to finance:** Statements on ownership and controlling interests in quota shares. Better ensure multi-year effects to allow planning and investment. Stable raw material access to factories and so avoid unnecessary fluctuations in employment in the sector. Look at pros and cons of processing vessels. Optimising quota utilization including in the coastal fisheries. Fleet adaptation and encouraging new entrants. Access to venture capital and foreign investment. Incentives to exploit new species, including support for experimental fishing.

**Ensuring competition and diversification of ownership:** Increasing spread of ownership, phasing in of redistribution of allowances. Access for young fishermen. Distributing coastal/offshore shrimp from 43/57 to 50/50 and managing sales between the two. Five year phasing out of unlimited travel licenses.

**Increased added value:** strengthen presence of Greenlandic officers in the Greenlandic fishing fleet<sup>39</sup>. Explore exclusivity model for experimental fisheries. Coherence with sector development and other areas such as education, labour market strategy, employment law, etc. The potential for aquaculture development. Promote added value operations and the influence of licences and quotas on these. Adequacy of data provision.

Fisheries management in Greenland tends to distinguish coastal fisheries and offshore fisheries. Coastal or inshore fisheries are those undertaken by vessels less than 75 GRT/120 GT, operating in Greenland's territorial waters (i.e. less than 3 nautical miles from the baseline). No vessels above 75 GRT (other than scallopers) can fish within 3 n miles of the coast and those larger vessels must have VMS installed. Vessels participating in either offshore or inshore fisheries must be licensed.

Executive Orders, E.O.s, define specific management elements, including the E.O. for lumpfish fishing of 6th May 2014. This repealed the Greenland Home Rule Government Order no. 13 of 13 May 2005 on fishing for lumpfish.

The Ministry of Fisheries, Hunting and Agriculture (MFHA) has overall responsibility for fisheries policy and the management of fish resources in Greenland, with the Greenland Institute of Natural Resources (GINR) responsible for providing the biological basis for fisheries management advice to the MFHA.

The Greenland Fishery License Control Authority (GFLK) is another key institution with responsibilities for monitoring control and surveillance. Offshore inspection duties are performed by the Royal Danish Navy's Arctic Command (AKO) by agreement with GFLK. However, this inshore fishery is overseen by GFLK's ten wildlife and fisheries compliance officers patrolling along the West Greenland coast (numbered between eight and ten officers over the last two years) spread throughout the management areas. AKO can also be requested to assist in inshore MCS activities where required.

Inshore inspection became more of a priority for GFLK as quota-free areas were introduced in the Greenland halibut fishery. GFLK achieved an inspection rate of around 5% of landings by weight. The lumpfish fishery becomes a focus of the regular inspection and surveillance activities during the fishing season between April and May.

An on-board observer scheme is not feasible due to the small size of the vessels (most below 9.4m/30 feet) that are single operators. GFLK fishery inspectors/wildlife officers patrol coastal waters checking that fishing is undertaken as per seasonal restrictions and that technical measures such as mesh sizes and the gear is marked with identifiers.

### **Fishery-specific management**

Greenland's lumpfish fishery is licensed and regulated by a lumpfish management plan and a number of specific fisheries rules (e.g. Exec Order No. 2 of 2016 on the fishing of lumpfish) in addition to the general fishery management framework described above. Those rules specify minimum allowed mesh size (260mm), bycatch allowances and standards of catch reporting from buyers. It is regulated The Greenlandic lumpfish fisheries are licensed and regulated by fisheries rules specifying minimum allowed mesh size

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<sup>39</sup> most skippers and officers are foreign, mainly Faroese, Danish or Icelandic

(260mm), bycatch allowances and standards of catch reporting from buyers, and is regulated by nationally set yearly quotas as well as fishing period restrictions.

Some of the most important regulations are:

- Selvstyrets bekendtgørelse nr. 2 af 2. februar 2016 om fiskeri efter stenbider (Government of Greenland regulation no. 2 February 2, 2016 on lumpfish fisheries) <http://lovgivning.gl/lov?rid=%7b4C224EDB-EDD0-4579-AC44-A3DC0731E4A1%7d#>  
Note: This defines "commercial" fishing as " the fishing that takes place for the purpose of the sale of the entire catch, or parts thereof." This recognises that the fishery relates to the roe of the lumpfish and therefore in this instance carcasses can be discarded. The discard ban specifies "§ 5. Catches damaged during production on board may be thrown overboard as a quality discard. Quality discard must be collected in baskets or otherwise and weighed and logged before the draft is made."
- Selvstyrets bekendtgørelse nr. 7 af 4. april 2016 om rapportering af indhandlinger af fisk og fiskeriprodukter (Government of Greenland regulation no. 7, April 4 2016, on the reporting of fishes and fishery products)
- <http://lovgivning.gl/lov?rid={014E036B-7E4E-4D88-88E6-ED0E160B0E1B}>
- Selvstyrets bekendtgørelse nr. 4 af 30. marts 2017 om tekniske bevaringsforanstaltninger i fiskeriet (Government of Greenland regulation no. 4, March 30, 2017 on technical conservation measures in fisheries) <http://lovgivning.gl/lov?rid={CB5A3A48-3C1F-42ED-8395-9886BD403C52}>
- Forvaltningsplan for stenbiderfiskeriet 2018. [Management plan for the lumpfish fishery] Naalakkersuisut, Departement for Fiskeri, Fangst og Landbrug. Version 3.0


The lumpfish management plan was developed through extensive consultation with stakeholders. As stated in the Plan (v3.0 2018), management is based on the following regime:

- Annual license for all fishermen regardless of vessel size, specific to the area (1A to 1F).
- Total TAC for the whole of Greenland (conversion factor of 6.7 lumpfish to roe, i.e. 10 000t of lumpfish equates to 1,500t of roe)
- 85% of the TAC is allocated according to the history of the NAFO sub-areas 1A to 1F
- 15% of the TAC is evenly distributed between the NAFO sub-areas 1A to 1F
- Fixed fishing period (currently 44 days from a locally determined date when the lumpfish have roe. This was reduced down from an initial 47 days as per HCR due to reductions in CPUE).

The number of licenses issued by MFHA per year was:

**Table 24 Number of licenses 2015-2019**

Year	Licenses
2019	961
2018	879
2017	614
2016	606
2015	670



The above numbers of licenses are greater than the total number of active fishers as some fishers apply for two licences if operating across area boundaries. GFLK and KNAPK state that over 700 fishers now participate in the fishery.

Reporting is by logbook for vessels over 9.4m (30ft) and by landing declaration for vessels under 9.4m. Around 80% of landings are made by dinghies, i.e. less than 9.4m and requiring a landing declaration. The same information is requested from both reporting systems, including weight of all catch by species (and number of individuals when seabirds or marine mammals are caught as bycatch).

Weekly reporting is made to GFLK/MFHA from the processing centres, but when the TAC for an area is close to being exhausted, this reporting becomes daily. When the TAC is going to be reached, the MFHA issues an order to stop the fishery, which is published in the press and reported to all participants.

There is no discarding permitted, other than lumpfish carcasses. In this fishery the 'catch' is the roe of the lumpfish, but around 15% of carcasses are landed for sale to processors.

There are limitations of 2 nets for recreational lumpfish fisheries and these cannot be sold to processors, they can only be for the 'purpose of private use of the catch'; only licensed lumpfish fishers are permitted to sell the roe. The recreational catch of roe is negligible, estimated to amount to around 25 t per year (GINR, 2019).

## 7.5.2 Principle 3 Performance Indicator scores and rationales

### PI 3.1.1 – Legal and/or customary framework

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it:		
		<ul style="list-style-type: none"> <li>- Is capable of delivering sustainability in the UoA(s);</li> <li>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>- Incorporates an appropriate dispute resolution framework</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	There is an effective national legal system <b>and a framework for cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2	There is an effective national legal system and <b>organised and effective cooperation</b> with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.	There is an effective national legal system and <b>binding procedures governing cooperation with other parties</b> which delivers management outcomes consistent with MSC Principles 1 and 2.
	Met?	Yes	Yes	Yes
Rationale				
<p>The Greenland lumpfish fishery operates entirely within the inshore (3 nautical miles) of Greenland's West Coast, which is under the Greenland Self-Government's regulation and legal system. Should lumpfish be determined to be part of a wider stock that would be shared with Canada across the Davis Strait or perhaps links to the Icelandic stock, there is a mechanism through NAFO to establish a joint assessment of lumpfish with bilateral agreements between Canada and Greenland and Iceland and Greenland. <b>SG60 is met.</b></p> <p>The stated aim of the Fisheries Act is to ensure appropriate and biologically sound exploitation of Greenland's fish stocks, with emphasis on: conservation of resources and reproduction; keeping ecosystem impacts of fishing at acceptable levels; matching fishing opportunities with capacity; and, consideration of economic and social considerations related to the fishing industry, processing industry and other related industries. The Fisheries Act covers commercial and non-commercial fishing activities in Greenland's EEZ, Greenlandic commercial fisheries operating outside Greenland's EEZ and landings or transshipments from foreign fishing vessels operating in Greenland's EEZ. <b>SG80 is met.</b></p> <p>Protection of ETP stocks is implemented as Landstings Act no 29 of 18 December 2003 on the Protection of Nature. The main objective is to support the Government of Greenland on its implementation of the Biodiversity Convention and other closely related international agreements and to conserve the biodiversity in Greenland. Other Executive Orders under the Act include binding commitments to co-operate with other parties to ensure management outcomes consistent with principles 1 and 2 such as its membership of the Arctic Council, Fisheries Partnership Agreements with the European Union and agreements with Norway, Canada and Iceland. The lumpfish fishery is entirely within Greenland's EEZ and there are binding commitments to ensure sustainable practice and to ensure relevant parties co-operate through the Fisheries Council. <b>SG100 is met.</b></p>				
b	Resolution of disputes			
	Guide post	The management system incorporates or is subject by law to a <b>mechanism</b> for the	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution

		resolution of legal disputes arising within the system.	of legal disputes which is <b>considered to be effective</b> in dealing with most issues and that is appropriate to the context of the UoA.	of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>

#### Rationale

GFLK and the police initially warn and then fine or confiscate gear and catch using powers afforded by the Fisheries Act. However, Article 13 para 38 of the Fisheries Act 1996 establishes the right of stakeholders to appeal decisions and that these can be resolved by the District Court (in the case of the small- scale vessels operating in the lumpfish fishery) or the General Court for larger vessels and companies. **SG60 is met.**

Greenlandic Law requires compliance with judicial decisions. Unless otherwise agreed, a two-month period is stated under the Fisheries Act for an adequate response to judicial decisions. This is a transparent mechanism that is proven to be effective with various legal challenges regarding violations of fisheries regulations. **SG80 is met.**

Stakeholders (including GFLK) identified that legal disputes are proactively avoided through discussion of emerging issues, primarily through the Fisheries Council. The strength of the Fisheries Council in pro-actively avoiding legal dispute is illustrated through the agreement on numerous regulatory developments and management plans (such as lumpfish) that are discussed, and a proposal submitted to the MFHA. The Fishery Council process has therefore been tested and proven to be effective. **SG100 is met.**

Respect for rights				
<b>C</b>	Guide post	The management system has a mechanism to <b>generally respect</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>observe</b> the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.	The management system has a mechanism to <b>formally commit</b> to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

#### Rationale

The Greenland Fisheries Act “aims to ensure appropriate and biologically sustainable use of fish stocks.” It includes the requirement for the “rational and best utilization, according to usual biological advice and according to the recreational needs of the population.” The term “rational and best utilization according to biological advice “ makes sustainable exploitation implicit. Article 8 of the Act proposes technical measures, closed seasons and closed areas to protect natural resources, which is consistent with the objectives of MSC Principle 2. **SG 60 is met.**

The division of resources between inshore and offshore fisheries is an example of the mechanism by which the legal rights and customs of local people are respected. There is recognition of the legal rights of people dependent on fishing and this is implicit in the wording of the Fisheries Act (Article 1), as well as the allocation of a certain proportion of quotas to coastal fisheries. This indicates that the system observes the legal rights of fishery-dependent peoples **SG 80 is met.**

There is no formal commitment to legal rights that are explicitly stated and **SG100 is not met.**

#### References

- Greenland Fisheries Act, 1996 (amended)
- Government of Greenland Executive Order no. 6 of 21 May 2014 on fishing for lumpfish

- Landstings Act no 29 of 18 December 2003 on the Protection of Nature

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	95
Condition number (if relevant)	



## PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Roles and responsibilities			
	Guide post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>generally understood</b> .	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for key areas</b> of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are <b>explicitly defined and well understood for all areas</b> of responsibility and interaction.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The section above describes the organisations involved in fisheries management system in Greenland. These roles and the individuals representing are well understood by stakeholders **SG60 and SG80 are met**.

The organisation of the MFHA is well understood by stakeholders, as is the membership and role of the Fisheries Council. Article 12 of the Fisheries Act explicitly states the aspects of fisheries regulation where the Fisheries Council can advise.

Article 9 of the Act defines the role and responsibilities of the GINR.

Article 11 of the Act specifies the role of the GFLK.

These are therefore explicitly defined functions and roles. From discussions with stakeholders these are clearly well-understood for all areas of responsibility. **SG100 is met**.

Consultation processes				
<b>b</b>	Guide post	The management system includes consultation processes that <b>obtain relevant information</b> from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that <b>regularly seek and accept</b> relevant information, including local knowledge. The management system demonstrates consideration of the information and <b>explains how it is used or not used</b> .
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

The Fisheries Council (which meets monthly or more regularly at the request from a member organisation for an extraordinary meeting) is the main mechanism by which relevant information, including local knowledge is sought and accepted by the MFHA. **SG 60 is met**.

Any changes in legislation such as proposed Executive Orders are circulated for comment to a full range of stakeholders. The Fisheries Commission established in 2019 to draft a revised Fisheries Act will produce recommendations that will be reviewed by Parliament and proposals then put out to consultation. **SG80 is met**.

There is regular consultation between the fishermen's representatives in KNAPK and their members, which creates a direct link between the fishers and the MFHA.

The working group on the development of the management plan for lumpfish and the Fisheries Commission process illustrates the extensive consultation processes in place.

GFLK and MFHA produce press releases and media announcements to inform fishers of important developments and reporting requirements. MFHA has recently introduced a text alert system informing fishers directly to their mobile phones.

The management system also ensures there is feedback to the Fisheries Council and through reporting on those discussions, inform stakeholders of how information was used and not used in decision-making (MFHA, KNAPK pers. comms.) **SG100 is met.**

Participation				
<b>C</b>	Guide post		The consultation process <b>provides opportunity</b> for all interested and affected parties to be involved.	The consultation process provides <b>opportunity and encouragement</b> for all interested and affected parties to be involved, and <b>facilitates</b> their effective engagement.
	Met?		<b>Yes</b>	<b>Yes</b>

#### Rationale

Participation of the Fishers and Hunters association (KNAPK) and the Greenland Employers Association enables all interested and affected parties to be involved in consultation processes.

Any changes in legislation such as proposed Executive Orders are circulated for comment to a full range of stakeholders, including these groups whose membership extends to all participants in the fishery. **SG 80 is met.**

The Fisheries Council structure facilitates the effective engagement of all stakeholders as member organisations disseminate information to individual members. This is extremely difficult with a very widely dispersed group of stakeholders in remote locations, but there is evidence of efforts to facilitate effective engagement with the development of the lumpfish management plan involving a number of stakeholder seminars. **SG100 is met.**

#### References

- Greenland Fisheries Act, 1996 (amended)
- Lumpfish Management Plan (v3.0 2018)
- Fisheries Commission Terms of Reference (2019)

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	<b>≥80</b>
Information gap indicator	<b>Information sufficient to score PI</b>

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>100</b>
Condition number (if relevant)	

### PI 3.1.3 – Long term objectives

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are <b>implicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are <b>explicit</b> within management policy.	<b>Clear</b> long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are <b>explicit</b> within <b>and required by</b> management policy.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Partial</b>
Rationale				

The Greenland Fishery Act explicitly states “In the administration of this Act, emphasis must be placed on the biologically responsible conservation and reproduction of resources and on keeping the fishery’s impact on the ecosystem at an acceptable level. Moreover, emphasis is placed on the most rational and seasonally best exploitation in accordance with common biological advice and the recreational needs of the inhabitants”. This explicit statement is consistent with the Precautionary Approach.

The section above lists relevant objectives, which illustrate that clear long-term objectives are in place and that these are consistent with the MSC criteria for both Principles 1 and 2. **SG60 and SG80 are met**

As stated in the current Fisheries Partnership Agreement (FPA) between the EU and Greenland both parties are: “DETERMINED to cooperate, in their mutual interest, in securing continued responsible fisheries to ensure the long-term conservation and sustainable exploitation of marine living resources,” EC, 2007).

The Partnership Agreements and management plans, including the lumpfish management plan re-iterate the Fisheries Act and are therefore explicit within management policy, but this is not a stated requirement of management policy and therefore **SG100 is only partially met and a score of 90 is given.**

#### References

- EC (2007) FISHERIES PARTNERSHIP AGREEMENT between the European Community on the one hand, and the Government of Denmark and the Home Rule Government of Greenland, on the other hand.
- Greenland Fisheries Act, 1996 (amended)
- Lumpfish Management Plan (v3.0 2018)

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	<b>90</b>
Condition number (if relevant)	

## PI 3.2.1 – Fishery-specific objectives

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guide post	<b>Objectives</b> , which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>implicit</b> within the fishery-specific management system.	<b>Short and long-term objectives</b> , which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.	<b>Well defined and measurable short and long-term objectives</b> , which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are <b>explicit</b> within the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Partial</b>

### Rationale

The Lumpfish Management Plan re-states the Fisheries Act objectives introduced in 2010 that "In the administration of this Act, emphasis must be placed on the conservation and reproduction of resources and on keeping the fishery's impact on the ecosystem at an acceptable level. Moreover, emphasis is placed on the most rational and seasonally best exploitation in accordance with common biological advice and the recreational needs of the inhabitants". This represents long-term objectives consistent with the MSC criteria for both Principles 1 and 2.

The short-term objectives outlined in the Lumpfish Management Plan relate to the application of a TAC to be reviewed based on LPUE; effort limit including the removal of gear at the end of the fishery to avoid 'ghost fishing'; and by-catch management arrangements. These indicate short-term objectives that are consistent with P1 and P2 outcomes. The P1-related objectives are clearly measurable, related as they are to LPUE.

The definition of by-catch given in the Government's Executive Order no. 14 of 6 December 2011 states that all living organisms are covered when these are not part of the vessel's fishing permit. If individuals of the target species do not meet the minimum size, these are also to be considered as by-catches. It also states that all fish and shellfish must be brought ashore, unless stated in the license, and that the fishery must be stopped if the by-catch exceeds 10% by weight. The fishing must not resume less than 5 miles from the location of the net and must not return to the starting point before a minimum of 60 hours has elapsed. Finally, if Atlantic halibut are taken as by-catch in all but trawl fisheries, they must not be retained on board, but must be released live as far as possible. These are measurable short-term objectives relating to P2 outcomes. **SG60 and SG80 are met.**

**SG100 is partially met** as short and long-term objectives to achieve P1 outcomes are well defined and measurable. However, with the exception of the by catch rule in the legislation which gives a measurable objective, other P2 aspects of habitat ETPs, etc are less well defined than the P1 objectives and are not measurable. Therefore, a **score of 90 is given.**

### References

- Greenland Fisheries Act, 1996 (amended)
- Lumpfish Management Plan (v3.0 2018)
- Executive Order no. 14 of 6 December 2011 on the by-catch of the fishery
- Executive Order no. 2 of February 2016

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range

≥80

Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score

**90**

Condition number (if relevant)

## PI 3.2.2 – Decision-making processes

PI 3.2.2		The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery		
Scoring Issue		SG 60	SG 80	SG 100
a	Decision-making processes			
	Guide post	There are <b>some</b> decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are <b>established</b> decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
	Met?	Yes	Yes	
Rationale				

The Lumpfish Management Plan, Fisheries Act and Executive Order no 2 of 2016 on fishing for lumpfish, describe the measures and strategies to ensure the continued sustainable exploitation of the lumpfish fishery. Data is collected on the basis of landings declarations, logbooks and purchases, i.e. factory landings, at the production site, which reports to GFLK. All lumpfish roe is landed to fish plants and recorded in an electronic database. This information is then provided to GINR to undertake stock assessment based on Landings Per Unit Effort (LPUE). Based on the stock assessment and advice by GINR, MFHA sets the TAC per area. The annual proposals are presented and discussed at Fisheries Council, including to KNAPK, who pass this information to members. These processes were set out in the Lumpfish Management Plan, which was reviewed in 2016 and a version 3 of the plan (2018) is currently in place.

These decision-making processes are explicit in the Management Plan, the Fisheries Act and the Executive Orders relating to the lumpfish fishery. These are all well established and result in measures and strategies to achieve the objectives therefore **SG60 and SG80 are met**.

Responsiveness of decision-making processes				
b	Guide post	Decision-making processes respond to <b>serious issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to <b>serious and other important issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to <b>all issues</b> identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	Yes	Yes	No
	Rationale			

The decision-making processes specified in the management plan enable a response to serious issues such as significant changes to LPUE or by-catch. Should a response to changes in LPUE be required, to date the management response has been on reducing the number of fishing days permitted in the season (down from 47 days to 44). **SG60 is met**.

The structure involving the Fisheries Council with a broad membership considering all fisheries matters in Greenland, coupled with review of the plan (which has been carried out as proposed) enables the plan to be adaptive in a transparent and timely manner. KNAPK undertake information campaigns following a recognition that reporting needed to be improved. GFLK carried out targeted control activities to improve gear marking and reduce the amount

of abandoned gear in lumpfish fisheries. There are also annual lumpfish stakeholder meetings that discuss a wide range of issues arising, with permanent agenda items being LPUE results, stock assessment and bycatch rates. These meetings result in either revisions to the Lumpfish Management Plan or other actions to be implemented by MFHA or GFLK. These illustrates the timely and adaptive manner in which decision-making processes respond to serious and other important issues. **SG 80 is met.**

The management systems did respond to changes in LPUE, reducing the fishing season in accordance with the HCR. It is also expected that management will respond to, the issues of reporting raised in Christensen et al, 2019 but this will not be apparent until closer to the new lumpfish season. However, it is not evident as yet that decision-making processes would respond to **all** issues arising from research, monitoring and evaluation (such as by-catch or more localised issues). **SG100 is not met.**

Use of precautionary approach			
<b>C</b>	Guide post	Decision-making processes use the precautionary approach and are based on best available information.	
	Met?	Yes	

#### Rationale

The uncertainties identified in elements of the assessment have led to the adoption of a precautionary 90 per cent of proposed TAC, allocated on a 85/15 basis that enables further precaution.

The best available information is used for the determination of TAC and other decisions pertinent to the fishery. The lumpfish meetings held each year Include P2 related aspects as evidence of PA. **SG80 is met.**

Accountability and transparency of management system and decision-making process				
<b>d</b>	Guide post	Some information on the fishery's performance and management action is generally available on request to stakeholders.	<b>Information on the fishery's performance and management action is available on request</b> , and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders <b>provides comprehensive information on the fishery's performance and management actions</b> and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	Yes	Yes	No

#### Rationale

Biological advice is provided by GINR each autumn, which is considered at a hearing of the Fisheries Council. The minutes of Fisheries Council meetings are available to those requesting it **SG60 is met.**

The MFHA then enacts the advice agreed upon, which is also announced. GFLK will also provide information on enforcement activity and punitive actions on request. Information in terms of catch and by-catch is publicly available through annual statistical publications (Statistics Greenland, 2019). The lumpfish management plan is now well-established and the latest iteration (v3.0 published on the MFHA website) that the provision of information and management responses have occurred as per the plan. Minutes of the Fisheries Council, included within these a summary of the assessment, are available to stakeholders on request. **SG80 is met.**

There is not a clear process showing that formal reporting on management actions or inaction would occur. Annual discussions on lumpfish within the Fisheries Council and a summary of discussions at the annual lumpfish-specific meetings are available to stakeholders on request but are not published and therefore **SG100 is not met**.

Approach to disputes				
e	Guide post	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	Yes	Yes	Yes
Rationale				

A two-month limit for the government departments to take action is explicitly stated in Fisheries Act, which in relation to disputes can be considered timely. **SG60 and SG80 are met**.

The Fisheries Council is a mechanism that proactively avoids conflict and legal challenge. In Greenland, where fisheries is the main economic sector and accounting for over 95% of exports, fisheries matters are discussed at length and in great detail in the Parliament and through general committee processes. The lumpfish management plan processes are also well defined and were widely consulted upon. **SG 100 is met**.

#### References

- Executive Order no. 2 of February 2016
- MFHA (2018) Lumpfish Management Plan v3
- Statistics Greenland (2019) Greenland in Figures

#### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

#### Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	85
Condition number (if relevant)	



### PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	MCS implementation			
	Guide post	Monitoring, control and surveillance <b>mechanisms</b> exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A <b>comprehensive</b> monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>

#### Rationale

Control measures are defined within the lumpfish management plan and have been demonstrated across a number of fishing seasons. Many of these (vessel licensing, fishing seasons, gear specifications, compulsory reporting of landings and sales/processing monitoring) are under the General Fisheries Law and Executive Orders. The landings of this fresh product have been shown to respect the vessel licensing system and the fishing season. The comparatively limited recreational catch of roe is managed via a two-net restriction and the need for commercial license to sell the roe to processors.

GFLK has demonstrated an ability to enforce MCS mechanisms in the fishery, such as checking landing declarations and logbooks against sales notes. There is a mechanism by which landings from the lumpfish fisheries are monitored on a weekly and (when closer to the TAC being reached) a daily basis. There are also initiatives to remove unlabelled fishing gear and gear found in the water outside of the fishing season. These MCS mechanisms are implemented and there is a reasonable expectation that they are effective **SG60 is met**.

The MCS system includes requirements for GFLK to monitor fishing activity and that fishers correctly report catches of the target species and all other catch. There is a recognition by GFLK that the level of control on this element for this small-scale fishery over the area of the West Greenland is limited. GFLK cross-checks landings declarations and logbooks with sales notes and processing activity. There is evidence that the MCS system is effective in ensuring the TAC is not exceeded, that fishing seasons are complied with, as well as other regulatory requirements such as gear marking. However, it is less certain that the requirements to retain and report all by-catch of non-target species are controlled and the fisher self-reporting can be verified to the same extent as for the target species. The information gathering on by-catch is solely based on self-reporting by the fishers, but there is no independent verification of that reporting. **SG80 is not met**.

Sanctions				
<b>b</b>	Guide post	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, <b>are consistently applied</b> and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and <b>demonstrably</b> provide effective deterrence.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>

#### Rationale

Article 13 of the Fisheries Act outlines sanctions in terms of fines etc. and how they are to be applied. GFLK and other stakeholders have identified that they are applied consistently. **SG60 is met**.

Confiscation of nets in the water, fines etc. have been shown to provide effective deterrence. They are therefore thought to provide effective deterrence in the lumpfish fishery and **SG80 is met**.

However, there is no evidence that these proposed sanctions provide a demonstrably effective deterrent and therefore **SG100 is not met**.

Compliance				
<b>C</b>	Guide post	Fishers are <b>generally thought</b> to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery.	<b>Some evidence exists</b> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.	There is a <b>high degree of confidence</b> that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.
	Met?	<b>Yes</b>	<b>No</b>	<b>No</b>
Rationale				

Sales reporting received by MFHA from fishers via the buyers appears to provide an effective system of data collection and demonstrates a level of compliance. GFLK and fisher groups suggest that fishers generally do comply with the management system and do provide the information necessary to manage the fishery, not least catch levels to enable CPUE to be determined. **SG60 is met**.

By-catch reporting relies on self-reporting (whereas landed commercial catch is recorded and corroborated with sales notes). There are indications (such as in Christensen et al, 2019) that catch of non-target species like bird by-catch may be under-reported in the fishery and there is no evidence to demonstrate that fishers comply with these aspects of the management system. **SG80 is not met**.

Systematic non-compliance				
<b>d</b>	Guide post	There is no evidence of systematic non-compliance.		
	Met?		<b>Yes</b>	
Rationale				

GFLK presents an annual report and state that there is no evidence of systematic noncompliance. **SG80 is met**

References	
<ul style="list-style-type: none"> <li>Christensen et al, 2019 Bycatch in the lumpfish (<i>Cyclopterus lumpus</i>) fishery in the Nuuk area, West Greenland, during the 2019 fishing season. Greenland Institute Of Natural Resources, July 2019</li> <li>GFLK Annual Report 2018</li> <li>Government of Greenland Executive Order no. 15 of 22 December 2011 on reporting of catches in coastal fishery.</li> <li>Government of Greenland Executive Order No. 4 of 30 March 2017 on Regulation of Fisheries through Technical Conservation Measures.</li> <li>Government of Greenland Executive Order no. 7 of 4 April 2016 on reporting of purchases of fish and fishery products</li> <li>Government of Greenland Fisheries Act 1996 (updated)</li> </ul>	

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
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Information gap indicator

Information sufficient to score PI

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score

**70**

Condition number (if relevant)

**Condition 5**

## PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives There is effective and timely review of the fishery-specific management system		
Scoring Issue		SG 60	SG 80	SG 100
<b>a</b>	Evaluation coverage			
	Guide post	There are mechanisms in place to evaluate <b>some</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>key</b> parts of the fishery-specific management system.	There are mechanisms in place to evaluate <b>all</b> parts of the fishery-specific management system.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Rationale				

A review of the lumpfish management plan was conducted in 2016 as per the stated review process. The present version of the management plan version 3 (2018) “will be reassessed after two consulting periods in 2020, unless there are circumstances that require a prior change.” **SG60 and SG80 are met.**

The review mechanism requires that the Fisheries Council be involved in evaluation and approval of the management plan and all relevant Executive Orders, equating to all parts of the fishery-specific management system. The changes made between versions are presented in the latest iteration of the management plan and demonstrate that all parts of the management system are evaluated and amended if necessary. **SG 100 is met.**

<b>b</b>	Internal and/or external review			
	Guide post	The fishery-specific management system is subject to <b>occasional internal</b> review.	The fishery-specific management system is subject to <b>regular internal</b> and <b>occasional external</b> review.	The fishery-specific management system is subject to <b>regular internal and external</b> review.
	Met?	<b>Yes</b>	<b>Yes</b>	<b>No</b>
Rationale				

The West Greenland Lumpfish fishery is a Greenland-managed fishery that is regularly reviewed by the management authorities and the Fisheries Council. **SG60 is met**

Expertise in addition to GINR is provided primarily from Danish institutions such as Aarhus University and Roskilde University on environmental issues and DTU Aqua on fisheries aspects. Occasional external review is conducted as part of obligations under the Danish block grant. **SG80 is met.**

These external assessments are not a regular scheduled review by external reviewers of the fisheries management system. **SG100 is not met.**

### References

- MFHA, 2018. Lumpfish Management Plan v3 (2018)

### Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	≥80
Information gap indicator	Information sufficient to score PI

Overall Performance Indicator scores added from client and Peer Review Draft Report

Overall Performance Indicator score	90
Condition number (if relevant)	

## 8 References

- Garcia-Mayoral E., Olsen M., Hedeholm R., Post S., Nielsen E. E. and Bekkevold D. 2016. Genetic structure of West Greenland populations of lumpfish *Cyclopterus lumpus* Journal of Fish Biology (2016) doi:10.1111/jfb.13167, available online at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)
- Kennedy, J., Durif, C. M. F., Florin, Ann-B., Fréchet, A., Gauthier, J., Hússy, K., Jónsson, Sigurðurþór, Ólafsson, Halldór G., Post, S., and Hedeholm, R. B. 2018. A brief history of lumpfish fishing, assessment, and management across the North Atlantic. – ICES Journal of Marine Science, doi:10.1093/icesjms/fsy146.
- MFHA, 2018. Forvaltningsplan for stenbiderfiskeriet 2018 (Management plan for lumpfish fishery 2018) Department for Fishery, Hunting and agriculture
- PINNGORTITALERIFFIK 2017. Lumpfish limit reference points. Greenland Institute of Natural Resources Nuuk, 6/7 2017 Jr.nr: 3702-00
- PINNGORTITALERIFFIK 2019. Assessment of lumpfish (*Cyclopterus lumpus*) in West Greenland based on commercial data 2010-2019. Greenland Institute of Natural Resources Nuuk, July 2019
- DNV GL 2015 Initial assessment of the Greenland lumpfish fishery. Public Certification Report for Sustainable Fisheries Greenland. DNV GL Report No.: 2014-018, Rev. 5 Certificate No.: F-DNV-165369 Date: 2015-08-13. Authors Lassen Hans, Lockwood Stephen, Cappell Rod, Meldre Pedersen Guro
- Davenport J. 1985. Synopsis of the biological data on lumpsucker *Cyclopterus lumpus* (Linnaeus, 1758). FAO Fisheries synopsis No. 147. Rome 1985.
- FAO <http://www.fao.org/3/x5685e/x5685e04.htm>

## 9 Appendices

### 9.1 Assessment information

#### 9.1.1 Previous assessments

The West Greenland lumpfish fishery was first assessed in 2015, see Lassen et al (2015) available at <https://fisheries.msc.org/en/fisheries/greenland-lumpfish/@assessments>.

The assessment of the lumpfish was based on an RBF process.

The 2015 assessment found that the fisheries achieved a score of less than 80 for six individual performance indicators and therefore six appropriate conditions had been raised. Three recommendations were also made by the assessment team. The conditions and their status are summarised in Table 25.

**Table 25 Summary of Assessment Conditions in the 2015 Assessment**

Condition	PI(s)	Year closed	Justification
<b>1:</b> The client should present evidence that the harvest strategy is achieving its objectives.	1.2.1	SA4- (2019)	GINR presented a study of the performance of the HCR and found that the HCR will meet the criterion that the stock will fluctuate around the target value.
<b>2:</b> The client should ensure that well defined harvest control rules are in place that are consistent with the harvest strategy and ensures that the exploitation rate is reduced as limit reference points are approached.	1.2.2	SA 3 (2018)	A revised management including reference points was institutionalised in 2018. These points are included in the HCR embedded in the management plan.
<b>3:</b> It should be established whether Brünnich's guillemot is a by-catch species in the lumpfish fishery and its population status. If a by-catch of the lumpfish fishery and outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding.	2.2.1	SA2 (2017)	The reporting of the by-catches has been upgraded based on a change in the statistical requirements to the fishery. Data have been presented and analysed.
<b>4:</b> The client shall provide evidence that the partial strategy will work and is being implemented effectively	2.2.2	SA2 (2017)	Better knowledge on the by-catch of Brünnich's guillemot in the lumpfish fishery, Rosing Lund (2016) and Merkel (pers. Comm.)  Based on the data collected under the new statistical regulation it is demonstrated that the fishery is not a risk to fish by-catches, sea birds and marine mammals. The data form the basis for a partial strategy that allows management to regulate the fishery if required.

Condition	PI(s)	Year closed	Justification
<b>5:</b> Ensure quantitative 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.	2.2.3	SA2 (2017)	Reporting of the by-catches has been upgraded based on a change in the statistical requirements to the fishery. Data on the catch profile in the lumpfish fishery for 2016 and 2017 have been presented and analysed.
<b>6</b> The client should present a research plan that provides the management system with a strategic approach to research and reliable and timely information sufficient to achieve the objectives consistent with MSC's Principles 1 and 2.	3.2.4	SA 1 (2016)	Research plan presented

### 9.1.2 Small-scale fisheries

**Table 26 Small-scale fisheries**

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
UoA-1	100%	100%



## 9.2 Evaluation processes and techniques

### 9.2.1 Site visits

The ACDR was prepared as a desk -study based on public available information and input from the Client (SFG). Site visits were scheduled to be held on 12<sup>th</sup> and 13<sup>th</sup> of September 2019.

The CPRDR/PCDR is prepared based on a site visit to Nuuk, Greenland on 12th and 13th September 2019. Stakeholders were informed 30 days before the site visit and given the opportunity to provide information in advance. Information from the client and stakeholders was reviewed by the assessment team before the on-site meetings. In some cases, information was not available at the on-site meeting but was supplied within the cut-off date requirements in FCP v.2.1. Table 27 provides details on who was met, and the topics discussed.

**Table 27 Site visit 12-13 September 2019 at Nuuk, Greenland.**

Meeting	Topics	Name and organisation
Stakeholder meeting by Skype: Birdlife International 11.09.2019	Bird populations affected by the lumpfish	Rory Crawford- Birdlife International
Client meeting 12.09.2019	<ul style="list-style-type: none"> <li>- Review of basic info about the company: <ul style="list-style-type: none"> <li>• Ownership or organizational structure</li> <li>• Roles and responsibilities in the MSC Fisheries certification process</li> </ul> </li> <li>- Vessel/certificate member list</li> <li>- Change in personnel in science, management or industry and their impact on the management of the fishery;</li> <li>- Changes to the fishery and its management; Any changes to regulations;</li> <li>- Review of fishing operations: Fishing season, allocation of fishing days, fishing areas and gear used (specifications)</li> <li>- Review of impact on ecosystem: <ul style="list-style-type: none"> <li>• all by-catch of fish species (species and quantities 5 preceding years)</li> <li>• by-catch of marine mammals, birds, ETP species (species and quantities)</li> <li>• Recording of bycatch of fish and shellfish species, marine mammals, ETP species and birds</li> <li>• Discarding practices</li> <li>• Overlap of the fisheries with sensitive habitats and closed areas</li> </ul> </li> <li>- Compliance with rules and regulations: Control, surveillance and monitoring routines Disputes with national/ international authorities during 2018/2019</li> <li>- Records of sanctions and penalties (if any) for 2018/2019</li> <li>- Performance in relation to conditions of certification</li> <li>- Any developments or changes within the fishery which impact traceability and the ability to segregate MSC from non-MSC products <ul style="list-style-type: none"> <li>• Traceability system on board and at landing</li> <li>• Labelling of products/changes in labeling of products</li> <li>• List of landing sites in 2017/2018</li> <li>• First point of landing</li> <li>• First point of sale</li> <li>• Main products/change in product range</li> <li>• Main markets</li> </ul> </li> <li>- IPI issues</li> <li>- Any other significant changes in the fishery</li> </ul>	<ul style="list-style-type: none"> <li>-Kristina Guldbæk, SFG</li> <li>-Rasmus Hedeholm, SFG</li> <li>-Lisbeth Schönnemann-Paul, SFG</li> </ul>

-Ministry of Fishing, Hunting and Agriculture  -Ministry of Environment-Greenland halibut 12.09.2019	- Changes in personnel in science, management or industry and their impact on the management of the fishery; - Changes in the Regulatory framework and fishery management system (objectives, mechanisms for decision-making, monitoring, control, inspection, evaluation), including compliance of the certified fleet; - Changes affecting the 'management loop' (outcome, management, information) assessed in the initial certification process for the certified species and the other species impacted by the fishery, as well as for marine habitats and ecosystems impacted by the fishery;	-Denise Schroeder, APNN -Emanuel Rosing, Government of Greenland -Ditte Marie Hjertm Government of Greenland -Anders Bjørn Larsen, Government of Greenland.
Control, Monitoring and research:  GFLK, GINR, KNAPK 13.09.2019	- Change in personnel in science, management or industry and their impact on the management of the fishery; - Changes to the fishery and its management; Any changes to regulations; - Changes in the Regulatory framework and fishery management system (objectives, mechanisms for decision-making, monitoring, control, inspection, evaluation), including fisheries statistics systems and compliance of the certified fleet; - Any change affecting the 'management loop' (outcome, management, information) assessed in the initial certification process for the certified species and the other species impacted by the fishery, as well as for marine habitats and ecosystems impacted by the fishery; - Changes to the scientific base of information, including stock assessments; - Status of by-catch species including birds and marine mammals - Fisheries and hunters' statistics - Status of the Greenland lumpfish population - Status of bird populations affected by the Greenland lumpfish fishery - Marine mammals affected by the Greenland lumpfish fishery	-Tønnes Berthelsen, KNAPK -Mads T Nedergaard, GFLK -Signe Hansen, GFLK - Flemming Merkel (on Skype) GINR -Nynne Nielsen, GINR -Aqqalu Rosing-Asvid, GINR -Helle Torp Christensen, GINR -Adriana Nogueira, GINR

## 9.2.2 Stakeholder participation

There was no stakeholder participation for the ACDR.

Thirty days prior to the site visit, all stakeholders were informed of the visit and the opportunity to provide advance information to the auditors or to meet with the team during the site visit. DNV GL received a request from Birdlife International for participation at the site visit, but no written submissions regarding the Greenland lumpfish fishery. The Birdlife International request was planned for the 12<sup>th</sup> of September 2019 but was later facilitated to the 11<sup>th</sup> September 2019 at the stakeholder's request.

The participants present at the different stakeholder meetings in Nuuk, Greenland on the 12<sup>th</sup> and 13<sup>th</sup> September 2019 are given in Table 27 above.

## 9.2.3 Evaluation techniques

The ACDR was based on a desk-top study with information from the client on request, and the client document checklist.

Information on the reassessment process was made publicly available through [www.msc.org](http://www.msc.org) at given stages of the assessment as outlined in Table 3. DNV GL published the reassessment announcement along with the Announcement Comment Draft report on 12th August 2019. These were published on the MSC website and followed by stakeholder notifications by direct emails.

In addition to that, all relevant stakeholders identified at the beginning of the original assessment were reached through direct e-mails and given a possibility to monitor the assessment process and provide feedback to the assessment team. Relevant main stakeholders were interviewed in September 2019 as outlined in sections 9.2.1 and 9.2.2 above.

Information gathered is presented in this report and in the enclosed scoring tables. As no stakeholder comments were submitted during the stakeholder consultancy period prior to the site visit in Nuuk, Greenland, information gathered during the site visits formed the main basis of the stakeholder consultancy for this assessment.

The interviews were based on audit agenda sent to all involved stakeholders.

At these meetings, it was confirmed that the fishery has developed as in previous years and that there were no changes in the management, control and enforcement of the fishery.

The default assessment tree from the MSC Fisheries standard v 2.01 Annex SA was used for the scoring of the reassessment.

Information was reviewed by the assessment team at the scoring meetings held on 14th and 15th September, in Nuuk, Greenland. The team finalised scoring through Skype meetings on the 31st October 2019 as well as by email exchange.

After all relevant information was compiled and analysed, the assessment team scored the Unit of Assessment against the Performance Indicator Scoring Guideposts (PISGs) in the final tree. The team discussed evidence together, weighed up the balance of evidence and used their judgement to agree on a final score following MSC FCP v2.1 process and based on consensus. Each scoring issue was scored and then averaged to principle scores. Individual Performance indicators were scored. Scores for individual PIs were assigned in increments of five points. Any divisions of less than five points were justified in the relevant scoring table. Scores for each of the three Principles were reported to the nearest one decimal.

Some scoring issues do not have a scoring guidepost at each of the 60, 80 and 100 levels. The scoring issues and scoring guideposts are cumulative; this means that a PI is scored first at the SG60 levels. If not all of the SG scoring issues meet the 60 requirements, the fishery fails, and no further scoring occurs.

If all of the SG60 scoring issues are met, the fishery meets the 60 level, and the scoring moves to SG80 scoring issues. If no scoring issues meet the requirements at the SG80 level, the fishery receives a score of 60. As the fishery meets increasing numbers of SG80 scoring issues, the score increases above 60 in proportion to the number of scoring issues met; PI scoring occurs at 5-point intervals. If the fishery meets half the scoring issues at the 80 level, the PI would score 70; if it meets a quarter, then it would score 65; and it would score 75 by meeting three-quarters of the scoring issues. If the fishery meets all of the SG80 scoring issues, the scoring moves to the SG100 level. Scoring at the SG100 level follows the same pattern as for SG80.


MSC do not require the SG100s to be assessed (or rationales provided) when all of the scoring issues within the SG80 level are not met, as per FCR 7.10.5.3, except in cases where obtaining a combined scoring element PI score require it (7.10.7). However, if the assessment team judge that it would be useful to assess the SG100s they may do so – ref. interpretation log <https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218>

The assessment has followed the interpretation log and scored all SG100s.

The final scores are based on group consensus within the assessment team. During the scoring process the assessment team discussed the information available for evaluating PIs with the intention to develop a broad opinion of performance of the fishery against each PI thus assuring that the assessment team was aware of the issues for each PI. Subsequently, the assessment team member responsible for each principle discussed the relevant scoring tables and provided provisional scores. The assessment team members reviewed the rationales and scores, and recommended modifications as necessary, including possible changes in scores. PI scores were entered into MSC's Fishery Assessment Scoring Worksheet (Table 16) to arrive at Principle-level scores.

The assessment team recommends the reassessment certification as the weighted average score is 80 or more for all the three Principles and all individual scoring issues are met at the SG60 level.

Conditions are set where the fishery fails to achieve a score of 80 to any Performance Indicators. Conditions with milestones are set to result in improved performance to at least the 80 level within a period set by the assessment team. The client is required to provide a client action plan to be accepted by the assessment team. The client action plan shall detail:

- 
- how conditions and milestones will be addressed
  - who will address the conditions
  - the specified time- period within which the conditions and milestones will be addressed
  - how the action(s) is expected to improve the performance of the UoA
  - how the CAB will assess outcomes and milestones in each subsequent surveillance or assessment
  - how progress to meeting conditions will be shown to CABs.

Principle scores result from averaging the scores within each component, and then from averaging the component scores within each Principle. If a Principle averages less than 80, the fishery fails.

Based on the evaluation of the fishery presented in this report the assessment team recommends the certification of the Greenland Lumpfish fishery, with five conditions and three recommendations, for the client Sustainable Fisheries Greenland.

## 9.3 Peer Review reports

### 9.3.1 PEER REVIEWER A:

Fishery	Assessment Start Year	Peer Reviewer (A/B/C)	Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Greenland lumpfish	2019	PR A	Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	The assessment team has been thorough in applying the standard. The most significant concern I have found is associated with the use of reference point proxies, and stock health in relation to them (see PI 1.1.1, Scoring Issues A&B).	Thank you for the comment this is addressed in answers to specific PI's.
Greenland lumpfish	2019	PR A	Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	The five conditions identified address important deficiencies. I note that the conditions are sometimes dependent on the successful outcome of another condition. Timing and scheduling therefore is important, and I offer some comments on that.	Thank you.
Greenland lumpfish	2019	PR A	Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		n/a	
Greenland lumpfish	2019	PR A	Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	More detailed figure and table captions would be helpful. For example, it should be noted that estimates of bycatch are made from self-reported values. Also, more information needs to be provided on how the final estimates of stock wide removals are made. It appears to be based on sampling of the catch by processors but also includes some	Thank you for the comment. The discussion of self-reporting is related to the nature of the Greenland society and the possibilities for a black market. The largest town Nuuk has around 15,000 inhabitants (total population in Greenland is around 56,000 inhabitants) and there are no

					extrapolation. More details should be provided.	simple routes for export for the main buyer Royal Greenland, which is publicly owned. Particularly, that there is a need to process the roe suggests that the landing data are generally accurate.
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Fishery	Year	UoA stock	UoA gear	PR (A/B/C)		PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.1.1	Yes	No (no score change expected)	NA	<p><b>Scoring Issue A.</b> While I accept the conclusion that catch rates are higher than those expected at the point of recruitment impairment, the report needs to be clearer how the PRI was determined. Clearly, it is a proxy based on a short (10 yr) long time series, and it seems like the FCR guidance (PRI=20%B0=1/2BMSY) has been used. This should be stated more explicitly. Note that Section 2.2 of the PRDR seems to equate Blim and Btrigger, which is confusing (inconsistent with Fig. 2) and needs to be revised.</p> <p>The GINR stock assessment document is not readily available online. I thank the PRC and CAB for quickly getting it for me. Unfortunately, the assumptions concerning the reference points were not well defined there either. More effort is needed in the PRDR</p>	The original assessment included a condition to define reference points which were done in 2017. The reference to this setting of the reference points are (as noted in the report under PI 1.1.1) PINNGORTITALERIFFIK 2017. Lumpfish limit reference points. Greenland Institute of Natural Resources Nuuk, 6/7 2017 Jr.nr: 3702-00. The key argument provided in the study is "The assessment and scientific advice for West Greenland lumpfish is based on a Landing per Unit Effort (LPUE) target. This target is the average of the 2010-2013 LPUE. A limit reference points should be set according to a certain level of this target LPUE. The advisory rule is a sliding rule, but no lower limit on fishing pressure has been set (Blim). The spawning component is believed to be comprised of relatively few cohorts; primarily	Accepted (no score change)

to define the reference points, and justify their determination (which appears to be rather arbitrary).

three and four year- olds. If this is indeed the case overfishing can lead to rapid stock decline assuming a strong spawner-recruit relationship. Because lumpfish is a nest-guarding species this is believed to be the case. Therefore, it is necessary to be relatively cautious when setting a Blim. The stock does not appear to have been reduced to a level that has impaired the recruitment and furthermore the fishery is relatively new. Assuming that the stock is somewhere between a virgin biomass (K) and the optimal level from an exploitative viewpoint (BMSY) a Blim of:  
 $0.5 * LPU_{\text{target}} = 0,5 * 213 \text{ kg roe pr. landing} = 106,5 \text{ kg roe pr. landing}.$   
 The Btrigger is set based on this value applying a buffer based on a CV of 20%.  
 The application of the 0.5 rule is based on an analysis is based on Caddy and Mahon (1996), Chapter 2.5. They report on a survey of 91 stock and recruitment data sets for Europe and North America suggest that for stocks considered to have average resilience, a biomass level of 20% of the unfished level should be considered a recruitment based LRP. In the case of little-known stocks, the LRP should be set at

										<p>30% of the unfished biomass level. The theoretical analysis by Mace (1994) supported these recommendations and suggested that these results may be applicable to stocks outside the North Atlantic. The LPUE 2010-2013 is at a high level and the fishery was rather new at the time. Application of a 50% rule was, until better data are available considered to be precautionary.</p> <p>References:</p> <p>Caddy J. and Mahon  <a href="http://www.fao.org/3/v8400e/V8400E02.htm#ch2.5">http://www.fao.org/3/v8400e/V8400E02.htm#ch2.5</a></p> <p>Mace, P.M. 1994. Relationships between common biological reference points used as thresholds and targets of fisheries management strategies. Canadian Journal of Fisheries and Aquatic Sciences 51:110-122.</p> <p>Gabriel Wendy L. and Mace Pamela M. 1999. A Review of Biological Reference Points in the Context of the Precautionary Approach Proceedings, 5th NMFS NSAW. 1999. NOAA Tech. Memo. NMFS-F/SPO-40.</p>	
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.1.1	Yes	No (material score reduction expected to <80)	NA	<p><b>Scoring Issue B.</b> It is less obvious that the stock is fluctuating around Bmsy based on Fig. 2. The median estimates of three of the four most recent values are less than Bmsy proxy. Better support for this conclusion is</p>	<p>Thank you for the comment. There are only proxies for both Biomass and Fishing mortality available and the standard's FCR § SA 2.2.4 allows that fishing mortality proxies be used for scoring. Because proxies are used the general</p>	Accepted (no score change)



								needed.	uncertainty of the stock assessment is considerable. Therefore, a precautionary approach has been taken to setting of reference points. Concerning the evaluation whether the 2010-2013 is a MSY approximate level or not, this judgement is drawn based on the development of the fishery, the fishery had been at a stable level since around 2005 and before that the fishery was clearly developing. Based on the extent of the Greenland coast and the limited fishery it was considered that the exploitation could not be very extensive and there were and are no signs of over-exploitation, e.g. fished out grounds. As the fishery is only on the spawning component and because there only what seems to be about 2 year- classes in the fishery one would not expect the length composition to be an effective exploitation indicator. If the stock is below BMSY and at the same time lightly ( $F < F_{MSY}$ ) exploited, I propose that the reference points should be revisited.	
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.1.2			<p>The PRDR seems to rely upon the exploitation rate figure (Fig. 4), which shows that recent exploitation rates were <math>&lt; F_{msy}</math>. But that information tells us nothing about biomass levels. The stock could be <math>&lt; B_{msy}</math> and be lightly exploited.</p> <p>The PRDR states that "The 2010-2013 F level is considered to be at an approximate FMSY level". How was this determined, please explain.</p>	Not scored in the PRDR	NA

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.1	No (no score change expected)	Yes	NA	Scoring agreed for all scoring issues. However, I would suggest including more background (observer reports, for example) to substantiate the claim that relatively few males are caught in the fishery.	The fishery is for roe, the mesh size will not catch many males because of the size difference between males and females (mesh size 260 mm), and finally there are very few males on the market.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.2	Yes	No (scoring implications unknown)	NA	Scoring Issue A. According to the FCR, to achieve a score of 100 "most of the time" means at least 70% of the duration of the time series. Fig. 2 suggests only 60% of the LPUE values were above the MSY proxy, although there is error around those estimates.	The Fishing mortality indicator suggests that $F < F_{MSY}$ has been observed at 8 out of 10 years, see PI 1.1.1b. One observation is just around the MSY proxy. The time series is very short.	Not accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.2	Yes	Yes	NA	Scoring Issue B. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.2	Yes	Yes	NA	Scoring Issue C. Scoring agreed, but the PRDR is meant to justify the use of a proxy for exploitation rate (see SA 2.5.7.1)	Thank you for the comment, the tools are supposed to assure that exploitation is restricted through effort control supplemented with a TAC. Text is clarified	Accepted (no score change)

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.3	No (no score change expected)	Yes	NA	<p>Scoring Issue A. The PRDR is missing a couple of recent references from Canadian Atlantic and Arctic waters that contain information on stock structure, productivity and generation time. These are:</p> <p>Simpson, M. R., J. Gauthier, H. P. Benoit, D. MacDonald, K. Hedges, R. Collins, L. Mello, and C. Miri. 2016. A pre-COSEWIC assessment of the Common Lumpfish (<i>Cyclopterus lumpus</i>, Linnaeus 1758) in Canadian Atlantic and Arctic waters. DFO Canadian Science Advisory Secretariat (CSAS) Research Document 2016/068:v + 135 pp.</p> <p>COSEWIC. 2017. COSEWIC assessment and status report on the Lumpfish <i>Cyclopterus lumpus</i> in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xi + 78 pp. (<a href="http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&amp;n=24F7211B-1">http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&amp;n=24F7211B-1</a>).</p>	Thank you, these references are inserted in the Report	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.3	Yes	Yes	NA	<p>Scoring Issue B. Please justify the statement on P. 37 that "The accuracy of the catch and effort statistics is good". How is this known?</p> <p>The annual frequency of stock assessments is noted and</p>	The catch statistics is checked based on information from the buyers. There are virtually no alternative routes for selling fish. Furthermore, the major buyer - Royal Greenland - is public owned.	Accepted (no score change)

									laudable, for a relatively small scale fishery.		
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.3	Yes	Yes	NA	Scoring Issue C. Please justify the statement on P. 38 that "the only other fishery of any significance....". How is this known?	The fisheries statistics is well established in Greenland. The system is very small and there are fisheries inspectors that visit the landing places.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	1.2.4	Yes	Yes	NA	Scoring Issues A-E inclusive. Scoring agreed. Please explain what SPiCT (population model) is. I imagine it is a surplus production approach but having a sentence or two explaining it would be helpful.	SPiCT is a stochastic surplus production model in continuous time (SPiCT), which in addition to stock dynamics also models the dynamics of the fisheries. This enables error in the catch process to be reflected in the uncertainty of estimated model parameters and management quantities. Benefits of the continuous-time state-space model formulation include the ability to provide estimates of exploitable biomass and fishing mortality at any point in time from data sampled at arbitrary and possibly irregular intervals. See Pedersen M. and Berg C. W. 2016 A stochastic surplus production model in continuous time. Fish and Fisheries. Wiley <a href="https://doi.org/10.1111/faf.12174">https://doi.org/10.1111/faf.12174</a>	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.1.1	Yes	Yes	NA	Scoring Issues A-B inclusive. Scoring agreed.	Thank you	Accepted (no score change)

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.1.2	Yes	Yes	NA	Scoring Issues A-E inclusive. Scoring agreed.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.1.3	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed. Please explain on what basis are "Landing records are highly accurate...." (P. 60) I understand that discards are prohibited, but how can we be certain that they do not occur?	This is an essentially inshore fishery with a high degree of scrutiny, inc. from other fishers. There is no incentive to discard fish, esp. in this highly selective fishery (non-target bycatch is <0.02% of total catch weight).	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.2.1	Yes	Yes	NA	Scoring Issue A-B inclusive. Scoring Agreed.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.2.2	No (no score change expected)	No (no score change expected)	Yes	Scoring Issues A-E inclusive. Scoring Agreed. However, there is evidence presented on Page 45/46 from Birdlife International studies that the self reported catch of seabirds is a considerable underestimate of the real mortality associated with the fishery. But the rationale presented on P. 61 does not seem to include that evidence, instead focussing on mortality from hunting. If colony sizes are indeed increasing to the extent noted in the PRDR, then I agree that the population size of eiders (for example) is not a concern. However, it would be	From our discussions with stakeholders, inc. with both fishers and with specialists on Arctic seabirds, it was concluded that whilst bird bycatch in this fishery is under-reported (as evidenced by the Birdlife International study - Christensen et al, 2019), this is not nearly on the same scale as hunting. The lumpfish fishery takes place over a short period in certain areas. Therefore we feel that, by raising two conditions (for secondary species management and information) we have been proportionate in addressing this issue.	Accepted (no score change)

								<p>appropriate to indicate that there is some evidence that fishery bycatch could be in the same order of magnitude as hunting, if I interpreting the results of the Birdlife study correctly (and recognizing there is a lot of extrapolation needed).</p> <p>It is therefore difficult to comment on the effectiveness of management measures, given the self reported nature of bycatch information, and the limited evidence that self reported estimates severely underestimate the real situation.</p> <p>The identified condition is critically linked to Condition 2 in my view. While the objective of reducing bycatch of unwanted species is of course laudable, I think there is an initial requirement to show that existing monitoring programs (particularly the self-reporting component) is providing precise and accurate estimates of bycatch. If it is not possible to demonstrate the adequacy of monitoring, then monitoring programs should be improved. Logically, the timeframe for Condition 2 should precede that of Condition 1.</p>	<p>Looking at the timeframe of Condition 1 (2.2.2 management and Condition 2 (2.2.3 information) we understand the point you raise. However, we do not see any real benefit in delaying Condition 1 until Condition 2 is fulfilled. We have therefore placed a statement at the end of the Condition Milestones that "It is noted that this condition is linked to Condition 2, in that robust information on 'out of scope' bird and sea mammal by-catch levels will be essential to inform the continuing need for these alternative measures to minimise UoA-related mortality of the unwanted catch. Annual surveillance reports assessing the progress of Condition 1 should acknowledge this linkage and inter-actions between the two issues".</p>	
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Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.2.3	Yes	Yes	Yes	Scoring Issues A-C inclusive. Scoring agreed. Condition 2 seems to be critically important.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.3.1	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed. As a point of information, Canada's authority on the status of endangered wildlife has determined that lumpfish in Canadian waters (including the eastern Arctic adjoining the UoA here) is Threatened. The Canadian government has not yet reached a conclusion on that recommendation, however. See COSEWIC 2017 for further details on the status determination.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.3.2	Yes	Yes	Yes	Scoring Issues A-E inclusive. Scoring agreed. The condition #3 seems reasonable and appropriate, but is three years really required to "provide evidence that a regular review of the potential effectiveness...."?	Thank you. The assessment team has jointly agreed upon the milestones.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.3.3	Yes	Yes	Yes	Scoring Issues A-B inclusive. Scoring agreed. Condition #4 appears reasonable and appropriate.	Thank you.	Accepted (no score change)

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.4.1	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.4.2	Yes	Yes	NA	Scoring Issues A-D inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.4.3	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.5.1	Yes	Yes	NA	Scoring Issues A. Scoring agreed.	Thank you.	Accepted (no score change)



Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.5.2	Yes	No (no score change expected )	NA	Scoring Issues A-C. Scoring agreed. However, on P. 52 it is noted that "Some lumpfish gillnets are left in the water after the 44 day season ends, either deliberately abandoned or for some reason not retrieved." While it is noted that attempts are made by authorities to retrieve such nets, I wondered if some were lost and therefore contribute to ghost fishing. Also in the document it is noted that the gillnets are preferentially set in high energy environments, therefore increasing the likelihood of loss. The report would benefit from some discussion of these issues, I believe.	A recommendation has been added that "The fishery is encouraged to retrieve all nets where possible at the end of the season to reduce the potential for the ghost fishing of abandoned, lost or discarded fishing gear".	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.5.3	Yes	Yes	NA	Scoring Issues A-D inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	2.5.3	Yes	No (non-material score reduction expected )	NA	Scoring Issue E inclusive. The assessment team awards a score of 100 to monitoring. This seems inconsistent with Conditions 2 and 4 which are intended to evaluate and improve monitoring. I suggest a score of 80 would be more appropriate.	We believe that these scoring issues have been dealt within Pls 2.2.3 and 2.3.3 and it would be punitive to reduce the score here as well for the same reasons, especially given the small spatio-temporal footprint of the fishery relative to its risk to the wider ecosystem.	Not accepted (no score change)

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.1.1	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.1.2	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.1.3	Yes	Yes	NA	Scoring Issues A. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.2.1	Yes	Yes	NA	Scoring Issues A. Scoring agreed.	Thank you.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.2.2	Yes	Yes	NA	Scoring Issues A-E. Scoring agreed.	Thank you.	Accepted (no score change)

Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.2.3	Yes	Yes	Yes	Scoring Issues A-D. Scoring agreed. Condition 5 seems reasonable and appropriate, and consistent with the Conditions raised under P1 and P2. I also note that there is a recreational fishery for lumpfish in the UoA, as indicated in the report. However, there is no information presented on the scale of the removals. For the information on MCS to be complete, some commentary on this fishery is also needed. Perhaps refer to GINR assessment document, which gives an estimate of 25 t/yr for this fishery.	Text added to background and scoring rationale re. recreational fishery: the comparatively limited recreational catch of roe is managed via a two-net restriction and the need for commercial license to sell the roe to processors.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland Coastal Waters, NAFO Subarea 1	Gillnet	PR A	3.2.4	Yes	Yes	NA	Scoring Issues A-C inclusive. Scoring agreed.	Thank you.	Accepted (no score change)

### 9.3.2 PEER REVIEWER B:

Fishery	Assessment Start Year	Peer Reviewer (A/B/C)	Question	Yes/No	Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables.	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)
Greenland lumpfish	2019	PR B	Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report?	Yes	There are two substantive issues that I raise in the review, which are i) the definition of reference points and ii) reliance on self-reporting data for scoring of out-of-scope / ETP bycatch, plus a few smaller things. Apart from this, however, the scoring is OK and the rationales are clearly written ('SG60 is met' 'SG80 is not met'). There is perhaps some confusion about procedure, e.g. for a SI in P2 with no applicable scoring elements, when to score 'n/a' and when to give it a default score; also in P2 adding up to get aggregate scores for PIs with several SIs plus several scoring elements. I suggest DNV double-check this has been done right.	Thank you for the comment. The two issues are addressed in the specific answers to the PI 1 and PI 2 indicators
Greenland lumpfish	2019	PR B	Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses]	Yes	In fact, based on experience in Iceland, I would suggest that the timeframe (milestones) for meeting the conditions about bycatch data is a bit ambitious.	Milestones for all 5 conditions have been revised to encompass the entire certification cycle.
Greenland lumpfish	2019	PR B	Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses]		not included - v.2.1	
Greenland lumpfish	2019	PR B	Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities?		n/a	

Greenland lumpfish	2019	PR B	Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary)	N/A	See 'PI comments' sheet for some comments about the associated background text (e.g. on bycatch). I did not go through the text as a proof reader, but I noticed some issues - e.g. Table/Figure references in the text with the wrong numbers. A map with the NAFO areas would be useful since they are extensively referred to. There are some unexplained acronyms (LPCUE? I assumed this was a typo). In general the text could use a bit of a proof read, except for the background text and rationales for P3 which are a model of concision and clarity; good work Rod!	Thank you for the comment, as noted LCPUE is a typo for LPUE and has been corrected in the report. A NAFO map has been inserted in the executive summary.
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Fishery	Year	UoA stock	UoA gear	PR (A/B/C)	PI	PI Information	PI Scoring	PI Condition	Peer Reviewer Justification (as given at initial Peer Review stage)	CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR)	CAB Response Code
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.1.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Sla. The scoring rationale lacks a justification for why LPUElim (LPUE 106.5kg/landing) is a suitable proxy for the PRI. The background in the report does not explain why this reference point was set at this value, and according to Figure 2, it is well below any LPUE in the recorded time series (which admittedly isn't very long). (Lacking any other information, the usual approach is to set Blim at the lowest point in the time series, which is usually considered to be precautionary.) It is	The issue seems to be whether the reference points are appropriate. The original assessment included a condition to define reference points which were done in 2017. The reference to this setting of the reference points are (as noted in the report under PI 1.1.1) PINNGORTITALERIFFIK 2017. Lumpfish limit reference points. Greenland Institute of Natural Resources Nuuk, 6/7 2017 Jr.nr: 3702-00. The key argument provided in the study is "The assessment and scientific advice for West Greenland lumpfish is based on a Landing per Unit Effort (LPUE) target. This target is the average of the 2010-2013	Not accepted (no score change)



									<p>meaningless to evaluate where the stock might be in relation to a reference point if we have no idea what this reference point means. The rationale needs to include some discussion of the basis for which LPUElim is considered to be a suitable proxy for the PRI, or above the PRI. Presumably Pinngortitaleriffik set it at that level for some reason? Could you explain?</p>	<p>LPUE. An LPUE decline below this target leads to a reduced catch advice, and vice versa. A limit reference points should be set according to a certain level of this target LPUE. The advisory rule is a sliding rule, but no lower limit on fishing pressure has been set (Blim). The spawning component is believed to be comprised of relatively few cohorts; primarily three and four-year olds. If this is indeed the case overfishing can lead to rapid stock decline assuming a strong spawner-recruit relationship. Because lumpfish is a nest-guarding species this is believed to be the case. Therefore, it is necessary to be relatively cautious when setting a Blim. The stock does not appear to have been reduced to a level that has impaired the recruitment and furthermore the fishery is relatively new. Assuming that the stock is somewhere between a virgin biomass (K) and the optimal level from an exploitative viewpoint (BMSY) a Blim of: <math>0.5 * LPUE_{target} = 0,5 * 213 \text{ kg roe pr. landing} = 106,5 \text{ kg roe pr. landing}</math>. The Btrigger is set based on this value applying a buffer based on a CV of 20%.</p>
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Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.1.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	<p>Slb. I totally agree with the analysis of the LPUE 'msy' proxy at the start of the rationale at the bottom of p27. However, I think the same issue arises with the Fmsy proxy. According to p24 and Figure 4 (repeated in the rationale helpfully), the proxy for F is catch (or actually landings) divided by LPUE (the best approximation they can manage to catch/biomass). But some simple algebra reveals that <math>L/(L/E) = L \cdot E/L</math> i.e. E. So this is not a proxy for F whatsoever, it is just effort (measured as number of landings). Effort is not a good proxy for F because there is no measure of biomass included (F is approximately catch (or possibly effort) per unit biomass, as is said on p24).</p> <p>In addition, even if it were, there is no evidence that the reference level of F (or E in fact) has any connection to the stock being at MSY. Rather, it seems like quite a high level of effort at a time when potentially (from</p>	<p>Thank you for the insightful comment and the reference to the MSC standard. The assessment team is well aware of the overall aim to maintain productivity in the population and for this reason the evaluation of the stock status includes an indicator of biomass, indicator of fishing intensity (number of fishers and area of the fishery together with an indicator of the fishing mortality. Judging the development of the catch is difficult as there are two main external factors: market of lumpfish roe which has varied and alternative fishing possibilities (cod and Greenland halibut).</p> <p>The proxy for the fishing mortality is based on the fundamental relationship <math>F = q \cdot f</math> (f is the fishing intensity, to remain within the notation of Beverton and Holt, see formula 3.3 p. 26)</p> <p>Beverton R.J.H and S.J. Holt 1957. On the dynamics of Exploited Fish Populations. Fishery Investigations Series II, Volumen XIX. London: Her Majesty's Stationery Office 1957</p> <p>The basis for the reference points are elaborated on in the answer to PRA on 1.1.1.</p>	Not accepted (no score change)
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								<p>what I understood in the background) some high year classes in the stock were being fished down. The Btrigger reference point is also used in the rationale as an indicator for Bmsy, in that <math>1.4 \times B_{trigger}</math> is considered as another possible proxy (relating to an approximation of 5% CIs). But it does not explain why Btrigger was set at the level of 161 kg/landing either.</p> <p>For both SIa and SIb, the team needs much better consideration of MSC guidance in relation to scoring stock status using proxies - see FCRG GSA2.2.3.1 where a range of options and examples are provided (e.g. in the blue box 'Examples - proxies' on p.378, the first two examples potentially apply here, but read the entire section). The general intent of SIb is that the stock be maintained at a productive level, so a consideration of the productivity of the stock when fished at proxy levels is required, if there is no</p>	<p>The trigger point is calculated based on a CV of 20% (<math>B_{trigger} = B_{lim} \times \exp(C1.645 \times 0.2)</math>)</p> <p>The fishery was established at the present level by around 2005. This level was based on the stability of the catch level, note that the peak around 2013 and the following drop was a result of market for lumpfish roe and alternative fishing of Greenland halibut. see development of the catches 1987-2019 below. In general, therefore the fishery seems to be stable over a period of 15 years and because the fishery is as far as known is mainly based on two year-classes (3 and 4) it is judged that the fishery has stabilised. The catch development is found in the report, section 7.3.4.</p> <p>The problem is that there is little information beyond the Y/R calculations presented by Hedeholm et al (2014) at the first assessment on precisely where are the MSY level. At least the present (15 years) catch stability suggests strongly that the current level is well above the Blim limit</p>	
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									direct information about MSY reference points. I am concerned that if the stock was actually fished at an effort level corresponding to the (alleged) Fmsy proxy there is not good evidence that this would maintain the stock at a productive level in the long term. In practice, the management seems to regard it something like a Flim (Elim) - which is better, but does not make it any more useful as a proxy for scoring this SI.		
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.1.2					NA	
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Sla. I don't actually have a problem with their harvest strategy - I think it's reasonable enough for the short term given the information they have. (In the medium term I would look to refine it since the predicted performance from Figure 6 is no way to run a stable fishery.) The problem, however, is that based on the information in the background and the rationale for 1.1.1 we have no basis for knowing whether it will meet	Thank you. The harvest strategy is designed to meet MSC objectives and is responsive to stock development. The issue on uncertainty is dealt with under Sib. The harvest strategy based on the development in the stock over the recent 15 years suggests that the harvest strategy is based and the stock is in stable state.	Accepted (no score change)

									objectives as per 1.1.1, since the reference points have no connection to these objectives - the same issue as arises for 1.1.1. If there is a solution for that issue can be found (i.e. more suitable proxies or a better justification for the current ones in scoring against the PRI and MSY levels) then fine - that also applies here. That being said, I would still question whether SG100 is met in that the harvest strategy only approximates the objectives via proxies.		
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Slb. The trouble is that $F < F_{proxy}$ is not a convincing objective in terms of meeting the requirements of 1.1.1 - particularly not since this rationale states that effort (which is what this $F_{proxy}$ really is, apparently) varies depending on conditions in the halibut fishery. But anyway, I have already rehearsed this issue above. Other than that, could you explain the various acronyms (GFLK, GINR) which appear in this rationale for the first time? I understood what they	The objective is not defined in terms of fishing mortality, which is here used as support for the conclusions, the objective is to maintain the stock biomass at a high level as measured at the LPUE. The acronyms are given in the Acronym list. The text has been updated	Accepted (no score change)

									meant eventually but not until I got to P2.		
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.1	Yes	Yes	NA	Slc,d,e,f. OK.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.2	Yes	Yes	NA	Slc. I agree - this is a pretty conservative HCR, as can be seen from Figure 6. In fact, in the long run I think it's untenable for the stability of the fishery (tendency to ratchet the TAC down to an unreasonably low level) but it should be OK in the short run.	Thank you	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.2	No (no score change expected)	Yes	NA	Slb. The analysis in the rationale is good, but there is also the uncertainty as to whether the reference points in the HCR have been defined at the right level - we have no information about why Blim or Btrigger are set where they are, and no evidence that the reference level is sustainable, except a statement that it is (last sentence of the rationale for SG80). Given that the HCR is pretty conservative, however, I think the scoring is justified.	Thank you for the comment. See PRA PI 1.1.1 on comments on how the reference points have been set	Accepted (no score change)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.2	Yes	Yes	NA	Slc. It would be nice to have some consideration of landings in relation to the TAC - has the TAC ever been exceeded? Perhaps a table or graph somewhere in the background or rationale. But probably not essential.	Thank you for the comment. The TAC has never been exceeded.	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.3	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.4	Yes	Yes	NA	Slc. OK	Thank you	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.4	No (material score reduction expected to <80)	No (material score reduction expected to <80)	NA	Slb. I disagree with this scoring. Based on the information presented in this report, we have no evidence that the reference points are set at levels which are relevant to the stock, in terms of recruitment (PRI) or productivity (MSY). SG80 is definitely not met. SG60 is difficult. (What does MSC mean: generic reference points appropriate to the species category? What is the species category - fish?!?) But I guess a reasonable argument can be made on the basis that the system seems to be working in practice to maintain the fishery on an even keel.	The appropriateness of the reference points is discussed under PI 1.1.1 above. SG80 is considered to be met as the reference points are considered to be appropriate.	Not accepted (no score change)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.4	Yes	Yes	NA	Slc. My initial feeling was that this scoring is a bit generous given the high level of uncertainty in the whole management system, but actually it is true that considerable efforts have been made to address what can be addressed, plus in some sense, an empirically-based assessment has less inherent uncertainty than one that filters empirical data through a stock assessment model full of assumptions. I think this scoring is fair - other issues are dealt with elsewhere (in my comments at least).	Thank you	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	1.2.4	Yes	Yes	NA	Sld,e. OK	Thank you	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.1.1	Yes	Yes	NA	Slb first sentence, typo 'secondary'. You could edit the rationales to about 1/4 of their current length, but apart from that they are fine!	Spelling corrected.	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.1.2	Yes	Yes	NA	Sld. All you have to say is that none of the primary species are sharks.	No comment.	Accepted (no score change)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.1.3	Yes	No (no score change expected)	NA	Sla. I think that this is wrong - you should score it as met at 100 by default, as you have done for 2.1.1a. But it makes no difference to the overall scoring.	We have scored this 100. As observed by the peer reviewer, this has no impact on the overall PI score.	Accepted (score increased)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.2.1	No (scoring implications unknown)	No (scoring implications unknown)	NA	Here and in Table 23, where are the guillemots?? They are mentioned right at the start of the report in Table 2 (weaknesses) as a concern, but in the scoring they are not included. Overall, the analysis in the background section about bycatch is a bit garbled if I'm honest. For one thing, before they go awol, the discussion refers to common guillemot (Uria aagle), except on p47 where it switches to Brunnich's guillemot (Uria lomvia) - you also mention somewhere the thick-billed murre which is also U. lomvia. So to start with sort out species and species names. Table 2 says that guillemots are rare winter migrants, which might be the case for common guillemot (although do you mean summer migrant??? I'm far from an expert on guillemots but winter	The main text has been re-organised to make it less garbled. As part of this re-write, we have made it clear that whilst the common guillemot is caught by offshore gillnets, it is not a bycatch in the lumpfish gillnet fishery. For this reason it was not considered further in the scoring.	Accepted (no score change)

									<p>migrations to Greenland seems a bit odd considering that in Wales they only spend the summer - perhaps double check?). Brunnich's guillemot, however, appears to breed in Greenland in large numbers (although again I'm no expert; I'm just asking you to check). Then also it is stated on p45: <i>'for the purposes of this assessment, it is assumed that all of these birds are taken in lumpfish nets'</i> - but the discussion then goes on to argue (in the section about Brunnich's guillemot) why this is not in fact the case - so are you assuming it is or not?</p> <p>Apart from the missing guillemots, the scoring for the other species is OK. I'm not 100% certain that the scoring elements have been added up correctly - perhaps DNV could double check?</p>		
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.2.2	No (scoring implications unknown)	No (scoring implications unknown)	Yes	Missing guillemots.	See 2.2.1 above	Not accepted (no score change)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.2.3	Yes	Yes	No	Scoring OK. For the condition, I think you need milestones each year, plus I would be tempted to consider a longer timeframe - experience in Iceland suggests that improving the data on this bycatch is more difficult than you might think.	Annual milestones have been included and the timeframe extended to four years.	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.1	Yes	No (scoring implications unknown)	NA	The list of ETP species in the scoring and in Table 23 is completely different from the list on p49.	Agree that the long-tailed duck ( <i>Clangula hyemalis</i> ) was missed off the list on p49 and has now been added.  We have thoroughly reviewed this section and revised the main text and lists. Based upon this review, we have removed the harbour seal from the scoring	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.1	Yes	Yes	NA	Sl.a. I don't think there are any 'limits' for harbour seals either - zero TAC does not count as limits. So probably this shouldn't be scored.	See above	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.1	No (material score reduction expected to <80)	No (material score reduction expected to <80)	NA	Sl.b. What figures do you get if you extrapolate the figures from Christiansen et al. for long-tailed ducks in the same way as done for eider ducks? I'm not sure your confidence in the official bycatch data is justified for this species, since I gather from the rationale for 3.2.3 below	We don't have the necessary data to extrapolate the total numbers of long-tailed ducks killed by this particular fishery, but the Christiansen <i>et al</i> (2019) observer data suggests that this would be much lower (c. 10%) than the common eider duck. Furthermore, discussions with fishers suggest that long-tailed duck bycatch is very low.	Not accepted (no score change)



									that it is solely based on self-reporting by fishermen. In the Icelandic lumpfish fishery, these data were eventually demonstrated to be highly unreliable (a massive underestimate), with severe (eventually terminal) consequences for their MSC certification. Obviously this issue applies to the out-of-scope secondary species as well, but the scoring of 2.2.1 and 2.2.2 is mainly predicated on the status of the populations rather than the bycatch of the fishery, so it does not really arise (except in 2.2.3 where there is a condition, rightly so). For the long-tailed duck, however, the population may not be in good shape, so scoring has to rely on showing that the fishery is not hindering recovery and rebuilding. I would like to see a closer and more sceptical look at the figures.	Two conditions have been raised specifically for this species e.g. for 2.3.2 (management) and 2.3.3 (information). The team considers these together to be a reasonably precautionary response to the uncertainty raised by the Peer Reviewer.	
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.1	Yes	Yes	NA	Slc. SG100 is filled in Yes but only met for one of the two species.	Now resolved as scoring is only for the long-tailed duck	Accepted (non-material score reduction)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.2	Yes	Yes	NA	Sla. I think SIb should be scored for both species, as per comment above.	Now resolved as scoring is only for the long-tailed duck	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.2	Yes	Yes	Yes	SIb. OK. Re the condition, the list of ETP species in Condition 3 is different again from the other lists. Reading on, I see why, but it's pretty confusing - can't you just make a clear list and stick to it? The rest is OK - the milestones for unwanted catch are aligned with Condition 1, which makes sense.	Now resolved as scoring is only for the long-tailed duck.	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.2	No (scoring implications unknown)	No (scoring implications unknown)	NA	SIc. I question for the ducks whether the bycatch data available constitutes an objective basis for confidence given that it is solely fishermen self-reporting which has not been shown elsewhere to be reliable. I don't know for sure, but I question. See also rationale for 2.3.3 and 3.2.3.	The text has been changed and rescored at 60.	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.2	Yes	Yes	Yes	SId,e. OK	Thank you.	Accepted (no score change)

Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.3.3	Yes	Yes	No	<p>This healthy scepticism about the data for the ducks should also include PIs 2.3.1 and 2.3.2. It says at the end of the rationale for SIa that the two elements make 90, which is not the case. Also, that's not how you add them up - you should score each scoring element (species) for all SIs and then amalgamate the scores across elements, not within SIs across all scoring elements. Down and then across rather than across and then down, if you see what I mean (probably not - it's very confusing). Re the condition, same comments as for Condition 2.</p>	Now resolved as scoring is only for the long-tailed duck	Accepted (non-material score reduction)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.4.1	Yes	No (scoring implications unknown)	NA	<p>SIb. I don't think it is correct to score this as NA. If the fishery does not interact with any VMEs, it gets a default score of 100 (or 80 depending on how confident you are about the evidence).</p>	We understand that this scoring issue need not be scored if there are no VMEs.	Not accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.4.2	No (scoring implications unknown)	Yes	NA	<p>SIb. I don't disagree with the scoring but the rationale is not really 'based on information about the UoA and/or</p>	<p>The main text has been amended to make it more relevant to the UoA.</p> <p>We understand that this scoring</p>	Not accepted (no score change)

									habitats involved'. Sld needs to be scored.	issue need not be scored if there are no VMEs.	
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.4.3	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.5.1	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.5.2	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	2.5.3	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.1.1	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.1.2	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.1.3	Yes	Yes	NA			
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.2.1	Yes	No (non-material score reduction expected)	NA	Regarding SG100, I raise the same issue as in Principle 1, i.e. that although the objectives (management targets) for the lumpfish fishery are well defined in theory (Fmsy, Btrigger etc.) they are not apparently measurable in practice. I suggest discuss with the P1 expert.	P1 expert has responded that the ref. points are appropriate - the proxies used are measurable.	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.2.2	Yes	Yes	NA			

Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.2.3	Yes	Yes	Yes	Regarding the condition, it is fine, but based on experience in Iceland, I would be tempted to give them more time. This issue proved to be very difficult for the Icelandic lumpfish fishery.	Agree changes can take longer than expected, although this is about ensuring that evidence of current requirements is available rather than wholesale MCS changes. Have extended to 4 year with year 2 milestone of changes being approved, and year 3 implementation, year 4 evidence.	Accepted (no score change)
Greenland lumpfish	2019	W Greenland	gillnets	PR B	3.2.4	Yes	Yes	NA			

### 9.3.3 Peer Reviewer A- Follow up comments & DNV GL response

Fishery	Year	UoA stock	UoA gear	PR (A/B/C)	PI	PR Comment Code	Peer Reviewer Justification (as given at Public Comment Draft Report (PCDR) stage)	CAB response to Peer Reviewer's comments (as included in the Final Draft Report)	CAB Response Code
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.1.1	Yes	<b>Scoring Issue A-B.</b> The CAB provided an informative response of my concerns regarding the definition of reference points. I found it interesting that both peer reviewers identified the same issue in the report. But while the CAB provided a comprehensive response, it was not clear to me if they plan to clarify the report by including those details.	The answer has been inserted as requested see section 7.3.4.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.1.2		Not scored in the PRDR		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.1	Yes	I requested substantiation of the claim that no males are caught. The CAB provided some clarification but again it was not clear if that will be included in the report.	The male catch is sold on the local markets (DNV GL reassessment report p 38) and was at the original assessment estimated at 25 t annually. This number is confirmed annually at the GINR assessments. A sentence is inserted in the justification for PI 1.2.3b (Monitoring )	Accepted (no score change)

Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.2	No (non-material score reduction expected)	<b>Scoring Issue A.</b> I had noted that the Bmsy proxy (LPUE, Figure 2) was less than the benchmark in many years in the series, and a score of 100 was not warranted. The CAB responded by indicating that the Fmsy benchmark was generally below the threshold, which is accurate. However, I think that the biomass proxy is at least as important, and I still maintain that the the scoring of 100 is too high. I acknowledge that this is not likely to affect the scoring substantially, however.	The biomass indicator (LPUE has 6 observation above the MSY proxy and 4 below. The score is maintained, see Figure 3. Furthermore, but this is not within the remits of the scoring the MSY proxy is very high compared to the Blim set.	Not accepted (no score change)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.2	Yes	<b>Scoring Issue B.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.2	Yes	<b>Scoring Issue C.</b> I had requested justification for use of the exploitation rate proxy, which the CAB has supplied, as well as clarification in the text. Thank you.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.3	Yes	<b>Scoring Issue A.</b> Additional references I supplied were included in the report, thank you.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.3	Yes	<b>Scoring Issue B.</b> Scoring agreed. I assume that the additional clarification will be added to the report.	Additional clarification added to the report	Accepted (no score change)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.3	Yes	<b>Scoring Issue C.</b> Scoring agreed. I assume that the additional clarification will be added to the report.	Text added to the report.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	1.2.4	Yes	<b>Scoring Issues A-E inclusive.</b> I had requested a brief explanation of the SPicT population model, which was provided. I found the summary to be helpful since it explained how key uncertainties were dealt with. I would recommend that this text be added to the report, if it has not already been done so.	Clarification added to the report	Accepted (no score change)

Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.1.1	Yes	<b>Scoring Issues A-B inclusive.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.1.2	Yes	<b>Scoring Issues A-E inclusive.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.1.3	Yes	<b>Scoring Issues A-C inclusive.</b> The CAB provided some justification for their conclusions that discards are not significant in this fishery. Again, I recommend that their explanation be added to the report.	Text added to the report.	Accepted (no score change)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.2.1	Yes	<b>Scoring Issues A-B inclusive.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.2.2	Yes	<b>Scoring Issues A-E inclusive.</b> Scoring agreed. I noted the evidence that seabird mortality was considerably underestimated. The CAB responded with additional stakeholder information, which was helpful. I also appreciated the more explicit linkages between the two conditions (2.2.2 management and 2.2.3 information).		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.2.3	Yes	<b>Scoring Issues A-C inclusive.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.3.1	Yes	<b>Scoring Issues A-C inclusive.</b> Scoring agreed		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.3.2	Yes	<b>Scoring Issues A-E.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.3.3	Yes	<b>Scoring Issues A-B.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.4.1	Yes	<b>Scoring Issues A-C inclusive.</b> Scoring agreed		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.4.2	Yes	<b>Scoring Issues A-D inclusive.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.4.3	Yes	<b>Scoring Issues A-C inclusive.</b> Scoring agreed		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.5.1	Yes	<b>Scoring Issue A.</b> Scoring agreed.		



Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.5.2	Yes	<b>Scoring Issue A-C.</b> Scoring agreed. I appreciate the recommendation that has been added to help avoid ghost fishing.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.5.3	Yes	<b>Scoring Issues A-D.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	2.5.3	No (non-material score reduction expected)	<b>Scoring Issues E.</b> I had maintained that the score of 100 was too high given that two conditions were raised for improved monitoring. I continue to maintain that it is illogical to award a score that implies monitoring is complete, yet suggest two conditions for improved monitoring. SG 80 would be more appropriate scoring. However, I acknowledge that the reduced score is non-material.	We now accept this and Scoring Issue E has been rescored at 80. This brings the overall PI score down from 95 to 90.	Accepted (non-material score reduction)
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.1.1	Yes	<b>Scoring Issues A-C.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.1.2	Yes	<b>Scoring Issues A-C.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.1.3	Yes	<b>Scoring Issue A.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.2.1	Yes	<b>Scoring Issue A.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.2.2	Yes	<b>Scoring Issue A-E.</b> Scoring agreed.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.2.3	Yes	<b>Scoring Issue A-D.</b> Scoring agreed, and I note the CAB has added text on the recreational fishery, thank you.		
Greenland lumpfish	2019	West Greenland lumpfish coastal waters	Gillnet	PR A	3.2.4	Yes	<b>Scoring Issues A-C</b> inclusive. Scoring agreed.		

### 9.3.4 Peer Reviewer B- Follow up comments & DNV GL response

Fishery	Year	UoA stock	UoA gear	PR (A/B/C)	PI	PR Comm-ent Code	Peer Reviewer Justification (as given at Public Comment Draft Report (PCDR) stage)	CAB response to Peer Reviewer's comments (as included in the Final Draft Report)	CAB Res-ponse Code
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.1.1	No (material score reduction expected to <80)	<p>Thanks to the CAB for providing some explanation of the derivation of the reference points. Just to make sure, this is what I understood:</p> <ol style="list-style-type: none"> <li>1. The target (MSY proxy) level is the average LPUE for 2010-13 i.e. 213 kg/landing.</li> <li>2. Blim is 50% of this level (106.5 kg).</li> <li>3. Btrigger (161kg) is derived from Blim plus SE - i.e. a level above which B has a low probability of being below Blim.</li> </ol> <p>So all the ref points are derived from the assumption that the LPUE at 2010-13 results from a stock which is at or above the MSY level. Given the history of the fishery let me buy in to that for now, although I would prefer it to be a bit better justified in the report.</p> <p>I still, however, have issues with the scoring and rationales of 1.1.1 in this regard:</p> <p>1.1.1b is scored in relation to this 'Fmsy proxy' of L/LPUE, and I am still struggling with the idea that this is a suitable proxy for Fmsy. The CAB suggests that this is equivalent to <math>F=qf</math> (catchability * fishing intensity) - but it isn't because catchability is not constant - it varies with biomass (at least, this is the underlying assumption if we are taking LPUE to be proportional to biomass). <math>F=qf</math> equates to F being proportional to both biomass and fishing</p>	I am sorry that the issue remains and will look carefully into the issue at the coming surveillance audits. Particularly we urge the Client to improve on the stock assessment. The reference points were updated in 2017 based on further information and the reference points should be revisited within the next few years.	Accepted (no score change)

effort, while L/LPUE has no biomass component  
- it is only  $f$  not  $F$ .

I (again) refer you to the guidance on scoring 1.1.1b using proxies, and specifically the critical (i.e. auditable) guidance in relation to scoring using  $F$  (GSA2.2.4, indicated as critical by an orange line in the margin). I am reproducing it below for your convenience:

The following expectations should be applied if the starting biomass is unknown:

- At least a 60 score is justified if  $F$  is likely to have been at or below  $F_{MSY}$  for at least one generation time of the species (or for at least two years, if greater). This level of  $F$  is generally expected to be able to recover, or maintain, a population to be “likely” above its  $PR$ .
- At least an 80 score is justified (B highly likely above the  $PR$  and at or fluctuating around  $B_{MSY}$ ) if  $F$  is likely to have been at or below  $F_{MSY}$  for at least two generation times (or for at least four years, if greater).

The biomass is not at the  $MSY$  proxy level, so you are choosing to score using the  $F_{msy}$  proxy (pseudo-proxy) - but even accepting this proxy as suitable, your scoring does not follow the guidance: for a score of 80  $F$  should have been at or below the  $MSY$  level for at least two generation times - which according to the rationale is 20 years. You have a time series of 10 years, of which the  $F_{msy}$  proxy was exceeded in two years. The scoring approach does not follow MSC requirements.

I would also refer the CAB to 7.19.5 (version

							2.01) which definitely to me implies that you need to incorporate the information provided in response to the peer reviewers in the actual report, as well as in the response to PR comments - so for example the explanation of reference points needs to be added in to the P1 section (either background or 1.1.1 rationale). Also, the explanation of the reference points is still really garbled - for example, the target level of LPUE (MSY proxy) is shown in Figure 3 at ~195 kg, while in 1.1.1b 201 kg is mentioned, even though it actually appears to be 213 kg (as best I understood).		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.1.2		Not scored in PCDR (although probably should have been). (I suspect that applying the HCR and the GT here would still result in a pass, but I haven't tried it.)		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.2.1	Yes	As noted above, I'll accept that LPUE=213 kg/landing is a reasonable objective.		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.2.2	Yes	As above		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.2.3				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	1.2.4	Yes	As above		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.1.1				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.1.2				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.1.3				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.2.1	Yes	Much clearer		

Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.2.2	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.2.3	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.3.1	Yes	OK, I'll buy that argument		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.3.2	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.3.3	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.4.1	Yes	I was wrong, sorry		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.4.2	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.4.3				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.5.1				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.5.2				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	2.5.3				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.1.1				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.1.2				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.1.3				
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.2.1	Yes	See 1.1.1		
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.2.2				



Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.2.3	Yes			
Greenland lumpfish	2019	lumpfish	lumpfish nets	PR B	3.2.4				

## 9.4 Stakeholder input

### 9.4.1 Birdlife International

#### Stakeholder contact and assessment details

Category	Contact details
Title	Mr.
First name*	Rory
Last name*	Crawford
Organisation*	BirdLife International
Email*	<a href="mailto:rory.crawford@rspb.org.uk">rory.crawford@rspb.org.uk</a>
Department	Marine Programme
Job title	Bycatch Programme Manager
Description	<p>BirdLife International is a global Partnership of independent organisations working together as one for nature and people.</p> <p>The overarching objectives of the Marine Programme are:</p> <ul style="list-style-type: none"><li>• Promote the collaborative international action that is vital to arrest seabird declines</li><li>• Advocate for the conservation of seabirds at national, regional and global levels</li><li>• Work directly with fishers and other stakeholders to reduce seabird bycatch and other threats to seabird populations</li></ul> <p>BirdLife is also a member of the MSC's Stakeholder Advisory Council</p>
Phone number	0141 331 9801
Postal address	c/o RSPB, 10 Park Quadrant, Glasgow G3 6BS
Fishery name*	Greenland lumpfish fishery
Certification body (CAB)*	DNV GL
Assessment Stage*	Attendance at the site visit
Register*	I wish to register as a stakeholder - please keep me informed about each stage of the assessment process

## General comments

General comments	Evidence or references	CAB response to stakeholder input	CAB Response Code
<p>It is notable that conditions on data collection regarding seabird bycatch (largely through logbooks but supplemented by some at-sea inspection) under the previous certification period have not yielded sufficiently accurate information on the scale of the impact of this fishery on seabirds. The recently published observer report highlights the need to address this issue sufficiently in this certification such that the scale of impacts can be properly determined and action can be taken to remedy the seabird bycatch issue in the Greenlandic fishery. Since the certification of the Greenland fishery, the Icelandic fishery for lumpfish has been suspended because of seabird bycatch issues (along with seals), and the Norwegian fishery has been certified with conditions on this performance indicator. There is sufficient precedent, and evidence from this fishery itself, that the existing means of reporting bycatch is insufficient and that an independent, observer-based scheme is now required to meet the MSC certification requirements under 2.3.3</p>	See previous tab	The assessment team has set a condition for this PI- condition 4. - see previous tab.	Accepted (no score change)

## Performance Indicator (PI) input

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response to stakeholder input	CAB response code
<b>Principle 1</b> - Sustainable fish stocks						
1.1.1 - Stock status						
1.1.2 - Stock rebuilding						
1.2.1 - Harvest strategy						
1.2.2 - Harvest control rules and tools						
1.2.3 - Information and monitoring						
1.2.4 - Assessment of stock status						
<b>Principle 2</b> - Minimising environmental impacts						



<b>2.1.1 - Primary species outcome</b>						
<b>2.1.2 - Primary species management</b>						
<b>2.1.3 - Primary species information</b>						
<b>2.2.1 - Secondary species outcome</b>						
<b>2.2.2 - Secondary species management</b>						
<b>2.2.3 - Secondary species information</b>						
<b>2.3.1 - ETP species outcome</b>						
<b>2.3.2 - ETP species management</b>		Depending on the information provided by substantially improved bycatch monitoring of this fishery, actions here maybe become relevant.			<p>Birds and marine mammals are mainly an unwanted catch, although some might be legally taken to meet fisher subsistence needs so long as it is reported and not sold. As such it is not targeted and generally considered a nuisance.</p> <p>Whilst there has been the periodic consideration of alternative measures to reduce the incidence of bird and sea mammal bycatch in the lumpfish fishery by GINR and others, there is no evidence of any regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and that they are implemented as appropriate. The assessment team has set a condition for this PI - condition 3.</p>	Accepted (no score change)
<b>2.3.3 - ETP species information</b>	New independent information on seabird bycatch	Since the previous certification, there has been implementation of a self-reporting scheme for seabird lumpfish fishery. We have flagged at the annual surveillance reporting stages	<a href="http://www.natur.gl/fileadmin/user_files/Dokumenter/Rapporter/Lumpfish_bycatch_proj">http://www.natur.gl/fileadmin/user_files/Dokumenter/Rapporter/Lumpfish_bycatch_proj</a>		<p>The number of birds caught by gillnets is well recorded, and whilst it cannot be disaggregated according to target fishery e.g. lumpfish, cod or seal in the Piniarneq, it can be disaggregated from GLFK's self-assessment data. All professional hunters, which include fishermen, must be licensed, a condition of which is that all fish, birds and mammals must be retained and reported to</p>	Accepted (no score change)

		<p>that the reporting of this information as absolute bycatch numbers (as was done) is problematic because it is unlikely to reflect actual bycatch levels because of self-reporting biases. Further, the official at-sea checks of bycatch levels were not extrapolated to the fishery level/compared with the levels self-reported. Since then, a project to assess seabird bycatch in the fishery was conducted (see reference) and even though observer effort was relatively limited, scaled up to ~25% of lumpfish landings, bycatch was found to be around 2 orders of magnitude higher than that report through logbooks. Evidently, there is a clear need to properly establish the seabird bycatch impact of this fishery on common eiders (now Near Threatened in Europe inc. Greenland) and other species (inc. Long-tailed duck, listed as globally Vulnerable; but also potentially others given the issues of under-reporting and the small sample size from observer work)</p>	<a href="#">ect_final_note.pdf</a>		<p>Piniarneq (and from 2017 onwards online). Whilst this provides some quantitative information on the amount of bird bycatch taken in the fishery, there are indications that this could be a considerable under-estimate, esp. for long-tailed ducks. As such, the current system is not considered adequate to assess the impact of - nor support a management strategy for - the lumpfish fishery on ETP bird species such as the long-tailed duck. The assessment team has set a condition for this PI-condition 4.</p>	
<b>2.4.1 - Habitats outcome</b>						

2.4.2 - Habitats management strategy						
2.4.3 - Habitats information						
2.5.1 - Ecosystem outcome						
2.5.2 - Ecosystem management strategy						
2.5.3 - Ecosystem information						
<b>Principle 3</b> - Effective management						
3.1.1 - Legal and/or customary framework						
3.1.2 - Consultation, roles and responsibilities						
3.1.3 - Long term objectives						
3.2.1 - Fishery-specific objectives						
3.2.2 - Decision-making processes						
3.2.3 - Compliance and enforcement						
3.2.4 - Monitoring and management performance evaluation						

#### 9.4.2 Birdlife International: Follow up comments

Performance Indicator (PI)	Input summary	Input detail	Evidence or references	Suggested score change	CAB response to stakeholder input	CAB response code
<b>Principle 1</b> - Sustainable fish stocks						
1.1.1 - Stock status						

1.1.2 - Stock rebuilding						
1.2.1 - Harvest strategy						
1.2.2 - Harvest control rules and tools						
1.2.3 - Information and monitoring						
1.2.4 - Assessment of stock status						
Principle 2 - Minimising environmental impacts						
2.1.1 - Primary species outcome						
2.1.2 - Primary species management						
2.1.3 - Primary species information						
2.2.1 - Secondary species outcome						
2.2.2 - Secondary species management	Disagreement over evidence for partial strategy working; concern over consumption of seabirds and mammals in a certified fishery	Under 2.2.2b, it is argued the fishery meets SG80 because the self-reported bird and mammal bycatch data from the fishery has shown a decline from 2016 to 2018. Most fundamentally, this is concerning because the self-reported data are known to be an unreliable estimate of real bycatch levels, as the Christensen et al (2019) study shows. Rather than this being objective evidence, it is evidently a biased source which is not accurately representing the situation. While we do not debate that a 'partial' strategy could said to be in place for secondary species, there is no objective, reliable evidence on which to base this, which the Christensen et al study (and the justifications given under other scoring issues) show clearly. 2.2.2b should be re-scored to reflect this, meeting SG60 but not SG80.  Additionally, we are concerned about the statement under 2.2.2e (p76)	Christensen et al (2019) - as sent at site visit stage.	65	2.2.2b. This scoring issue is about the management strategy e.g. is it likely to work, rather than the adequacy of information. We accept the findings of Christensen et al (2019), which is why the information PI (specifically 2.2.3c) incurs a condition. However, we do consider, whatever the shortfalls of the information system, that there has been a relative fall in bird bycatch over time, which suggests the partial strategy is working, and thus this meets SG 80.  2.2.e. We can confirm that neither birds nor sea mammals are targeted, nor is their catch encouraged in anyway. As mentioned by the report, bird and marine mammal bycatch is considered a nuisance as it may result in net damage and entanglement, at considerable cost to the fisher. We have revised the text to make this clearer.	Not accepted (no score change)

		which notes that some fishers take bycaught marine mammals and seabirds for consumption. While noting that this is entirely legal, this would appear to make these species a target catch for some within the fishery. Given that this is expressly forbidden under the MSC scheme, this extent of this should be urgently clarified and any vessels consuming bird/mammal bycatch should be excluded from the UoC.				
<b>2.2.3</b> - Secondary species information	Agreement	We agree with the scoring for 2.2.3a and c and the consequent condition (however, we note that it is perplexing that the information is not considered adequate to support a partial strategy, yet it is deemed under 2.2.2. that there is an objective basis for confidence that the partial strategy will work. More details above			See above. Under 2.2.2 it is the partial strategy that is the key consideration. The reported figures, whatever the flaws considered in 2.2.3, do provide a relative trend.	
<b>2.3.1</b> - ETP species outcome						
<b>2.3.2</b> - ETP species management	Agreement on scoring, though serious concerns about implementation of conditions through current action plan	Comments here apply under 2.3.3 too, as the conditions are heavily linked. At present there is no explicit intention or plan in the client action plan to implement some form of independent observer coverage in this fleet. There continues to be a reliance in 2020 and 2021 on examining and bolstering the self-reporting systems, without requiring the collection of independent at-sea observer data (via the methods used in Christensen et al 2019) to act as a means of genuinely verifying this information. This fishery has been certified for 5 years and an external project (the Christensen 2019 study) was the only source of information that proved the existing reporting system for bycatch is unreliable. This is openly acknowledged in the report, so why is it deemed acceptable to wait until 2022 to assess whether the current bycatch registration scheme	Christensen et al (2019) - as sent at site visit stage.		The CAP has now been updated to confirm that in 2021 SFG & GINR will be conducting an independent project on (i) assessing bycatch levels in this fishery (e.g. updating Christiansen <i>et al</i> , 2019) and (ii) reporting on the effectiveness of mitigation approaches.	

		provides adequate information (as per the client action plan)? We agree that actions can be taken to improve self-registration, but there needs to be an independent means of checking the accuracy of this data. This is clearly established, and should be required from 2021 at the latest (acknowledging challenges of sea time in 2020 given COVID 19).				
<b>2.3.3</b> - ETP species information	Agreement, though concerns about implementation through current action plan	see above			See above	
<b>2.4.1</b> - Habitats outcome						
<b>2.4.2</b> - Habitats management strategy						
<b>2.4.3</b> - Habitats information						
<b>2.5.1</b> - Ecosystem outcome						
<b>2.5.2</b> - Ecosystem management strategy						
<b>2.5.3</b> - Ecosystem information						
<b>Principle 3</b> - Effective management						
<b>3.1.1</b> - Legal and/or customary framework						
<b>3.1.2</b> - Consultation, roles and responsibilities						
<b>3.1.3</b> - Long term objectives						
<b>3.2.1</b> - Fishery-specific objectives						
<b>3.2.2</b> - Decision-making processes						
<b>3.2.3</b> - Compliance and enforcement						
<b>3.2.4</b> - Monitoring and management performance evaluation						

**From:** Chaudhury, Sandhya  
**Sent:** mandag 4. mai 2020 09:22  
**To:** Rory Crawford <Rory.Crawford@rspb.org.uk>  
**Cc:** Yann Rouxel <Yann.Rouxel@rspb.org.uk>  
**Subject:** RE: Greenland lumpfish fishery- PCDR published

Thank you Rory,

DNV GL confirms receipt of comments from Birdlife on the PCDR for the Greenland lumpfish reassessment. The assessment team will go through this and revert.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

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**From:** Rory Crawford <Rory.Crawford@rspb.org.uk>  
**Sent:** fredag 1. mai 2020 11:52  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Cc:** Yann Rouxel <Yann.Rouxel@rspb.org.uk>  
**Subject:** RE: Greenland lumpfish fishery- PCDR published

Hey Sandhya,

Many thanks again for the offer of an extension – thankfully I was able to carve out some time to work on this and include our comments here in the template.

All the best,

Rory

**From:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Sent:** 30 April 2020 13:38  
**To:** Rory Crawford <Rory.Crawford@rspb.org.uk>  
**Subject:** RE: Greenland lumpfish fishery- PCDR published

Dear Rory,

DNV GL understands the situation and we are also affected. Unfortunately we do have commitments with the experts in the assessment team and timelines are difficult to co-ordinate. Had we known this a couple of weeks ago we could have tried to rearrange schedules.

Nevertheless, we will extend the deadline by a week and hope you can revert to us by Friday 08.05.2020.

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)  
Mobile +47 404 00 404

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**From:** Rory Crawford <Rory.Crawford@rspb.org.uk>  
**Sent:** torsdag 30. april 2020 12:23  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Subject:** RE: Greenland lumpfish fishery- PCDR published

Hi Sandhya,

Appreciate this is late in the day, but I'm wondering if DNV GL would permit comments on the PCDR being submitted slightly later than the deadline? My work has been heavily impacted by Covid, as my wife and I try to work full time with two children under the age of four at home. This has been on my 'to do' list for a while but I've had to deal with business critical work as a priority. I believe I can get full comments to you by mid next week, but I don't think I'll be able to make the 2<sup>nd</sup> May.

All the best,

Rory



**From:** [Chaudhury, Sandhya](#)  
**To:** [Rory Crawford](#)  
**Cc:** [Yann Rouxel](#); [tim@consult-poseidon.com](#); 'Hans Lassen'; [rod@consult-poseidon.com](#)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.  
**Date:** onsdag 11. september 2019 00:28:00

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Dear Rory,

The team has been trying to fit in a meeting with you before Friday. Unfortunately Thursday is already confirmed so the team is willing to meet you at 0200PM (Greenland time)/5PM your time. Please confirm and we will call you up on skype.

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)  
Mobile +47 404 00 404

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**From:** Rory Crawford [<mailto:Rory.Crawford@rspb.org.uk>]  
**Sent:** onsdag 28. august 2019 13:11  
**To:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>; [tim@consult-poseidon.com](mailto:tim@consult-poseidon.com); 'Hans Lassen' <[hans.lassen@lassen.mail.dk](mailto:hans.lassen@lassen.mail.dk)>; [rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Thanks Sandhya – do let me know. Worst comes to worst I can try and make the meeting on the 13<sup>th</sup>.

Cheers

Rory

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**From:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Sent:** 21 August 2019 09:06  
**To:** Rory Crawford <[Rory.Crawford@rspb.org.uk](mailto:Rory.Crawford@rspb.org.uk)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>; [tim@consult-poseidon.com](mailto:tim@consult-poseidon.com); 'Hans Lassen' <[hans.lassen@lassen.mail.dk](mailto:hans.lassen@lassen.mail.dk)>; [rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Dear Rory,

The audit agenda for 13<sup>th</sup> September 2019 is already confirmed with the different parties. The assessment team will be meeting at NUUK on the 11<sup>th</sup> and I will let you know then if we can

manage to take an extra hour on 13 for a Skype meeting with you. Rest assured, we will try our best.

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)  
Mobile +47 404 00 404

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**From:** Rory Crawford [<mailto:Rory.Crawford@rspb.org.uk>]  
**Sent:** tirsdag 20. august 2019 17:17  
**To:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>; [tim@consult-poseidon.com](mailto:tim@consult-poseidon.com); 'Hans Lassen' <[hans.lassen@lassen.mail.dk](mailto:hans.lassen@lassen.mail.dk)>; [rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Many thanks Sandhya,

Is there any prospect of moving the discussion to the Thursday? I ask as I don't work Fridays and will be at home with my children.

All the best,

Rory

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**From:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Sent:** 20 August 2019 14:51  
**To:** Rory Crawford <[Rory.Crawford@rspb.org.uk](mailto:Rory.Crawford@rspb.org.uk)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>; [tim@consult-poseidon.com](mailto:tim@consult-poseidon.com); 'Hans Lassen' <[hans.lassen@lassen.mail.dk](mailto:hans.lassen@lassen.mail.dk)>; [rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Dear Rory,

Enclosed is our agenda for the site-visit. We have slotted you in for a Skype meeting at 1400 hours (Greenland time zone).

If you would let me know your skype address I will call you up at the given time.

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)

Mobile +47 404 00 404

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**From:** Chaudhury, Sandhya  
**Sent:** tirsdag 13. august 2019 12:59  
**To:** Rory Crawford <[Rory.Crawford@rspb.org.uk](mailto:Rory.Crawford@rspb.org.uk)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>; [tim@consult-poseidon.com](mailto:tim@consult-poseidon.com); 'Hans Lassen' <[hans.lassen@lassen.mail.dk](mailto:hans.lassen@lassen.mail.dk)>; [rod@consult-poseidon.com](mailto:rod@consult-poseidon.com)  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Dear Rory,

I confirm having received your email. We will try to arrange a video conference I will revert in a day or two with details.

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)

Mobile +47 404 00 404

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**From:** Rory Crawford [<mailto:Rory.Crawford@rspb.org.uk>]  
**Sent:** tirsdag 13. august 2019 10:16  
**To:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Cc:** Yann Rouxel <[Yann.Rouxel@rspb.org.uk](mailto:Yann.Rouxel@rspb.org.uk)>  
**Subject:** RE: Greenland lumpfish: Announcement of reassessment.

Dear Mrs. Chaudhury,

We'd like to register as stakeholders and attend the site visit if possible – we won't be able to make it in person, but is a videoconference feasible?

All the best,

Rory

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**From:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Sent:** 13 August 2019 08:03  
**To:** Chaudhury, Sandhya <[Sandhya.Chaudhury@dnvgl.com](mailto:Sandhya.Chaudhury@dnvgl.com)>  
**Subject:** Greenland lumpfish: Announcement of reassessment.

### 9.4.3 Client comments and assessment team response on Client Review Draft Report.

**From:** [Rasmus Hedeholm](#)  
**To:** [Chaudhury, Sandhya](#)  
**Cc:** [Kristina Guldbaek](#); [Lisbeth Due Schönnemann-Paul](#)  
**Subject:** RE: Greenland lumpfish fishery - revised timeline  
**Date:** torsdag 13. februar 2020 13:31:47  
**Attachments:** [report comments](#) [additional.docx](#)

Dear Sandhya

I have looked through the report following the review process. I have some additional comments that are attached.

The action plan will be updated according to the new milestones shortly.

Kind regards

Rasmus

Page	Client comment	P2 Response
Page 7, table 2: Now page 8- P2	It seems an exaggeration to state under principle 2.2 that "Large numbers" of out of scope species are caught.	Agreed. Statement removed.
	Common guillemot is mentioned under principle 2.2.1, but this is a relic from previous assessments. Considerable effort has gone into determining that common guillemot is not caught in the lumpfish fishery. It was most likely due to an ambiguity in the reporting system, which was removed when the management system became aware of this issue. Hence, in 2017 and 2018 no common guillemot was reported as bycatch. This is supported by Merkel (2001) also referenced in the reassessment report.	Agreed. Statement removed.
Page 12-13, Table 10: Now page 14 – P2	There are several conditions pertaining to the bycatch of long-tailed duck. These conditions arise from 1) long-tailed duck is considered an ETP species because it is listed in the "Agreement on the Conservation of African-Eurasian Migratory Waterbirds", 2) There were two long-tailed ducks reported in Christensen et al. (2019) and 3) there is no Greenland based strategy to ensure that long-tailed duck bycatch is minimized.	The comments made are useful and add to the overall discussion on long-tailed duck.
	SFG and the assessment team had lengthy discussions on the ETP categorization, and it will not be repeated here at full. However, if you read the AEWA single species action plan for long-tailed duck, they recognize two general populations. The European population is well researched, has had declines in population size etc. and	This said, the Greenland and Iceland breeding populations are included in Column 1, Table 1 of the African-Eurasian Migratory Waterbird Agreement (AEWA), and is thus considered as endangered, threatened or protected (ETP) species. As per SA 3.1.5 of the MSC Fisheries Standard v2.01, this would classify this species as an ETP. Yes, the Greenland Red List considers this as 'Least concern', but does note that it is "sometimes also taken as by-catch in stone bite [lumpfish] nets in spring, but the extent is unknown" (English translation) and concludes that "The species is classified as 'vulnerable' (VU) on the International Red List (IUCN), due to declining stocks in both North America and Europe. Compared with the result mentioned above of a census of the winter stock in West Greenland, this raises some concern and the stock in

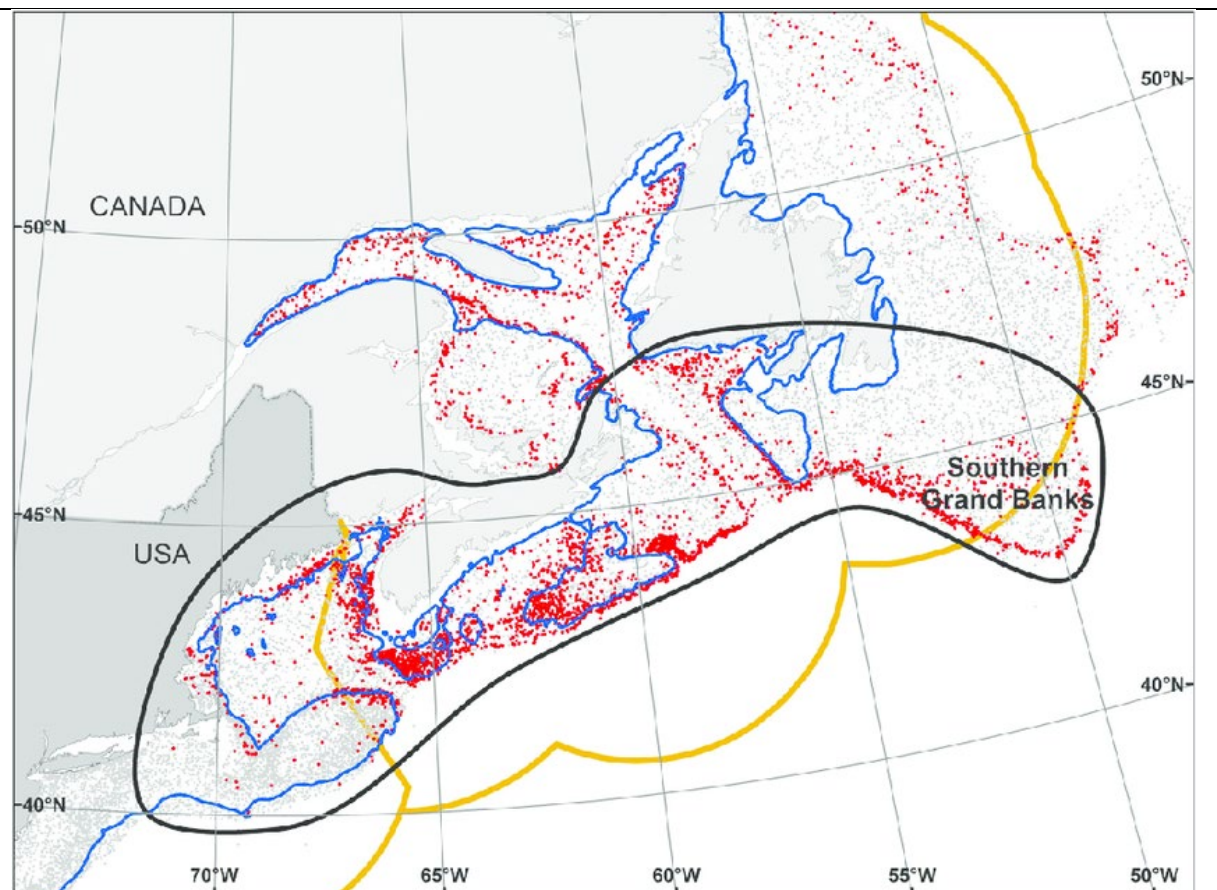
	<p>should be treated accordingly (i.e. an ETP species). However, on the Greenland/Iceland population the AEWA report concludes that: <i>"Little information is available on the trend of this population; it was given as stable by Wetlands International, 2012, based on Pihl &amp; Laursen, 1996, but has more recently been given as unknown (BirdLife International, 2015)"</i>.</p> <p>The inclusion of both long-tailed duck populations on the AEWA list is justified by the global IUCN red list. Here long-tailed duck is listed as "Vulnerable" and this applied to both populations. Recently (2018), an updated regional Greenland IUCN red list was published, including long-tailed duck. Recognizing that two separate populations exists, the local Greenland red list provides a much more detailed account of the relevant population, and the Greenland IUCN red list, lists long-tailed duck as "Least Concern" and references relevant literature. Hence, treating long-tailed duck as an ETP species in the re-certification of West Greenland lumpfish is not based on the best available scientific knowledge and surely this should form the basis of an MSC assessment.</p> <p>Based on this it seems unreasonable to categorize long-tailed duck as an ETP species in Greenland. Second, catching two individuals in a limited survey is at best limited grounds to base conditions on. Meeting the conditions will require extensive work and resources and such allocation of resources should hinge on proper arguments (see later comments as well).</p> <p>A more reasonable approach would be that the registration of long-tailed ducks in Christensen et al. (2019) calls for further studies on the actual bycatch of this species. If such studies find it to be a substantial bycatch (note that none are reported in bycatch statistics) then conditions can be set accordingly. Hence, condition 2 covers the issue and conditions 3 and 4 are superfluous.</p>	<p><i>Greenland should therefore be monitored"</i>. Given the above, we still consider the long-tailed duck to be an ETP and that the conditions should still stand.</p> <p>It should also be noted that we presented the above argument to Flemming Merkel, an acknowledged specialist in Greenland's seabirds. He replied (18 September 2019): "I agree with your assessment. For the wintering population of long-tailed duck in Southwest Greenland, which are the one potentially at risk of bycatch, I would like to add that the contribution from various breeding populations is uncertain. There is no question that some are of Icelandic origin, but another proportion is likely from the Canadian breeding population (which is much larger than in Iceland). However, the contribution from Canada is poorly studied. A third and likely small contribution to the winter population, is the Greenlandic breeding population. The Southwest Greenland winter population appears to be declining, based on a winter survey in 2017. The results of this survey have been accepted for publication in Polar Research". This again supports our position. It should be noted that Polar Research paper referred to above showed that <i>"The winter population of long-tailed ducks in Southwest Greenland was significantly smaller in 2017 (41,572 birds; 95% CI: 31,396 – 55,241) compared to 1999 (94,382 birds; 95% CI: 66,943 – 133,070)"</i><sup>40</sup>.</p>
Page 14, last	<p>It is stated that: "...though there is no incentive for this as prices are very low". A more correct wording would be, that:</p>	<p>Text replaced with "Carcasses are most often cast overboard as they hinder the fishery by overloading</p>

<sup>40</sup> Merkel, Flemming & Johansen, Kasper & Nielsen, Rasmus & Petersen, Ib & Sterup, Jacob & Mosbech, Anders (2019). Wintering seabirds in south-west Greenland, 2017. Polar Research. 38. 10.33265/polar.v38.3462.

paragraph : Now page 16, last paragraph . P2	“...carcasses are most often cast overboard as they hinder the fishery by overloading the small dinghies and low landing prices present the fishermen with little incentive to keep the carcasses”.	the small dinghies and low landing prices present the fishermen with little incentive to retain them”
Page 45, text and table 21: Now page 47 – P2	This is the origin for the statements about common guillemot used in table 2 (see above). The numbers regarding guillemots should be treated as misreporting and not incriminate the fishery and support arguments that the fishery has an unintended bycatch of this species. This fact is also stated on 47 of the reassessment report (second paragraph).	The text has been clarified as a result of the Peer Reviewer comments. We agree that the common guillemots are not caught in lumpfish gillnets and after this fact is stated, are not included in the scoring at all. We also think the misreporting referred to in the comment refers to the Brünnich’s guillemot ( <i>U. lomvia</i> ). This misreporting is clearly described in the report.
Page 49, “Atlantic halibut” paragraph Now page 51 – P2:	It is stated that the Atlantic halibut stock: “...is assumed to be in a depleted state” and Trzcinski and Bowen (2016) are referenced. This reference shows the opposite – that the Atlantic halibut stock is currently in a good state, but more importantly, it deals with the Canadian Atlantic halibut stock, and in no way deals with the Greenland stock of Atlantic halibut. Using this reference, the text implies to the reader that the stock status in Greenland is known and that the stock is depleted. This is not the case.	<p>Thank you for the comment and my apologise for the misreading of text. Actually, the sentence was intended to quota Trzcinski and Bowen (2016) for that at least somewhere in the North Atlantic the Atlantic halibut is recovering. The paper reviews the history of the Atlantic halibut in Canadian waters and shows that the stock was depleted but is now recovering. The halibut stocks in the Northwest (NW) Atlantic are separated from those of the Northeast (NE) Atlantic. In the NW Atlantic, the analysis of the population structure of halibut in four locations (Bay of Fundy, Scotia Shelf, Gulf of St. Lawrence, and Iceland), didn’t reveal genetic differentiation (<a href="#">Reid et al. 2005</a>). In the NE Atlantic, research did not find either any significant genetic differentiation in the halibut populations of Norway, Greenland and Faroe Islands, although possibly there is a segregated population in southern Norway (<a href="#">Seitz et al. 2014</a>). The classification in the assessment is maintained as ‘ETP’ based on the IUCN classification ‘EN’ Global. The basis is 1) Atlantic halibut is like other marine fish species not included in the Greenland Redlist 2018. <a href="https://natur.gl/raadgivning/roedliste/3-alle-arter-kilder/">https://natur.gl/raadgivning/roedliste/3-alle-arter-kilder/</a>, 2) GINR does not provide information on the stock status, 3) Canadian and US taggings suggest that Canadian and US EEZ stocks do not directly interfere with the Atlantic halibut in West Greenland waters and therefore the stock recovery reported for these areas are not directly applicable for west Greenland.</p> <p>There is a clear need to update the classification of Atlantic halibut and with specific data for Davis Strait and Baffin Bay and I hope that at the next surveillance such data will be presented.</p> <p>Sobel, J. 1996. <i>Hippoglossus hippoglossus</i> . The IUCN Red List of Threatened Species 1996: e.T10097A3162182. <a href="https://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T10097A3162182.en">https://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T10097A3162182.en</a>. Downloaded on 16 February 2020. The stock is classified as ‘VU’ for Europe and ‘EN’ Globally. The IUCN website asks for an update.</p> <p>Kersula, M., and Seitz, A. Diverse migratory behaviors of Atlantic halibut (<i>Hippoglossus hippoglossus</i>, L.) based on the 2000–2017 Maine halibut tagging</p>



		<p>program. <i>J. Northw. Atl. Fish. Sci.</i>, <b>49</b>: 13–24. doi:10.2960/J.v50.m719</p> <p>DFO Science Advisory Report 2009/036 Date modified: 2018-27-04 Assessment of Atlantic Halibut on the Scotian Shelf and Southern Grand Banks (NAFO divisions 3NOPs4VWX5Zc) Atlantic halibut can move large distances creating some uncertainty in stock structure. Other sources of uncertainty including vessels, bait and temperature effects on the halibut survey and commercial index, have not been fully analyzed. A lack of a population model and biological reference points make it impossible to know whether the stock is rebuilt or what is precautionary.</p> <p>M. Kurtis Trzcinski, and William Don Bowen 2016. The recovery of Atlantic halibut: A large, long-lived, and exploited marine predator <i>ICES Journal of Marine Science</i> 73(4):fsv266. DOI: 10.1093/icesjms/fsv266</p> <p>Atlantic halibut (<i>Hippoglossus hippoglossus</i>) have a long history of exploitation in the Northwest Atlantic and have gone through several periods of high biomass followed by a population crash. An assessment model using data collected on the Scotian Shelf and southern Grand Banks shows that the population peaked in 1984, then decreased sharply to a low in 1993. Several management measures were taken during the decline, including reductions in total allowable catch and a minimum size limit. Concurrently, removals by the otter trawl fishery were drastically reduced following the collapse of the cod (<i>Gadus morhua</i>) fishery. In 2003, recruitment increased and continued to be high for 6 years. Fishing mortality rates were moderate in the late 1990s and 2000s and the population increased. By 2009, the Atlantic halibut population was highly productive with both high biomass and high levels of recruitment. The coincidence in the timing of population recovery and management actions indicates that effective management contributed to the recovery of Atlantic halibut.</p>
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Atlantic halibut is categorized as an ETP species based on the IUCN red list. The last IUCN assessment on Atlantic halibut is from 1996. During this period, Atlantic halibut (at least based on Trcinski and Bowen (2016)) was actually depleted. This situation has now changed and using this old reference to the current situation goes against better judgement. For instance, the NE Atlantic population is assessed and a much better state currently than during the 1990's. Iceland also produces scientific advice and stock status. This information is published, and the assessment team should use recent updated information rather than rely strictly on a framework dictating an obviously outdated IUCN assessment.

The Norwegian IUCN redlist classifies Atlantic halibut as "Least concern".

Atlantic halibut is caught in West Greenland scientific surveys and GINR could be consulted on their view on the development of Atlantic halibut in Greenland waters.

Thank you for the comment. As noted above the error has been acknowledged and corrected

Thank you for the comment. It is likely that the productivity of Atlantic halibut has increased across the entire North Atlantic. However, the assessment team has not been presented with appropriate data nor had a competent group to draw conclusions from such data.

Thank you for the comment. The assessment team strongly encourage GINR to present its data and that such an evaluation will be available at the next surveillance audit.



Page 51, LT duck para: Now page 53 – P2	Detail, but the numbers listed for the 1999 survey are not the ones comparable to the 2017 numbers. The correct numbers are 94,399 [66,960-133,087]. See also page 74.	Corrected. Please note that the figures we quoted were correctly taken from a draft of the paper kindly provided by Flemming Merkel in advance of its publication in December 2019.
Page 65, Atlantic halibut PI 2.2.1 Scoring table now page 68	Here it is again stated the Atlantic halibut population: "...is assumed to be in a depleted state..." but this is not supported by a relevant reference. The opposite is better supported by the literature.	Thank you for the comment. As noted above the only substantive evaluation available is the IUCN Global (EN). This is as noted quite old and probably outdated but until a re-evaluation is presented the current classification as ETP stock is maintained.
Page 70, Birds paragraph PI 2.2.3 now page 73:	It is incorrect that all fish must be reported through Piniarneq. Piniarneq only includes birds and mammals. Also, seabirds taken as fishery bycatch is not reported separately to GFLK. GFLK rely on sales slips and Piniarneq data.	That is also how we understand the situation. The text has been clarified.
	In Christensen et al. (2019), the authors (GINR) state that: " <i>The only significant bycatch is common eider</i> ". Hence, they do not consider the capture of two long-tailed ducks (or other species) relevant. Implicitly this means that the bycatch of other species has insignificant impact on those species (including long-tailed duck) and is not considered relevant.	The point of this is that long-tailed duck bycatch in this fishery has not been picked up by the Piniarneq records, yet this (albeit limited) observer data confirms that it is present in the bycatch. As an ETP there are no thresholds of what is significant or not, so it is considered relevant as far as the assessment is concerned.
	The authors further state that: " <i>The breeding population of common eider has been increasing in Northwest Greenland since around 2001, but so far the magnitude of impact from hunting and bycatch has not been quantified, i.e. the proportional reduction in population growth caused by hunting and bycatch. This is a natural next step to carry out.</i> " The authors do not suggest that the data is inadequate to perform such an analysis for common eider (the only significant bycatch species), but rather that it has not been done yet. The standard does not say, that such data should be used. In this case the common eider population is so large and increasing that the data clearly shows that the fishery does not negatively impact the population. Hence, SG 80 should be met.	We agree the status common eider duck is increasing and this scores 80 in PI 2.2.1. However, PI 2,2,3 is about information, and the Christensen observer data shows that self-reporting of sea birds in general is under-recorded. This is the reason for the <80 score and need for a condition.
Page 70. Marine mammal paragraph Now page 73:	Christensen et al (2019) is referenced here as a source suggesting that marine mammal bycatch may be underreported. However, Christensen et al (2019) found zero bycatch of marine mammals. The argument is valid for seabirds, but not for mammals. In fact, the argument could be reversed. The Piniarneq data does include seals, but this does not lead to a conclusion about over-reporting (which it	This is a reasonable argument and we have rescored it at 80. We consider this fails to meet SG 100, as there is no independent verification.  Condition 2 has been amended accordingly e.g. reference to marine mammals removed.

	<p>probably should not), but it does support that seals and mammals in general are reported reliably through Piniarneq. Further, Christensen et al (2019) specifically mention that the fishermen involved in the study were all asked about seals as bycatch beyond what was actually observed in the nets, and they all knew seal bycatch occurred, but was a rare, non-annual event, for all of them. Further, bycatch of mammals is so small, that it should clearly be “adequate to assess the impact of the UoA on main secondary species” (no impact) and therefore SG 80 is met in this case. The argument is completely like the one made for wolfish on page 71, and here SG 100 is met even though the numbers cannot be disaggregated to species level, unlike for mammals. This is an inconsistent interpretation of the MSC standard.</p>	
Page 79, long-tailed duck section PI 2.3.3 - Now page 81:	As mentioned under the “page 70” comment, this is not correct. Please see earlier comment.	Text has been amended.
Additional comments (13-02-20) Page 51	: “Three species are initially...” should be changed to “Four species are initially...”	Text has been amended.
Page 53:	Concerning the long-tailed duck it is stated that “Whilst not in the current (2018) Greenland Red list...”. This is not the case. Through the Greenland Institute of Natural Resources website ( <a href="http://www.natur.gl">www.natur.gl</a> ) you can access the current Greenland red list ( <a href="https://natur.gl/arter/3-alle-arter-kilder/">https://natur.gl/arter/3-alle-arter-kilder/</a> ). Here it is clearly stated that long-tailed ducks are listed as “Least concern”.	Text has been updated.
page 56.	This mistake is repeated in table 23	As noted above, we maintain that the long-tailed duck should be treated as a an ETP in this fishery. Hence its inclusion in this table is maintained.
Page 65:	In the “king eider” paragraph, it is stated that King eider: “..is not on the Greenland 2018 red list”. This is incorrect. King eider is listed as “Least concern”. Please see comment above.	Text amended.
Page 172:	“Year 3” is repeated. I have assumed that the latter should be “Year 4”.	Correct, text amended.



#### 9.4.4 MSC Technical Oversight

## CERTIFIED SUSTAINABLE SEAFOOD

Date: 27/04/2020

SUBJECT: MSC Technical Oversight for Greenland lumpfish - Public Comment Draft Report

Dear Sandhya Chaudhury (Det Norske Veritas (DNV-GL) Certificati

Please find below the results of our Technical Oversight review. This was completed by both the Fisheries Standards Team and Supply Chain Standards Team.

Ref	Type	Page	Requirement	Reference	Details	PI
30670	Minor	123	FCP7.17.9.1 v.2.1	A rationale shall be presented to support the team's conclusion.	PI 3.2.4. SI b. From the rationale it is not clear how regularly or occasionally the internal or external reviews are conducted respectively for this fishery.	3.2.4,
30673	Minor	68	FCP7.17.9.1 v.2.1	A rationale shall be presented to support the team's conclusion.	PI 2.2.1. SI a. King eider duck. The team notes that "Based on [least concern ratings] the species has undergone a small, statistically insignificant increase, over the last 50 years in North America, it is highly likely (=>70%) that king eider ducks are above biologically based limits [therefore SG80 is met]". The rationale would benefit from additional information to support the team's conclusion with respect to the score.	2.2.1,
30674	Minor	73	FCP7.17.9.1 v.2.1	A rationale shall be presented to support the team's conclusion.	PI 2.2.2. SI a. Marine Mammals. The team note that "[short fishing duration], combined with a large mesh-size and a move netting sites further offshore, represents a cohesive arrangement that have been proven to work to...[]... minimise marine mammal bycatch". The rationale would benefit from information as to how measures in the partial strategy specifically relate to marine mammals.	2.2.2,
30679	Guidance	18	FCP-7.9.1.2 v.2.1	The CAB shall confirm that the fishery client maintains appropriate records to demonstrate the traceability back to their UoCs of certified fish or fish products.	Traceability. Section 6.2. Two record keeping systems are described based on vessel size – logbook reporting for vessels above 9.4m; landing declaration for vessels below. Please confirm the UoC vessels include both vessel reporting systems? And both systems enable traceability back to the certified fish/ fish products.	

# CERTIFIED SUSTAINABLE SEAFOOD

30680	Guidance	19	FCP-7.9.1.4 v.2.1	For each risk factor identified in 7.9.1.3, the CAB shall describe the risk present and details of the mitigation or management of risk.	Traceability. Section 6.2.3. While a small amount, the fishery retains non-certified species as detailed in Table 20. Although Greenland lumpfish can be easily distinguished from other species, but female fish gets cut/ processed, please describe the segregation measures in place to prevent processed lumpfish being mixed with non-UoC catch? Further please clarify if roe are extracted from non-UoC species? If so how is lumpfish roe separated from non-UoC species' fish roe?	
30681	Guidance	21	FCP-7.9.1.5.c v.2.1	7.9.1.5 The CAB shall identify and document in the Announcement Comment Draft Report:  c. The point from which subsequent Chain of Custody certification is required.	Traceability. Table 13. The latest processors list on the MSC website is from 2017, assume no changes – but 3 of the 8 companies do not have a valid CoC certificate. Please confirm if the list has not changed?	

This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact the relevant FAM or SCS manager for more information.

Marine Stewardship Council  
cc: Assurance Services International

DNV GL Response:

SubID	Page Reference	Grade	Requirement Version	Oversight Description	Pi	CABComment
30670	123	Minor	FCP7.17.9.1 v2.1	PI 3.2.4. SI b. From the rationale it is not clear how regularly or occasionally the internal or external reviews are conducted respectively for this fishery.	3.2.4,	<p>Frequency of internal review is stated in scoring issue a, however, rationale text revised to: The West Greenland Lumpfish fishery is a Greenland-managed fishery that is regularly reviewed by the management authorities and the Fisheries Council every two years. SG60 is met</p> <p>Expertise in addition to GINR is provided primarily from Danish institutions such as Aarhus University and Roskilde University on environmental issues and DTU Aqua on fisheries aspects. Occasional external review is conducted as part of obligations under the Danish block grant. The Rigsrevisionen undertakes audits for the Danish Public Accounts Committee with the most recent audit of activities in Greenland being in 2013. SG80 is met.</p> <p>The external assessments are not a regular scheduled review by external reviewers of the fisheries management system. SG100 is not met.</p>

30673	68	Minor	FCP7.17.9.1 v2.1	PI 2.2.1. SI a. King eider duck. The team notes that "Based on [least concern ratings] the species has undergone a small, statistically insignificant increase, over the last 50 years in North America, it is highly likely ( $\Rightarrow 70\%$ ) that king eider ducks are above biologically based limits [therefore SG80 is met]". The rationale would benefit from additional information to support the team's conclusion with respect to the score.	2.2.1,	We have provided further information that support's IUCN's Red List status of 'Least Concern'.
30674	73	Minor	FCP7.17.9.1 v2.1	PI 2.2.2. SI a. Marine Mammals. The team note that "[short fishing duration], combined with a large mesh-size and a move netting sites further offshore, represents a cohesive arrangement that have been proven to work to...[...] minimise marine mammal bycatch". The rationale would benefit from information as to how measures in the partial strategy specifically relate to marine mammals.	2.2.2,	We have provided further evidence supporting a partial strategy to avoid marine mammal bycatch.
30679	18	Guidance	FCP-7.9.1.2 v2.1	Traceability. Section 6.2. Two record keeping systems are described based on vessel size – logbook reporting for vessels above 9.4m; landing declaration for vessels below. Please confirm the UoC vessels include both vessel reporting systems? And both systems enable traceability back to the certified fish/ fish products.		Text added: The UoC includes both reporting systems and both reporting systems enable traceability back to the certified fish/ fish products in the same manner.

30680	19	Guidance	FCP-7.9.1.4 v2.1	Traceability. Section 6.2.3. While a small amount, the fishery retains non-certified species as detailed in Table 20. Although Greenland lumpfish can be easily distinguished from other species, but female fish gets cut/ processed, please describe the segregation measures in place to prevent processed lumpfish being mixed with non-UoC catch? Further please clarify if roe are extracted from non-UoC species? If so how is lumpfish roe separated from non-UoC species' fish roe?	Text added: All harvested bycatch species are retained and landed. Roe is not extracted from any of these bycatch species. Segregation of bycatch species at landing is ensured as only the certified lumpfish females are cut open at sea while all other non-certified species are whole.
30681	21	Guidance	FCP-7.9.1.5.c v2.1	Traceability. Table 13. The latest processors list on the MSC website is from 2017, assume no changes – but 3 of the 8 companies do not have a valid CoC certificate. Please confirm if the list has not changed?	Updated list on the MSC website on 30.06.2020



## 9.5 Conditions

**Table 28 – Condition 1**

Performance Indicator	<b>2.2.2 Secondary species management</b> 2.2.2 e: There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.
Score	65
Justification	<p>Birds and marine mammals are mainly an unwanted catch, although some might be legally taken to meet fisher subsistence needs so long as it is reported and not sold. As such it is not targeted and generally considered a nuisance.</p> <p>Whilst there has been the periodic consideration of alternative measures to reduce the incidence of bird and sea mammal bycatch in the lumpfish fishery by GINR and others, there is no evidence of any regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and that they are implemented as appropriate.</p>
Condition	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species and that they are implemented as appropriate.
Milestones	<p><b>Year 1</b> - Provide evidence of a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch being formalised on a regular basis. Score remains at 65.</p> <p><b>Year 2 &amp; 3</b> – 75 Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species has been undertaken. Score remains at 65.</p> <p><b>Year 4</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species has been undertaken and that they are implemented as appropriate. Rescored to 80.</p> <p>It is noted that this condition is linked to Condition 2, in that robust information on 'out of scope' bird and sea mammal by-catch levels will be essential to inform the continuing need for these alternative measures to minimise UoA-related mortality of the unwanted catch. Annual surveillance reports assessing the progress of Condition 1 should acknowledge this linkage and inter-actions between the two issues.</p>
Consultation on condition	Consultation with GINR, GFL & APNN.

**Table 29 – Condition 2**

Performance Indicator	<b>2.2.3 Secondary species information</b> 2.2.3 a: Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.  2.2.3 c: Information is adequate to support a partial strategy to manage main secondary species
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Score	65
Justification	<p>The number of seabirds and marine mammals caught by gillnets is well recorded, and whilst it cannot be disaggregated according to target fishery e.g. lumpfish, cod or seal in the Piniarneq, it can be disaggregated from GLFK's self-assessment data. All professional hunters, which include fishermen, must be licensed, a condition of which is that all fish, birds and mammals must be retained and reported to <i>Piniarneq</i> (and from 2017 onwards online).</p> <p>Whilst this provides some quantitative information on the amount of main bird and marine mammal bycatch taken in the fishery, there are indications that this could be a considerable under-estimate, esp. for birds. As such, the current system is not considered adequate to (i) assess the impact of the lumpfish fishery on secondary main 'out of scope' seabird species nor (ii) support a partial strategy to manage these species.</p>
Condition	Quantitative information is available and adequate to (i) assess the impact of the UoA on main secondary 'out of scope' sea bird species with respect to status and (ii) support a partial strategy to manage these main secondary species.
Milestones	<p><b>Year 1</b> – Provide evidence that sufficient and robust data are being collected on the catch and likely mortality of 'out of scope' sea bird species. If this evidence shows that the data being currently collected is either insufficient or not robust enough to both (i) to assess the impact of the UoA on main secondary species with respect to status or (ii) support a partial strategy to manage these main secondary species, to put in place mechanisms for improvement. Score remains at 65.</p> <p><b>Year 2</b> – Provide evidence that improvements, if required, are being made and implemented. Score remains at 65.</p> <p><b>Year 3</b> - Provide evidence that improvements, if required, are being implemented and the result included in annual assessments. Rescored to 75.</p> <p><b>Year 4</b> – Provide evidence that quantitative information is available and adequate to (i) assess the impact of the UoA on main secondary 'out of scope' seabird species with respect to their status and (ii) to support a partial strategy to manage these main secondary species. Rescored to 80.</p>
Consultation on condition	Consultation with GFLK.

**Table 30 – Condition 3**

Performance Indicator	<p><b>2.3.2 ETP species management</b></p> <p>2.3.2 b: There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species</p> <p>2.3.2 e: There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.</p>
Score	65
Justification	<p>Three ETP species have historically interacted with this fishery:</p> <ol style="list-style-type: none"> <li>1. Hooded seal (<i>Cystophora cristata</i>)</li> <li>2. Harbour seal (<i>Phoca vitulina</i>)</li> <li>3. Long-tailed duck (<i>Clangula hyemalis</i>)</li> </ol> <p>Of these, given the very low incidence of hooded and harbour seals being caught over recent years, only the long-tailed duck is considered in the assessment (see main text for</p>

	<p>more details). The assessment itself shows that the long-tailed duck fails scoring issues 2.3.2 b (management strategy in place) and 2.3.2 e (Review of alternative measures to minimize mortality of ETP species). This condition is therefore specifically for the long-tailed duck.</p> <p>In general, birds and marine mammals are mainly an unwanted catch, although some might be legally taken to meet fisher subsistence needs, so long as it is reported and not sold. As such it is not targeted and generally considered a nuisance. There is a cohesive arrangement comprising a number of measures that have been proven to work over a number of years to both maximise target fish catch and minimise bird bycatch that represents a partial strategy. However, there are no specific mechanisms for ensuring the lumpfish fisheries do not catch long-tailed ducks, so this does not represent a full strategy.</p> <p>Whilst there has been the periodic consideration of alternative measures to reduce the incidence of bird and sea mammal bycatch in the lumpfish fishery by GINR and others, there is no evidence of any regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (e.g. the long-tailed duck) and that they are implemented as appropriate.</p>
Condition	There is evidence of a strategy in place that is expected to ensure the UoA does not hinder the recovery of the ETP species (long-tailed duck) and that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of this species and that they are implemented as appropriate.
Milestones	<p><b>Year 1</b> – Provide evidence of a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) being formalised on a regular basis. Score remains at 65.</p> <p><b>Year 2</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) has been undertaken. Score remains at 65.</p> <p><b>Year 3</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) has been undertaken and that they are implemented as appropriate. Score remains at 65</p> <p><b>Year 4</b> – Provide evidence that, based on information about the fishery (see Condition 4 – for 2.3.3b), a strategy is in place that is expected to ensure that the UoA does not hinder the recovery of ETP species (specifically the long-tailed duck). Rescored to 80.</p>
Consultation on condition	Consultation with GINR, GFLK & APNN.

**Table 31 – Condition 4**

Performance Indicator	<p><b>2.3.3 ETP species information</b></p> <p>2.3.3 a: Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>2.3.3 b: Information is adequate to measure trends and support a strategy to manage impacts on ETP species.</p>
Score	60
Justification	The number of birds caught by gillnets is well recorded, and whilst it cannot be disaggregated according to target fishery e.g. lumpfish, cod or seal in the Piniarneq, it can be disaggregated from GFLK's self-assessment data. All professional hunters, which

	<p>include fishermen, must be licensed, a condition of which is that all fish, birds and mammals must be retained and reported to <i>Piniarneq</i> (and from 2017 onwards online).</p> <p>Whilst this provides some quantitative information on the amount of bird bycatch taken in the fishery, there are indications that this could be a considerable under-estimate, esp. for long-tailed ducks. As such, the current system is not considered adequate to assess the impact of - nor support a management strategy for - the lumpfish fishery on ETP bird species such as the long-tailed duck.</p>
Condition	Quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species, in particular the long-tailed duck. It should also be adequate to measure trends and to support a strategy to manage impacts on this ETP species.
Milestones	<p><u>Year 1-3</u> – Provide evidence that sufficient and robust data are being collected on the level and trends in the catch, likely mortality and impact on ETP species (in particular the long-tailed duck). Rescored to 70.</p> <p><u>Year 4</u>– Provide evidence that sufficient and robust data are being collected on the level and trends in the catch, likely mortality and impact on ETP species (in particular the long-tailed duck) and that they are adequate to support a strategy to manage these ETP species (see Condition 3 – for 2.3.2b). Rescored to 80.</p>
Consultation on condition	Consultation with GFLK & GINR.

**Table 32 – Condition 5**

Performance Indicator	<p>3.2.3</p> <p>a: A monitoring, control and surveillance <b>system</b> has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.)</p> <p>c: <b>Some evidence exists</b> to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.)</p>
Score	70
Justification	<p>(a) It is not evident that the requirements to retain and report all by-catch of non-target species are controlled and the fisher self-reporting can be verified to the same extent as for the target species. The information gathering on by-catch is solely based on self-reporting by the fishers, but there is no independent verification of that reporting.</p> <p>(c) By-catch reporting relies on self-reporting (whereas landed commercial catch is recorded and corroborated with sales notes). There is no evidence to demonstrate that fishers comply with these aspects of the management system.</p>
Condition	<p>The monitoring, control and surveillance <b>system</b> is implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. <b>The monitoring, control and surveillance system with regard to bycatch of non-target species does not clearly demonstrate that management measures, strategies and rules are enforced. There is no evidence that demonstrate that fishers comply with the management requirement of providing information for the effective management of the fishery.</b></p> <p>Provide evidence to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</p>

Milestones	<b>Year 1:</b> Agree on amendments to the reporting & MCS system to ensure by-catch reporting is accurate and this can be independently verified. Score remains at 70.
	<b>Year 2:</b> Official approval MSC system amendments including reporting requirements. Score remains at 70.
	<b>Year 3:</b> Implement amendments to the reporting and MCS protocols. Score remains at 70.
	<b>Year 4:</b> Provide evidence of catch & bycatch reporting and independent verification that reporting is sufficiently accurate. Rescored to 80.
Consultation on condition	Consultation with GFLK.

**Table 33 - Recommendations**

Number	Recommendation	Performance indicator
1	The data available for stock assessment be supplemented with a record of directed effort e.g. the number of nets soaked and total fishing days	1.2.3b
2	The stock assessment approach be reviewed by external expert, e.g. published in a peer reviewed journal.	1.2.4e
3	The fishery is encouraged to retrieve all nets where possible at the end of the season to reduce the potential for the ghost fishing of abandoned, lost or discarded fishing gear.	2.5.2c

## 9.6 Client Action Plan

Condition number	1 (PI 2.2.2e)
Condition text	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species and that they are implemented as appropriate.
Milestones (Year 1=2021)	<p><b>Year 1</b> - Provide evidence of a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch being formalised on a regular basis. Score remains at 75.</p> <p><b>Year 2 &amp; 3</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species has been undertaken. Score remains at 75.</p> <p><b>Year 4</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of the unwanted catch of main 'out of scope' secondary species has been undertaken and that they are implemented as appropriate. Rescored to 80.</p>
Institutions involved	SFG, <b>GINR</b> , GFLK, APNN
Action plan and time frame	<p><b>2020:</b> Start working group with two objectives:</p> <ol style="list-style-type: none"> <li>1. Analyze bycatch patterns in space and time (SFG, APNN, GFLK).</li> <li>2. Review literature on mitigating actions for gillnets (SFG, GINR, KNAPK).</li> </ol> <p>Output is a document that concludes on the applicability of the methods to the Greenland lumpfish fishery and suggests the best practice to get an effect.</p> <p>Discuss mitigating actions feasibility with fishermen.</p> <p>Annual meeting after fishery with fixed agenda (GINR, SFG, APNN, KNAPK, fishermen):</p> <ul style="list-style-type: none"> <li>o Description of fishery in this year – should be LPUE relatable.</li> <li>o Bycatch – when, where, what?</li> <li>o Events of importance (including ETP interactions)</li> <li>o Possible improvements to fishery to reduce bycatch of especially 'out-of-scope' species.</li> <li>o Evaluate initiatives from previous years.</li> </ul> <p><b>2021 &amp; 2022:</b> Hold annual meeting with agenda as above.</p> <p>Possibly conduct trials with any applicable methods for mitigation.</p> <p><b>2023:</b> Hold annual meeting with agenda as above.</p> <p>Evaluate trials of mitigation actions:</p> <ul style="list-style-type: none"> <li>- Do they work? Why, why not.</li> <li>- Should they be changed, extended or abandoned?</li> <li>- Have other ideas developed as a result of trials?</li> <li>- Based on condition 2, is mitigation needed?</li> </ul>
Expected improvement	<ul style="list-style-type: none"> <li>- Improved stakeholder communication.</li> <li>- Knowledge based decisions on mitigating actions.</li> <li>- Annual meetings will allow for due diligence in relation to changes in the fishery as they relate to bycatch (particular areas, seasons, species etc) and a review of the mitigating actions is in place.</li> </ul>
CAB assessment	<ul style="list-style-type: none"> <li>- The CAB will have access to summaries from annual meetings as well as other meetings.</li> <li>- All stakeholders will be available for SA consultations.</li> <li>- Bycatch data will be made available by the authorities.</li> </ul>
Progress documentation	<ul style="list-style-type: none"> <li>- The progress will be documented through meeting summaries and by tangible changes to the fishery as mitigating actions are possibly incorporated into fishery practice.</li> </ul>

Condition number	2 (PI 2.2.3a and 2.3.3c)
Condition text	Quantitative information is available and adequate to (i) assess the impact of the UoA on main secondary 'out of scope' sea bird species with respect to status and (ii) support a partial strategy to manage these main secondary species.
Milestones (Year 1=2021)	<p><b>Year 1</b> – Provide evidence that sufficient and robust data are being collected on the catch and likely mortality of 'out of scope' sea bird species. If this evidence shows that the data being currently collected is either insufficient or not robust enough to both (i) to assess the impact of the UoA on main secondary species with respect to status or (ii) support a partial strategy to manage these main secondary species, to put in place mechanisms for improvement. Score remains at 65.</p> <p><b>Year 2</b> – Provide evidence that improvements, if required, are being made and implemented. Score remains at 65.</p> <p><b>Year 3</b> - Provide evidence that improvements, if required, are being implemented and the result included in annual assessments. Rescored to 75.</p> <p><b>Year 4</b> – Provide evidence that quantitative information is available and adequate to (i) assess the impact of the UoA on main secondary 'out of scope' seabird species with respect to their status and (ii) to support a partial strategy to manage these main secondary species. Rescored to 80.</p>
Institutions involved	SFG, GFLK, industry
Action plan and time frame	<p><b>2020:</b> Simplify the bycatch registration process at landing sites by:</p> <ul style="list-style-type: none"> <li>- Introducing electronic registration at most sites.</li> <li>- Re-iterating the importance to landing site employees.</li> </ul> <p>Continuously underline the importance of bycatch registration to fishermen – use annual meetings (see condition 1)</p> <p>Meet with industry and GFLK to discuss possible ways of improving bycatch registration.</p> <ul style="list-style-type: none"> <li>- Possibly agree with GFLK on special attention to bycatch registration in the lumpfish fishery.</li> </ul> <p>Meet with GINR to discuss what an "adequate" level of information is, that would allow GINR to assess the impact of the lumpfish fishery on main secondary 'out of scope' species.</p> <p>Plan project for 2021 season with GINR that will have two objectives:</p> <ol style="list-style-type: none"> <li>1. Provide an independent source of bycatch levels</li> <li>2. Investigate mitigation measures</li> </ol> <p><b>2021:</b> Evaluate the impact of initiatives to improve bycatch registration (GFLK, industry)</p> <ul style="list-style-type: none"> <li>- Can more be done to motivate fishermen to report?</li> <li>- Compile data on bycatch before and after recent initiatives.</li> <li>- Have initiatives had a measurable effect on bycatch levels?</li> <li>- Discuss current and additional measures on place to minimize bycatch and evaluate if more can be done.</li> </ul> <p>Conduct project on bycatch (SFG, GINR)</p> <ul style="list-style-type: none"> <li>- Provide report on bycatch – relate to Christensen et al. (2019).</li> <li>- Provide report on effect of mitigation.</li> </ul> <p><b>2022:</b> Evaluate if the current bycatch registration provides adequate information. If not, decide on initiatives that must be implemented to meet the requirements.</p> <p>Discuss current and additional measures in place to minimize bycatch and</p> <p><b>2023-2025:</b> Continue to improve quality of quantitative information by repeating action for 2020-2022.</p>
Expected improvement	<ul style="list-style-type: none"> <li>- Improved bycatch reporting.</li> <li>- A GINR evaluation of the level of information – does it provide the quantitative information needed to evaluate the effect of the fishery.</li> <li>- Detailed knowledge on distribution of bycatch in time and space.</li> <li>- Clear description of all measures in place to ensure optimal bycatch reporting and how they relate to secondary species management.</li> </ul>
CAB assessment	<ul style="list-style-type: none"> <li>- The CAB will have access to summaries from the annual meetings.</li> <li>- All stakeholders will be available for SA consultations</li> <li>- Bycatch data will be made available by the authorities.</li> <li>- All measures in place will be clearly described prior to annual audits.</li> </ul>
Progress documentation	<ul style="list-style-type: none"> <li>- The progress will be documented by aggregated data on registered bycatch.</li> <li>- If conducted, a research project on bycatch levels will qualify the information from the bycatch registrations.</li> </ul>



Condition number	3 (PI 2.3.2 b&e)
Condition text	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species. There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.
Milestones (Year 1=2021)	<b>Year 1</b> – Provide evidence of a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) being formalised on a regular basis. Score remains at 75. <b>Year 2</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) has been undertaken. Score remains at 75. <b>Year 3</b> – Provide evidence that a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species (specifically the long-tailed duck) has been undertaken and that they are implemented as appropriate. Score remains at 75 <b>Year 4</b> – Provide evidence that, based on information about the fishery (see Condition 4 – for 2.3.3b), a strategy is in place that is expected to ensure that the UoA does not hinder the recovery of ETP species (specifically the long-tailed duck). Rescored to 80.
Institutions involved	SFG, GFLK, APNN, KNAPK, fishermen
Action plan and time frame	<b>2020:</b> This condition strongly relates to conditions 1 and 2. See action plan for condition 1 and 2 (annual meeting).  Clarify through existing data and consultations with KNAPK and fishermen what the extent of ETP bycatch is: <ul style="list-style-type: none"> <li>- Data from Piniarneq described and aggregated (SFG, APNN).</li> <li>- Interview fishermen specifically about long-tailed duck bycatch at annual meetings (see condition 1 action plan) or at specific consultations.</li> </ul> At annual meeting (see condition 1), discuss if there has been changes to the bycatch of ETP species. If so: <ul style="list-style-type: none"> <li>- Discuss why such changes have occurred.</li> <li>- Discuss if any strategy can be implemented that would minimize the bycatch of ETP species.</li> </ul> Discuss with APNN, KNAPK if changes should be made to the management plan or existing executive orders. Changes should aim at: <ul style="list-style-type: none"> <li>- Minimizing bycatch of ETP if needed - i.e. if data shows that ETP species are increasing in numbers, what specific action should be taken to ensure the bycatch is reduced?</li> </ul> <b>2021</b> Repeat annual meeting and follow up on 2020 actions.  Implement necessary changes in management plan.  Implement necessary changes to executive orders.  Make sure changes to fishery are described and monitored.  <b>2022-2025</b> Repeat process from 2020 and 2021
Expected improvement	<ul style="list-style-type: none"> <li>- Annual review of the bycatch levels in general, including ETP species.</li> <li>- Procedure to ensure that appropriate actions are taken</li> </ul>
CAB assessment	<ul style="list-style-type: none"> <li>- The CAB will have access to summaries from the annual meetings.</li> <li>- All stakeholders will be available for SA consultations.</li> <li>- Bycatch data will be made available by the authorities.</li> <li>- A strategy will be formally described in the Lumpfish management plan.</li> </ul>
Progress documentation	<ul style="list-style-type: none"> <li>- Summaries from annual meetings and ad hoc meetings during the year.</li> <li>- Changes to the management plan as appropriate</li> </ul>



Condition number	4 ( PI 2.3.3 a & b)
Condition text	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. Information is adequate to measure trends and support a strategy to manage impacts on ETP species.
Milestones (Year 1=2021)	<b>Year 1-3</b> – Provide evidence that sufficient and robust data are being collected on the level and trends in the catch, likely mortality and impact on ETP species (in particular the long-tailed duck). Score remains at 75. <b>Year 4</b> – Provide evidence that sufficient and robust data are being collected on the level and trends in the catch, likely mortality and impact on ETP species (in particular the long-tailed duck) and that they are adequate to support a strategy to manage these ETP species (see Condition 3 – for 2.3.2b). Rescored to 80
Institutions involved	GINR, GFLK, SFG
Action plan and time frame	This conditions strongly relates to conditions 2-3. See action plan for this condition as they should ensure progress for this condition.
Expected improvement	<ul style="list-style-type: none"> <li>- Improved bycatch registration</li> <li>- Data of sufficient quality to support strategy (see condition 3)</li> </ul>
CAB assessment	<ul style="list-style-type: none"> <li>- Improved data on bycatch available from GFLK at SA consultations</li> <li>- Qualitative interviews with fishermen on long-tailed duck bycatch made available.</li> <li>- Possible changes to management plan explained.</li> </ul>
Progress documentation	<ul style="list-style-type: none"> <li>- Official bycatch numbers</li> <li>- Management plan</li> </ul>

Condition number	5 (PI 3.2.3a)
Condition text	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.)
Milestones (Year 1=2021)	<b>Year 1:</b> Agree on amendments to the reporting & MCS system to ensure by-catch reporting is accurate and this can be independently verified. Score remains at 70. <b>Year 2:</b> Official approval MSC system amendments including reporting requirements. Score remains at 70. <b>Year 3:</b> Implement amendments to the reporting and MCS protocols. Score remains at 70. <b>Year 4:</b> Provide evidence of catch & bycatch reporting and independent verification that reporting is sufficiently accurate. Rescored to 80.
Institutions involved	GFLK, SFG, industry.
Action plan and time frame	This condition strongly relates to conditions 2-3. See action plan for these conditions. Current legislation is adequate, and the effort will be directed at ensuring that fishers comply with the relevant legislation.  <b>2020-2025:</b> Work continuously with GFLK to ensure that reporting is improved. Make sure GFLK provides annual documentation of control effort.  If research project is conducted by GINR (see condition 2 action plan) use this as some level of verification of bycatch levels.
Expected improvement	<ul style="list-style-type: none"> <li>- Improved bycatch registration</li> <li>- Verification of reported bycatch levels from independent sources (GFLK, GINR)</li> </ul>
CAB assessment	<ul style="list-style-type: none"> <li>- All bycatch data made available to CAB at SA.</li> <li>- Reports from GFLK on control effort directed at verifying bycatch levels made available</li> <li>- All available reports from GINR studies on bycatch made available</li> </ul>
Progress documentation	<ul style="list-style-type: none"> <li>- Available reports</li> <li>- Official bycatch numbers</li> <li>- Relevant legislation</li> </ul>



Sustainable Fisheries Greenland  
Baldrianvej 2  
9310 Vodskov  
Denmark

### Confirmation as an active partner in the MSC-certification of the West Greenland lumpfish fishery

The Ministry of Fishery, Hunting and Agriculture (MFHA) hereby confirms its commitment to cooperate with Sustainable Fisheries Greenland (SFG) in its further work with the MSC-certification of the West Greenland lumpfish fishery.

The MFHA confirms that we will work actively together with SFG and deliver detailed information on bycatches, improving it to the highest standard possible. This information will be provided by the Greenland Fisheries License Control Authority (GFLK), which is an independent department within the MFHA.

The MFHA will work continuously to improve the management plan for lumpfish, such that it at all times dictates the conditions for the fishery in a way that is consistent with maintaining the MSC certificate.

Lastly, should any relevant matter regarding the process of maintaining the MSC-certification of this fishery arise, the Ministry also confirms its overall commitment to work as an active partner with Sustainable Fisheries Greenland.

Best Regards

Steen Christensen  
Chief Adviser  
Ministry of Fisheries, Hunting and Agriculture  
stch@nanoq.gl

Brevdato:  
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Akt nr.: 13084748

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11. februar 2020

To whom it may concern

## **Confirmation as an active partner in the MSC-certification of the West Greenland lumpfish fishery**

The Greenland Institute of Natural Resources (GN) hereby confirms its commitment to cooperate with Sustainable Fisheries Greenland (SFG) in its further work with the MSC-certification of the West Greenland lumpfish fishery.

Specifically, we confirm that, within the possibilities of our budget and human power, we will work with SFG to improve the validity of bycatch registrations, aiming to meet the conditions specified in the client action plan. This includes active participation in annual meetings and in developing research studies.

We will publish new and relevant information on species affected by the lumpfish fishery as it becomes available and will share information with the certification agency.

Lastly, should any relevant matter pertaining to the process of maintaining the MSC-certification of this fishery arise, we also confirm our overall commitment to work as an active partner with Sustainable Fisheries Greenland.

Mvh.

Fernando Ugarte

Head of department of Birds and Mammals

Aalisarnemut, Piniarnemut Nunalerinermullu Naalakkersuisoqarfik  
Departementet for Fiskeri, Fangst og Landbrug

Kalaallit Nunaanni Aalisarsinnaanemut Akuersissutinik Nakkutlilisooqarfik  
Grønlands Fiskerilicenskontrol

NAALAKKERSUISUT  
GOVERNMENT OF GREENLAND



06-10-2020

Akt nr. 15039954

### Letter of support

Postboks 501  
3900 Nuuk  
Tlf. (+299) 34 50 00  
Fax (+299) 34 63 60  
E-mail: GFLK@nanoq.gl  
www.naalakkersuisut.gl

To the MSC assessment team,

GFLK (Greenland Fisheries License Control Authority) hereby confirm that we have received and read the Client Action Plan regarding the continued MSC certification of the lumpfish fisheries in Greenland.

GFLK support the Client Action Plan and will work towards solving the problem areas raised in the five conditions within the given time frame.

Best regards

Inussiarnersumik inuulluaqqusillunga

Med venlig hilsen


Michael D. Pedersen  
Fiskerilicensinspektør, Cand.Jur.  
Head of GFLK

**Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat**  
The Association of Fishers & Hunters in Greenland  
Sammenslutningen af Fiskere og Fangere i Grønland



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Homepage: [www.knapk.gl](http://www.knapk.gl)

Ullaq, 02. October 2020  
J.nr. 11.01.07

To whom it may concern

Att.:  
Mailadr.: [kgu@polarseafood.com](mailto:kgu@polarseafood.com)

Una pill: **Statement from KNAPK**

From the Fishermen and Hunters Association of Greenland we hereby want to express that we will fully support the work from Sustainable Fisheries Greenland dealing with the MSC certification of the Lumpfish.

For the Association of Fishers and Hunters in Greenland it is vital that the Lumpfish as a specie is subject to a MSC certification and we will do our utmost to ensure that this certification is not endangered by any mis-management. The sustainability is vital for the Greenlandic coastnear fisheries society and to the economy of this small-scale fishery.

We hereby offer our resources to collaborate with all stakeholders in ensuring the certification of Lumpfish.

Inussiarnersumik inuulluaqqusillunga/Bests regards  
**Kalaallit Nunaanni Aalisartut Piniartullu Kattuffiat**

Tønnes Berthelsen  
CEO KNAPK

## 9.7 Surveillance

**Table 34 Fishery surveillance program**

Surveillance level	Year 1	Year 2	Year 3	Year 4
Level 5	On-site surveillance audit	Off-site surveillance audit	On-site surveillance audit	On-site surveillance audit & re-certification audit

**Table 35 Timing of surveillance audit**

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1	13 February	February 2022	Integrated on-site audit with the clients West Greenland offshore Greenland halibut fishery.
2	13 February	February 2023	
3	13 February	February 2024	
4	13 February	February 2025	

**Table 36 Surveillance level rationale**

Year	Surveillance activity	Number of auditors	Rationale
2	Off-site audit	2 auditors remote	Actions for year 2 milestones are limited to evidence of discussions required which can be provided by email and discussed with the client remotely.



## 9.8 Risk-Based Framework outputs

The Risk Based Framework has not been used for this reassessment.

## 9.9 Harmonised fishery assessments

No other stocks in the West Greenland inshore area are MSC certified. The only MSC certified species, in close proximity, is the West Greenland offshore shrimp fishery and West Greenland offshore Greenland halibut fishery. These are both bottom trawl fisheries with no impact on the lumpfish fishery. Similarly, neither species are caught in the lumpfish fishery.

**Table 37 Overlapping fisheries**

Fishery name	Certification status and date	Area	Assessment tree	Performance Indicators to harmonise
West Greenland cold-water prawn fishery	Certified February 2013	FAO 21	CR v 1.3	3.1
West Greenland offshore Greenland halibut	Certified May 2017	FAO 21	FCR 2.0	3.1
Greenland Lumpfish	Certified August 2015- in reassessment	FAO 21	FCP v2.1	3.1
Greenland cod, haddock and saithe trawl fishery	Certified May 2015	FAO 27	CR v1.3	3.1
Icelandic lumpfish fishery	Certified November 2013 – withdrawn April 2019.	FAO 27		NA
NFA Norway ling & tusk and NFA Norway lumpfish fishery	Certified October 2017	FAO 27		NA

There is no interaction between the lumpfish and the cold- water prawn fisheries or the offshore halibut fisheries. These fisheries are distinct though they are in the same FAO area, using very different gears. The impacted habitats are very different for these fisheries as also for the 3 fisheries in FAO 27. These fisheries are regulated under the same general legislation, but there are separate management plans and the licence systems are specific for each fishery.

**Table 38 Overlapping fisheries**

Supporting information	
No harmonisation meeting.	
Was either FCP v2.1 Annex PB1.3.3.4 or PB1.3.4.5 applied when harmonising?	<b>No</b>
Date of harmonisation meeting	<b>NA</b>
If applicable, describe the meeting outcome	
NA	



**Table 39 – Scoring differences**

Performance Indicators (PIs)	West Greenland cold-water prawn fishery	West Greenland offshore Greenland halibut	<b>Greenland lumpfish</b>	Greenland cod, haddock and saithe trawl fishery
Assessment tree	CR v1.3	FCR v2.0	FCP v 2.1	CR v1.3
FAO area	21	21	21	27
<b>PI 3.1.1</b>	<b>75</b>	80	<b>95</b>	100
<b>PI 3.1.2</b>	95	90	<b>100</b>	100
<b>PI 3.1.3</b>	80	90	<b>90</b>	100
<b>PI 3.1.4</b>	80	NA	<b>NA</b>	90

**Table 40 Rationale for scoring differences**

If applicable, explain and justify any difference in scoring and rationale for the relevant Performance Indicators (FCP v2.1 Annex PB1.3.6)
<p>The minor differences in the scoring are due to the fact that the two other fisheries in FAO 21 are shared stocks, while lumpfish is a single jurisdiction stock and the scoring of 3.1 reflects this – in the case of the prawn fishery this results in a condition on 3.1.1.</p> <p>The two other certified fisheries in FAO area 21 are also both offshore fisheries with different management arrangements to the inshore lumpfish fishery, albeit operating under the same Fisheries Act and therefore show consistent outcomes where the Fisheries Act is concerned but at PI level the outcomes differ due to the shared nature of the fisheries.</p>
If exceptional circumstances apply, outline the situation and whether there is agreement between or among teams on this determination
NA

## 9.10 Client agreements

### 9.10.1 ACDR

**From:** [Rasmus Hedeholm](#)  
**To:** [Chaudhury, Sandhya](#); [Kristina Guldbæk](#)  
**Subject:** Sv: Lumpfish - ACDR with comments  
**Date:** fredag 9. august 2019 22:12:00

---

Dear Sandhya

It was no problem.

SFG accepts the ACDR and confirms that DNV GL can continue with the reassessment process.

A nice weekend to You as well.

Kind regards,

Rasmus Hedeholm

---

**Fra:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>

**Sendt:** 9. august 2019 20:42

**Til:** Kristina Guldbæk

**Cc:** Rasmus Hedeholm

**Emne:** RE: Lumpfish - ACDR with comments

Thanks,

This is highly appreciated, your giving it priority. It has been challenging to meet all deadlines during this holiday season.

I will go through this and have it ready for publication and announcement for Monday 12.08.2019. But Before that I need your formal confirmation to continue with the reassessment process (these are new requirements in the FCP v2.1). It would suffice if you just sent an email stating that you accept the ACDR and confirm that DNV GL can go ahead with the reassessment process.

Have a nice weekend.

BR / MVH

For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

E-mail [sandhya.chaudhury@dnvgl.com](mailto:sandhya.chaudhury@dnvgl.com)

Mobile +47 404 00 404

### 9.10.2 CPRDR

**From:** Rasmus Hedeholm <rhe@sfg.gl>  
**Sent:** mandag 9. mars 2020 13:00  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Subject:** RE: Greenland lumpfish fishery - revised timeline

Dear Sandhya

Thank you, and please extend my appreciation to the assessment team for taking the time to be so thorough in responding to my comments.

I will finalize the action plan before the revised deadline and inform you about the development in the fishery concerning the possible changes.

Best regards

Rasmus

---

**From:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Sent:** 9. marts 2020 11:44  
**To:** Rasmus Hedeholm <rhe@sfg.gl>  
**Cc:** Kristina Guldback <kgu@polarseafood.com>; Lisbeth Due Schönnemann-Paul <lisc@royalgreenland.com>  
**Subject:** RE: Greenland lumpfish fishery - revised timeline

Dear Rasmus,

Enclosed please find the team's response to your additional comments. Please note that this has been included in the updated version of the report – also enclosed.

Please note that after the revised milestones (as a result of the PR comments) the deadline for the client Action Plan is 17.03.2020 .

Thank you.

BR / MVH  
For DNV GL Business Assurance Norway AS

Sandhya Chaudhury  
Principal Specialist

---

**From:** Rasmus Hedeholm <rhe@sfg.gl>  
**Sent:** torsdag 13. februar 2020 13:30  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Cc:** Kristina Guldback <kgu@polarseafood.com>; Lisbeth Due Schönnemann-Paul <lisc@royalgreenland.com>  
**Subject:** RE: Greenland lumpfish fishery - revised timeline

Dear Sandhya

I have looked through the report following the review process. I have some additional comments that are attached.

The action plan will be updated according to the new milestones shortly.

Kind regards

Rasmus

### 9.10.3 Forced and Child Labour Policies, Practices and Measures

**From:** Kristina Guldbæk <kgu@polarseafood.com>

**Sent:** torsdag 4. februar 2021 08:17

**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>

**Cc:** Rasmus Hedeholm <rhe@sfg.gl>

**Subject:** SV: Greenland lumpfish Recertification - Forced and Child Labour Policies, Practices and Measures Template

Dear Sandhya,

Please find attached self-declaration regarding forced and child labour.

We can also confirm that during the last 2 years, none of the entities in the coastal fishery for lumpfish has been convicted for violating the rules and regulations regarding forced and child labour mentioned in the document.

Med venlig hilsen / Best regards

**Kristina Guldbæk**

Sustainable Fisheries Greenland



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## 9.11 Evaluation of triggering expedited audit – June to September 2020

The West Greenland lumpfish certificate expires 13 February 2021 based on the certification date 13 August 2015 and the COVID-19 extension of 6 months. The certificate is under reassessment. The fourth surveillance audit report was published on 12 November 2019. The next scheduled audit (first surveillance) will be around January 2022. There is no surveillance audit planned for 2020 and 2021. The reassessment report will be published in February 2021.

The fishery for the 2020 season takes place March-June (incl) and regulations (inter alia TAC) were issued according to the Management Plan prior to the fishery start.

In late June DNV GL became aware of a derogation issued for the last few weeks of the fishing season, an increase of the TAC by 14% (163 t roe).

*The Covid 19 derogation CAB guidance of 17th April 2020 requires that CABs shall follow FCP v2.2 clause 7.29.1 (Box1) to trigger an expedited audit from 17th April 2020 until 25th September 2020 (when the FCP v2.2 becomes mandatory).*

*FCP v2.2 § 7.29.1: The CAB shall complete an expedited audit if the CAB becomes aware of changes to the circumstances of the fishery and /or of new information that may cause:*

*a. A PI score falling below 60*

*b. A principle score falling below an aggregate 80 score due to the changes to the score for 1 or more PIs.*

*§G7.29.1 defines examples of "significant new information" "Major changes in Management" as well as new information describing a major impact of the fishery. Also, there must be good reason to think that these are actual material difference and not a likely temporary change that may arise.*

*Everything else is to be audited at the next scheduled audit.*

As a result, the fishery was subjected to an evaluation of the need to trigger an expedited audit based on this information.

DNV GL requested the Client 'Sustainable Fisheries Greenland' to provide background information and received responses on 8<sup>th</sup> July 2020 from PINNGORTITALERIFFIK [GREENLAND INSTITUTE OF NATURAL RESOURCES] regarding sustainability of Lumpfish management plan after increase of TAC Nuuk, Greenland July 2020. This paper concludes:

In a hearing send out by Ministry of Fisheries, Hunting and Agriculture, Fisheries Division the 6th of May, 2020, GINR answered that it was not recommended to increase the TAC for the fishery in 2020 since it would exceed the biological advice and furthermore go against the agreed management plan. After the fishing season 2020 the fishery was evaluated. The development of LPUE have since 2016 been stable around 160 kg pr. landing, except in 2017, where it was historic high. In 2020, the LPUE was 241 kg pr. landing which is close to the high level in 2017. Based on this, GINR do not expect that an increased catch of 163 tons (14% of TAC) in a single year will risk the sustainability and precautionarily of the current management plan. However, an effect of not following the advice can be a postponed timeline in reaching the catch level in the reference period.

Further, the document indicates that work is in progress for updating the stock assessment methodology.

The assessment team triggered the required evaluation process and the following factors were considered:

Respecting the Management plan is a precondition for the certificate. The advice for 2020 was 1,159 t and the TAC was set at this level but later in May 2020 this was increased by 163 t (14%). The fishery in 2018/2019 has been slightly below 1,100 t annually (2019 = 1,096 t roe). The TAC in 2018 and 2019 of 1300 t was therefore not caught. The fishery for 2020 is (8842 t (~1,320 t roe) source Greenland statistics download 11/07/2020).

Abstract from GINR 2019:

... a two-year advice [2020-2021] (following the management plan) for the total allowable catch (TAC) and fishing days. The landings per unit effort (LPUE) de-creased in 2018 and 2019 from the preceding two years. This decrease resulted in a reduction of the advice from the current 1300 t and 41 fishing days to be 1159.21 t and 37 days in 2020 (reduction of 10.83%) and 1018.42 t and 32 days in 2021 (reduction of 21.66%).

DNV GL considered that the derogation only affects scoring under Principle 1. There are no changes to the ecosystem effects (Principle 2) and no changes to the management (Principle 3). The fishery has no international aspects and the issues are only related to Greenland.

**Table 41 DNV GL analysis of Principle 1 at Expedited audit**

<i>MSC scoring</i>	<i>DNV GL analysis</i>
1.1.1 Stock status	Stock status not severely affected rather abundance judged by catch rates were unexpectedly high
1.2.1 and 1.2.2 Harvest strategy/HCR	The derogation was based on considerations not part of the management plan
1.2.3 and 1.2.4 the stock assessment approach	Not affected

The criterion for calling an expedited audit in FCP v2.2. § 7.29.1

**Table 42 Criteria for Expedited Audit**

The CAB shall complete an expedited audit if the CAB becomes aware of changes to the circumstances of the fishery and/or of new information that may cause:	DNV GL evaluation
a. A PI score falling below 60.	1.2.1a SG60 is met based on the Ministers declaration that the Management plan is still valid 1.2.2c SG60 is met
b. A Principle score falling below an aggregate 80 score due to the changes to the score for 1 or more PIs.	1.2.1a SG80 is not met and the overall score would be 70 1.2.2c SG80 is not met and the overall score would be 75.
c. A change in scope (as per 7.4, 7.5.2 or 7.5.3)	Not relevant

The current scoring of the stock assessment in the PCDR of 2<sup>nd</sup> April, 2020 for principle 1 is

**Table 43 Potential scores at Expedited Audit.**

	<b>PCDR 2020</b>	<b>Potential scores at expedited audit</b>
1.1.1	80	80
1.1.2	Not scored	Not scored
1.2.1	95	70
1.2.2	90	75
1.2.3	80	80
1.2.4	80	80
<b>Overall</b>	<b>84.2</b>	<b>77.5</b>

The preliminary conclusion therefore was that criterion b. in Table 42 is met and an expedited audit is required. The client, SFG found that an expedited audit was not required and assured the assessment team that the lumpfish management plan is still valid. The plan has not been suspended and is currently under revision and that they would be happy to contact the Ministry of Fisheries to request a statement confirming this and possibly also explain the situation regarding the TAC setting of 2020 if this could be of further benefit in the evaluation.

Given the short deadlines and the difficulty in contacting all parties due to the holiday season and the Covid 19 situation a Variation Request was submitted to MSC to extend the evaluation period from the required 30 days to 60 days. MSC accepted this on the 7<sup>th</sup> August 2020 – see enclosure at the end of this chapter.

Following further information was submitted on 22<sup>nd</sup> July 2020:

a) Rasmus Hedeholm (SFG): Lumpfish MP and HCR note following 2020 fishery. This note repeats GINR's conclusion but based on a more detailed analysis. However, the data used for 2020 are the same as used by GINR and are not a full assessment of the stock for 2020.

b) Greenland Ministry for Fisheries, Hunting and Agriculture [Akt 14247872]. This document is signed by the Greenland Minister. The document stresses that the Management plan is not void but still applies. Further that a revision of the management plan is ongoing, and that the derogation was introduced maintaining the 2019-2020 exploitation combined within the scientific advice. The Minister declared that the Management plan is still in effect and that the derogation is therefore of temporary nature.

On 2<sup>nd</sup> September 2020 DNV GL received the following documentation from SFG:

- Letter from MFHA regarding assurance of robustness of the lumpfish management plan. From Head of Division Birgitte Jacobsen.
- Official timeline from MFHA for the revision of the lumpfish management plan.
- Letter with copy of information received from MFHA in relation to possible changes in the revised lumpfish management plan.

From these the assessment team concluded:

- The Greenland administration and political leadership stress that the West Greenland lumpfish Management Plan remains valid although it is admitted that the in-season TAC increase was an action outside the HCR embedded in the management plan
- The stock remains within safe biological limits as the 2020 abundance seems based on the LPUE indicator to be high. On that basis PI 1.1.1 remains scored at SG80 or above.
- The fishing strategy and HCR remains unchanged based on the assurance by the minister and the stakeholders (Document from the post-season evaluation) PI 1.2.1 and 1.2.2 will score unchanged SG60 or above.
- The Stock assessment (PI 1.2.3 and 1.2.4) scores are not affected.
- Principle 2 scorings are not affected by the in-season TAC increase.
- Principle 3 The objectives, general management framework, and compliance are not affected and also Principle 3 scorings will remain unchanged above at SG60 or above.

There is therefore no basis for an Expedited Audit.

The documentation also includes a commitment for revising the management plan including a roadmap and timetable for this revision.

The Assessment team further comments:

- The deadline for a revised and evaluated Management Plan is 29 January 2021. DNV GL expects to receive this plan at this deadline at the latest.
- The 2020 fishing season (April-June) is over and there is no MSC certified fishery for lumpfish until the 2021 season beginning in April.
- DNV GL will, based on the revised plan, review if an Expedited Audit is required and notes that such an Expedited Audit will be concluded prior to the start of the 2021 fishing season. On that basis the assessment team will judge the status of the MSC certificate for Greenland Lumpfish fishery.

#### **Information Enclosures enclosed:**

##### Client submissions:

1. Letter from MFHA regarding assurance of robustness of the lumpfish management plan. From Head of Division Birgitte Jacobsen.
2. Official timeline from MFHA for the revision of the lumpfish management plan.
3. Letter with copy of information received from MFHA in relation to possible changes in the revised lumpfish management plan.
4. Statement concerning the lumpfish fishery from the Minister of Fisheries
5. Note from SFG
6. Information from GINR regarding the lumpfish stock and TAC increase

##### Emails received from Rasmus and Kristina:

- 04.06.2020
- 25.06.2020





## Assurance that the management plan remains robust

02-09-2020  
Sags nr.: 2020 - 3650  
Akt nr.: 14740764

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During the lumpfish fishing season 2020, the TAC was raised with an amount corresponding to the amount of unfished quota in 2019. The Ministry underlines that the TAC increase, is *without any precedents* and was only effectuated due very special circumstances during the 2020 fishing season. This included an extremely lucrative fishery with a faster than expected depletion of the TAC in certain areas and very high levels of LPUE, the acknowledged stock size indicator. The level of the TAC increase was equivalent to the unfished TAC from the previous fishing season, and although not specified for lumpfish, between-year quota transfer is normal practice in other Greenland fisheries and the practice will be addressed in connection to the lumpfish management plan evaluation in autumn 2020.

Major changes in the management of fisheries are not made ad hoc, but is subject to a well-documented and inclusive process, involving a comprehensive consultation process. This includes a proposal draft by The Department of Fisheries, Hunting and Agriculture based on inputs from stakeholders in the fishery (e.g. the industry, KNAPK, GFLK, GN) a hearing period, consideration of feedback from the stakeholders, approval by the Minister of Fisheries and final decision by the government (Naalakkersuisut).

Regardless of the extraordinary circumstances that lead to the Naalakkersuisut decision, this process was followed in this case.

Shortly after the end of the season, APNN convened to an evaluation meeting with all stakeholders. All participants agreed that the TAC from now on should be in accordance with the strategy outlined in the management plan.

The raised TAC is capable of having a great negative impact on the industry if we lose our MSC certificate. This is clear to all stakeholders. Thus, the motivation to keep the TAC at the scientifically advised level, as well as the interest in improving the management of the lumpfish, is now greater than ever. The TAC will be in accordance with the Management Plan in future fishing seasons.

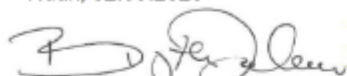
The Ministry is currently revising The Management Plan in collaboration with a working group consisting of stakeholders of the lumpfish fishery. The new management plan is scheduled to be in force before the 2021 fishing season, as described in the present



management plan of 2020. APNN intends to act in accordance with the new management plan.

**Naalakkersuisoqarfik sinnerlugu**  
**På Departementets vegne**

Nuuk, 02.09.2020

  
Birgitte Jacobsen, PA, Afdelingschef



Nuuk, July 2020

## Regarding sustainability of Lumpfish management plan after increase of TAC

Greenland Institute of Natural Resources (GINR) received 26<sup>th</sup> of June 2020 a request from SFG regarding whether there is evidence to support that the current management plan for Lumpfish continues to be sustainable and precautionary despite the TAC increase in 2020.

In a hearing send out by Ministry of Fisheries, Hunting and Agriculture, Fisheries Division the 6<sup>th</sup> of May, 2020, GINR answered that it was not recommended to increase the TAC for the fishery in 2020 since it would exceed the biological advice and furthermore go against the agreed management plan.

After the fishing season 2020 the fishery was evaluated. The development of LPUE have since 2016 been stable around 160 kg pr. landing, except in 2017, where it was historic high. In 2020, the LPUE was 241 kg pr. landing which is close to the high level in 2017. Based on this, GINR do not expect that an increased catch of 163 tons (14% of TAC) in a single year will risk the sustainability and precautionarily of the current management plan. However, an effect of not following the advice can be a postponed timeline in reaching the catch level in the reference period.

The current management plan is considered precautionary, and a theoretical evaluation of the harvest control rule based on the available data in September 2019 showed that exploratory model runs, using both F and catch status quo scenarios as well as no catch, all indicated that the stock would increase over time. Hence, the conclusion was that although the actual timeline was uncertain, the stock should rebuild under the current management regime (Document: Harvest control rule evaluation for Greenland lumpfish fishery, September 2019).

The available time series for this stock have until now been rather short which have made an analytical assessment impossible. The current management plan is in a process of being revised. The time series has increased since the current assessment procedure was established. Thus, it is investigated whether sufficient data is now available to be able to move from a trend-based assessment to an analytical assessment using the Surplus Production in Continuous Time (SPiCT) model. It is too early to evaluate the output from the model runs and more work is needed to validate the model. However, none of the results obtained in this work or the development of the stock in general is subject to concern regarding the future development of the lumpfish stock in West Greenland.

Regards,

Søren Post, MSc. and Helle Torp Christensen, Ph.D.

Greenland Institute of Natural Resources



Nuuk, 3rd september 2020

To:

Sandhya Chadhury

Hans Lassen

## Information from MFHA regarding possible changes in the revised management plan for the lumpfish fishery

Please find below (in Danish) copy of information from the MFHA regarding the requested overview of possible changes to the lumpfish management plan which is currently under revision. Information which you have requested in connection with the evaluation of the MSC-certificate for the West Greenland lumpfish fishery.

The information was received by Sustainable Fisheries Greenland after a meeting held on 21 August 2020. It is important to note that it is still a bit early in the revision process so we cannot at this point determine how the different topics will look like in the finished management plan. The official timeline for the revision process, which you will also find attached, gives an overview of the different steps in the process.

Please let us know if the information needs to be translated into English.

Best regards

On behalf of Sustainable Fisheries Greenland

Kristina Guldback

Herunder følger den opdaterede liste over de emner der skal behandles i forbindelse med den nye forvaltningsplan for stenbider, med udgangspunkt i mødet vedr. stenbider MSC d. 21. august 2020.

- **Rådgivningsprocedure.** Overvej ny proces for rådgivning- fx rådgivning hvert år ift. hvert andet år. Erfaringer fra de seneste års fiskeri bør vægtes ifm. Rådgivning og fastsættelse af TAC.
- **Revideret rådgivningsmodel.** Kan en SPiCT model, eller en anden model, danne et bedre grundlag for den videnskabelige rådgivning? (det er en udfordring med LPUE, at når fangsten er stor, medfører det højere TAC)
- **Kvoteforførsel mellem år.** Overvej om ubrugt kvote skal kunne overføres fra ét år til det efterfølgende år (ubrugt kvote er ikke kumulativ over flere år). I så fald, skal overførelsen da være indenfor- eller mellem områder?

- **Kvoteoverførsel mellem områder.** Hvordan skal kvoteoverførsel håndteres mellem områder inden for sæsonen?
- **Stenbider-hanner.** Den gældende plan foreskriver at stenbider-hanner kan fiskes året rundt. Den nye bekendtgørelse for stenbider omfatter ikke hanner. Fiske-perioden for hanner bør derfor specificeres i den nye forvaltningsplan. Fiskeperioden for hanner fastsættes (fx 1/1 til slutningen af fiskerisæsonen for kvabso?)
- **Opdeling af NAFO områder.** Ønsker fra KNAPK om at opdele NAFO 1C, 1D og 1E op i to områder, 1Ca og 1Cb osv, pga forskellige ønsker om startdato.
- **Særlige omstændigheder.** Afsnit om "særlige omstændigheder" inden for en fiskesæson. Skal særlige omstændigheder føre til mulighed for at ændre kvote eller fiskeperiode?
  - LPUE højere end XX kg/landing inden for sæsonen
  - LPUE lavere end XX kg/landing inden for sæsonen
  - Ekstraordinær bifangst af fugle eller havpattedyr
  - Ugunstige vejrforhold i ekstraordinært lange perioder
- **SMS-service.** Er det muligt, som i laksefiskeriet, at sende SMS'er ud til licensholdere med fx halvvejsmelding og slutmelding, så fiskere har bedre mulighed for at tage garn op og indhandle når kvoten er fisket op.
- **Status fra indhandlingssteder.** Er det muligt at indhandlingsstederne kommer med daglige estimater på den indhandlede mængde, samt på hvad der er fisket, men endnu ikke indhandlet.
- **Bifangster.** Hvordan får vi fiskerne til at melde om deres bifangster?
- **Licenser.** Licensuddelingerne er eksploderet, mulighed for begrænsning til kun at vælge ét forvaltningsområde, eller andre måde at begrænse tendensen. Evt. mulighed for at fiske i ét område og indhandle i et andet.  
Overholdes regler i fiskeriet ikke i ét år, vil der ikke blive udstedt licens i det/de to efterfølgende år.
- **Efterladte garn.** Mulighed for at lave lov om at sætte GPS på alle garn. Forslag om at når der er gået tre dage efter lukning af fiskeriet, må alle tage efterladte garn op.
- **Antal garn.** Skal der være max antal garn der må tillades? Fx max 50 garn pr licens. – svært at kontrollere.  
Forslag om at alle garn har chipmærke+navn. Overholdes dette ikke, udstedes der ikke licens efterfølgende år.
- **Omladning.** Det er forbudt at omlade og det skal tydeliggøres.
- **Fiskedage.** Bør følge videnskabelig rådgivning fra GN for at leve op til MSC standarder.
- **Fiskeperiode.** Tidligste dato for fiskeriets start 15.april. Ved at forsinke starttidspunktet, vil fiskeriet i højere grad foregå efter at de fleste havfugle har forladt overvintringspladserne. En analyse af de seneste års landingsdata (jf. assessment 2019) viser desuden, at fiskeriet generelt er ineffektivt i denne periode og kun har en mindre indflydelse på de samlede fangster. Ønske fra KNAPK om at startdatoen i NAFO 1F er tidligere, fx 24. marts. GE foreslår 25. marts.



Sustainable Fisheries Greenland  
Att. Kristina Guldbæk

### Statement concerning the 2020 lumpfish fishery

First and foremost, the Ministry of Fisheries, Hunting and Agriculture emphasizes that the current management plan for the commercial fishery for lumpfish is still in force. It has *not* been put out of force.

The Ministry underlines that the TAC increase in the 2020 fishing season, is *without any precedents*, as can be seen in table 1 below.

The Ministry emphasizes that the local and regional socioeconomic significance of the coastal lumpfish fishery for many small-scale fishermen and their settlements was the background for the extraordinary increase of the 2020 TAC. Socioeconomic sustainability will be taken into consideration in the development of a new and improved management plan.

In 2020, the fishery in some management areas experienced large catches from the very beginning of the season, and the TAC was used up earlier than in any previous year. The Government of Greenland decided that an increase equivalent to the unused quota of 2019 could be a precautionary solution that ensured all management areas equal access to the fishery.

The 2020 increase in TAC matches the unexploited TAC in 2019, which means, that *over a 2-year period (2019-2020) the total catch (2.416 t) has not exceeded the scientific advice (2.459 t)*.

Table 1: Scientific Advice, TAC and catch for all management areas in West Greenland in the period 2015-2020 (tonnes)

	2015	2016	2017	2018	2019	2020
<b>Advice</b>	1.500	1.500	1.300	1.300	1.300	1.159
<b>TAC</b>	1.500	1.500	1.300	1.300	1.300	1.159
<b>Extra quota</b>						204
<b>Final TAC</b>						1.363
<b>Catch</b>	1.058	744	1.103	1.002	1.096	1.320
<b>Unexploited TAC</b>	442	756	197	298	204	43

Considering the development of the 2020 lumpfish fishery, the Ministry gathered all relevant stakeholder from the lumpfish fishing industry immediately after the end of the fishing season to evaluate this year's fishery as the Ministry finds that it is important to learn from such extraordinary situations and ensure continue improved management.

During the meeting, it became evident that all participants in the lumpfish fishery wants to ensure that *the TAC set by Naalakkersuisut does not exceed the scientific advice*. Thus, it was agreed that improvements were needed for the coming fishing season in order to ensure that the management and control upholds to the management plan, that the TAC

22-07-2020  
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## Lumpfish MP and HCR note following 2020 fishery

Author: Rasmus Hedeholm

The 2020 lumpfish roe TAC was increased during the season, and the total catch was 1321 t roe, which is a 14% increase from the original TAC of 1158 t. Such an increase is not mandated by the current management plan, and the increase has prompted a request from the MSC Conformity Assessment Body, DNV. Basically, DNV are questioning if there is evidence to support that the current management plan continues to be sustainable and precautionary despite the TAC change. They have requested this information to be able to evaluate if the Greenland lumpfish fishery should be subject to an expedited audit.

The current lumpfish HCR is set up to be precautionary and allow the stock to rebuild to the reference level which it is currently below. The reference level is the average LPUE from 2010-2013. In short, if LPUE increases but is below the reference level the TAC is maintained, and if the LPUE does not increase, the TAC is reduced until an increase is seen in LPUE.

There is no analytical model at present to forecast stock development, and as such it is not possible to simulate any catch scenarios and thus provide any measure of the risk associated with different catch scenarios. To argue that the HCR is indeed precautionary, a simulation was carried out in early 2020 at the annual audit based on a combination of a surplus production model (SPiCT) and the expected LPUE response.

Reference points are defined, and these are also LPUE based. The two most recent LPUE values (2019: 167; 2020: 241) are both above the  $LPUE_{trigger}$  value (161) and well above the  $LPUE_{lim}$  value (107). Hence, the stock is estimated to be in a good condition and the stock decline seen from 2013 to 2016 has apparently been reversed, indicating that the HCR is meeting its objective. With the current HCR, the 2021 and 2022 TAC advice will be maintained compared to 2020.

There are historical empirical data to suggest that the 2020 catch will not have a large negative effect. From 2003-2007 catches were equally high and LPUE values in the years when the 2003-2007 cohorts presumably recruit (2010-2013 – no values before 2010) were high. LPUE values in 2015-2018 declined, and this fishery was based on cohorts from years with catches exceeding 1500 t in 2011-2013. The exception to this is the 2017 LPUE value, which is unexplainably high. This perhaps links to a recruitment success or environmental anomaly. In the previous HCR evaluation in 2019, the 2017 LPUE was disregarded.

### SPiCT model

The current advice procedure is not ideal, and rests on key assumptions. This means that particularly the stock size indicator is subject to uncertainty. This uncertainty is not handled in the current advisory process and should ideally be handled in a model setting, specifically set up to

incorporate parameter uncertainty. Production models are usually used when no age or length data are available, which is exactly the case for lumpfish. The Surplus Production in Continuous Time (SPiCT) model also incorporates an observation error term on both catches and LPUE. This was previously fitted to these data, but now additional data are available, and more time has been allocated to optimizing the model fit.

Although not yet evaluated for use as the primary advisory tool, lessons can be learned with respect to the impact of increasing the 2020 TAC above the original TAC.

#### *Input data*

- Catch data from 1969-2020.
- LPUE from 2010-2020.
- LPUE uncertainty, defined as yearly SE/mean.

#### *Method*

Some assumptions were made:

- The  $B/B_{msy}$  ratio was assumed to equal 1 in 2010. This is a key assumption. The 2010-2013 period is in the current advisory process assumed to represent the LPUE target – or  $B_{msy}$ . This assumption is carried into the SPiCT model. Preliminary runs were done without this assumption, but these models either failed to converge or provided unrealistic results.
- Catch data are available from 1969-2020. However, there is an unexplained decline in catches between 1985 and 1996. Here catches were very low (<60 t). These data were excluded from the model as attempts to verify them were unsuccessful.

Three runs were compared.

- 1) A run with the original 2020 TAC and 2020 LPUE value and  $F_{msy}$  in 2021
- 2) A run with the realized 2020 catch and 2020 LPUE value and  $F_{msy}$  in 2021.
- 3) A run with the realized 2020 catch and 2020 LPUE value and  $F$  status quo in 2021 (i.e. . that further increased by 14% (1506 t).

#### *Results*

All three model runs converged, model diagnostics were relatively fine and a two-year retrospective plot shows the model to be stable over the past few years (Fig. 1).

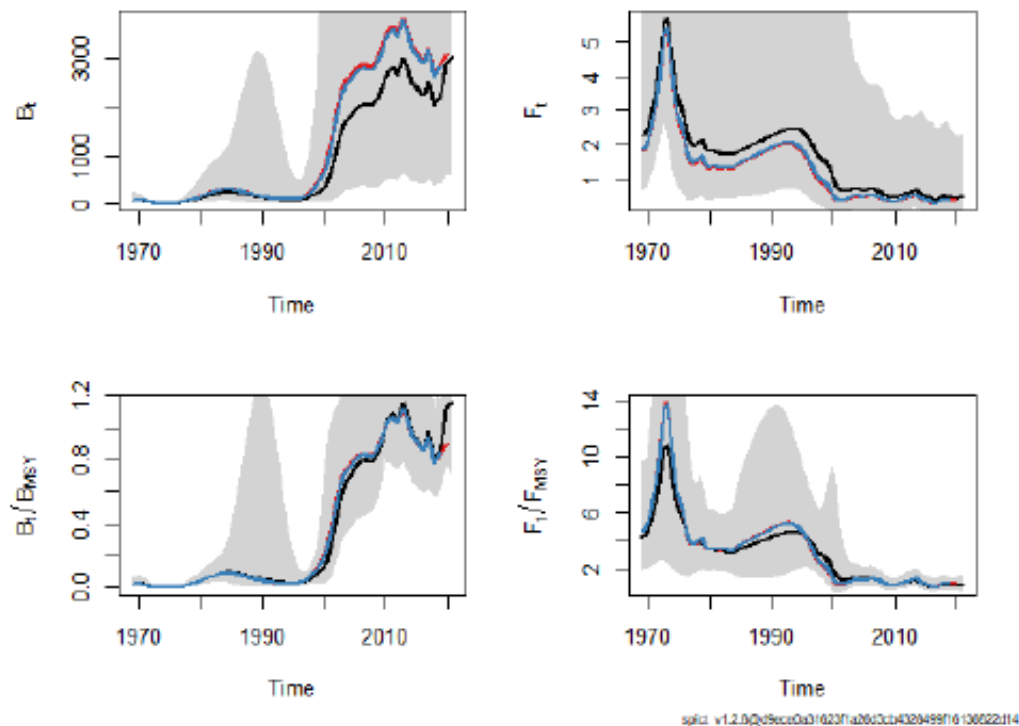


Figure 1: Retrospective plot from run 2.

Confidence limits are wide on all parameters. For instance, the 95% confidence limits on the biomass in 2020 is 1073t-10115t, with a prediction of 3295 t. However, estimates are more certain in the latest part of the period where the stock size indicator, LPUE, becomes available.

$F_{msy}$  is estimated to be 0.41, which is relatively high. MSY is estimated to be 1362 t. Based on the historical development of the fishery, this does seem to be an unrealistic level of catch.

Comparing the 3 model scenarios, they are quite similar. Because the increased TAC in 2021 keeps the  $F/F_{msy}$  ratio below 1, the predicted catch in 2021 based on an  $F_{msy}$  assumption will increase further from the 2020 catch. Based on this, there is no reason to suggest that the increased catch in 2020 has significantly increased the risk of the stock falling below any limit reference point. In fact, the conclusion based on this model is, that the stock has been slightly under-exploited in recent years. The key-output from the different scenarios are listed in table 1.



Run	Catch 2020/2021	F in 2020/2021	F/F <sub>msy</sub> in 2020/2021	B in 2021/2022	B/B <sub>msy</sub> in 2021/2022
1. Original TAC, F <sub>msy</sub> in 2021	1159/1321	0.39/0.50	0.79/1.00	3151/3254	1.16/1.20
2. Realized 2020 TAC, F <sub>msy</sub> 2021	1321/1321	0.43/0.53	0.81/1.00	2981/3011	1.16/1.15
2. Realized 2020 TAC, F <sub>aq</sub> 2021	1321/1322	0.43/0.43	0.84/0.84	3295/3300	1.13/1.16

B<sub>msy</sub> in run 2 is estimated to be 3231 t and other reference points candidates are B<sub>lim</sub>=30% of B<sub>msy</sub> = 969 t, and B<sub>trigger</sub> = B<sub>lim</sub>\*1.4= 1357 t. The stock is well above the limits.

**In conclusion**, there is nothing in the available empirical data to suggest that the catch levels in recent years has prevented the lumpfish stock size from increasing. Since the 2020 total catch was below the levels previously associated with a stock decline and because the stock is above limit reference points, this single-year TAC overshoot should present little risk to the overall long-term state of the stock. This is also evident in the TAC advice for 2021 and 2022, which increases despite the overshoot. Lumpfish are presumably 3-5 years old when spawning and the spawning component appears to be limited to very few cohorts. Hence, a 1-year catch above biologically sustainable levels can potentially have a large effect, but this will not be seen for 3-5 years. The SPiCT model is a promising approach for this stock, and the presented model supports that the stock is large and that the 2020 TAC increase in no way negatively affected the stock, in fact, it indicates an exploitation closer to the optimal level.



Nuuk, July 2020

## Regarding sustainability of Lumpfish management plan after increase of TAC

Greenland Institute of Natural Resources (GINR) received 26<sup>th</sup> of June 2020 a request from SFG regarding whether there is evidence to support that the current management plan for Lumpfish continues to be sustainable and precautionary despite the TAC increase in 2020.

In a hearing send out by Ministry of Fisheries, Hunting and Agriculture, Fisheries Division the 6<sup>th</sup> of May, 2020, GINR answered that it was not recommended to increase the TAC for the fishery in 2020 since it would exceed the biological advice and furthermore go against the agreed management plan.

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Regards,

Søren Post, MSc. and Helle Torp Christensen, Ph.D.

Greenland Institute of Natural Resources

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**From:** Rasmus Hedeholm <rhe@sfg.gl>  
**Sent:** torsdag 25. juni 2020 13:38  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Subject:** RE: Greenland lumpfish - tranfer of quota

Dear Sandhya

That is correct. It is not stated in the management plan, that quota can be transferred from one year to the next – yet. The management plan is being revised this autumn, and that issue is on the provisional agenda. The magnitude of the 2020 TAC increase was identical to the TAC-advice difference from the year before. Let me know if I can clarify anything else.

Best regards

Rasmus

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**From:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Sent:** 25. juni 2020 13:27  
**To:** Rasmus Hedeholm <rhe@sfg.gl>  
**Subject:** Greenland lumpfish - tranfer of quota

Dear Rasmus,

The journalist Merete Lindstrøm claims that “Transfer of quotas is not part of the management plan for lumpfish in Greenland. The government has moved 204 tons from last year to this year, I really need a quote on that. “

Before we comment on that I would like some confirmation from you.

Thank you.

BR / MVH  
For DNV GL Business Assurance

Sandhya Chaudhury  
Principal Specialist

---

**From:** Rasmus Hedeholm <rhe@sfg.gl>  
**Sent:** torsdag 4. juni 2020 16:25  
**To:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Cc:** Kristina Guldbæk <kgu@polarseafood.com>; Lisbeth Due Schönnemann-Paul <lisc@royalgreenland.com>  
**Subject:** RE: Greenland lumpfish - request from journalist.

Dear Sandhya

Yes, I am familiar with the background. The same newspaper approached us on the matter several times. The reason is, that during the 2020 fishery season it became clear that the fishery was very good this year. Because of that, the government decided to transfer unused quota from 2019 to 2020. In total, this meant that approximately 150 tons was added to the original 2020TAC (approximately 200 t was unused in 2019). There was some debate in Greenland about this decision in relation to the MSC certificate, as there were differences of opinion about the significance of the TAC increase.

Please give me a call if you would like me to elaborate on it.

Kind regards

Rasmus

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**From:** Chaudhury, Sandhya <Sandhya.Chaudhury@dnvgl.com>  
**Sent:** 4. juni 2020 15:12



**To:** Rasmus Hedeholm <rhe@sfg.gl>

**Cc:** Kristina Guldbæk <kgu@polarseafood.com>; Lisbeth Due Schönnemann-Paul <lisc@royalgreenland.com>

**Subject:** Greenland lumpfish - request from journalist.

Dear Rasmus,

Hope all is well at your end in these very trying Covid 19 times.

I wanted to inform you that DNV GL has been approached by a journalist, Merete Lindstrøm from Sermitsiaq.AG in Greenland who is writing about the report on MSC certification for Greenland lumpfish. She has requested to talk to us on “reports say that there are a few things to be noted to continue the MSC on lumpfish in Greenland. I would like you to elaborate on that. Also I have some questions regarding management of the quotas.”

I am wondering if you have any knowledge on the background for this request, any discussions in Greenland regarding this fishery, etc. This would help us in reverting to her request.

Thank you.

BR / MVH

For DNV GL Business Assurance Norway AS

**Sandhya Chaudhury**  
**Principal Specialist**



Sandhya Chaudhury  
Det Norske Veritas (DNV-GL) Certification  
Veritasveien 1  
Høvik  
Norway  
1363

Sent by email

Date: 06/08/2020

Subject: Request for variation to the MSC Certification Requirement v2.2 FCP-7.29.4 for Greenland lumpfish

Dear Sandhya Chaudhury,

I write with reference to your submission on 28/07/2020 of a request for variation to the MSC Certification Requirement (CR) to allow:

Delay the triggering of an expedited audit on Greenland lumpfish fishery until 08th September 2020 – 60 days instead of the required 30 days after new information was identified and confirmed.

As you are aware, the CR procedures relating to v2.2 FCP-7.29.4 state:

The CAB shall announce an expedited audit, if triggered, within 30 days of becoming aware of the relevant information

These are integral to ensuring all MSC accredited Conformity Assessment Bodies operate in a consistent and transparent manner. The MSC intends that these requirements be met across all fisheries and CoC certificate holders, except in exceptional, well-justified circumstances, as part of the MSC programme.

MSC notes the factors presented supporting your request, including:

- The 2020 Greenland lumpfish season closed in June 2020. A derogation was issued for a 14% Total Allowable Catch (TAC) increase for the last few weeks of the fishing season. The CAB requested information from the client on the increase and received a response on 8 July.
- The CAB has stated that the team is in the process of clarifying whether the TAC increase should trigger an expedited audit and has noted time constraints due to Covid-19 and time of year.
- The CAB is requesting a Variation Request to extend the timeline by 30 days to determine whether an expedited audit is needed.
- The fishery is undergoing reassessment and the Final Draft Report is expected in November 2020.

Given the rationale provided, the MSC is willing to grant a variation to the CR in this case subject to the following conditions:

- If the CAB determines that an expedited audit is not needed at this stage, the CAB shall document the expedited audit review process in the subsequent surveillance report for transparency.

If you have any questions regarding this response, please do not hesitate to contact the relevant Fisheries Assessment Manager for this fishery.

Marine Stewardship Council  
cc: Assurance Services International

Marine Stewardship Council fisheries assessments  
28 July 2020

DNV GL Business Assurance

# Greenland lumpfish fishery MSC Variation Request



SAFER, SMARTER, GREENER

## 1 Marine Stewardship Council variation request

Table 1 – Variation request

1	Date submitted to the MSC
	2020-07-28
2	CAB
	DNV GL Business Assurance
3	Fishery name and certificate number or CoC certificate number
	Greenland lumpfish fishery
4	Lead auditor or program manager
	Sandhya Chaudhury
5	Request prepared by
	Sandhya Chaudhury
6	Scheme requirement(s) for which variation requested
	<p>7.29.4 The CAB shall announce an expedited audit, if triggered, within 30 days of becoming aware of changes to the circumstances of the fishery, or of new information that may cause a 'material difference' as defined in 7.20.6.c.(7.29.1)</p> <p>FCP v.2.2 clause 7.29.1 The CAB shall complete an expedited audit if the CAB becomes aware of changes to the circumstances of the fishery and/or of new information that may cause</p> <ul style="list-style-type: none"> <li>a. A PI score falling below 60.</li> <li>b. A Principle score falling below an aggregate 80 score due to the changes to the score of one or more PI's.</li> </ul>
7	How many times has a variation for this requirement been accepted for the same assessment of the same fishery?
	None



Table 2 – Variation justification

1	Proposed variation
	Delay the triggering of an expedited audit on Greenland lumpfish fishery until 08 <sup>th</sup> September 2020 – 60 days instead of the required 30 days after new information was identified and confirmed.
2	Additional time requested
	Original deadline date 08 August 2020
	Modified deadline date requested 08 September 2020
	Length of additional time requested 30 days.
3	Justification
	<p>The Greenland lumpfish fishery for, the 2020 season, took place in March-June (incl) and regulations (inter alia TAC) were issued according to the Management Plan prior to the fishery start. In late June DNV GL became aware of a derogation issued for the last few weeks of the fishing season, an increase of the TAC by 14% (163 t roe) as a TAC transfer from unharvested quota in 2019. DNV GL requested the Client 'Sustainable Fisheries Greenland' to provide background information and received responses on 8 July.</p> <p>The Greenland lumpfish fishery has had a TAC transfer for the 2020 fishing season. The transfer of TAC is not covered by the present management plan which was reviewed at the last on-site meeting in September 2019. The CAB was made aware of this transfer on the 4<sup>th</sup> of June 2020 and initiated communication with the client for confirmation and clarification. The confirmation of the TAC transfer was received from the client on 08<sup>th</sup> July 2020.</p> <p>There have been several rounds of communication with the client and subsequent evaluation meetings between the Team Leader and the Principle expert for this fishery assessment, both by email and TEAMS meetings. Clarifications have been presented regarding the TAC transfer and the stock. To evaluate if this new information does have an effect on material outcome which is not temporary the team has requested further clarifications and assurance on the management plan. Clients submission on this will have to be corroborated by the relevant authorities. The triggering of an expedited audit will then depend on evaluation of this information, once received.</p> <p>As per requirements the expedited audit should be announced by 08.08.2020. The extension is requested on consultation with the Principle expert and based on the Covid-19 situation and its general effect on total workload as well as the summer holiday season affecting the different parties, as also access to all information required for an evaluation to trigger the expedited audit.</p>
4	If a fishery assessment, implications for assessment
	The fishery is ongoing reassessment- the Public Comment Draft Report was published on 02 April 2020 and the Final Report is scheduled to be published in November 2020 (Covid 19 derogation extension). This Variation Request has no implication on the reassessment process deadlines.
5	If a fishery assessment, mitigation of the implications for assessment
	NA
6	If a fishery assessment, how many conditions does the fishery have and will their progress be affected (positive or negative)?
	The PCDR specifies 5 conditions and 3 recommendations for this fishery. Their progress will not be affected by this Variation Request.



7	What is the status of the current assessment or audit?
	The Greenland lumpfish certificate expires 13 February 2021 based on the certification date of 13 August 2015 and the COVID-19 extension of 6 months. The certificate is under reassessment. The fourth surveillance audit report was published on 12 <sup>th</sup> November 2019. The next scheduled audit (first surveillance) will be around January 2022. There is no surveillance audit planned for 2020 and 2021. The reassessment report will be published in February 2021.
8	Further comments
	NA
9	If applicable, additional information added after the MSC's request
	NA

## 2 Template information and copyright

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Template version control		
Version	Date of publication	Description of amendment
1.0	1 January 2011	Date of application
1.1	24 October 2011	Updated to include a confidential information section
1.2	10 January 2012	Updated to include more detailed instructions on confidential information section
1.3	14 January 2013	Updated in line with requirements in MSC Certification Requirements v1.3, including P2 to P1 'expedited audit'
2.0	08 October 2014	Updates in line with release of Fisheries Certification Requirements v2.0
2.1	04 October 2016	Updated contact information
3.0	17 December 2018	Release alongside Fisheries Certification Process v2.1
3.1	28 March 2019	Non-substantive changes to improve clarity and usability

A controlled document list of MSC program documents is available on the [MSC website](https://www.msc.org) (msc.org)

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## 9.12 Objection Procedure

No objections were received on the Final Report and Determination.

## 10 Template information and copyright

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### Template version control

Version	Date of publication	Description of amendment
1.0	17 December 2018	Date of first release
1.1	29 March 2019	Minor document changes for usability

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## About DNV GL

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