

## Marine Stewardship Council (MSC) Public Comment Draft Report

### SARPC Kerguelen and Crozet toothfish (*Dissostichus eleginoides*) fishery

On behalf of

**SARPC**

Prepared by

**Control Union Pesca Ltd**

**October 2018**

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## Glossary

Acronym	Definition
AAMP	Agence des Aires Marines Protégées (French MPA Agency)
ACAP	Agreement on the Conservation of Albatrosses and Petrels
C3P	Comité des bonnes pratiques de la pêche palangrière (TAAF)
CASAL	C++ Algorithmic Stock Assessment Laboratory
CBC	Code de Bonne Conduite (code of good conduct) for minimising bycatch
CC	Conseil Consultatif (TAAF)
CCAMLR	Commission for the Conservation of Antarctic Marine Living Resources
CEBC-CNRS	Centre d'Etudes Biologiques de Chizé
CEMR	Compagnie des Experts Maritimes de la Réunion (catch landing certificates)
CNRS	Centre National de la Recherche Scientifique
COPEC	Contrôleur de Pêche – Scientific observer and controller, checking compliance for TAAF-DPQM and TAAF-DCPN
CoC	Chain of Custody
CPUE	Catch per Unit Effort
CROSS-RU	Centre Régional de Surveillance et de Sauvetage de La Réunion (MTES)
CRPMEM	Comité régional des pêches maritimes et des élevages marins
CUP	Control Union Pesca
DMSOI	Direction de la Mer – Sud de l'Océan Indien (MTES)
DPMA	Direction des Pêches Maritimes et de l'Aquaculture (MAA)
EEZ	Exclusive Economic Zone
ETP	Endangered Threatened and Protected (species)
ERA	Ecological Risk Assessment
FAM	Fishery Assessment Methodology (MSC scheme document)
FCR	Fisheries Certification Requirements (MSC scheme document)
FMP	Fishery Management Plan
GRT	Gross Tonnage
GTPA	Groupe de Travail Pêche Australe (TAAF)
HCR	Harvest Control Rule
HIMI	Heard Island and MacDonal Islands (Australia)
IPEV	Institut Paul Emile Victor (French Polar Research Institute)
IRCS	International Radio Call Sign
IUU	Illegal, Unreported, Unregulated
LRP	Limit Reference Point
LTL	Low Trophic Level (species)
MAA	Ministère de l'Agriculture et de l'Alimentation

Acronym	Definition
MCMC	Monte Carlo Markov Chain (modelling method)
MCS	Monitoring Control and Surveillance
MEC	ME Certifications Ltd (now CUP)
MEP	MacAlister Elliott and Partners Ltd (now CUP)
MNHN	Muséum National d'Histoire Naturelle (in Paris)
MTES	Ministère de la Transition Ecologique et Solidaire
nm	Nautical mile
MOM	Ministère des Outre-Mer
MPA	Marine Protected Area (=AMP Aire Marine Protégée)
PCR	Public Certification Report
PI	Performance Indicator (of the MSC Standard)
PRI	Point of Recruitment Impairment (stock reference point)
PSA	Productivity Susceptibility Analysis
RFMO	Regional Fisheries Management Organisation
SARPC	Syndicat des Armements Réunionnais de Palangriers Congélateurs
SG	Scoring Guidepost
SGB	Substratum, geomorphology, and (characteristic) biota
SIOFA	Southern Indian Ocean Fisheries Agreement
SSB	Spawning Stock Biomass
TAAF	Terres Australes et Antarctiques Françaises
TAAF-DCPN	Direction de la Conservation du Patrimoine Naturel (TAAF Nature Conservation)
TAAF-DPQM	Direction des Pêches et des Questions Maritimes (TAAF Fisheries and Maritime)
TAC	Total Allowable Catch
TRP	Target Reference Point
UoA	Unit of Assessment
UoC	Unit of Certification
VME	Vulnerable marine ecosystems
VMS	Vessel Monitoring System
WG-EMM	CCAMLR Working Group on Ecosystem Monitoring and Management
WG-FSA	CCAMLR Working Group on Fish Stock Assessment
WG-IMAF	CCAMLR Working Group on Incidental Mortality Associated with Fishing

## Executive Summary

This report covers the MSC full re-assessment of the SARPC Kerguelen and Crozet demersal longline toothfish (*Dissostichus eleginoides*) fishery. The assessment team consisted of Sophie des Clers (Team Leader, Principle 2, Principle 3), Robin Cook (Principle 1) and Henry Ernst (assisting team member). A site visit was held between the 13<sup>th</sup> and 15<sup>th</sup> February 2018 in Le Port, Réunion (France). The assessment was undertaken in accordance with the MSC Fisheries Certification Requirements (FCR) version 2.0 for assessment procedure and scoring. The Risk-Based Framework (RBF) was used for PI 2.2.1 (Secondary species outcome).

The client fishery covers vessels that are part of the Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC), targeting two separate stocks of toothfish, inside the French EEZs around the islands of Kerguelen (UoA1) and the islands of Crozet (UoA2). The vessels are licensed by the Terres Australes et Antarctiques Françaises (TAAF) (the French Southern and Antarctic Lands). All vessels in the fleet are freezer vessels and are flagged to France. Occasionally, vessels will fish in SIOFA areas, or embark on exploratory fisheries in other CCAMLR waters (Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.4a and 58.4.4b), but these areas are not included in the UoC. All vessels land in Le Port, La Réunion.

The Terres Australes et Antarctiques françaises (TAAF) administration is the fishery manager. Its Direction des Pêches et des Questions Maritimes (DPQM) is the licensing authority. It sets annual individual vessel quotas from the TAC for the target species in each the two UoAs, based upon scientific advice from the MNHN peer-reviewed by CCAMLR working groups. The TAAF Direction de la Conservation du Patrimoine Naturel (DCPN) monitors and regulates the fishery's impacts on the non-target species, habitats and ecosystems. The DCPN also manages the Réserve Nationale Naturelle des TAAF, a reserve of national importance that was extended to the entire EEZs and to include further offshore marine protected areas closed to fishing in December 2016. The French Fisheries legislation (France, 2018) provides the overall framework for the management of vessel activities, compliance with key international obligations, crew welfare and voluntary measures such as the FAO Code of Conduct, Port State measures, and the efforts against IUU fishing. Locally, the fishery's management system is formalised as a Fishery's management plan (FMP) set out in TAAF Arrêté n° 2015-102 of 1st September 2015 for 3 years, which is currently being revised. Each year, the FMP is implemented through a set of Technical Prescriptions. The TAAF cooperation with other parties takes place through several advisory bodies: CCTA, GTPA and C3P, with increased transparency over the years. The fishery operates in close collaboration with CROSS-RU, the regional control and surveillance agency to combat a historically important IUU threat.

Separate stock assessments were undertaken for the Kerguelen and Crozet toothfish populations. In both cases, the stocks declined from their unexploited level in 1979 to approximately 60% of virgin biomass ( $B_0$ ) in 2017. Both are above the point at which recruitment would be impaired (PRI), defined as 20% of the virgin biomass ( $B_0$ ). A harvest strategy is set out in the order ("arrêté") n°2014-78 of August 19, 2014 (TAAF, 2014), which defines the rules of fishing activities in the French EEZs of Kerguelen and of Crozet and states the objective of ensuring long-term conservation and optimal use of fishing resources in the EEZs. The strategy includes limiting the entrants, a TAC for each zone (consistent with CCAMLR rules), and stringent control of IUU fishing. Technical measures such as compulsory VMS, 100% observer coverage, closed areas, closed seasons and move on rules (detailed in the report) flesh out the harvest strategy. The Management Plan was established in 2015 and is to be reviewed by the end of 2018.

Key data sources on interactions with Principle 2 (non-bait) species are the COPEC observer reports and Avistock/Avipêche data. Toothfish is currently the only species in the fishery with stock assessment in place (including reference points). Therefore, the only other primary species/ stocks are

those used as bait: mackerel, japanese chub mackerel, and shortfin squid . The fishery is not expected to impact the status of the stocks given the (relatively) very small quantities used. The ridge scaled rattail (“grenadier” in the report) was a main secondary species for both UoAs, with the Kerguelen sandpaper skate being the only other main secondary species for the Kerguelen UoA, while the blue antimora and the whiteleg skate made up the other main secondary species in the Crozet UoA. Birds and mammals were the main groups of ETP species with which this fishery interacts. The fishery has successfully decreased seabird mortality by using brickle curtains and by setting and hauling at night – these measures are reportedly implemented regularly and with success. Interactions with marine mammals are actively minimized. The fishery respects the CCAMLR conservation measures (CCAMLR, 2017) and the French biodiversity protection legislation for the TAAF national reserve (RNN). The provisions have been translated into measures specific to this fishery (TAAF fishery regulations, TAAF 2017a). Strategies detailed in the report are in effect, to minimize orca and sperm whale depredation. There is currently no concern over the impact of the fishery on the status of marine mammals or birds with which it interacts. Annual reviews on the effectiveness of measures to limit impacts on ETP species are undertaken, and the practicality of alternatives are discussed at CCAMLR and by the TAAF with vessel captains. The observer/controller (COPEC) presence on each vessels is a key strength of this fishery, together with the active collaboration of the fleet with the CROSS-RU to monitor and deter possible IUU activities in and around the EEZs and the strong determination of SARPC members to constantly improve the environmental performance of their fishing activities. The improvements made have resulted in detectable change, and the ongoing research is expected to further improve the fishery’s performance vis-à-vis bycatch and ETP species interactions. The fishing gear (demersal longline) means that the impacts on habitats are minor. Collaborative work (MNHN, TAAF, RNN, AAMP, UPMC, CNRS (Chizé)) has laid the foundation for the identification of biodiversity “hotspots” to protect, beyond those already established and protected.

The team’s **provisional determination** is that the fishery meets the Principles and Criteria for MSC certification. Aggregate scores for each principle are as shown in the table below:

Principle	Score UoA1 – Kerguelen	Score UoA2 - Crozet
Principle 1 – Target Species	85.0	83.3
Principle 2 – Ecosystem	89.7	89.7
Principle 3 – Management System	84.8	84.8

One condition has been proposed, on Principle 2. The proposed condition is as follows:

Condition number	Condition	Performance Indicator
1.	There needs to be a <b>regular</b> review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of <b>unwanted catch</b> of main secondary species, and they are implemented as appropriate, for both UoA1-Kerguelen and UoA2-Crozet	2.2.2e

The following recommendations were also issued by the team:

Recom. number	Description
1 (both UoAs)	For TAAF to look into the feasibility of using CCAMLR fishing season dates, in order to make TAAF and CCAMLR data easily comparable and to increase transparency.

Recom. number	Description
2 (both UoAs)	For TAAF/ the MNHN to compile annual weight equivalents of all rays caught, cut off and discarded by species and by UoA, so that the implementation of the Code of Conduct (CBC) to limit skates and rays bycatch can be monitored in greater detail.
3 (both UoAs)	For the TAAF and associated scientists, to analyse fisheries dependent and independent information available for the fishery in both UoAs regarding the survival of cut off skates.
4 (both UoAs)	It is recommended the stock assessment reports submitted to CCAMLR for each of the two UoAs document all the input data and provide a comprehensive discussion of the model diagnostics in order to provide greater transparency.
5 (both UoAs)	For the TAAF and associated scientists to conduct a footprint analysis for each UoA, in order to build an understanding of habitat impacts and to eliminate the need to extrapolate, e.g. from HIMI information.

## Résumé exécutif

Ce rapport porte sur la réévaluation MSC de la pêcherie palangrière de légine SARPC à Kerguelen et Crozet. L'équipe d'audit consiste de Sophie des Clers (Team Leader, Principe 2, Principe 3), Robin Cook (Principe 1) et Henry Ernst (soutien technique). La visite de site a eu lieu du 13 au 15 février 2018 au Port, à La Réunion (France). L'audit a été mené en accord avec les "MSC Fisheries Certification Requirements (FCR)" version 2.0 pour la procédure et la notation. L'approche d'évaluation des risques ("Risk-Based Framework" ou RBF) a été utilisée pour noter l'indicateur de performance IP 2.2.1 (État des stocks des espèces secondaires).

La pêcherie opère dans les Zones Économiques Exclusives françaises autour des archipels des Iles Kerguelen (UoA1) et Crozet (UoA2). Les navires des pêcheries évaluées dans ce rapport sont des palangriers congélateurs. Ils sont tous membres du Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC) et leurs licences de pêche sont délivrées par l'administration des Terres Australes et Antarctiques Françaises (TAAF). Certains des navires pêchent également dans la zone SIOFA, ou en exploration dans d'autres Divisions (58.4.1, 58.4.2, 58.4.3a, 58.4.4a et 58.4.4b) de la CCAMLR, mais ces zones ne sont pas incluses dans l'Unité de Certification (UdC). Tous les navires débarquent au Port, à La Réunion.

La pêcherie est gérée par l'administration des TAAF basée à La Réunion. Sa Direction des Pêches et des Questions Maritimes (DPQM) délivre les licences de pêche et fixe des quotas annuels pour chaque navire et chaque unité d'évaluation (UoA) à partir du total de capture admissible (TAC) de légine qui est fixé sur la base de l'avis scientifique du MNHN revu au sein des groupes de travail de la CCAMLR. La Direction de la Conservation du Patrimoine Naturel (DCPN) des TAAF assure le suivi et la réglementation des impacts de la pêcherie sur les espèces capturées accessoirement, les habitats et les écosystèmes. La DCPN assure également la gestion de la Réserve Nationale Naturelle (RNN) des TAAF, dont le périmètre a été étendu à l'ensemble des ZEEs et par la désignation de nouvelles réserves marines intégrales en Décembre 2016. La Loi française sur la pêche (France, 2018) fournit le cadre général pour la gestion des activités navires, le respect des obligations souscrites dans le cadre des conventions internationales, le bien-être et la sécurité de l'équipage, le suivi des mesures volontaires du Code de Bonne Conduite de la FAO, les Mesures d'Etat de Port (Port State measures), et la lutte contre la pêche INN. Au niveau local, la gestion de la pêcherie est formalisée par le Plan de Gestion (FMP) figurant à l'Arrêté n°2015-102 du 1er septembre 2015 pour une durée de 3 ans, dont la révision est en cours. La mise en œuvre du FMP se fait par la publication annuelle de prescriptions techniques. La coopération des TAAF avec d'autres parties est organisée au sein de plusieurs organes consultatifs : CCTA, GTPA et C3P, avec une transparence accrue depuis la certification initiale. La pêcherie travaille en étroite collaboration avec CROSS-RU, l'agence régionale de contrôle et de surveillance pour combattre les risques de pêche INN très importants par le passé.

Des évaluations des stocks distinctes ont été entreprises pour les stocks de légines de Kerguelen et de Crozet. Dans les deux cas, les stocks ont diminué par rapport à leurs niveaux non-exploités ( $B_0$ ) en 1979, et se situent aux alentours de 60%  $B_0$  en 2017. Les deux stocks se situent au dessus du niveau auquel le recrutement serait menacé (PRI). Une stratégie d'exploitation est fournie dans l'Arrêté n° 2014-78 du 19 août 2014 (TAAF, 2014), qui réglemente les activités de pêche dans les ZEE françaises de Kerguelen et de Crozet, avec pour objectifs d'assurer la conservation à long terme et l'utilisation optimale des ressources halieutiques dans les ZEEs. La stratégie limite le nombre de navires autorisés, un TAC pour chaque zone (en conformité avec les règles de la CCAMLR) et un contrôle rigoureux de la pêche INN. Les mesures techniques telles que le VMS obligatoire, la couverture à 100% par les observateurs, les fermetures spatiales et saisonnières, et les règles de 'move on' (détaillées dans le rapport) définissent la stratégie d'exploitation. Le plan de gestion a été établi en 2015 (TAAF, 2015) et doit être révisé d'ici la fin de 2018.

Les sources principales de données sur les interactions avec les espèces du Principe 2 (à l'exclusion des appâts) sont les rapports d'observations scientifiques des COPEC et les données Avistock / Avipêche. La légine est la seule espèce de la pêche pour laquelle une évaluation des stocks existe (y compris points de référence). Les seules autres espèces primaires sont donc les espèces/ stocks utilisés comme appâts : le maquereau, le maquereau japonais et l'encornet rouge argentin. Étant les quantités (relativement) très faibles d'appâts utilisés, les impacts de la pêche sur ces stocks ne sont pas considérés comme étant significatifs. Le grenadier est une espèce secondaire principale commune aux deux UoAs, la raie rugueuse est la seule autre espèce secondaire principale pour l'UoA1-Kerguelen ; l'antimora et la raie taaf sont les deux espèces secondaires principales pour l'UoA2-Crozet. Les oiseaux et les mammifères sont les principaux groupes d'espèces ETP avec lesquelles cette pêche interagit. La pêche a réussi à réduire la mortalité des oiseaux en utilisant des rideaux de Brickle et en imposant une mise à l'eau et levée nocturne des palangres – ces mesures sont mises en œuvre de manière régulière et efficace. Les interactions avec les mammifères marins sont minimisées d'une manière active. La pêche respecte les mesures de conservation de la CCAMLR (CCAMLR, 2017) et la législation française sur la protection de la biodiversité de la réserve nationale des TAAF (RNN). Les dispositions ont été traduites en mesures spécifiques à cette pêche (TAAF, 2017a). Des stratégies détaillées dans le rapport existent, qui visent à minimiser la déprédation par les orques et les cachalots. Cette pêche ne représente pas actuellement de menace pour les populations de mammifères marins ou d'oiseaux présents avec lesquelles elle vient en contact. L'efficacité des mesures visant à limiter les impacts sur les espèces ETP est revue chaque année, et la faisabilité de mesures alternative est discutée à la CCAMLR et par les TAAF avec les capitaines des navires. La présence d'observateurs/contrôleurs (COPEC) sur chaque navire (100%) est un atout clé de cette pêche, ainsi que la collaboration étroite de la flottille avec le CROSS-RU pour surveiller et décourager les activités INN possibles dans et autour des ZEEs, et une constante détermination des membres du SARPC pour améliorer la performance environnementale de leurs activités de pêche. Ces changements ont apporté des améliorations significatives et les projets de recherche en cours devraient continuer à améliorer les performances de la pêche par rapport aux interactions avec les prises accessoires et les espèces ETP. L'engin de pêche (palangre démersale) signifie que les impacts sur les habitats marins sont mineurs. Le travail collaboratif (MNHN TAAF, RNN, AAMP, UPMC, CNRS (Chizé) et) a établi les bases pour l'identification des zones de biodiversité élevée à protéger (au-delà des zones qui existent déjà).

La **détermination provisoire** de l'équipe est que la pêche répond aux Principe et Critères de certification du MSC. Les scores agrégés pour chaque principe sont les suivants :

Principe	Score UdE1 – Kerguelen	Score UdE2 - Crozet
Principe 1 – Espèce cible	85.0	83.3
Principe 2 – Écosystème	89.7	89.7
Principe 3 – Système de gestion	84.8	84.8

Une condition est proposée concernant le Principe 2 :

Numéro de condition	Condition	Indicateur de performance
1.	Une revue <b>régulière</b> de l'efficacité potentielle et de la faisabilité pratique de mesures alternatives pour minimiser dans chaque UoA la mortalité des <b>captures indésirées</b> des espèces secondaires principales, et de leur mise en œuvre appropriée, pour les deux UoA1 Kerguelen et UoA2- Crozet).	2.2.2e

Les recommandations suivantes ont également été proposées par l'équipe :

Numéro de recom.	Description
1 (UoA1 et UoA2)	Que les TAAF examinent la faisabilité d'utiliser les dates de saison de pêche CCAMLR, afin de rendre les données des TAAF et de la CCAMLR facilement comparables et d'améliorer la transparence.
2 (UoA1 et UoA2)	Que les TAAF / MNHN compilent annuellement les équivalent en poids de l'ensemble des raies capturées, cut off, et rejetées par espèce et par UoA, afin que la mise en œuvre du Code de bonne conduite (CBC) qui vise à limiter les prises accessoires de raies puisse être suivie plus en détail.
3 (UoA1 et UoA2)	Que les TAAF et les chercheurs associés analysent les informations (indépendantes et issues des pêcheries) disponibles pour les deux UoA concernant la survie des raies rejetées en cut off.
4 (UoA1 et UoA2)	Que les rapports d'évaluation des stocks soumis à la CCAMLR pour chaque UoA fournissent une description détaillée des données utilisées et une discussion approfondie des diagnostics du modèle, de manière à augmenter la transparence de leur utilisation.
5 (UoA1 et UoA2)	Que les TAAF et les chercheurs associés conduise, pour chaque UoA, une analyse de l'empreinte de la pêche sur les habitats benthiques, de manière à développer les connaissances de ses impacts sur les habitats et à éliminer le besoin d'extrapoler à partir d'informations concernant d'autres pêcheries (e.g. HIMI).

# 1 Authorship and Peer Reviewers

## 1.1 Assessment Team

**Dr Sophie des Clers (Team Leader, Principles 2 and 3)** is an independent scientific expert in fisheries management systems. She has over 30 years' experience in the formulation, monitoring, and evaluation of fisheries and aquaculture projects to build management capacity in the public and the private sector. She has been involved in a number of previous MSC assessments and pre-assessments including for cod, haddock, saithe, sole, herring, blue whiting, sardine, lobster, whelks, lobster, tuna and billfish fisheries.

Sophie has extensive knowledge Southern Ocean fisheries, having worked on the UK Falkland islands toothfish fishery, and having been involved with the SARPC toothfish since its pre-assessment in 2010. She speaks fluent French, the main language in which the fishery operates. Sophie thus meets the following competency criterion in Table PC3: - Current knowledge of the country, language and local fishery context. Having completed the v2.0 training, she is a fully qualified Team Leader (Table PC1) and is trained in the Risk Based Framework (RBF) requirements which were applied in this assessment. With over 30 years' experience in fisheries ecology and management, Sophie meets the competency criteria in Table PC3: - Fishing impacts on aquatic ecosystems; - Fishery management and operations. She has passed the v2.0 Traceability module and therefore meets the PCR criterion 'Understanding of the CoC Standard and CoC Certification Requirements'.

No conflict of interest has been identified for Dr des Clers regarding the certification of the SARPC toothfish fishery.

**Dr Robin Cook (Principle 1)** studied zoology at Durham University followed by a PhD in population dynamics from Oxford University. He worked for many years at the Marine Laboratory, Aberdeen and was Director there from 2002-2011. He worked mainly in the field of demersal fish stock assessments and assessment methodology. During the 1990s he was chair of the ICES North Sea demersal assessment working group and served on the ICES Advisory Committee on Fishery Management (ACFM) and the EU Scientific, Economic and Technical Committee on Fisheries (STECF).

Presently, Robin is a Senior Research Fellow at Strathclyde University, Glasgow, focusing on bio-economic modelling of grey seal predation on demersal fish and the assessment of data-poor stocks. He has published over 80 scientific papers including a number dealing with the status of North Sea cod, and has provided his Principle 1 expertise for the MSC assessment of the following fisheries: SFSAG North Sea cod, SFSAG Rockall haddock, SFSAG North Sea haddock (expedited assessment for the addition of whiting, hake (European), Plaice (European) and saithe), Joint demersal fisheries in the North Sea and adjacent waters. Having passed the MSC online v2.0 Team Member training, Dr Cook meets the requirements of Table PC2.

Dr Cook also meets the following requirements in Table PC3: 1. Fish stock assessment: In a career spanning over 40 years, Robin has gained experience with the following stock assessment techniques: Bayesian age structured assessment models, Bayesian state-space models applied to demersal stocks that include marine mammal predation interactions, Surplus production modelling of mixed species, Extended Survivors Analysis (XSA), Time Series Analysis (TSA), Stock Synthesis, BAM, ADAPT, SAM and related methods. 2. 5 years or more experience working with the biology and population dynamics of the target or species with similar biology: Robin is an expert in demersal fisheries population dynamics. While his expertise has focused on North Atlantic systems, this knowledge is transferable to the fisheries in the Southern Ocean. Dr Cook is therefore a qualified Principle 1 assessor for this fishery.

No conflict of interest has been identified for Dr Cook regarding the certification of the SARPC toothfish fishery.

**Henry Ernst (assisting team member):** Henry obtained a MSci in marine biology from the University of Southampton. He has a broad background in marine research including inshore fisheries, functional marine ecology and aquaculture research. Prior to joining MEC he was engaged in benthic invertebrate identification and biomass work with the National Oceanographic Centre, Southampton, United Kingdom and data compilation and analysis for Antarctic benthic invertebrates with the British Antarctic Survey. Fluent in English, French and German, Henry joined the MEC team in 2017 as a fisheries officer and contributes to the production and completion of MSC fisheries reports for publication. Henry speaks fluent French, the main language in which the fishery operates. Having completed the MSC Online v 2.0 Team Member Training, Henry meets the requirements for Table PC 2.

No conflict of interest has been identified for Henry regarding the certification of the SARPC toothfish fishery.

## **1.2 Peer Reviewers**

The MSC Peer Review College compiled a shortlist of potential peer reviewers to undertake the peer review for this fishery. Two peer reviewers were selected from the following list:

- Andrew Hough
- Chris Grieve
- Johanna Pierre
- Sascha Brand-Gardner

A summary of their experience and qualifications is available via this link: <https://fisheries.msc.org/en/fisheries/sarpc-toothfish/@assessments>

## 2 Description of the Fishery

### 2.1 Units of Assessment (UoAs) and Scope of Certification

The SARPC toothfish fishery targets two separate stocks of Patagonian toothfish (*Dissostichus eleginoides*), inside the French EEZ around the islands of Kerguelen (UoA1) and the islands of Crozet (UoA2).

The Kerguelen component of the fishery was certified by MEP on the 3<sup>rd</sup> September 2013 using MSC Fishery Assessment Methodology (FAM) version 2.0 (2009) for scoring. The Crozet component of the fishery was certified by MEC on the 16<sup>th</sup> December 2016 through an expedited assessment as an extension of scope of the certified SARPC toothfish Kerguelen fishery, using the same FAM version 2.0 (31<sup>st</sup> July 2009) for scoring and following the MSC Fisheries Certification Requirements (FCR) version 2.0 (1<sup>st</sup> October 2014) for procedure. The last surveillance audit prior to re-certification for the combined fishery was the fourth annual surveillance for UoA1 – Kerguelen, and the first annual surveillance for UoA2 – Crozet (MEC, 2018).

CU Pesca confirms that the fishery under re-assessment is within the scope of the MSC Fisheries Standard (7.4 of the MSC Certification Requirements v2.0):

- The target species is not an amphibian, reptile, bird or mammal;
- The fishery does not use poisons or explosives;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- The client or client group does not include an entity that has been successfully prosecuted for a forced labour violation in the last 2 years;
- The fishery has in place a mechanism for resolving disputes, and disputes do not overwhelm the fishery;
- The fishery is not an enhanced fishery as per the MSC FCR 7.4.3; and
- The fishery is not an introduced species-based fishery as per the MSC FCR 7.4.4.

The Unit of Assessment defines the full scope of what is being assessed, and includes the Unit of Certification and any other eligible fishers. Other eligible fishers” would be operators that have been evaluated as part of the Unit of Assessment, but who are not eligible to use the MSC Fishery certificate without a certificate sharing agreement with the client group. There are no other eligible fishers identified for this fishery, therefore the Units of certification (UoCs) are the same as the UoAs.

Because the fishery targets two separate stocks, there are two separate UoAs, as far as Principle 1 is concerned. The same applies to Principle 2, because the islands are some 2 000 nm apart and ecosystem features differ, but the Governance and fisheries management systems (Principle 3) are common to the two UoAs. The UoAs are characterised in Table 1 and Table 2.

**Table 1. UoA1-Kerguelen stock**

<b>Species</b>	Toothfish ( <i>Dissostichus eleginoides</i> )
<b>Geographical range</b>	France (TAAF) EEZ Kerguelen (CCAMLR Division 58.5.1)
<b>Method of capture</b>	Demersal longline

<b>Stock</b>	Kerguelen toothfish stock
<b>Management Systems</b>	TAAF / France / CCAMLR: <b>Input controls:</b> limited entry, closed season and areas, gear restrictions. <b>Output controls:</b> Total Allowable Catch (TAC) on main species and catch limits on bycatch species
<b>Client group</b>	Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC)
<b>Other eligible fishers</b>	None

**Table 2. UoA2-Crozet stock**

<b>Species</b>	Toothfish ( <i>Dissostichus eleginoides</i> )
<b>Geographical range</b>	France (TAAF) EEZ Crozet (CCAMLR Division 58.6)
<b>Method of capture</b>	Demersal longline
<b>Stock</b>	Crozet toothfish stock
<b>Management Systems</b>	TAAF / France / CCAMLR: <b>Input controls:</b> limited entry, closed season and areas, gear restrictions. <b>Output controls:</b> Total Allowable Catch (TAC) on main species and catch limits on bycatch species
<b>Client group</b>	Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC)
<b>Other eligible fishers</b>	None

### 2.1.1 Final Units of Certification (UoCs)

#### (PCR ONLY)

The PCR shall describe:

- a. The UoC(s) at the time of certification.
- b. A rationale for any changes to the proposed UoC(s) in section 3.1(c).
- c. Description of final other eligible fishers at the time of certification.

(References: FCR 7.4.8-7.4.10)

### 2.1.2 Total Allowable Catch (TAC) and Catch Data

Both UoAs are managed with annual TACs, fixed by the management administration of the Terres Australes et Antarctiques Françaises (TAAF), on the basis of scientific advice provided by the Museum National d'Histoire Naturelle (MNHN). Since the pre-assessment and initial certification for UoA1-Kerguelen in August 2013, scientific advice has gradually evolved in line with the practice of CCAMLR, to include in its analysis all annual catches landed, lost to depredation or discarded from the fleet, and catch allowances set aside for research purposes.

The CCAMLR summary data for annual catches in each UoA cannot be compared to the TACs fixed by the TAAF because the fishing season dates differ. The CCAMLR fishing season dates are 1<sup>st</sup> December-30<sup>th</sup> November and those of the TAAF are 1<sup>st</sup> September-31<sup>st</sup> August. Therefore the TAC and catch data for both stocks are provided by the TAAF (Table 3 and Table 4).

For the 2017/18 fishing season, the TAC has been set at 5 050 tonnes for UoA1-Kerguelen (Table 3) and 1 100 tonnes for UoA2-Crozet (Table 4). For UoA1-Kerguelen, 10 tonnes were set aside for the POKER IV research cruise, and therefore the UoA's share of the TAC is 99.8%.

The “green weight” is the equivalent live weight of the catch. This is obtained, for both UoAs, by applying a conversion factor to the landed factory processed product. Conversion factors are devised for each of the three to four annual fishing trips by an on-board observer-controller (“contrôleur de pêche” (COPEC) – fishing controller employed by the TAAF). Landings are tightly controlled against the TAC and allocated quota for each vessel at the end of each trip and regularly during the last trip. TAC overshoots are therefore extremely rare. Conversely, the TAAF relies on a quota tax for part of its revenue, and vessels incur a penalty if they do not catch the quota allocated to them. Therefore, landed product equivalent live weight closely mirrors the TAC for each UoA and year.

**Table 3. TAC and catch (tonnes) for the Kerguelen stock (UoA1) (TAAF)**

<b>TAC</b>	Year	2017/18	Amount	5 050 tonnes
<b>UoA share of TAC</b>	Year	2017/18	Amount	99.8%
<b>Total green weight catch by UoC</b>	Year (most recent)	2016/17	Amount	5 055
	Year (2 <sup>nd</sup> most recent)	2015/16	Amount	5 314

**Table 4. TAC and catch (tonnes) for the Crozet stock (UoA2) (TAAF)**

<b>TAC</b>	Year	2017/18	Amount	1 100 tonnes
<b>UoA share of TAC</b>	Year	2017/18	Amount	100%
<b>Total green weight catch by UoC</b>	Year (most recent)	2016/17	Amount	1 309
	Year (2 <sup>nd</sup> most recent)	2015/16	Amount	985

Since 2015/16 for UoA1-Kerguelen and 2016/17 for UoA2-Crozet, at the end of each fishing season, catch figures and scientific on-board observer reports are analysed to estimate the quantities of fish caught but lost through depredation, which may be as high as 30% of the green weight of the catch in UoA2-Crozet (see Section 2.3.3). This is taken into account in the setting of the TAC.

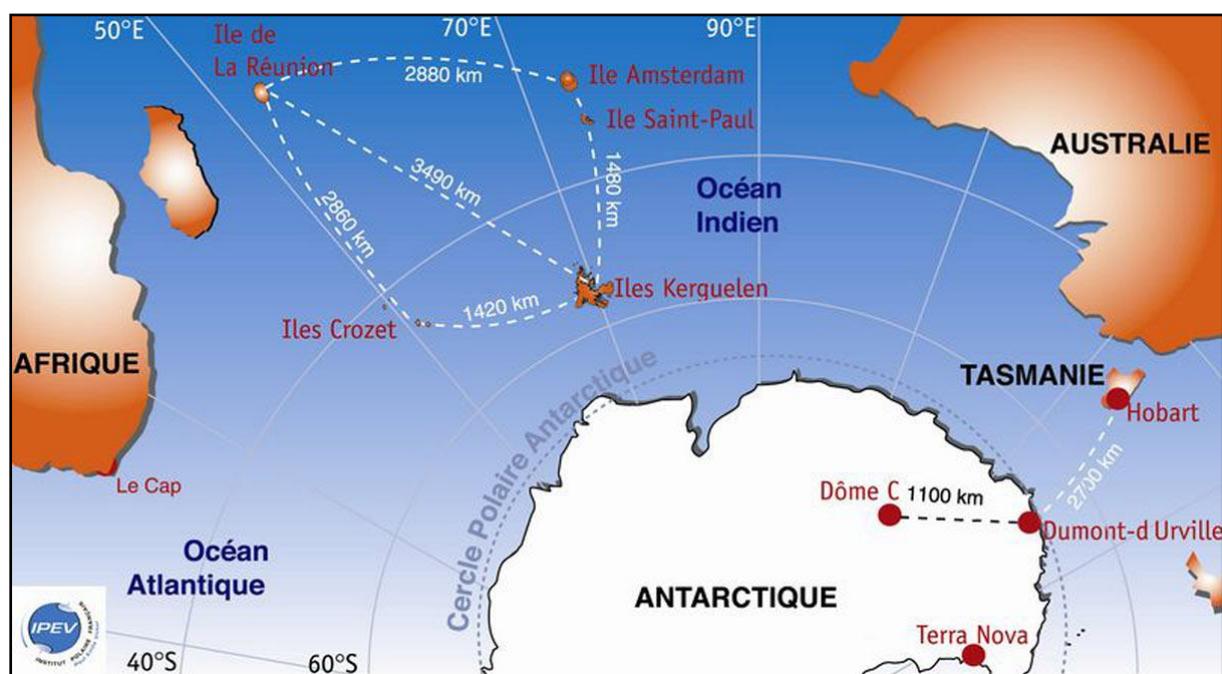
## 2.2 Overview of the fishery

The institutions involved in the management of the fishery are the same as prior to the first certification period of the UoA1-Kerguelen, with some minor changes in the names and prerogatives at French ministerial level from 2017 (MEP, 2013 - for details see section Principle Three: Management System ). The Terres Australes et Antarctiques françaises (TAAF) administration is the fishery manager through its Direction des Pêches et des Questions Maritimes (DPQM), which is also the licensing authority and sets annual TACs for the target species in the two UoAs, based upon scientific advice from the MNHN peer-reviewed by CCAMLR. The TAAF Direction de la Conservation du Patrimoine Naturel (DCPN) monitors and regulates the fishery’s impacts on the non-target species, habitats and ecosystems. The DCPN also manages the Réserve Nationale Naturelle des TAAF, a reserve of national importance that was extended in December 2016 to include offshore marine protected areas.

### 2.2.1 Fishing areas and seasons

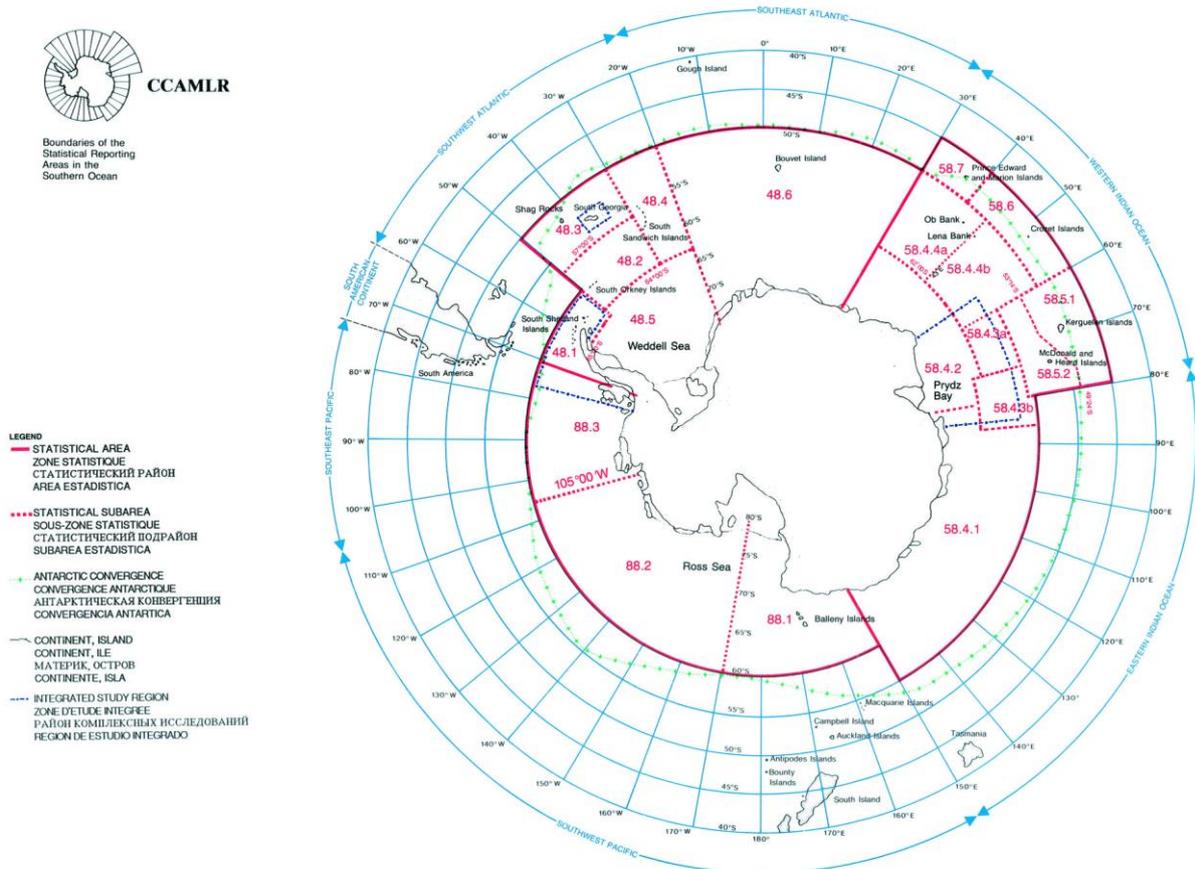
There are two fishing areas for the fleet – the Kerguelen plateau (CCAMLR area 58.5.1) and the area around Crozet Island (CCAMLR area 58.6), which are 767 nm apart (1 420 km, Figure 1).

Fishing around the Crozet islands is more exposed and generally less productive, but the TACs are set separately for the two areas and vessels have to fish both if they do not want to lose some of their UoA1-Kerguelen quota the following season. All boats fish continuously for several weeks at a time before landing their catch at Le Port in La Réunion. The vessels make between three and four trips per year. The longline fishing areas have not changed since the first assessment; some maps can be found in Appendix 8.



**Figure 1. Map of Kerguelen and Crozet Islands with distances to La Réunion port (source: IPEV)**

The TAAF operates on the basis of a fishing season that runs from 1 September – 31 August while CCAMLR operates a season from 1 December – 30 November (these have changed over CCAMLR’s history). This can cause some minor discrepancies between datasets. French data are converted to the CCAMLR season for reporting at CCAMLR, in order to facilitate comparison with other toothfish fisheries. Fishing operations, production and impacts are managed and reported separately for the two UoAs, which are in different CCAMLR statistical zones (Figure 2).



**Figure 2. Map of the CCAMLR Statistical boundaries. Kerguelen is in 58.5.1 and Crozet in 58.6, in the top right of the map.**

### 2.2.2 Vessels, fishing gear and operation of the fishery

The fishery is exploited by seven longliner vessels, all members of the (Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC). A list of vessels is provided in Table 5.

**Table 5. List of SARPC longliner vessels in the fishery – February 2018**

Company	Vessel	IMO Number	IRCS	Length (m)	GRT
Armas Pêche	Mascareignes III	9245407	FOVB	55.49	1,295
Les Armements Réunionnais	Ile Bourbon	9245421	FOSP	55.49	1,295
Sapmer	Albius	9245433	FPXZ	55.49	1,295
	Cap Horn I	9246968	FQBI	55.49	1,295
Cap Bourbon	Cap Kersaint	9747601	FISH	59.45	2,086
Comata-Scapêche	Ile de la Réunion I*	9246970	FQBU	55.49	1,295
Pêche Avenir	Saint-André	9511181	FNTD	56.40	1,282

\* Will be replaced by new vessel "Ile de la Réunion II" autumn 2018

All SARPC vessels use demersal longlines (palangre), CCAMLR gear type “automatic bottom longlines”. The lines are set through autoliners with weighed sinking lines (Figure 3) and hooks baited with mackerel or squid (see Principle Two: Ecosystem ). Other fishing methods are not allowed in Kerguelen except with dispensation for the purpose of scientific research. Pots may be used as well as longlines in Crozet if specifically authorised, but haven’t been for several years.

The setting of lines and their characteristics are regulated by CCAMLR provisions, which are translated and strengthened into TAAF regulations as follows:

- Vessels and lines are clearly and visibly identified at all times (art.9 of Prescriptions techniques – TAAF,2017 to conform with CCAMLR CM 10-01); and the gear used by each vessel is reported to CCAMLR through the CROSS upon coming to port (art.8 TAAF,2017 and CCAMLR CM 10-03);
- Lines are set from 500 m down to ~2000 m depth and are deployed at night to mitigate bird mortality. Fishing is forbidden in territorial waters, in all waters shallower than 500m and in protected areas;
- For the protection of juveniles toothfish, one/ several shorter test lines (min. 3 000 hooks, altogether max hooks 9 000 UoA1-Kerguelen, 12 000 UoA2-Crozet) is/are set upon arrival to a new fishing “sector” for a maximum of 5 hours, with at least one hook at depth shallower than 1 000m depth, to detect the presence of juveniles (fish TL<60 cm). The catch weight of more than 10% juvenile toothfish on a test line imposes a 2 nm move-on and new test line (TAAF,2017 Annexe I §2.5 for Kerguelen and §3.3 for Crozet);
- For the protection of seabirds, white weighted lines (5g/m CCAMLR CM 25-02) are mandatory (TAAF, 2017 annexe 2) set using tori lines and – for the vessels that do not have a moon pool, lines are hauled under a (Brickle) curtain;
- For the protection of marine mammals, short (3 000 hooks) and shallower lines are used to speed up hauling and leave the zone if whales arrive; a move-on rule without setting a line in case of orca presence around Kerguelen is in place, and a move-on rule by 60 nm or more when depredation is observed around Crozet; (TAAF, 2017 Annexe II).

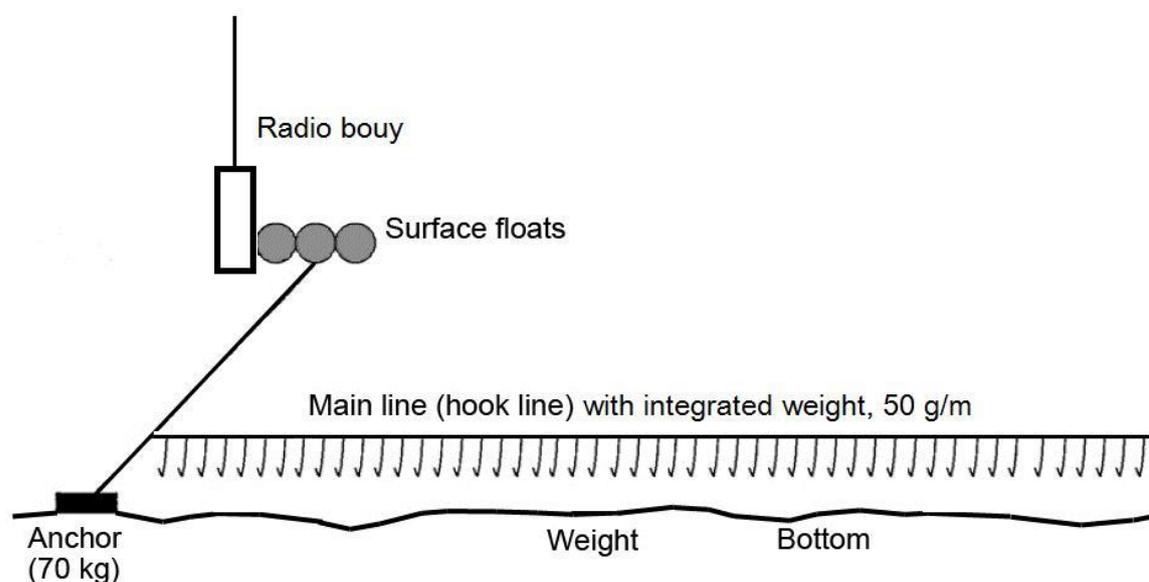


Figure 3. Demersal autoline system (Source: CCAMLR.org)

### 2.2.3 Other fisheries in Kerguelen and Crozet French EEZ and associated CCAMLR areas

Numerous toothfish fisheries take place inside and outside the jurisdiction of the CCAMLR regional fisheries management organisation (RFMO) in the Southern Ocean. Concentrating on those of immediate relevance to this fishery, we exclude fisheries targeting Antarctic toothfish (*D. mawsoni*), which is a different species of toothfish, and consider three groups, those that are 1) presently MSC-certified, 2) in geographic proximity, and other 3) experimental fisheries prosecuted by the SARPC fleet:

- MSC-certified fisheries targeting *D. eleginoides* are<sup>1</sup> i) inside the CCAMLR area: Australian Heard Island and McDonald Islands (HIMI) toothfish and icefish longline and trawl fisheries (Division 58.5.2, Antarctic, Southern & Indian Ocean FAO Area 58) and South Georgia longline fishery (Subarea 48.3, South Atlantic FAO Area 48); ii) outside the CCAMLR area: Falkland Islands toothfish longline fishery (South Atlantic FAO Area 41) and Macquarie Island (MI) longline and trawl fishery (South Pacific FAO Area 81);
- Fisheries nearby are: the MSC-certified Australian HIMI toothfish longline fishery takes place on the Kerguelen Plateau and is relatively close to the UoA1-Kerguelen fishery, although the stocks are considered as separate management units. The longline fishery in the South African EEZ around Prince Edward Islands (subarea 58.7 and part of FAO Area 51<sup>2</sup>) is quite close to UoA2 – Crozet (Figure 2), although separated by deep canyons and also considered to be a separate stock. There are no fisheries other than this fishery currently taking place inside the French Kerguelen and Crozet EEZ, and no other fisheries inside division 58.5.1(Kerguelen) and subarea 58.6 (Crozet) are presently authorised by the CCAMLR;
- Some of the SARPC vessels are presently taking part in exploratory longline fishing for *Dissostichus* spp., in CCAMLR waters (Divisions 58.4.1, 58.4.2, 58.4.3a, 58.4.4a and 58.4.4b), and in the SIOFA Agreement Area to the North of Kerguelen and Crozet in the Southern Indian Ocean (FAO Area 51). Presently these fisheries are not included in the MSC certification. They may fish both fisheries within a single fishing “trip”; this is examined in the Traceability section.

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<sup>1</sup> <https://fisheries.msc.org/en/fisheries/@@search?q=toothfish&search=>

<sup>2</sup> CCAMLR, 2018. Fishery Report 2017: *Dissostichus eleginoides* Prince Edward Islands South African EEZ (Subarea 58.7 and part of FAO Area 51) <https://www.ccamlr.org/en/system/files/07%20TOP%20587%202017.pdf>

## 2.3 Principle One: Target Species

### 2.3.1 Target species overview

The fishery targets Patagonian toothfish (*Dissostichus eleginoides*, Figure 4). Patagonian toothfish (also sold as Chilean sea bass) is a benthic-pelagic species found in sub-Antarctic waters near the Antarctic Convergence current (see Figure 2) in the Pacific, Atlantic and Indian Oceans. It is found at depths between 200 m and 2 500 m, with individuals migrating to increasingly deeper water as they grow larger (Rogers et al., 2006). Toothfish is a top predator, with a trophic level determined to be around 4.0, based on food items (Fishbase), therefore it is not a low trophic level (LTL) species.

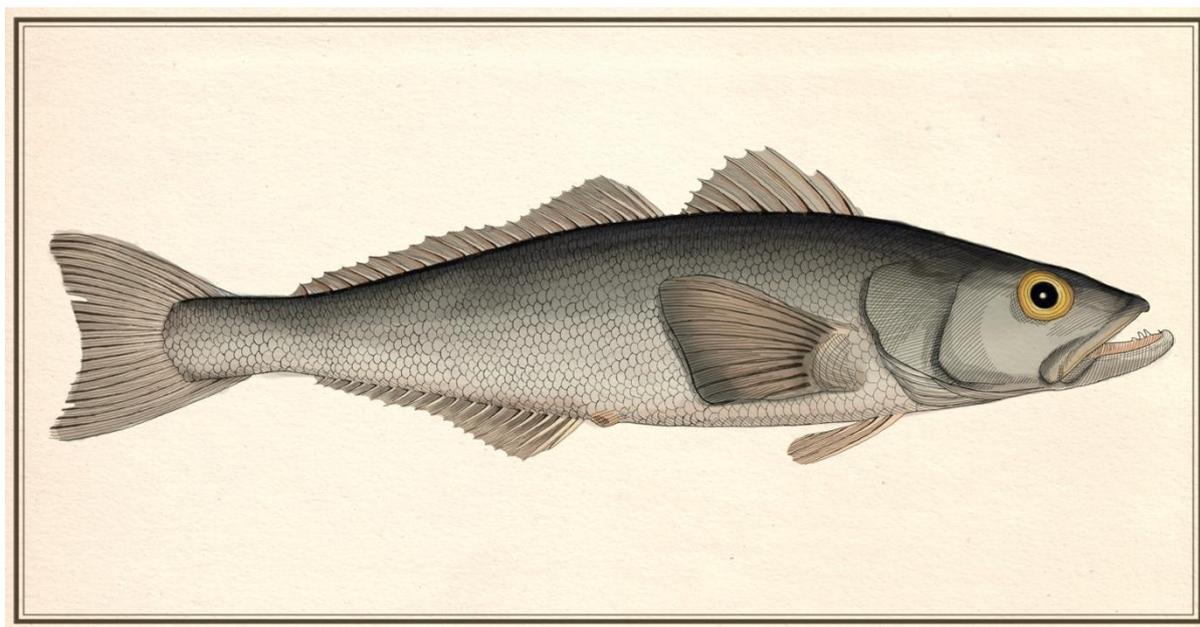
The species' geographic distribution ranges from 30°s in the Pacific, to Cape Horn, along the coast of Argentina, off southern Patagonia, the Falkland Islands, South Georgia, Shag Rocks and the islands of the Scotia Arc, to shelves and seamounts of the Indian sector, Crozet, Kerguelen-Heard Ridge, Bouvet Islands and Macquarie Island (García de la Rosa et al., 1997).

The extent to which Patagonian toothfish populations are separated is not well understood (CCAMLR, 1995). Studies have demonstrated marked genetic differentiation between populations of Patagonian toothfish located in different geographic regions, namely the Falkland Islands (Malvinas), South Georgia, Prince Edward and Marion Islands, Crozet Islands, Kerguelen Islands, Heard/McDonald Islands and Macquarie Islands. Within the Southern Indian Ocean area oceanic ridge systems and seamounts may act as oceanic "stepping stones", promoting adult migration and/or larval dispersal and thus giving the region a homogenous genetic structure (Appleyard et al., 2004; Rogers et al., 2006). Tagging experiments at Heard Island (Division 58.5.2) show long-distance movements of sub-adult/adult fish between zones (Heard to Kerguelen and also to Crozet), but the proportion of exchange between stocks is assumed to be very small (Sinegre et al., 2017a).

### 2.3.2 Information sources and data collection

For both UoAs fisheries-dependent data include:

- Catches, provided by compulsory log-books, cross-checked with COPEC data (stemming from observer coverage of all vessels and 25% of all lines hauled) and 100% dock-side monitoring;
- Biological data collection including representative samples of length, weight, sex and maturity stage for toothfish and other species; a conversion factor between processed fish and live fish is calculated for each trip;
- COPECs set two tags per fish with a ratio of one fish tagged and released per tonne of fish caught;
- Otoliths for age determination have been collected for the last three years; a preliminary growth curve for Kerguelen and Crozet areas combined was provided in 2015.



**Figure 4. Patagonian toothfish (*Dissostichus eleginoides*, C.-A. Neofotistou)**

In the case of Kerguelen, fishery-independent data on toothfish biology are collected by regular scientific demersal research vessel trawl surveys (POKER). In Crozet, grounds are not flat enough to be trawled properly, so that a scientific campaign like POKER cannot be set up (the MNHN set up 2 trials on the commercial vessel named “Austral”, but the trawl tore every two stations and the work on board was counterproductive). A summary of the data available for the stock assessments is given in Table 6.

**Table 6. Data available for the assessment of the Kerguelen and Crozet toothfish fisheries.**

Information	Kerguelen – UoA1	Crozet – UoA2
Basic biological information – length/weight, aging (scales), size at maturity, sex ratios, reproduction etc.	Research cruises – POKER I (2006), POKER II (2010), POKER III (2013) and POKER IV (2017). Data from Heard also likely to apply (single stock or metapopulation).	Data (growth curve, natural mortality) from Heard and McDonald Islands are applied (Sinegre et al., 2017b). A preliminary analysis of otoliths was provided in 2015.
Tagging data – migration, population structure	49371 toothfish tagged since 2006, with 5766 recaptures. Some evidence for long distance movements although most recaptures local (Rélot-Stirneemann 2012).	9667 toothfish tagged since 2005, with 620 recaptures. Some evidence for long-distance movements although most recaptures are local.
Genetic studies	Joint France-Australian work suggests no genetic differentiation between Kerguelen and Heard	Suggests a lack of genetic differentiation among West Indian Ocean sector although proportion of exchange between stocks is thought to be very small
Fishery-independent biomass estimates	RV surveys, but only down to 1000m – POKER I,II,III and IV	Not available. Area not suitable for trawl surveys

Information	Kerguelen – UoA1	Crozet – UoA2
	POKER II random stratified trawl survey. Biomass extrapolations made using two methods (TRAWLCI and Australian method)	
Catch and effort data	Logbooks and observers data	Logbooks and observers data
Catches for other fisheries, including IUU	Catch data collected from other French and foreign fisheries back to 1979. Rates of IUU estimated by CCAMLR.	Catch exclusively from French fishery. Rates of Illegal, Unreported, Unregulated (IUU) fishing estimated by CCAMLR. IUU considered non-existent in Crozet EEZ at present
Standardised CPUE	Longline CPUE standardised for month and year effects, also calculated separately by area but not used in assessment.	No – longline CPUE standardised for month and year effects, was calculated until 2012. Longline CPUEs are considered as poor biomass index and are not used for assessment purposes.
Length-frequency in catch	Observers and quayside inspections data	Observers and quayside inspections data
Catch-at-age	Otoliths have been collected since 2014 but age compositions are not used in the assessment as insufficient otoliths are available for a growth curve.	Otoliths have been collected since 2014 but age compositions are not used in the assessment as insufficient otoliths are available for a growth curve.

### 2.3.3 Depredation

Depredation is defined as the removal of fish from lines or from nets by marine mammals or other predators (Guinet et al., 2015). Depredation may result in significant losses for fishers and fishing companies, as well as conservation implications for fish resources as losses due to depredation are generally not accounted for in fish stock assessments and quota allocation processes; although they are in this case (see below).

Orca (*Orcinus orca*) and sperm whale (*Physeter macrocephalus*) depredation occurs in a number of sub-Antarctic toothfish longline fisheries with economic and, potentially, conservation impacts. The issue is particularly important in the Crozet fishing area where depredation, especially by orca, is one of the highest observed in all toothfish longline fisheries (Guinet et al., 2015). Both species of whale may remove most of the fish whole from the hooks, and a direct depredation rate estimate is therefore not possible. Instead, the rate of depredation is indirectly estimated using a statistical model that incorporates the observed rate of interaction between mammals and longlines using photo-identification, and an assessment of catch per line reduction in the presence of cetaceans, compared with lines without interactions, in  $0.1^\circ \times 0.1^\circ$  geographical cells.

In UoA2-Crozet, Tixier et al. (2010) estimated the depredation rate to be 17.7% (orcas alone 8.0%, and orcas and sperm whales 9.7%) at the time, when the TAC was smaller and therefore fishing activities were reduced. Gasco et al. (2014) re-estimated depredation using two different models. The two methods gave similar results in percentage terms, with depredation rates varying between 27.3% to 29.1% of the total catch (landed and depredated). A figure of 29.6% or 529 tonnes was used in 2017 for UoA1-Crozet (CCAMLR, 2018a). According to Gasco et al. (2014 and pers. com.), these estimates are higher than previously because (i) the new method of calculation avoids some of the biases of the previous one; (ii) a change in fishing strategy with relatively more fishing in Crozet, and (iii) increasing

numbers of orca around Crozet. By contrast, depredation was estimated to be 5.8% or 303 tonnes in 2017 for UoA1-Kerguelen (CCAMLR, 2018a).

The high depredation rate has important implications, as it creates uncertainty in the estimation of fishing mortality. Moreover, the two species of whales appear to eat preferentially larger fish, which may create a bias in the size-frequency distributions observed in the catch (Gasco et al., 2014). Several depredation reduction measures have been proposed, such as the use of test lines and move on rules in the presence of whales prior to setting a line (Tixier et al., 2010), which are now included in the fishery regulations (TAAF, 2017b).

#### 2.3.4 Stock assessment

The assessments for both the Kerguelen and Crozet stocks use the statistical model, CASAL (see Bull et al., 2012), accepted by the CCAMLR Scientific Committee. It is also used to assess the stocks of Patagonian toothfish (*D. eleginoides*) in Heard and McDonald Islands (CCAMLR division 58.5.2), in South Georgia (CCAMLR division 48.3) and the stock of the Antarctic toothfish in the Ross Sea (CCAMLR divisions 88.1 and 88.2), (Sinegre and Duhamel, 2015).

The underlying population dynamics model is age-structured. Length observation data are fitted by converting numbers at age to number at length using a growth model. Model parameters and derived quantities are estimated using a penalised likelihood approach with constraints on some parameters (e.g. virgin biomass, fleet selectivity and recruitment). Posterior distributions of the parameters can be obtained through MCMC (Monte Carlo Markov Chain). In the Kerguelen assessment relative year class strength (i.e. recruitment) is heavily constrained, which is necessary to achieve model convergence. This strongly implies that there is little information in the data on recruitment variability.

A descriptive report of the CASAL stock assessment model was presented at the Kerguelen Plateau Symposium in Hobart, Tasmania in November 2017. This peer reviewed report will be publicly available in 2018. At present, the stock assessment (WG-FSA) reports are very limited in their content and do not present the data input or full model diagnostic output. Hence the robustness of the assessments is not transparent. The assessments are presented annually to the Working Group on Fish Stock Assessment of the CCAMLR which reviews the assessment and makes recommendations for future analyses and use of data. This provides an internal quality assurance check and might be regarded as an internal peer review.

##### 2.3.4.1 UoA1 – Kerguelen Stock Assessment

The assessment is summarised in Sinegre et al. (2017a). Catch data are disaggregated by fleet and depth. These data are also divided between length composition and age composition components. Poker survey and tagging data are included in the model. Three configurations of the model were run where R1 excludes age composition data, R2 includes the age data and R3 relaxes the recruitment constraint. Table 7 shows the model configurations.

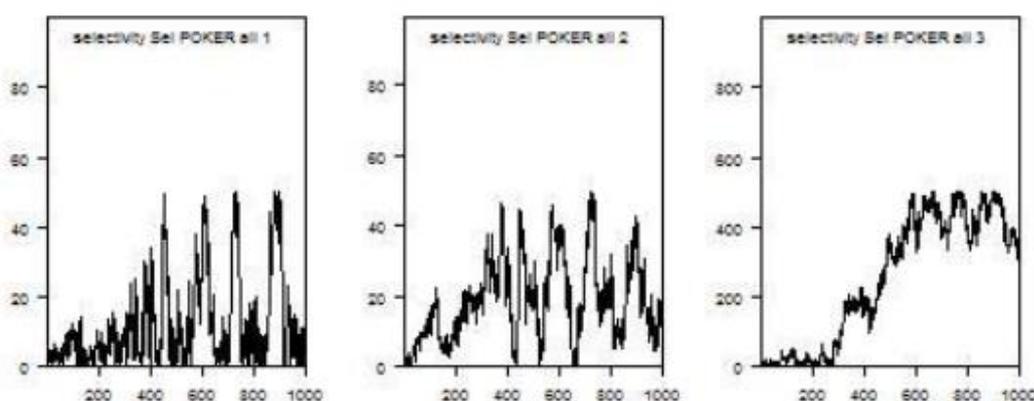
Diagnostics from the MCMC runs show that model R3, where year class strength is estimated, does not converge for the POKER selectivity parameters and is therefore unreliable (Figure 5). This is a cause for concern regarding the robustness of the assessment.

Only three model alternatives are reported which is very limited given the uncertainties in the data. It means that the full range of uncertainty has not been explored and the robustness of the assessment has not been tested adequately. There are, for example, important assumptions in the assessment about the level of depredation, tag loss rate and the relative weighting given to the data components. Data weighting can have a very significant impact on parameter estimates but this has apparently not been explored.

Despite reservations about the exploration of uncertainty in the assessments, the distance of the current biomass from reference points means that the judgement of stock status is likely to be robust.

**Table 7. Model configurations used in the UoA1-Kerguelen assessment. DNC=double normal curve, YCS= year class strength, VBGF= von Bertalanffy growth function (Sinègre et al., 2017a).**

Runs	Description						B0 Tonnes	SSB 2016 Tonnes	SSB status (%)	Objective function
2015	Sinègre & Duhamel, 2016 (R3)						244546	150122 (a)	61	1463
	<b>Selectivity</b>	<b>VBGF</b>	<b>Depredation</b>	<b>Age/Length</b>	<b>YCS</b>	<b>Sexed</b>				
R1	DNC	Kerguelen 2017	Yes	Length	Fixed to 1	No	235388	142558	61	1559
R2	DNC	Kerguelen 2017	Yes	Age and length	Fixed to 1	No	234121	141525	60	1539
R3	DNC	Kerguelen 2017	Yes	Age and length	Estimated	No	232805	148497	64	1133



**Figure 5. MCMC trace plots for the POKER selectivity parameters from the R3 model for Kerguelen. The model attempts to estimate relative year class strength but as can be seen selectivity parameters for the POKER surveys do not converge.**

#### 2.3.4.2 UoA2-Crozet Stock Assessment

This is summarised in Sinègre et al. (2017b) and follows the same approach as the Kerguelen assessment except that no research vessel survey data are available and age composition data have not been used. Four model configurations were run that explore the number of sub fleets in the model and different growth functions. Model configurations are shown in Table 8.. YCS= year class strength, VBGF= von Bertalanffy growth function (Sinègre et al., 2017b)

Diagnostics from the MCMC runs show that model R3 does not converge for the trawl selectivity parameters and is therefore unreliable. This is a cause for concern regarding the robustness of the assessment.

Only four model alternatives are reported which is very limited given the uncertainties in the data. It means that the full range of uncertainty has not been explored and the robustness of the assessment has not been tested adequately. There are, for example, important assumptions in the assessment about the level of depredation, tag loss rate and the relative weighting given to the data components. Data weighting can have a very significant impact on parameter estimates but this has not been explored. Given the absence of fishery-independent data this is a significant omission, and a recommendation (#4) is issued, for the stock assessment reports presented to CCAMLR and used to provide scientific advice to be more detailed in the future.

Despite reservations about the exploration of uncertainty in the assessments, the distance of the current biomass from reference points means that the judgement of stock status is likely to be robust.

**Table 8. Model configurations used in the UoA2-Crozet assessment. YCS= year class strength, VBGF= von Bertalanffy growth function (Sinegre et al., 2017b)**

Runs	Description				B0 Tonnes	SSB 2017 Tonnes	SSB status (%)	Objective function
2016	Sinegre & Duhamel, 2016 (R1)				54577	36126 (a)	66	1269
	Sub- fisheries	VBGF	Depredation	YCS				
R1	6	Candy 2007	Yes	fixed to 1	58243	38755	67	1241
R2	6	Crozet 2017	Yes	fixed to 1	71519	49909	70	1226
R3	5	Candy 2007	Yes	fixed to 1	56723	37669	66	980
R4	5	Crozet 2017	Yes	fixed to 1	69606	48614	70	991

### 2.3.5 Stock trends

The standard stock assessment reports on present relative trends in spawning stock biomass with associate credible intervals. The trend for the R1 model for the Kerguelen stock is shown in Figure 6. This figure also shows the projected biomass under the assumption of a constant TAC of 5363 t, which satisfies the harvest control rule. Historically, according to the assessment, the stock declined from its unexploited level in 1979 to approximately 60% of virgin biomass in 2017.

The trend for the R3 model for the Crozet stock is shown in Figure 7. This figure also shows the projected biomass under the assumption of a constant TAC of 1627 t, which satisfies the harvest control rule. Historically the stock declined from its unexploited level in 1976 to approximately 60% of virgin biomass in 2017.

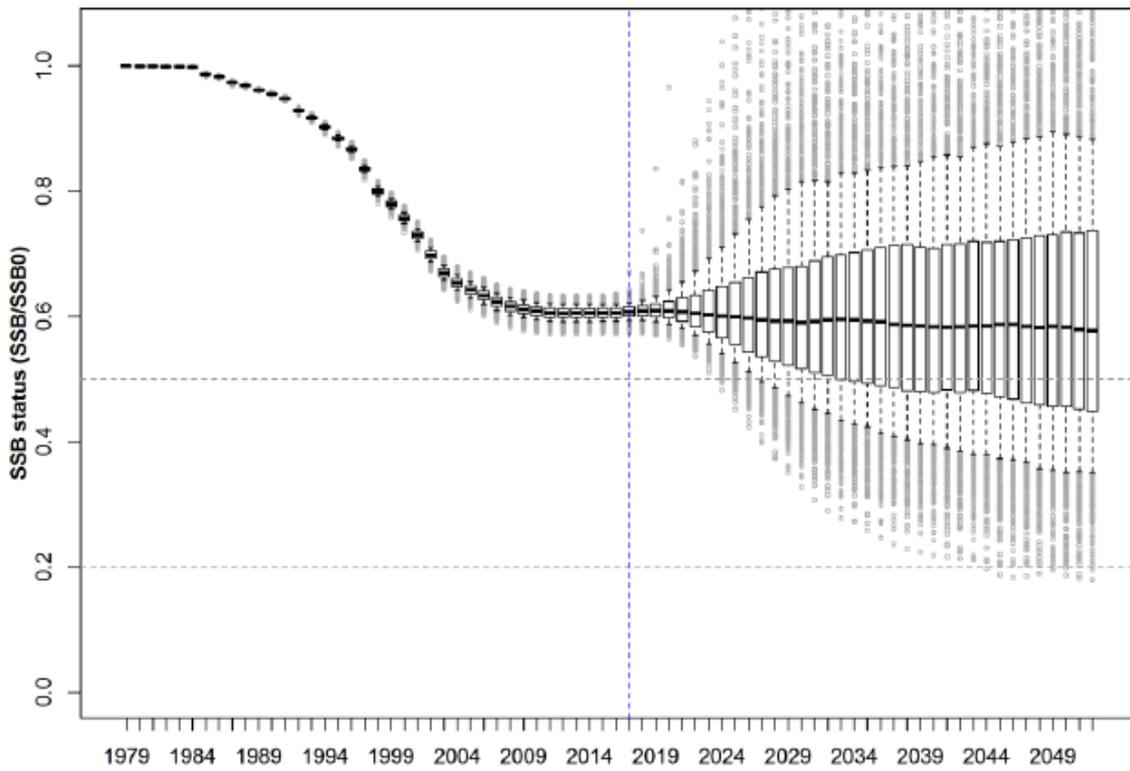


Figure 6. Historical and projected biomass relative to B0 for the UoA1- Kerguelen stock - model R1.

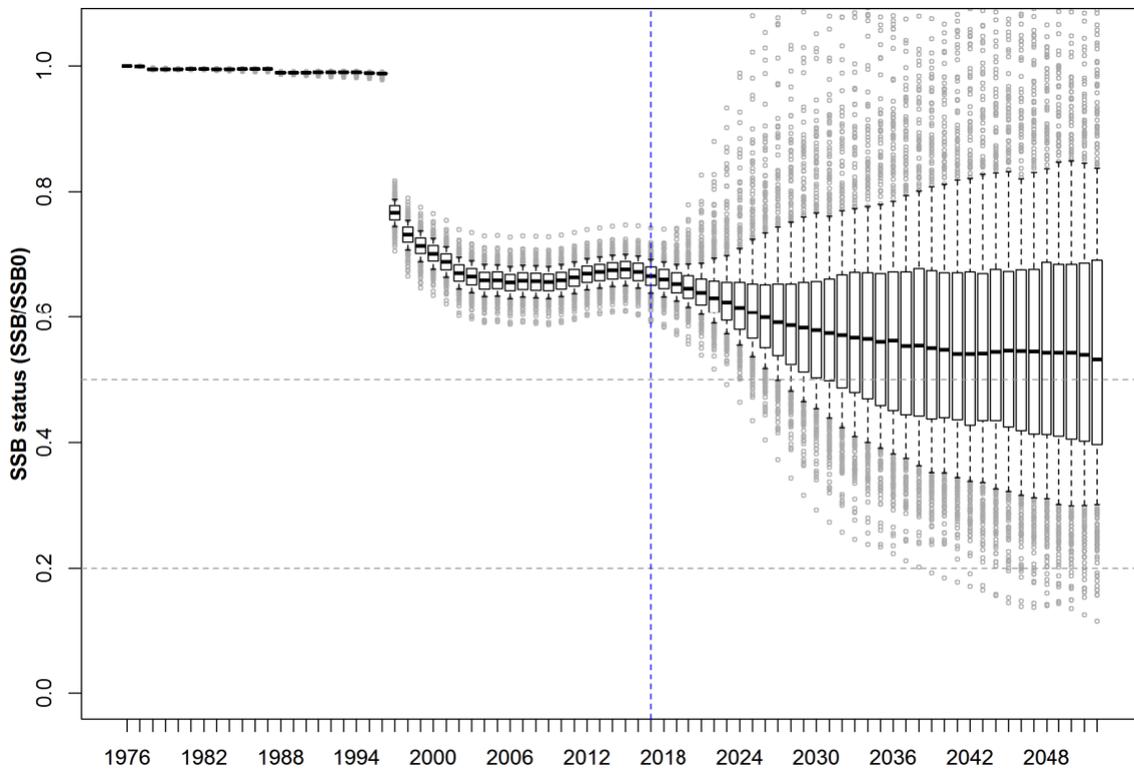


Figure 7. Historical and projected biomass relative to B0 for the UoA2-Crozet stock using model R3

### 2.3.6 Reference points

For both Kerguelen and Crozet stocks CCAMLR’s framework for reference points is used to evaluate stock status. CCAMLR defines the point at which recruitment would be impaired (PRI) as 20% of the virgin (pre-exploitation) biomass (“B zero” or  $B_0$ ), which is a recognized standard estimate of PRI (Parkes, 1999), as well as the MSC default level.

UoA1- Kerguelen: The most recent assessment estimates the 2017 biomass to be at 60.7% of  $B_0$  with a 95% credible interval of (58.5 – 62.8) (Sinegre et al., 2017a).

UoA2 – Crozet: The most recent assessment estimates the 2017 biomass to be 66% of  $B_0$  with a credible interval of (63.1-70.4) (Sinegre et al., 2017b).

Since the estimate of the 2017 biomass is well above the 20% $B_0$  value it is highly likely that the stocks are above their respective PRIs.

The management plan for both stocks is set out in TAAF (2015), which establishes 50% of  $B_0$  as the target biomass to be consistent with CCAMLR. However, an additional precautionary measure is used by TAAF that sets the target at 60% of virgin biomass ( $B_0$ ). Stock assessment estimates for both Kerguelen and Crozet placed the current SSB (Spawning Stock Biomass ) as above 60%  $B_0$  and show that the stock is fluctuating around its target value.

The MNHN produces a TAC range for Kerguelen and Crozet. It takes into account bycatch of rays, grenadiers and incidental captures of birds, as well as interactions with marine mammals. The MNHN proposes to the Prefect of the TAAF an option under the CCAMLR constraint (50% of  $B_0$ ) and recommends the option of 60% of  $B_0$ . Several options are therefore presented to managers.

The current values of the reference points are summarised in Table 9. It should be noted however, that the management points are interpreted relative to  $B_0$  and the absolute value of this point will change when the assessment is updated.

**Table 9. Reference points for the SARPC toothfish fishery**

	Type of reference point	Estimated value of reference point (t)	Current stock status relative to reference point
<b>UoA1-Kerguelen</b>	PRI	20% of $B_0 = 47072$	$B_{2017}/B_{20\%} = 3.03$
	Target biomass	50% of $B_0 = 117680$	$B_{2017}/B_{50\%} = 1.21$
	Management plan target	60% of $B_0=141216$	$B_{2017}/B_{60\%} = 1.01$
<b>UoA2-Crozet</b>	PRI	20% of $B_0 = 11362$	$B_{2017}/B_{20\%} = 3.34$
	Target biomass	50% of $B_0 = 28405$	$B_{2017}/B_{50\%} = 1.33$
	Management plan target	60% of $B_0=34086$	$B_{2017}/B_{60\%} = 1.11$

### 2.3.7 Harvest strategy

A global strategy is implemented through the order ("arrêté") n°2017-67 du 30 août 2017, which sets the rules of fishing activities in the French EEZ of Kerguelen and Crozet. It makes operational the TAAF management plan that sets out the objective of ensuring long-term conservation and optimal use of fishing resources in the EEZ, in order to achieve the maximum sustainable yield. The fishing operations should be conducted in a way that would preserve the ecosystem where those resources are living. In particular, the strategy includes:

- Limited entry in the fishery: only seven licensed vessels, using exclusively longlines, are allowed to fish;

- TAC, consistent with CCAMLR decision rules, based on scientific advice and local socio-economic considerations;
- The TAC is divided among the vessels, each allocation is a function of the performance of the vessel with regards to the regulation (quota, by-catches, etc.);
- Stringent control of IUU fishing.

Technical measures are also imposed:

- Compulsory Vessel Monitoring System (VMS);
- Compulsory electronic log-books and dock-side monitoring;
- 100% observer (controller) coverage; each observer (COPEC) should verify at least 25% of each line hauled;
- The fishing area is divided in 160 sectors (1° longitude x 0.5° latitude; TAAF, 2009); a maximum of two vessels should be present on the same sector at the same time; a vessel cannot fish on more than two sectors per trip; a vessel cannot fish on a sector more than ten days;
- Fishing at depths shallower than 500 m and in territorial waters around the islands is prohibited;
- Maximum number of hooks per line;
- MLS: If the proportion of undersized toothfish caught exceeds 10%, vessel should move on by at least 2.5 nautical miles.

The TACs (and other regulations) are formally set by the administrator of the TAAF. TAAF must take into account the scientific advice of the Muséum National d'Histoire Naturelle (MNHN), as well as the 'avis' (formal opinion) of the Cabinet of the Prime Minister and the Environment Ministry (MTES). Since 2013, advice from the MNHN is based on a quantitative stock assessment as described above. The MNHN proposes the level of the TAC that conforms to the CCAMLR reference points and recommends values consistent with 60%  $B_0$ .

The gear used in the UoA is longline and there is negligible unwanted catch of toothfish. It is not permitted to fish in waters less than 500m and this protects juvenile fish. As the fishery has 100% observer coverage and 25% of all lines are monitored, the effectiveness of these measures is routinely surveyed.

The Fishery Management Plan (TAAF, 2015) is intended to be revised periodically, and should be based on MNHN advice and on the principles of CCAMLR. The 1<sup>st</sup> review is planned to be completed by the end of 2018.

## 2.4 Principle Two: Ecosystem

An important change since the first certification has been the gradual build-up of permanent scientific capacity in support of population and ecosystem research at the MNHN, the TAAF-DCPN for the management of the extended RNN, and in associated research teams (CNRS-Chizé, IPEV).

A very large amount of data have been collected and analysed in recent years to determine the fishery's impacts on the Kerguelen and Crozet ecosystems (Principle 2).

### 2.4.1 Principle 2 definitions

The fishery's impact of non-target species is analysed differently if the species is from a "managed" stock or not, or considered Endangered, Threatened or Protected (ETP). These are defined as follows:

**Primary** species (MSC Component 2.1):

- Species in the catch that are not covered under P1
- Species that are within scope of the MSC program, i.e. no amphibians, reptiles, birds or mammals
- Species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit (LRP) or target reference points (TRP). Primary species can therefore also be referred to as 'managed species'.

**Secondary** species (MSC Component 2.2):

- Species in the catch that are not covered under P1
- Species that are not managed in accordance with limit or target reference points, i.e. do not meet the primary species criteria
- Species that are out of scope of the programme, but where the definition of ETP species is not applicable (see below).

**ETP** (Endangered, Threatened or Protected) species (MSC Component 2.3) are assigned as follows:

- Species that are recognised by national ETP legislation
- Species listed in binding international agreements (e.g. CITES, Convention on Migratory Species (CMS), ACAP, etc.)
- Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

Furthermore, both **primary** and **secondary** species are defined as 'main' if they meet the following criteria:

- The catch comprises 5 % or more by weight of the total catch of all species by the UoC;
- The species is classified as 'less resilient' and comprises 2 % or more by weight of the total catch of all species by the UoC. Less resilient is defined here as having low to medium productivity, or species for which resilience has been lowered due to anthropogenic or natural changes to its life-history;
- The species is out of scope but is not considered an ETP species (secondary species only);

- Exceptions to the rule may apply in the case of exceptionally large catches of bycatch species.

#### 2.4.2 Information on non-target species

There are two key sources of information for the analysis of Principle 2 species other than bait, the 'Avipêche/Avistock' notifications of catches and production, and the COPEC Observer reports.

The 'Avipêche/Avistock' provide data on the vessel production by weight for toothfish and numbers and weights for the others, by species. They indicate the fishing zone (KER or CRO EEZ) and whether the fish are retained and processed (or eaten on board or at the scientific onshore bases), discarded with or without being weighed, or cut off.

The detail of catch by species used to be available as spreadsheet tables, by vessel, for Kerguelen and for Crozet. The practice stopped as the MNHN and TAAF have put new validation processes in place, which have led to corrections in the taxonomy and other information.

The COPEC observers submit a report at the end of each trip, based on the data collected and estimates obtained from detailed examination of 25% of all lines hauled. The vessel captain signs some of the sections that form the basis of the reports to CCAMLR and the production and quantity checks (see Section 2.5.7). Once validated by the TAAF and MNHN, the detailed COPEC scientific reports are eventually communicated to the fishing companies; these were provided to the assessment team.

Observer reports were provided for all the trips in 2014/2015, 2015/16 and 2016/17 seasons (three to four trips by each vessel, with Kerguelen and Crozet clearly separated). The COPEC reports are very detailed, and provide, among other things:

- Catch and discard data along the same lines as 'avistock', with notes on any possible discrepancies with avipêche/avistock data;
- Details on vessel operations, including depth, moving on, on the basis of test line or full line catch results;
- Length-frequency measurements;
- Details of any tagging carried out and tag returns;
- Details of any bird interactions and outcome (dead, injured, unharmed) and how they came about; also what bird avoidance devices were in place and whether they were deployed correctly;
- Interactions with marine mammals (depredation, entanglement);
- Respect for the rules (bycatch thresholds from Code of conduct, VME catches and regulations, requirements to limit orca depredation, respect of the rules for occupying zones, treatment and discharging of rubbish and offal);
- Various comments on, for example, the attitude of the captain, COPEC and crew, the practicality of implementing regulations.

Unfortunately, the TAAF does not yet have access to the MNHN database at this date (April 2018) and could not provide the team with annual summary information for all species caught by weight going back five years. Therefore the data published in CCAMLR reports are used in this report, which are less detailed and a little different from the TAAF summaries because of the different fishing season dates. In any case, the team is satisfied that the information is complete enough to determine that the fishery is operating as before and its impacts are similar to previous years.

Regarding the COPEC reports, the TAAF advised using only the last two fishing years for percentage calculation because some of the validation protocols were changed after the 2014/15 season. Therefore the detail of species composition by weight had to be analysed manually from trip summary tables in the COPEC reports. Not all tables from the scanned paper reports were legible enough, but the data available cover the whole range of vessels and trips for Kerguelen-UoA1 and Crozet-UoA2 and all possible species.

### 2.4.3 Catch of non-target species

Overall, the tonnage of non-target 'Other' species is between four and five times higher in Kerguelen than in Crozet, roughly commensurate to the fishing pressure which is determined by the toothfish TAC fixed in each UoA. Annual catch of toothfish (*D. eleginoides*) and other species reported to CCAMLR are indicated in Table 10 for UoA1-Kerguelen and Table 11 for UoA2-Crozet for the last five seasons. The tonnage of 'Others' varies between 12% and 19% of the total catch in Kerguelen, and between 12% and 22% in Crozet.

**Table 10. UoA1 – Kerguelen: Catches (tonnes) of Toothfish and Other species in the French EEZ in Division 58.5.1 (CCAMLR, 2018a)**

Fishing season*	Toothfish	Macrourids	Rajids		<i>Antimora rostrata</i>	Total Others	Total
	Catch (t)	Catch (t)	Catch (t)	Nb. released	Catch (t)	Catch (t)	Catch (t)
2012/13	4 899	690	433	15 878	26	1 149	6 048
2013/14	5 342	728	308	12 455	67	1 103	6 445
2014/15	5 667	750	68	39 727	75	893	6 560
2015/16	4 367	605	9	33 641	69	683	5 050
2016/17	5 531	694	13	19 139	56	763	6 294

\* The CCAMLR fishing season dates apply (1<sup>st</sup> December-30<sup>th</sup> November, those of the TAAF are 1<sup>st</sup> September-31<sup>st</sup> August.)

**Table 11. UoA2 – Crozet: Catches (tonnes) of Toothfish and Other species in the French EEZ in Division 58.6 (CCAMLR, 2018b)**

Fishing season*	Toothfish	Macrourids	Rajids		<i>Antimora rostrata</i>	Total Others	Total
	Catch (t)	Catch (t)	Catch (t)	Nb. released	Catch (t)	Catch (t)	Catch (t)
2012/13	673	96	75	2 457	21	192	865
2013/14	840	64	33	1 242	17	114	954
2014/15	778	92	53	10 182	36	181	959
2015/16	868	109	17	22 575	75	201	1 069
2016/17	1 054	120	33	22 358	142	295	1 349

\* The CCAMLR fishing season dates apply (1<sup>st</sup> December-30<sup>th</sup> November, those of the TAAF are 1<sup>st</sup> September-31<sup>st</sup> August.)

Of the non-target species, Grenadiers (macrourids) are caught in the largest quantities, followed by rajids and Blue Antimora. All Antimora and some of the grenadiers are discarded and the rays have

been increasingly cut off and released over the years, following the Code of Conduct (Code de Bonne Conduite - CBC) developed by the MNHN (see section 2.4.7.3).

The species other than toothfish caught in the fishery are relatively few (Table 12). We note a predominance of ray and shark species, and while the numbers of species caught are similar in the two UoAs of Kerguelen (12) and Crozet (11), some species are specific to each UoA.

**Table 12. Names of species caught in the SARPC Kerguelen and Crozet toothfish fishery**

Common name	French common name	Scientific name
Patagonian toothfish	Légine australe	<i>Dissostichus eleginoides</i>
Grenadier	Grenadier	<i>Macrourus</i> spp.
Blue antimora	Antimore bleu	<i>Antimora rostrata</i>
Whiteleg skate	Raie épineuse taaf	<i>Amblyraja taaf</i>
Mixed skates	Raies mix	<i>Bathyraja eatonii</i> & <i>Bathyraja irrasa</i>
Kerguelen sandpaper skate	Raie rugueuse	<i>Bathyraja irrasa</i>
Eaton's skate	Raie d'Eaton	<i>Bathyraja eatonii</i>
New grey skate	Raie grise (nouvelle esp.)	<i>Bathyraja</i> spp.
Lantern shark	Sagre long nez	<i>Etmopterus</i> spp.
Southern sleeper shark	Requin dormeur	<i>Somniosus antarcticus</i>
Porbeagle shark	Requin taupe	<i>Lamna nasus</i>
Portuguese dogfish	Pailona commun	<i>Centrocygnus coelolepis</i>
King crab	Crabe	<i>Lithodes</i> spp.
Giant cusk eel	Donzelle broche	<i>Spectrunculus grandis</i>
Macquarie blobfish	Cotte subantarctique	<i>Ebinania macquariensis</i>

Captures of non-target species are noted and estimates obtained from the detailed examination of 25% of all lines hauled by the COPEC on each vessel. For the species cut off, the percentage weight composition in Table 13 and Table 14 are obtained from the average weight of the individuals weighed in each UoA and over the two most recent years. Estimated weights of cut off individuals, which are not brought on board, are indicated in the last column of each table to illustrate the quantities involved.

Relative abundances of non-target species differ between the two UoAs, which most likely reflects the more diverse range of fishing depths and more extensive fishing grounds in UoA1 – Kerguelen (Table 13) than in UoA2 – Crozet (Table 14).

In UoA1-Kerguelen, taxonomic differences between the Kerguelen sandpaper skate (*Bathyraja irrasa*) and Eaton's skate (*Bathyraja eatonii*) are not always easy to determine, and therefore individuals in the category 'Mixed skates' may be either species. For these two species, the estimated average weight of cut off individuals is estimated first and raised for each species by the numbers cut off.

In Kerguelen and Crozet, all sharks are also cut off. The few that are counted as discarded correspond mostly to individuals found dead on the lines and brought on board for scientific examination. Sharks are protected in the CCAMLR area where targeted shark fisheries are forbidden. Catches are discussed in section 2.4.7.

The proportions of bycatch species, retained or discarded, during the last two fishing seasons are similar to those of previous years as per the detailed analyses presented in the certification reports (MEP, 2013; MEC, 2016). An important difference since UoA1-Kerguelen's initial certification in 2013 has been the increasingly large number of skates/rays that are cut off instead of coming on board to

be later discarded. However, the COPECs bring some specimens on board to determine the species, measure and weigh them before discarding them. On this basis, it is possible to estimate the weight corresponding to the numbers cut off, as described above.

**Table 13. UoA1 – Kerguelen: Catch species composition (average of 2015/16/17 two seasons). Source: CU Pesca compilation from COPEC reports**

Species	Cut off (nb)	Discard (t)	Retained (t)	Total (t)	% Catch	% Ret.	Estim. Cut off (t)
Toothfish		21	4 808	4 829	87.93%	99.57%	-
Grenadier		107	495	602	10.97%	82.15%	-
Mixed skates	27 995	5	-	5	0.09%	-	134.32
Blue antimora		44	-	44	0.80%	-	-
Kerguelen sandpaper skate	9 636	4	2	6	0.12%	30.94%	51.35
Eaton's skate	3 317	2	1	3	0.06%	29.69%	13.40
Lantern shark	-	2	-	2.28	0.04%	-	-
Southern sleeper shark	32	-	-	-	0.00%	-	1.60
Porbeagle shark	1	-	-	-	0.00%		
King crab	-	-	0.01	0.01	0.00%		
Giant cusk eel	-	0.002	-	0.00	0.00%		
Macquarie blobfish	-	-	0.00	0.00	0.00%		
<b>Total</b>	<b>40 980</b>	<b>186</b>	<b>5 305</b>	<b>5 492</b>	<b>100%</b>		<b>201</b>

**Table 14. UoA2 – Crozet: Catch species composition (average of 2015/16/17 two seasons). Source: CU Pesca compilation from COPEC reports**

Species	Cut off (nb)	Discard (t)	Retained (t)	Total (t)	% Catch	% Ret.	Estim. Cut off (t)
Toothfish		4	1 077	1 080	82.35%	99.64%	-
Grenadier		31	79	110	8.37%	71.94%	-
Blue antimora		87	0	87	6.66%	-	-
Whiteleg skate	28 242	16	18	33	2.54%	52.69%	115.80
New grey skate	-	0.589	-	1	0.04%	-	0.05
Giant cusk eel		0.500	-	1	0.04%	-	-
Southern sleeper shark	29	-	-	-	0.00%		1.43
Porbeagle shark	1	0.030		0.03	0.00%		0.01
Lantern shark		0.013	-	0.01	0.00%	-	-
Eaton's skate		0.006	-	0.01	0.00%	-	-
Portuguese dogfish		0.003	-	0.00	0.00%	-	-
<b>Total</b>	<b>28 272</b>	<b>139</b>	<b>1 173</b>	<b>1 312</b>	<b>100%</b>		<b>116</b>

#### 2.4.4 Bait

Bait species, which are an essential input for this longline fishery, are also examined under Principle 2. The SARPC provides a compilation of the tonnage used by the entire fleet by fishing season and details from the catch certificates obtained by the companies, which indicate the species and FAO area of the stock of origin.

Bait is bought for the fishery as a whole. Vessels switch from one UoA to the other during a single fishing trip, and therefore detailed quantities used in each UoA are not analysed, although daily usage could be reconstructed. Table 15 provides an average for the last two years of the quantities used by the entire fleet for the two UoAs of Kerguelen and Crozet together. Overall, the tonnage of bait represented more than 10% of the total tonnage caught, or around 12% of the weight of toothfish caught. All bait used is bought frozen, whole for the fish and tubes for the squid.

Atlantic mackerel from either stock is the preferred bait by far, with more than 85% of the 761 tonnes used per year on average over the last two years.

**Table 15. Allowable catch (tonnes/year in 2017) by managed bait species stock and use (tonnes/year) by the fishery (UoA1 and UoA2, average 2015/16 and 2016/17)**

Species	Mackerel ( <i>Scomber scombrus</i> )		Shortfin squid ( <i>Illex spp.</i> )	Chub mackerel ( <i>Scomber japonicus</i> )	Total (t)
	FAO 21 NW Atlantic	FAO 27 NE Atlantic	FAO 41 SW Atlantic	FAO 61 NW Pacific	
Stock / FAO area					
MSY or allowed catch (t, 2017)*	>15 000 t	> 0.8 million t	0.1 – 0.5 million t	> 0.5 million t	
Tonnage Bait used**	341	308	84	28	761
Bait as % total catch from the UoAs	4.58%	4.14%	1.14%	0.37%	10.23%

\* CU Pesca compilation, \*\* SARPC

#### 2.4.5 Designation of species under Principle 2

Toothfish is the only species caught in the fishery that has management tools in place including reference points. Therefore, as explained in Section 2.4.5 all bycatch of non-ETP species are ‘Secondary species’.

By contrast, all species used for bait are ‘Primary species’. However, only the two Atlantic mackerel species, which make up the equivalent of between 4% and 5% of the catch weight on average over the last two fishing seasons may be considered as ‘main’. The quantities of shortfin squid and Japanese chub mackerel used for bait consistently make up less than 5% of the UoCs’ total catch and are therefore minor species (Table 15).

The Principle 2 species designation and sources of information are deduced from Table 13 and Table 14 above. They are summarised in Table 16, by scoring component. There is no distinction of main or minor for ETP species.

**Table 16. Species considered under Principle 2 by component and category for UoA1-Kerguelen and UoA2 - Crozet**

Component	Main/ Minor	Species list	Source of information / reason
<b>2.1 Primary species (both UoAs)</b>	Main	Mackerel ( <i>Scomber scombrus</i> ) 1) FAO 21 NW Atlantic 2) FAO 27 NE Atlantic	Bait: close to 5% of total catch in some or all years (information from SARPC), managed stocks on the basis of scientific advice provided by 1) NOAA and 2) ICES
	Minor	Japanese Chub mackerel ( <i>Scomber japonicus</i> ) FAO 61 NW Pacific	Bait: less than 2% of total catch in all years (SARPC) – Japanese TAC takes account of High Seas catches

Component	Main/Minor	Species list	Source of information / reason
	Minor	Shortfin squid ( <i>Illex spp.</i> ) FAO 41 SW Atlantic	Bait: less than 2% of total catch in all years (SARPC) - Management systems in both Argentinian EEZ and Falkland Islands / Las Malvinas EEZ take account of High Seas catches
<b>2.2 Secondary species</b>	Main (both UoAs)	Grenadier ( <i>Macrourus carinatus</i> )	Avistock – catch > 5% of total catch in some or all years; partly retained
UoA1 - Kerguelen	Main UoA1	Kerguelen sandpaper skate ( <i>Bathyraja irrasa</i> )	Avistock – catch > 2% when including estimated weight of those cut off; very few retained, some discarded, mostly cut off
	Minor UoA1	Eaton skate ( <i>Bathyraja eatonii</i> )	Avistock – retained catch less than 2% of total catch even when including estimated weight of cut off; very few retained, some discarded, mostly cut off
		Blue antimora ( <i>Antimora rostrata</i> )	Avistock – catch < 2% of total catch; always discarded
UoA2 - Crozet	Main UoA2	Blue antimora ( <i>Antimora rostrata</i> )	Avistock – catch > 5% of total catch; always discarded
	Main UoA2	Whiteleg skate ( <i>Amblyraja taaf</i> )	Avistock – catch > 2%, and > 5% when including estimated weight of those cut off; some retained, some discarded, mostly cut off
	Sharks Minor (both UoAs)	Lantern shark ( <i>Etmopterus spp.</i> ) Southern sleeper shark ( <i>Somniosus antarcticus</i> ) Porbeagle shark ( <i>Lamna nasus</i> )	Identified from Avistock and COPEC reports Protected under CCAMLR fisheries regulations (sharks and birds) and French law (birds, marine mammals)
2.3 ETP species*	Birds	White-chinned petrel ( <i>Procellaria aequinoctialis</i> ) Grey petrel ( <i>Procellaria cinerea</i> ) Giant petrel ( <i>Macronectes spp.</i> )	Identified from Avistock and COPEC reports French law (national and TAAF) Agreement on the Conservation of Albatrosses and Petrels (ACAP)
	Marine mammals	Sperm whale ( <i>Physeter macrocephalus</i> ) Orca ( <i>Orcinus orca</i> )	Identified from Avistock and COPEC reports International French law (national and TAAF) CITES Appendix I (sperm whale)

\* see below

Other minor species are also occasionally caught as noted above, but these quantities are relatively very small and the fishery is not considered to have adverse impacts on their numbers.

Potential use of the risk-based framework (RBF) was announced to score the PIs 2.1.1 Primary species outcome and 2.2.1 Secondary species outcome, on the basis that “Stock status reference points may not be available – neither by derivation of analytical stock assessments nor by using empirical approaches” for the species concerned (FCRG v2.0, Table 3). In the event, the RBF was only required to be used for PI 2.2.1 Secondary species outcome. The results are presented in section 2.4.7.

## 2.4.6 Primary species

Only bait species are managed and therefore primary species. Atlantic mackerel NW and NE Atlantic stocks are the most used by far and may make up to 5% of the total catch in some years, and are therefore considered as main.

The choice of bait species and product type is entirely left to the vessel captains and the fishing companies, but a strategy is now in place by which the fishing companies check the bait catch certificates indicating the stock of origin to ensure that the bait comes from a stock that is managed in a manner compatible with the Principle 2 requirements for this fishery certification. The strategy is not published, but fishing companies produced evidence (NOAA factsheets, Monterey Bay Aquarium etc.) that they had checked the sustainability diagnosis of the mackerel stocks used.

### 2.4.6.1 Mackerel (*Scomber scombrus*) NE Atlantic stock (FAO area 27)

Mackerel from the NE Atlantic stock (FAO area 27 – ICES subareas 1-8 , 14 and Division 9a) come from a MSC certified fishery (Acoura Marine, 2017). The latest advice finds that the stock is not overfished, but fishing mortality is above the target level on the basis of a benchmarked stock assessment in 2017 (ICES, 2017). Annual quantities used by the fishery are around 350 tonnes, compared to an MSY-based agreed TAC for the stock in excess of 0.8 million tonnes per year in 2016 and 2017 (Table 15) and are therefore not expected to impact the status of the stock.

### 2.4.6.2 Mackerel (*Scomber scombrus*) NW Atlantic stock (FAO area 21)

The NW Atlantic (FAO area 21) mackerel stock is shared between Canada and the USA. For the US, the stock is currently assessed by NOAA. There are no MSC-certified fisheries on this stock. A stock assessment benchmark published in draft in November 2017 was peer reviewed by a panel of independent experts in January 2018 and published in February 2018 (NOAA, 2018<sup>3</sup>) who estimated the stock to be outside biological limits, overfished and subject to overfishing. SSB2016 was estimated to be 98 447 t, with a total annual catch of 12 600-15 400 tonnes between 2012 and 2016 and a median SSBmsy proxy of 196 894 t (90% CIs of 108 161 – 429 551 t) (NOAA, 2018), which indicates that the 2016 biomass was still below the PRI (taken to be 0.5\* SSBmsy proxy). Since the SSB all time low level of 2012, estimated fishing mortality has decreased sharply and SSB has been increasing, providing evidence of recovery.

The use by this fishery (300t) is negligible in relation to the NOAA-set TAC, and most importantly, the fishery ensures that all imported fish used for bait carry a NOAA catch certificate attesting that these are caught within the management system allowance inside the TAC and therefore do not hinder recovery.

### 2.4.6.3 Shortfin squid (*Illex spp.*) (FAO 41)

The Illex squid of the Patagonian shelf (zone FAO 41) is the shortfin squid (*Illex argentinus*), a widely distributed stock, currently managed by Argentina, and by the Falkland Islands Fisheries Department at the Southern end of its distribution range. Even though the South Atlantic Fisheries Commission has not convened for years, the resource is nevertheless managed by both parties, which both take account of catches on the High Seas outside 200 miles through their licensing policies. The species is annual and in its Southern range, the stock has been managed to ensure a 40% proportional escapement by limiting the number of fishing licenses and shortening the fishing season if necessary (Basson et al., 1996).

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<sup>3</sup> <https://nefsc.noaa.gov/publications/crd/crd1803/crd1803.pdf>

A recent retrospective stock assessment analysis from Taiwanese catches over the entire distribution range shows that, even though recruitment and abundance varied widely between years, influenced by changes in environmental conditions, long-distance migrations and management measures, historical exploitation rates (1983-2013) were lower than 60% and complied with the conservation goal of a 40% escapement rate (Chang et al., 2016). Between 2001 and 2010, catches of *Illlex argentinus* in Argentinian waters have been estimated to vary between 93 300 and 372 200 tonnes per year (Villasante et al., 2015) and have varied between 2 360 and 357 722 tonnes per year between 2011 and 2016 in the Falkland Islands fishery (FIG, 2018). The quantities used by the fishery (84 tonnes per year) are insignificant compared to the managed catches and are not expected to impact the status of the stock.

#### 2.4.6.4 NW Pacific (FAO 61) Chub mackerel (*Scomber japonicus*)

The Chub mackerel is a widely distributed stock, ranging from the Japanese to the Chilean coast. In the North West Pacific (FAO 61), part of the stock is managed by Japan in its waters with a TAC, and the other through the North Pacific Fisheries Commission (NPFC) for High Seas waters. The NPFC has initiated a regional stock assessment exercise, which will take place in 2018, and has adopted a Conservation Management Measure in 2017 that is destined to freeze fishing effort until new scientific advice is adopted (NPFC, 2018). In 2015 and 2016, the most recent two years when statistics are complete, Japanese catches were around 400 000 tones, Chinese catches about 140 000 tonnes and Russian catches 10 000 tonnes<sup>4</sup>. The quantities used by the fishery (28 tonnes per year, Table 15) are insignificant compared to the managed catches and are not expected to impact the status of the stock.

#### 2.4.7 Secondary species

'Main' secondary species are defined on the basis of the species in the total catch with % catch weight greater than 5%, or 2% for species assumed to be less resilient or more vulnerable. For UoA1-Kerguelen, grenadiers (macrourids) are 'main', and also the Kerguelen sandpaper skate (*Bathyraja irrasa*) if, to be precautionary, we also include all the estimated catch weight for cut off "mixed rays", which brings it above the 2% threshold (Table 13). For UoA2-Crozet, the grenadiers (macrourids), blue antimora and whiteleg skate (*Amblyraja taaf*) are 'main' (Table 14). All other species, including the Eaton's skate (*Bathyraja eatonii*), are considered as secondary 'minor' species (Table 16).

TAAF-DCPN reviews the captures of non-target species from the information in the COPEC report (see section 2.4.2), for each vessel at the end of each fishing trip ("marée"), and also in real-time in case of any incidental interaction reported by the vessel captain or the COPEC. Together with the % juvenile toothfish caught, the information is used as part of the 'environmental criteria' used by the TAAF-DPQM used to adjust the annual vessel quota allocation (section 2.2.2).

As part of the fishery's Management Plan Management, measures are reiterated and new ones introduced each year before the start of the new season in the form of technical prescriptions (Prescriptions techniques, TAAF 2017). Additional management measures for non-target species have been introduced with the extension of the National Reserve (RNN), which has closed an area previously fished (Skiff Bank). A Management Plan for the extended RNN is expected to be published in 2019. In the meantime, the RNN staff already places an additional scientific observer on board the vessels that can accommodate them (N. Gasco, pers. com).

Unlike Australian HIMI (SCS, 2017) or the fishery in South Georgia (Acoura Marine, 2018), the French fishery does not have a set maximum tonnage of non-target species (see CCAMLR, 2018), but the management measures in place that aim to minimise the fishery's impacts on non-target species have

<sup>4</sup> <https://www.npfc.int/system/files/2018-06/NPFC-2018-AR-Annual%20Summary%20Footprint%20-%20Chub%26Spotted%20mackerels.pdf>

been effective, as illustrated by the tonnage per species groups reported to CCAMLR each year, which show similar or decreasing quantities from season to season (Table 10, Table 11)<sup>5</sup>. However, an Ecological Risk Analysis (ERA) such as performed for the Australian HIMI fishery may provide more realistic environmental protection guidelines.

Main secondary species have not changed and are similar in all other longline Patagonian toothfish fisheries in the CCAMLR zone (Gasco and Duhamel, 2011). They are grenadiers (macrourids), rays (several species as discussed above) and the blue antimora.

#### 2.4.7.1 Grenadiers (both UoAs)

Macrourids (grenadiers) are mostly retained (82% in UoA1 and 77% from UoA2) and made up 11% (UoA1) and 9% (UoA2) of the total catch on average in the two fishing seasons 2015/16/17. Taxonomy of the grenadier group is rather complex and impossible to ascertain by the COPEC on board vessels. The species in both UoAs is thought to correspond to *Macrourus carinatus*, the most temperate species in these CCAMLR areas (Prof. Duhamel, pers. com. and Duhamel et al. (2005)).

Its stock biomass has been estimated for UoA1-Kerguelen, on the basis of trawl catches in the POKER research cruises, to fluctuate around 5 000 tonnes since 2006, while catches have altogether varied around 600 to 700t per year. The total biomass is most likely underestimated because adult grenadiers are mostly found at depths close to 1 000m, which are at the limit of POKER trawl sampling (MNHN, 2018). There is no biomass estimate for UoA2-Crozet. This scoring element was evaluated via the RBF (Table 36).

#### 2.4.7.2 Blue antimora (*Antimora rostrata*)

A deep-water morid species, Blue Antimora juvenile are found in shallow waters. Adults may be caught in depths up to 3 000m. According to species Duhamel et al (2005), the species is most likely to be very fecund. The biomass estimated from the POKER surveys (2006, 2010, 2013 and 2017) has been around 1 000 tonnes between the 500m and 1 000m depth contours for UoA1-Kerguelen, and assumed to be similar for UoA2-Crozet (Duhamel et al., 2005). This scoring element was scored using the RBF (Table 37).

All tonnage caught is discarded, and made up less than 1% of the total catch in UoA1 (Table 13) and about 7% in UoA2 (Table 14) over the last two years, it is therefore a 'minor' secondary species in UoA1-Kerguelen and a 'main' secondary species in UoA2-Crozet.

#### 2.4.7.3 Skates / rays

In both UoAs, the large majority of skates are now cut off, which reduces opportunities for research, according to the MNHN. If found dead on the lines, but still in line with human consumption quality rules, those rays that have commercial value are retained and processed. The skates discarded are those found dead and of no commercial value (Table 13 and Table 14). Relative to the total catch weight, rajids are caught in higher numbers in Crozet. This was noted by the MNHN in its retrospective analysis in 2014 (MNHN, 2014) and in the latest C3P report (TAAF, 2017). Recent differences could also be linked to the increased toothfish TAC in Crozet in 2015/16/17 (see MEC, 2018) and the shorter lines that are now more often set in Crozet to minimize interactions with orcas.

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<sup>5</sup> Absolute catch of non-target species at Crozet has been increasing, but since the toothfish TAC has increased significantly, bycatch has been reducing as a proportion of the overall catch; and assuming toothfish catch is proportional to effort, bycatch catch rates have been reducing (see Table 11).

Two species of skates are considered main when counting the estimated weight of those discarded and of those cut off: in UoA1 the Kerguelen sandpaper skate (*Bathyraja irrasa*) including unidentified mixed skates by precaution (197 t/year), and in UoA2 whiteleg skate (*Amblyraja taaf*, 149 t/year).

The stock biomass of the Kerguelen sandpaper skate (*B. irrasa*) has been followed through the Poker surveys for UoA1-Kerguelen. From the most recent data (POKER 4 in 2017), the MNHN estimates the species biomass to be between 5 000 and 10 000 tonnes down to depths of 1 000m around Kerguelen, and probably much more as *B. irrasa*'s ranges to depths down 2 000m and probably deeper. With an annual catch around 200 tonnes including those cut off and all mixed rays, the fishery in UoA1-Kerguelen is unlikely to have much impact on its stock biomass. This scoring element was scored using the RBF (Table 38).

The fishery in UoA2-Crozet catches some 150 tonnes per year of whiteleg skate (*Amblyraja taaf*). The species is widely distributed on offshore deep banks (Duhamel et al., 2005). There are no POKER surveys to provide biomass estimates, but CPUE time series from the fishery have shown increases since 2011 (Prof. Duhamel, pers. comm.). This scoring element was scored using the RBF (Table 39).

Management measures to protect rays include spatial exclusion, from waters shallower than 500m in both UoAs to protect juveniles, from the extended RNN that introduced closures in part based on ray concentrations in both UoAs (Koubbi et al., 2016a and b), and from the move on rules to avoid local depletion in concentration 'hot-spots'. A move-on rule applies to minimize the capture of all non-target species. Specifically for rays, moving on (by more than 2 nm for 10 days I Crozet or as long the 'sector' is exploited for Kerguelen) is triggered is more than 50 rays/ 1 000 hooks are observed from 25% of the line (TAFF, 2017a). In addition, the mandatory cut-off rule aims to avoid further trauma to individuals judged to be alive with little apparent wounds when the lines are hauled (2011 Code of Conduct, CBC - MNHN, 2014). The successful implementation of the management measures put in place by the CBC since 2014 is evident in both UoAs from the stable or reducing overall catch of rays as well as the significant increase in the numbers of skates/rays cut off by the vessels (Table 10 and Table 11).

The TAAF-DCPN also insists on counting the rays that have been cut off as precisely as possible. They expect to complete Ecological Risk Assessments (ERAs) for all species concerned in 2018.

The RBF workshop estimated, on the basis of published and un-published evidence mentioned by MNHN scientists (Kerguelen Plateau Symposium, to be published) that all main secondary species are highly likely to be above biologically based limits ( $SG \geq 80$ ) in both UoAs.

However, during the RBF workshop regarding these species, the MNHN team leader (Prof. Duhamel) asserted that new unpublished analyses led him to believe that survival of all ray species, even the most carefully cut off, could be lower than initially expected. This was new information to all other stakeholders, which will need to be evaluated. It may make no difference as far as the overall impact on the ray species concerned, but would question the premise of the cut-off management measure for these species. However, similar cut-off requirements have also been put in place elsewhere in the CCAMLR area on the basis of positive survival analyses (e.g. via CCAMLR Conservation Measure 41-10 (2017) on the Antarctic toothfish fishery in 88.2 – eastern Ross Sea and adjacent Antarctic shelf).

#### 2.4.7.4 Other minor secondary species

A few other species may be caught in the fishery, including sharks. CCAMLR has a specific conservation measure (32-18) in force since 2006, which:

- prohibits directed fishing on shark species in the Convention area, and

- stipulates that any bycatch of shark, especially juveniles and gravid females, taken accidentally in any fisheries, shall, as far as possible, be released alive (see CCAMLR, 2018).

Catches of sharks are mostly through entanglement with the line, which means that bringing live sharks on board, or even near enough to the vessel to cut them off the line, can be very hazardous to the crew. Numbers and estimated weights are extremely low (Table 13 and Table 14) and according to the MNHN surveys and analyses of COPEC data, there are likely to be no detectable impacts on the population biomass of the species concerned.

#### 2.4.8 ETP species

ETP (endangered, threatened and protected) species are defined as those formally protected by national or international legislation or treaties, including fisheries regulations. In the CCAMLR Convention area, these include birds, marine mammals and sharks.

The sharks listed in Table 16 are not given specific protection in the French/TAAF legislation other than the fishery has to minimize catches (TAAF, 2017a), therefore they are considered in section 2.4.7.4 above. The same applies to skates/rays which are also examined as secondary species (section 2.4.7.3) because their protection is not specified in French legislation or in international treaties beyond CCAMLR fisheries conservation management measures. The TAAF have pledged to follow up, including as part of the on-going process to update the extended RNN list of protected species. In any case, MSC stipulate that IUCN classification only requires species to be considered as ETP if they are i) out-of-scope species and ii) at the level of 'vulnerable' or above. Sharks and rays species are therefore considered under secondary rather than ETP.

For ETP species of relevance to the fishery, the TAAF environmental protection legislation incorporates CCAMLR conservation measures, and there is specific additional French protection legislation for<sup>6</sup>:

- All TAAF indigenous species of birds - arrêté ministériel du 14 août 1998<sup>7</sup>, and
- All species of marine mammals - arrêté ministériel du 1er juillet 2011<sup>8</sup>.

##### 2.4.8.1 Seabirds

CCAMLR publishes the detail of bird mortality reported each season, which remains very low after a large initial decrease in 2010. The total number of birds observed to be dead or wounded during fishing operations on 25% of the lines observed was 19 in UoA1-Kerguelen (Table 17) and 6 in UoA2-Crozet (Table 18) for the 2016-17 season (CCAMLR 2016a and b). The figures differ slightly from those of TAAF because of the difference in season start (see recommendation #1 in section 5.4). Individual vessel performances are presented and discussed annually during the C3P meeting (TAAF, 2017), but an in-depth analysis of specific risk factors remaining at vessel level was missing. Such a study has been initiated by the SARPC to identify in detail the combinations of risk factors of bird accidental capture or strike among the vessels, and provide a statistical basis for guidelines at vessel level. So far, the analysis only concerns the four Sapmer vessels operations over the last three seasons since 2014/2015 (E. Cousin, pers. com.). A draft report, which was communicated to the team, is expected to be published in 2018.

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<sup>6</sup> Detailed species list at <http://www.taaf.fr/Liste-des-especes-protegees>

<sup>7</sup> <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000000757293>

<sup>8</sup> [https://www.legifrance.gouv.fr/jo\\_pdf.do?numJO=0&dateJO=20110726&numTexte=8&pageDebut=12708&pageFin=12710](https://www.legifrance.gouv.fr/jo_pdf.do?numJO=0&dateJO=20110726&numTexte=8&pageDebut=12708&pageFin=12710)

The scientists in charge of monitoring the fishery’s impact on birds confirm that mortality rates from the fishery remain low (Nicolas Gasco, MNHN, pers. com.) and that there are no detectable impacts at population levels for petrels at present. Interactions with white-chinned petrels (several hundred thousand pairs in Crozet) remain very low. Grey petrels (several thousand birds) are followed at Kerguelen through mark-recaptures and there have been no detectable changes, an analysis is expected to be published in 2018 (Henri Weimerskirch, pers. com.). Birds censuses are undertaken regularly<sup>9</sup> and France reports to ACAP (Agreement on the Conservation of Albatrosses and Petrels) meetings<sup>10</sup> on the regular population monitoring of 5 species from Kerguelen and 6 from Crozet. In support of the RNN extension, the most recent bird census in 2018 is expected to be published in 2019.

**Table 17. UoA1 Kerguelen – Observed (25% of each line) numbers of birds killed and injured in the longline fishery, French EEZ Division 58.5.1 (CCAMLR, 2017a)**

Bird	Species	2014	2015	2016
White-chinned petrel	<i>Procellaria aequinoctialis</i>	4	9	7
Grey petrel	<i>Procellaria cinerea</i>	0	3	7
Giant petrel	<i>Macronectes</i> spp.	2	0	5

**Table 18. UoA2 Crozet - Observed (25% of each line) numbers of birds killed and injured in the longline fishery, French EEZ in Subarea 58.6 (CCAMLR, 2017b)**

Bird	Species	2014	2015	2016
White-chinned petrel	<i>Procellaria aequinoctialis</i>	6	11	6
Grey petrel	<i>Procellaria cinerea</i>	0	0	0
Giant petrel	<i>Macronectes</i> spp.	0	0	0

It is also worth noting that the new vessel (“Cap Kersaint”) configuration with a moon pool and hidden line shooting through the stern considerably reduces the risks of seabird interactions with the fishing gear; this will also be the case for the new “Ile de la Réunion II”, expected by the end of 2018 (Table 5).

#### 2.4.8.2 Marine mammals

A combination of CCAMLR conservation measures (CCAMLR, 2017), French biodiversity protection legislation for the TAAF national reserve (RNN) and ministerial decree protect all TAAF species of marine mammals (arrêté ministériel du 1er juillet 2011). Their provisions have been translated into measures specific to this fishery (TAAF fishery regulations, TAAF 2017a: art.10 Annexe II), which are highly likely to achieve the highest level of protection requirements of both national and international levels.

The fishery may impact marine mammals directly and indirectly. Direct impacts are through accidental catches of whales or seals becoming entangled in the longlines set at the bottom. For all fisheries in the CCAMLR Area, the numbers of marine mammals caught and released or killed must be reported

<sup>9</sup> see <http://www.taaf.fr/IMG/pdf/-593.pdf>

<sup>10</sup> see <https://www.acap.aq/en/advisory-committee/ac10/ac10-meeting-documents/3126-ac10-doc-11-pacswg-report/file>

on a monthly basis (CM 23-04 (2016) - CCAMLR, 2017) . Although this does not apply to fisheries in the French EEZs, monthly data are reported by the TAAF for both UoAs (CCAMLR, 2018 a and b). Any incident has to be reported in the logbooks and to the COPEC. Casualties are very rare in both UoAs – 1 elephant seal (*Mirounga leonina*) in 2016/17, the first mortality observed (UoA1-Kerguelen) since 2007 (CCAMLR 2018 a and b). The elephant seal population in the TAAF is the second largest in the world, and its status is stable or increasing (TAAF, 2016a).

The most frequent impact on marine mammals is indirect, from the depredation of fish caught on the lines. It is clear that depredation of the catch by marine mammals is a problem for this fishery. The observer reports note numerous instances where the catch was reduced or damaged by whales mostly for UoA1- Kerguelen and whales and orcas for UoA2-Crozet (Gasco et al., 2016), which may reach up to 30% of the initial total catch of toothfish in UoA2-Crozet, and 6% in UoA1-Kerguelen as described in section 2.3.3.

There is a strategy in place to limit depredation as part of the fisheries regulations (TAAF, 2017a). For UoA1-Kerguelen, where orcas have not learned the behaviour to the same extent as at Crozet, it is forbidden to haul in the presence of orcas. For UoA2-Crozet, vessels use shorter lines and faster hauling speed to try and limit depredation and where depredation has been a problem vessels move on at least 60 miles. From a detailed examination of 25% of all lines hauled, the COPEC evaluate whether the rules are being adhered to. They also contribute to monitoring any interactions as well as distant sightings as part of their scientific observation duties, now often complemented by a scientific observer for the National reserve (RNN).

Indirect effects of the fishery on orcas and whales are being monitored in both UoAs using photo-identification (for ex. Labadie et al., 2015 and 2018). For UoA1-Kerguelen, depredation by sperm whales tends to happen at depth unseen, so there is not much that vessels can do to avoid it. For UoA2-Crozet, the effect of “artificial food provisioning” , including higher population growth rate of depredating vs. non-depredating pods of orcas, has been demonstrated (Tixier et al., 2015). However, it is carried out by a small number of particularly aggressive individuals who have incorporated depredation into their foraging strategy (Roche et al., 2007) as a consequence of historical interactions with IUU fishing vessels to the north of Crozet, and it does not happen with other pods or in Kerguelen (Tixier et al., 2017).

There is presently no concern about the status of any of the populations of marine mammals concerned and impacts from the fishery are considered highly likely to be within acceptable limits (H. Weimerskirch, N. Gasco and TAAF, pers. comm.). There are no other MSC UoAs in the French EEZ of Kerguelen or Crozet or the respective CCAMLR sub-divisions. For UoA1-Kerguelen, impacts from the HIMI certified fishery on the Kerguelen Plateau need to be considered. Mortalities are found to be relatively very low (six southern elephant seal (*Mirounga leonina*) and one unidentified seal (CCAMLR, 2018c). Overall, there is no evidence that any significant population-level impact is likely on any of the marine mammal ETP species; mortalities remain very rare relative to the populations involved.

There are annual reviews of the effectiveness of the measures. The practicality of alternatives measures to scare away seabird and marine mammal are discussed regularly at CCAMLR, and also by TAAF with a presentation and discussions with the vessel captains at the annual C3P meeting.

A large number of scientific projects are on-going, which were presented at the 2017 Symposium on the Kerguelen Plateau, funded by the “Fondation des mers australes” (publication expected 2018). Numerous studies on the status of marine mammal populations and their interactions with the fishery have now been published to support the National Reserve extension (see TAAF, 2016a).

## 2.4.9 Habitats

The MSC FCR v2.0 requires habitats interacting with the fishery to be defined as ‘commonly-encountered’, ‘VME’ or ‘minor’, with definitions as given in Table 19.

**Table 19. Habitat definitions as per the MSC Fisheries Certification Requirements v2.0.**

FCR reference	Definition
<b>SA3.13.3.1</b>	A <b>commonly encountered habitat</b> shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat’s range within the management area(s) covered by the governance body(s) relevant to the UoA.
<b>SA3.13.3.2</b>	A <b>Vulnerable Marine Ecosystem (VME)</b> shall be defined as is done in paragraph 42 subparagraphs (i)-(v) of the FAO Guidelines (definition provided in GSA3.13.3.2). This definition shall be applied both inside and outside EEZs and irrespective of depth.
<b>GSA3.13.3.2</b>	<b>VMEs</b> have one or more of the following characteristic, as defined in paragraph 42 of the FAO Guidelines: Uniqueness or rarity – an area or ecosystem that is unique or that contains rare species whose loss could not be compensated for by similar areas or ecosystems Functional significance of the habitat – discrete areas or habitats that are necessary for survival, function, spawning/ reproduction, or recovery of fish stocks; for particular life-history stages (e.g., nursery grounds, rearing areas); or for ETP species Fragility – an ecosystem that is highly susceptible to degradation by anthropogenic activities Life-history traits of component species that make recovery difficult – ecosystems that are characterised by populations or assemblages of species that are slow growing, are slow maturing, have low or unpredictable recruitment, and/or are long lived Structural complexity – an ecosystem that is characterised by complex physical structures created by significant concentrations of biotic and abiotic features
<b>N/a</b>	<b>Minor habitats</b> are those that do not meet the above definitions.

### 2.4.9.1 Managed area and spatial footprint of the fishery

Following the extension of the RNN (TAAF, 2017c and Figure 8) the managed areas to consider are the the two French EEZs around the archipelagos of Kerguelen and of Crozet in their entirety, an approximate marine surface area of 1 500 000 km<sup>2</sup>, including 650 000 km<sup>2</sup> where no fishing other than for scientific purposes is allowed<sup>11</sup>.

For Kerguelen, eight ecoregions are identified. The deep waters (500-2000m) region (B6 - Koubbi et al., 2016a), where the fishery takes place, makes about half of the EEZ extent in surface area. On the basis of bathymetry and fishing activity maps communicated by the CROSS-RU, the area where fishing may occur makes up less than 20% of the managed area. For Crozet, six potential ecoregions are defined,. The fishery takes place on the edges of the Crozet shelf (EC4) and Del Cano Rise (EC5 - Koubbi et al., 2016b). On the same basis, the two areas together where fishing may occur around Crozet make up less than 20% of the managed area.

Australian scientists have developed a methodology to estimate the footprint of the HIMI fisheries on the Australian side of the Kerguelen Plateau. For longlines, they have found that less than 0.1% of their EEZ between 400m and 2 000m depth was impacted, up to 0.6% between 1 600m and 1 800m (Welsford et al., 2014). There is no such information for the French fisheries, but the precise spatial impact is likely to be of the same order of magnitude for UoA1-Kerguelen, and UoA2-Crozet. The audit Team recommends (recommendation #5) that a footprint analysis is conducted for each UoA, in order

<sup>11</sup> <http://www.taaf.fr/Perimetre-et-statuts-de-protection>

to build an understanding of habitat impacts and to eliminate the need to extrapolate, e.g. from HIMI information.

#### 2.4.9.2 Commonly encountered habitats

The typologies of the marine ecosystem components into marine “ecoregions” published by Koubbi et al. (2016a and b) around Kerguelen and Crozet were used to justify the MPA (RNN) extension, and to inform its future management plan. The collaborative work (TAAF, Agence des Aires Marines Protégées - AAMP, UPMC, CNRS (Chizé) and MNHN) that took place has resulted in a typology based on three ecosystem components: i) marine benthic, ii) marine pelagic, and iii) seabirds and marine mammals. The work aims to identify biodiversity features and ‘hotspots’ to protect. It will lead to the publication of atlases for each of the components, and to an update of the existing top predator atlas (Delord et al., 2013).

When determining which benthic habitats are impacted by longline fishing activities from the UoAs, the team considered habitats on the basis of the substratum, geomorphology, and (characteristic) biota (SGB) characteristics (FCR GSA3.13.2). There are a lot more data for UoA1-Kerguelen than for UoA2-Crozet, but benthic habitats have been described as part of the ecoregionalisation exercise for each area mentioned above. Using the standardised SGB Habitats nomenclature, the habitats most commonly encountered in the fishery are ‘fine sediments, with a mix of solitary epifauna (ascidians, bryozoans), crinoids, corals and mixed large erect communities’ (table GSA6). For both UoAs, the mix is mostly solitary and colonial epifauna is considered in more detail in the next section under VMEs.

The impact of demersal longlines on fine sediment habitats have been described using a video camera on the longlines in in other MSC-certified fisheries. The HIMI fishery (SCS, 2017) and also the Falkland Islands fishery, which concluded that “the only apparent impact of the gear seen through video imaging are fine furrows caused by line weights moving during hauling, although some drifting of the line is also possible” (Acoura, 2018b). In addition, the fishing gear used by the UoAs are anchored weighted lines, and therefore for these fine sediment habitats, it is highly unlikely that the UoAs would be causing serious or irreversible harm. However, until now, there is no evidence directly collected for either UoA.

#### 2.4.9.3 Vulnerable Marine Ecosystems (VME)

CCAMLR (2009) has issued a VME classification guide, which is kept on board the vessels and used by the COPECs and RNN scientific observers to establish a fine description of habitats and VME indicators.

CCAMLR recommended VME elements be reported to the WG-EMM (CM 22-06: CCAMLR, 2009), and included a number of VME indicator taxa in 2010, which were initially used to characterise and map out the most sensitive benthic habitats.

Beside the analyses mentioned above, which underpinned the RNN extension and on-going work to develop its new management plan, a large amount of work has been done by the MNHN to collect and describe and analyse the VME elements caught in the POKER (UoA1-Kerguelen) and other trawl surveys (UoA2-Crozet) and those that are found attached to the longlines. The MNHN team developed a specific data acquisition protocol in 2015, based on the collection, weighing and photographing of samples of benthic macroinvertebrates with subsequent identification by taxonomic experts. The protocol was presented at the CCAMLR Ecosystem Monitoring WG (WG-EMM) in 2017. It aims to assist in producing presence and abundance data for benthic macro-invertebrates caught during fishing in order to provide additional information on the distribution of VMEs and assist in the development of MPAs by improving habitat mapping (see Martin et al., 2017).

Within the CCAMLR area, VMEs include seamounts, hydrothermal vents, cold water corals and sponge fields (CCAMLR, 2012). Of the 23 taxonomic groups defined by CCAMLR as VME indicators, 10 have been identified in Kerguelen so far (TAAF, 2016), 6 of which were also found on the Skiff Bank (ascidians, Bathylasmatidae-crustaceans, Euryalida-ophiuroids, Hyocrinidae-crinoids, Gorgonacea and Hexactinellidae-sponges). In Crozet, 4 taxonomic groups have been found so far as VME indicators: Cnidaria, Bryozoa, Alcyonacea and Euryalida-ophiuroids, all suspension feeders dependent on nutrients and organic matter of planktonic origin. Apart from the ophiurids (brittle stars) the others are attached and colonial organisms (TAAF, 2016).

#### 2.4.9.4 Management measures to minimise the UoAs impacts on benthic habitats and VMEs

The fishery's impacts on habitats are minimised through two main management measures to control its spatial footprint: i) the permanent or temporary closure of specific areas and ii) a mandatory 2nm 'move-on' rule if the line brings up more 10kg VME/1 000 hooks (TAAF, 2017b), as well as related measures, for example that prohibit disposal of plastic and other non-organic waste.

Reporting is mandatory; the COPEC collect VME elements systematically for further examination by the MNHN. The vessels all carry VMS and the longlines have GPS beacons, therefore the VME information collected is georeferenced. The information collected is analysed and has already been used to justify the recent closure of most of the Skiff Bank to longline fishing as part of the RNN extension. The Skiff Bank to the west of Kerguelen, has been identified as a high biodiversity and VME hotspot, and is now mostly closed to fishing (TAAF, 2016a).

Most of the RNN 'reinforced protection' no-fishing extension concerns grounds that were not used by the fishery or that were already excluded by the current management regime, such as waters shallower than 500m. On the Kerguelen Plateau, some zones were also chosen to join up with existing protected areas of the Australian Marine Reserve system of Heard and McDonald Islands that were also based on bioregionalisation, with the explicit goal of protecting a comprehensive, adequate and representative collection of the existing Australian marine biota (SCS, 2017).

#### **2.4.10 Ecosystem impacts**

The Kerguelen and Crozet ecosystems are located along the Antarctic Convergence Zone, where the cold waters of the Southern Ocean meet the warmer waters of the Indian Ocean. The Antarctic Circumpolar Current (ACC) is the planet's largest current; its strong eastward flow is broken up into a number of circumpolar zones delimited by strong frontal systems which are characterised by increased biological productivity and biomass at all trophic levels of the pelagic ecosystem. The two main fronts, the Sub-Antarctic and the Polar fronts move seasonally: northwards in the southern hemisphere winter and southwards in the southern hemisphere summer; the archipelagos of Kerguelen and of Crozet (more to the North) are both situated within this dynamic frontal zone (MEP 2013, MEC 2016).

From its onset, the CCAMLR has followed an ecosystem approach to fisheries management (Art.II,3 CCAMLR, 1980) and used a precautionary approach from the late 1980s. The Scientific Committee established the CCAMLR Ecosystem Monitoring Programme to detect possible effects of krill (a keystone species) fishing on the performance of top-level predators, such as albatrosses, penguins, petrels and fur seals (Kock et al, 2007). All CCAMLR parties contribute to ecosystem research and information, and the results from strong national and international collaborations have been presented for both Kerguelen and Crozet archipelagos at two Symposium on Kerguelen Plateau Marine Ecosystems and Fisheries in 2010 (Duhamel and Welsford eds. 2011) and 2017 (forthcoming).

Both ecosystems have their specificities, but most species of seabirds, marine mammals and fish occur both at Kerguelen and Crozet. However, more than 1 000km, deep trenches and seamounts separate

the two archipelagos, and some species caught in the fishery occur in only one of the UoAs, such as the Kerguelen sandpaper skate (*Bathyraja irrasa*) in Kerguelen, and the whiteleg skate (*Amblyraja taaf*) in Crozet (see Table 13 and Table 14).

The eco-regionalisation work mentioned above (Koubbi et al., 2016a and b) was achieved through multi-disciplinary research and workshops that reviewed and combined pelagic and benthic ecoregions, in particular:

- Habitat characteristics (bathymetry, oceanography, primary production, biogeochemical parameters, ...),
- Types of species assemblages with consideration of endemism and conservation status, and
- Functionality (essential habitats such as spawning grounds, nursery grounds or foraging habitats, areas of high primary and secondary production or, structuring of the habitat by benthic species,...).

This large amount of multi-disciplinary international collaborative research on the fishery's ecosystems has also developed in numerous directions, for example incorporating remote sensing, and the tracking of birds and marine mammal predators to identify ecological 'hotspots' around the Crozet and Kerguelen archipelagos (O'Toole et al., 2017). The CROMEBA (Crozet Marine Ecosystem Based Management) project which ran from 2014-2017 (Overseas Ministry and RNN funding) and carried out by the UMR BOREA 7208 (MNHN-UPMC) aimed to remedy the relative lack of synthetic data for the Crozet archipelago (RNN, 2016).

Most of the ecosystem research has been directly used to extend the RNN marine perimeter and evaluate the importance of the existing protection. The researchers met to share results and on-going projects at the second international scientific symposium on the Kerguelen Plateau, which took place in Tasmania (Hobart) in November 2017. The Symposium public report is expected to be published later in 2018.

The fishery has been at the centre of these ecosystem research initiatives, providing questions but also a large quantity of information through on-board scientific observation, and providing financial and in-kind (research vessel) support for the POKER research cruises and a scholarship scheme by the SARPC companies foundation (Fondation d'entreprises des mers australes) to support young scientists.

## 2.5 Principle Three: Management System

The institutions involved in the management system have not changed since the fishery’s certification as described in the PCR for Kerguelen (MEP, 2013) and Crozet (MEC, 2016) and briefly below. The management system is common to both Kerguelen and Crozet UoAs.

The TAAF is a French administrative autonomous territory, grouping islands and Antarctic territories with no permanent civilian population. The administrative services are based in La Réunion and headed by a senior administrator or Préfet. The Préfet annually sets the Total Allowable Catch (TAC) and other fisheries management measures, from recommendations issued by its Nature Conservation and Fisheries teams (DCPN: Direction de la conservation du patrimoine naturel - Direction de la Réserve naturelle nationale; DPQM: Direction des pêches et des questions maritimes), taking account of the scientific advice of MNHN, the advice of CCAMLR as well as those of the ministries of the French government responsible for Fisheries. The ministries were re-organised after the last presidential elections and their names changed (Environment, Fisheries, Overseas territories, and Foreign affairs) but the Ministerial Directorates in charge have remained (see MEP, 2013 and Table 20).

The MNHN based in Paris provides scientific advice to the TAAF for the fisheries in both Kerguelen and Crozet. The on-board “contrôleur de pêche” (COPEC) has a dual role to enforce the TAAF regulations and to collect scientific data.

The Commission on the Conservation of Antarctic Marine Living Resources (CCAMLR) is the regional fisheries management organisation (RFMO) for the Southern Ocean, including Kerguelen (58.5.1 French EEZ) and Crozet (Subarea 58.6 French EEZ). The CCAMLR Scientific Committee Working Groups (WG-SAM for statistics and assessment methods, WG- FSA for fish stock assessment, WG-EMM for ecosystem monitoring and WG-IMAF for incidental mortality associated with fisheries) examine the data and validate models for the fishery.

The Centre régional opérationnel de surveillance et de sauvetage en mer – La Réunion (CROSS-RU - part of the DMSOI de la Réunion et des îles Eparses) is the organisation responsible for Monitoring Control and Surveillance (MCS). CROSS-RU has the use of a dedicated satellite surveillance system including radar (all vessels are equipped with a tamper-proof VMS system), and the use of French navy frigate patrol days as well as a dedicated surveillance vessel, the Osiris. The CROSS-RU organises fisheries surveillance patrols, shares intelligence with South Africa (Prince Edward and Marion Islands ZEE west of Crozet, Australia (for the Heard Island toothfish fishery on the Kerguelen Plateau) and New Zealand, and cooperates on Port State measures at regional level.

The TAAF has its own vessel register under which all vessels in the UoCs are registered. As a result all fishing vessels have to land their catch in La Réunion (Le Port) to be inspected by CEMR, an accredited marine experts Company separate from the TAAF. The products all frozen on board and stored in containers sealed by the COPEC prior to coming into port, and all sealed containers are systematically inspected by customs/ clearing agents upon landing.

**Table 20. Institutions involved in the management of the SARPC toothfish fishery**

Name	Department	Role / Responsibilities
CCAMLR	SC - Scientific Committee	Provides annual oversight for the French fisheries, but no direct management advice
	SCIC - Standing Committee on Implementation and Compliance	Review of compliance and implementation-related measures and policies, including Dissostichus sp. catch Documentation Scheme (CDS)

Name	Department	Role / Responsibilities
	WG-FSA - fish stock assessment)	Reviews stock assessment models and their bases for TACs, makes recommendation for future development
	WG-SAM - Statistics and methods	Reviews data analysis and stock assessment methods
	WG-EMM	Recommends VME data collection protocols, indicators and protection
	WG-IMAF - incidental mortality associated with fisheries	Proposes and evaluates methods from reducing bird mortality, reviews mortality figures.
Ministère de l'Agriculture et de l'Alimentation - MAA	DPMA - Direction des Pêches Maritimes et de l'Aquaculture	All ministries are consultees on the fishery, sit on the Consultative Committee and the Austral Fisheries WG – GTPA;
Ministère de la Transition écologique et solidaire - MTES	DMSOI - Direction de la Mer - Sud de l'Océan Indien	Also oversees CROSS-RU for MCS and consultee for fishery management;
Ministère des Outre-Mer – MOM	DGOM – Direction Générale des Outremer	Consultee for fishery management measures including the TAC;
Ministère de l'Europe et des Affaires Etrangères – MEAE	Foreign Affairs	Also represents France at CCAMLR.
CROSS-RU Regional Maritime Surveillance and Rescue Centre	Operational Control of French Navy, Fisheries patrols	In charge of fisheries MCS for Kerguelen and Crozet, regional collaborations with Australia, South Africa and New Zealand
MNHN	Biodiversity research, stock assessment, scientific advice to TAAF, maintains PECHEKER database	Provides scientific advice to TAAF; trains COPEC to collect fisheries and fisheries impacts data, undertakes stock assessment and other research.
CEBC-CNRS, Chizé	French Research Centre specialised in Ecology and Population Biology	Dedicated research programmes on marine mammals and seabirds in the TAAF
TAAF - Territorial Administration for Kerguelen and Crozet	TAAF-DPQM - Direction des Pêches et des Questions Maritimes	Manages fishery: set level of TAC and regulations; monitoring and surveillance, including COPEC observers
	TAAF-DCPN - Direction de la Conservation du Patrimoine Naturel	In charge of Nature conservation and management of nature reserves; also undertakes collaborative research projects with MNHN, CNRS and Universities
SARPC Client Group	Producers union for the toothfish fishery, includes 7 licenced vessels	Represents the interests of the fishery in any instances (including TAAF and at CCAMLR). Provides funding for management and research projects including stock assessments

### 2.5.1 Jurisdictions

The three jurisdictional levels involved in the fisheries regulation and management are 1) International: CCAMLR, 2) National: France, 3) Local: TAAF.

CCAMLR is the Regional Fisheries Management Organisation (RFMO), which oversees the collaborative ecosystem management and sustainable use of renewable resources inside the Antarctic Treaty perimeter, inside the Antarctic Convergence current around the South Pole. Toothfish are not highly migratory species (HMS), but their stocks straddle beyond EEZ boundaries on the High Seas.

The toothfish stock around the French Kerguelen islands (UoA1) was originally thought to be shared across the Kerguelen Plateau with that around the Australian Heard Islands and McDonald Islands (HIMI) (MEC, 2013). Past and on-going tagging studies have shown that the degree of fish movement between the two fisheries is very small, as a result, the stocks are not considered to be shared.

The SARPC regroups all commercial vessel owners-operators in the fishery. It contributes to a number of international initiatives, scientific analyses and provides a strong support in the fight against IUU. Fiscal Revenue from the fishery is also a major source of financing for the TAAF (38% in 2017, TAAF 2018a), but there are no fisheries co-management arrangements in place.

The need for transparency demanded by the MSC certification process and annual surveillance audits has most likely contributed to make some of the processes and the roles of key stakeholders more visible, and contributed strengthen their capacity.

### 2.5.2 Legal basis and management system

The fishery is managed through a system of regulations updated annually, which complement the Fishery Management Plan (FMP) by setting the annual TACs for each of the two UoAs, and allocating vessel quotas (initial, leftover during the season and any swaps as a result of vessel engine failure of other).

The TAAF toothfish FMP developed as part of the fishery's MSC certification efforts and published in 2015 for three years, is currently being reviewed. The review process was initiated at the end of 2017 with a finalized 5-year FMP scheduled to be published in August 2018, on time for the 2018/19 season. The FMP drafting process will involve a large number of stakeholders. At this time, five Working Groups (socio-economics, environment, regulation, TAC changes, and catches and scientific monitoring) are planned, who will also provide some external review of existing arrangements (TAAF, 2018). It will formalise the TAAF Environment Division (TAAF-DCPN) programme to monitor and keep the fishery's impacts low, and to protect the populations of marine mammals, seabirds and bycatch fish species including sharks and rays. For the latter, the TAAF-DCPN is also planning more collaborative work to update the IUCN Red List of species to be protected through the RNN (TAAF-DCPN pers.com.).

Of note during 2016 was the amendment to the FMP to allow for a maximum of seven vessels 'active at any one time in a given fishing area' - UoA1 or UoA2 - as opposed to the previous absolute maximum of seven vessels in the fishery; TAAF Arrêté n° 2016-60<sup>12</sup>) and quota (80t in UoA1 and 20t in UoA2) awarded to an additional non-SARPC vessel authorized during the 2016/17 season (TAAF Arrêté n° 2016-97 cf. previous Kerguelen surveillance report, MEC (2017). Although the vessel concerned did not renew its license for the 2017/18 season, two of the French ministries who oversee the fishery (Fisheries, Overseas Territories) mandated a joint independent expert mission to evaluate the current fishery's management system and examine the possibility of an additional vessel in the future. The

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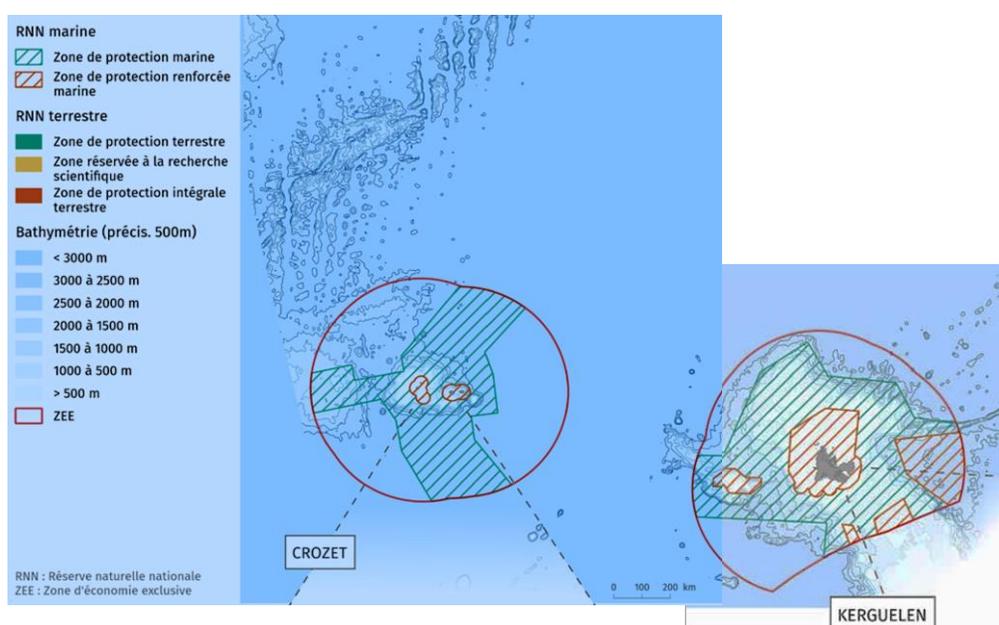
<sup>12</sup> All TAAF regulations are published in the official Journal <http://www.taaf.fr/Journal-officiel-des-TAAF>

mission travelled to La Réunion and interviewed all parties and was due to report in 2018. The report is unlikely to be public, but its recommendations are expected to be incorporated into the new FMP.

Until the new FMP is finalised, the TAAF Préfecture has extended the validity of the current FMP by a year from 1<sup>st</sup> Septembre 2018 to 31<sup>st</sup> August 2019.

The management plan for the extended National Natural Reserve (RNN in French), is also relevant to the fishery. It provides emphasis on biodiversity and habitats conservation and considers, among others, the influence and mitigation of the effects of climate change.

The TAAF RNN was created in 2006. The process to extend the Réserve Nationale Naturelle des TAAF (RNN) initiated in 2015 culminated in December 2016<sup>13</sup>, with the extension of the RNN, and in March 2017, with the declaration of the RNN protection perimeter to cover the remaining areas of the EEZs around Kerguelen and Crozet (and the Islands of St Paul and Amsterdam). The TAAF RNN protection perimeter now cover a surface of 1 662 766 km<sup>2</sup> or about 15% of all marine waters under French jurisdiction worldwide (TAAF, 2018a). The environmental regulation provisions of the RNN management plan (MP) will now apply to the entire TAAF EEZs and therefore to the fishery.



**Figure 8. RNN marine protected areas around Kerguelen and Crozet (from TAAF, 2017). Red striped polygons are closed to fishing, green striped are where regulated fishing activities may take place, and remaining areas of the EEZs make up the RNN protection perimeter.**

### 2.5.3 Objectives

Long-term objectives are defined at each management level by CCAMLR (regional), the French legislation and the TAAF Fisheries Management Plan (FMP) and TAAF RNN Management Plan (MP), which also define short-term objectives.

#### 2.5.3.1 Long-term objectives

Long-term objectives for ‘harvesting of marine resources and associated activities’ in the Convention area are defined in detail in the CCAMLR Convention (1980, art. II):

<sup>13</sup> Décret no 2016-1700 du 12 décembre 2016 portant extension et modification de la réglementation de la réserve naturelle nationale des Terres australes françaises

- a) Prevention of decrease in the size of any harvested population to levels below those which ensure its stable recruitment. For this purpose its size should not be allowed to fall below a level close to that which ensures the greatest net annual increment;
- b) maintenance of the ecological relationships between harvested, dependent and related populations of Antarctic marine living resources and the restoration of depleted populations to the levels defined in sub-paragraph (a) above; and
- c) prevention of changes or minimisation of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades, taking into account the state of available knowledge of the direct and indirect impact of harvesting, the effect of the introduction of alien species, the effects of associated activities on the marine ecosystem and of the effects of environmental changes, with the aim of making possible the sustained conservation of Antarctic marine living resources.

France is a signatory to CCAMLR's key long-term conservation objectives; including the precautionary reference points (implementation of paragraph a), and the ecosystem approach to fisheries management and the bird mortality action plan (implementation of paragraphs b and c), as set out in the rationales for Principle 2.

The EU Marine Strategy Framework Directive has been transposed into the French Environment Code (articles L. 219-9 à L. 219-18 et R. 219-2 à R. 219-17) and set out two priorities, an integrated management of the sea and coastal areas, and the protection and conservation of marine environment. France published its national integrated maritime policy at the end of 2009, the Blue Book - A national strategy for the sea and oceans (France, 2009). The French strategy is built around four priorities, i) Invest in the future – research, education, awareness; ii) Develop a sustainable economy of the sea (sustainable resource use, fisheries, shipbuilding, shipping, ports, marine recreation); iii) Promote the maritime dimension of the overseas territories – local authorities and stakeholders, assets and responsibilities, marine resources and economic development; and iv) Assert France's place on the international scene (international governance, contribution to EU integrated maritime policy, responsibilities, defence and security. The Strategy applies to all French overseas territories including (explicitly) the TAAF (also art. L219-2 of the Code de l'Environnement). Therefore, overarching objectives of the European directive apply, even though the TAAF are not part of the EU but only associated as an overseas territory.

A key objective with regards to the TAAF territories is to maintain French sovereignty. In this context, France recognises the need to be seen as a responsible custodian of the area. France regards itself as the guarantor to the international community of the preservation of the sub-Antarctic ecosystems in the TAAF area. In this context, France has worked to establish its largest national protected area, and the objectives for its management are well-defined (see below TAAF, 2016), a well-managed fishery in the Kerguelen and Crozet EEZ and to eliminate IUU fishing.

The objective for the management of fisheries in the TAAF zone is set out in the Fisheries Policy set out in the Code rural et de la pêche maritime, which directly applies to the TAAF since 1<sup>st</sup> January 2015 (Article L911-2: France, 2018). In agreement with the principles and rules of the European Common Fisheries Policy and international agreements, its first objective is (own translation): to allow a sustainable exploitation and value addition to the collective patrimony that are fisheries resources available to France (...) in respect of international agreements or on the High Seas, framed by an ecosystem approach to keep to a minimum any negative impacts on the environment.

#### 2.5.4 Management plans

Two management plans are relevant to the fishery, the Fishery's management Plan (FMP) and the TAAF RNN management plan (MP), which are both being revised. The new FMP is planned to span 5 years, like the existing and new RNN MP, which should both take effect in 2019.

##### 2.5.4.1 TAAF FMP

The existing TAAF (2015) FMP has a number of long-term objectives, to exploit fisheries resources sustainably, minimise ecosystem impacts including on habitats and trophic webs, within the confine of conservation measures set by CCAMLR and other international obligations (CBI, ACAP,...). The FMP also recognises and encourages the fishery's contribution to the local (La Réunion) and French economies through its vessel quota attribution criteria. Each year, the FMP is supplemented by Technical prescriptions that specify, among other measures, the fishing areas and fishing season dates (TAAF, 2017a).

Specific management measures are discussed under sections for Principle One and Principle Two.

The FMP also defines the close collaboration between TAAF (DCPN and DPQM) with the team at MNHN (UMR7208, BOREA) for its expertise on the production and its monitoring of exploited species and impacts on benthos; and the team from Centre National de Recherche Scientifique, Centre d'Etudes Biologique de Chizé (CNRS-CEBC) who research the fishery's impacts on seabirds and marine mammals.

##### 2.5.4.2 TAAF RNN MP

The objectives for the RNN extension were as follows (TAAF, 2016):

- To maintain ecosystem functionalities of the TAAF trophic webs, in addition to activities in support of the existing RNN;
- To preserve the richness of marine natural heritage, in terms of habitat diversity, marine species abundance with a special focus for emblematic endemic or regional species;
- To set up a framework and means to increase knowledge of sub-Antarctic ecosystems and ensure that these challenges are taken into account in management planning;
- To recognize the contribution that a large marine protected area brings to the global health of the oceans and to the regulation of the global carbon cycle.

The RNN MP has a number of operational objectives, which are summarised in (TAAF, 2017).

#### 2.5.5 Stakeholders and consultation processes

In the wake of the FMP drafting process, the fishery and marine environment managers (TAAF Directorates - DCPN and DPQM) have put in place new mechanisms of cooperation, which have addressed all previous conditions and recommendations regarding Principle 3 (see MEC, 2018).

The Groupe de Travail de la pêche australe (GTPA), which sat in January 2018, has seen its membership widened to include the fishing companies. It brings these key stakeholders together with fishery managers (ministerial levels and TAAF) and scientists to discuss research surveys, research findings and a wide range of topics, including the work plan to devise the new FMP by the end of 2018 (TAAF, 2018b). The GTPA meets at least once a year and is presently scheduled to meet more often to steer the revision of the Management Plan. The minutes have been communicated to the assessors in order to demonstrate the transparency and collaborative process of the new FMP drafting process.

The good practice consultative committee (Comité des bonnes pratiques de la pêche palangrière or - C3P), organised by TAAF to brief the vessel captains at the end of each season, published its minutes for the first time in 2017 (TAAF, 2017b).

Following the extension of the RNN, membership of its management consultative committee, has been extended to fishing company representatives and environmental NGOs (see TAAF, 2018a). The process also prompted a number of new projects bringing together a wide range of existing and new scientific partnerships (TAAF, 2016), including through the UMR BOREA<sup>14</sup> and for the top predators, the Chizé Centre for Biological Studies<sup>15</sup>.

Finally, the fishing companies are organised as a group within the Syndicat des Armements Réunionnais de Palangriers-Congélateurs (SARPC), which this year has signed a document pledging to support their collective MSC certification of Patagonian toothfish. The SARPC recruited a full-time representative in October 2017. Amongst many other tasks, she is in charge of supporting this fishery's MSC certification, collating and presenting the scientific and technical information from the SARPC members companies and vessels and is the contact point for all information requests to the TAAF and other administrations. The resulting improved access to information has been key to lifting most of the certification conditions during the 4<sup>th</sup> surveillance audit (MEC, 2018).

The SARPC is a founding member of COLTO, the Coalition of Legal Toothfish Operators (COLTO), which initiated a series of Industry-Science workshops and set up a Working Group on Science Collaboration<sup>16</sup>. The WG discusses challenges and shares best practice between deep water longline fisheries (including Alaska sablefish), and “to agree on up to 6 science programs that could work collaboratively with science and industry”. COLTO members support a variety of scientific projects collaborating with longline fishing companies, on the collection of oceanographic data such as through the MEOP (Marine Mammals Exploring the Oceans Pole to Pole) or SOOS (Southern Ocean Observing System) projects. SARPC members have also set up charitable trust, the ‘Fondation d’Entreprises des Mers Australes’<sup>17</sup> in 2013 to support scientific research and conferences.

### 2.5.6 Disputes and resolution mechanisms

The French system of administrative law incorporates a comprehensive range of appeal and recourse processes that are routinely used in fisheries management and have proven to be effective. The management of fisheries by TAAF which is a separate (and small) administrative constituency of uninhabited territories is different from that of fisheries of similar sizes in France. The local fisheries committee (CRPMEM - French local co-management institution) or a local producer organisation (empowered by the CFP to manage fisheries quota) are not involved in this fishery's management, and therefore do not intervene to facilitate close collaboration and prevent disputes from escalating. Disputes regarding TAAF administrative decisions may be taken to an Administrative court. This was tested in the season 2015/16 when several companies from SARPC and the COPECMA (a company representing another potential candidate vessel) contested the TAAF-DPQM decisions regarding the conditions for a new vessel entering the fishery, which went against some of the FMP provisions. In September 2017, two of the French ministries (Agriculture and Alimentation, Overseas territories) that oversee the fishery mandated a joint independent expert mission to evaluate the current vessel quota attribution system and rules for potential new entrants. The expert mission recommendations are expected to be included in the new FMP expected to take effect in 2019.

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<sup>14</sup> Research Unit Biology of Aquatic Organisms and Ecosystems, <http://borea.mnhn.fr/en>

<sup>15</sup> [http://www.cebc.cnrs.fr/GB\\_index.htm](http://www.cebc.cnrs.fr/GB_index.htm)

<sup>16</sup> <https://www.colto.org/toothfish-collaboration/norway-workshop/toothfish-science/>

<sup>17</sup> <http://www.fondation-mers-australes.re/#>

### 2.5.7 Fisheries surveillance and enforcement

MCS (Monitoring Control and Surveillance) activities for the fishery are organised in several levels, which reflect the institutional organisation of the fisheries management system.

On a day to day basis, the French national and TAAF-specific systems work alongside each other. The competent authority at national level with regards to fishing vessels MCS is the CROSS-RU. Based in La Réunion (RU), the CROSS (Centre Régional Opérationnel de Surveillance et de Sauvetage en mer) is also responsible for at sea search and rescue, surveillance for all maritime traffic and marine pollution across all French EEZ in the Southern Indian Ocean. The CROSS-RU is under the authority of the French Ministry of the Environment (MTES), Directorate for the Southern Indian Ocean (DMSOI). The DMSOI reports annually to the CCAMLR SCIC (Standing Committee on Implementation and Compliance), on the dates, numbers and types of inspections, controlling agents involved (gendarmerie maritime, gendarmerie, CROSS) and the items controlled for each vessel. Port inspections are undertaken as per the provisions of CCAMLR CM 10-03 (2015) (Port inspections of fishing vessels carrying Antarctic marine living resources).

The CROSS-RU, visited during the site visit, monitors vessels and any potential IUU activities (VMS, satellite-radars) in the French EEZ and the region generally. D. Person (CROSS-RU Director) confirmed that the risk of IUU activities remains high, with some sightings of potential illegal vessels every now and then just outside the 200 nm limits. Intelligence is shared at regional level with South Africa and Australia, and the vessels in the fishery provide active support by reporting or checking (from a distance) any suspicious activities. A recent CCAMLR surveillance collaboration with the French reported no IUU activities in CCAMLR zone 58, including International Waters, although some IUU fishing gear was recovered (CCAMLR, 2016).

The CROSS-RU checks the vessels' compliance with national and CCAMLR IUU and Port State Measures such as prior notification to land, catch certificates and CM10-03 annexes completed by the vessel Master. Port inspections are usually carried out by personnel from the gendarmerie maritime (Verdon patrol vessel and BSL-Brigade de surveillance littorale) and gendarmerie (BNC-Brigade nautique côtière) with support from CROSS-RU as needed. The CROSS-RU reports no incidence of non-compliance by the vessels in the fishery and stresses that compliance continues to be good in the fishery. Vessels are controlled at sea on average three times per year.

The vessels are systematically controlled by the authorities, while landing, and for the landed products by an independent certifier who checks quantities at all stages of the unloading process from the sealed freezer holds on board to the freezer warehouse. Products are also checked for species, sizes and fishing area. The information is later cross-checked with the e-logbooks estimated quantities and converted to equivalent live weight for the final landings statistics by the TAAF.

In addition, the TAAF administration has a system of on-board observers (COPECs) with a duty to control compliance with TAAF regulations, as previously described. The TAAF regulations are precise, and the COPEC control system reports the smallest deviation from the requirements, so apparent cases of non-compliance reported by the COPECs have to be considered in context.

The infractions noted are summarised and discussed annually by the DCPN and DPQM at the C3P meeting. The latest report, from the August 2017 meeting (TAAF-DPQM document TAAF/DPQM-17-84, 20 October 2017, 7p.) notes minor contraventions during the 2016-17 season. Depending on the facts, the vessel responsible will lose some of its toothfish quota allocation in the following year, although the precise basis of calculation remains undisclosed. The TAAF published some explanations for the first time in 2017, which show that environmental performance determines 35% (12.25% linked to seabird mortality, 17.5% to catches of rays and 5.25% to loss of lines) of the 75% discretionary vessel quota allocation. Whatever the final penalty figures, they can be extremely costly and provide

huge deterrence to the extent that all vessels are determined to ensure compliance, although difficulties are presented to the TAAF at the C3P meeting.

No regulatory impact assessments is conducted, therefore fishing operations constraints do not always seem to be clearly understood by the Administration. The SARPC has asked to be closely associated with the TAAF fisheries management system repeatedly, but the system is still very far from the Australian cooperative form of management.

### **2.5.8 Evaluation and review of the management system**

The first Fisheries Management Plan (FMP) for the fishery was put together three years ago (TAAF, 2015), and is presently being reviewed. Several processes have been working in succession, starting with the cross-ministerial Task Force that was mobilised to address the possibility of an additional vessel in the fishery attempted in 2016 and the mechanism by which vessel quotas were adjusted from year to year (section 2.5.4.1 above). There are no evaluation reports published to date, by the external Task Force or internal reviews, but the GTPA is kept informed and asked to provide regular input to the review process.

Implementation of the TAAF RNN 5-year MP is monitored regularly and the results are published in the RNN annual activity report (see TAAF, 2018a). The same process is expected for the forthcoming MP for the extended RNN.

### 3 Evaluation Procedure

#### 3.1 Harmonised Fishery Assessment

There are presently four other Patagonian toothfish fisheries that are MSC-certified (Table 21). Initially, the Kerguelen-UoA1 fishery was harmonised with the Australian Heard Island and MacDonald Island (HIMI) toothfish fishery, which also takes place on the Kerguelen Plateau. On the basis of new research evidence, it was concluded that the HIMI and Kerguelen stocks could be considered as separate management units during a final harmonisation between MEC and SCS conference call on the 11<sup>th</sup> November 2016.

The audit team also took account of the harmonisation considerations presented in the Australian HIMI certified fishery PCR (SCS, 2017) for the re-scoring of the P1 and P3 Performance Indicators upon closing conditions for this fishery during the 4<sup>th</sup> surveillance audit (MEC, 2018).

There is no need for harmonisation of Principle 1 and Principle 2 outcomes because of the separation between the units of assessments (stocks and areas fished). Regarding Principle 3, the scores awarded for fisheries inside the CCAMLR Convention area and the conclusions of the assessments are similar.

No further harmonisation is required at this stage.

**Table 21. Other MSC-certified Patagonian toothfish (*D. eleginoides*) fisheries (fisheries.msc.org)**

Fishery	Gear types	Locations
<u>Falkland Island toothfish</u>	Hooks And Lines - Set longlines	Southwest Atlantic (FAO Area 41)
<u>South Georgia Patagonian toothfish longline</u>	Hooks And Lines - Set longlines	Antarctic & Atlantic (FAO Area 48)
<u>Australian Heard Island and McDonald Islands Toothfish &amp; Icefish fisheries</u>	Hooks And Lines - Set longlines - Bottom Trawls	Antarctic & Southern Indian Ocean (FAO Area 58)
<u>Macquarie Island (MI) toothfish</u>	Hooks And Lines - Set longlines - Bottom Trawls	Southwest Pacific (FAO Area 81)

#### 3.2 Previous certification assessments

##### 3.2.1 UoA1 - Kerguelen

The Kerguelen component of the fishery was certified by MEP on the 3<sup>rd</sup> September 2013, using MSC Fishery Assessment Methodology (FAM) version 2.0 (2009) for scoring. The aggregate scores for the three Principles are given Table 22.

**Table 22. Principle-level scores for the SARPC Patagonian toothfish fishery UoA1-Kerguelen (MEC, 2013)**

Principle	Initial aggregate scores	Scores after 4 <sup>th</sup> surveillance audit
Principle 1	80	82.5
Principle 2	81	84.0
Principle 3	85	85.4

The UoA1-Kerguelen fishery certification was awarded with 4 conditions that were all lifted during the 4<sup>th</sup> annual surveillance audit. The are summarised in Table 23. The revised scores for each Principle are indicated in Table 22.

**Table 23. Summary of previous assessment conditions on the previous assessment for UoA1-Kerguelen**

<b>Condition 1: Sustainable stock assessment process.</b>	<b>PI</b>
By the end of the five-year certification period, the fishery must have in place a sustainable stock assessment process which i) evaluates the fishery with reasonable regularity; ii) is used to inform decisions about the level of the TAC by TAAF and other stakeholders and iii) is presented for regular review by CCAMLR WG-FSA.	1.2.4 a
<b>Justification - Closed Year 4</b>	<b>PI</b>
The models used to provide scientific advice are now the same as those used in the Australian HIMI toothfish fishery. The model results are used to inform annual catch limits set by France that comply with the CCAMLR decision rules. The WG-FSA documents are publicly available from the CCAMLR website, within 6 months of the annual meeting.	1.2.4 a
<b>Condition 2: Systematic monitoring of grenadiers, rays and bycatch Code of conduct.</b>	<b>PI</b>
A monitoring system needs to be put in place for grenadiers and rays, appropriate to the scale of the fishery, which will provide indication of possible risks to the stock. The assessment team needs to see evidence of the systematic implementation of the Code of conduct. A process of review and revision of the Code of conduct in the light of trends in the fishery is required. The fishery should provide data on catch of rays and grenadiers at each annual audit.	2.1.1 a and c 2.1.2 a and c 2.1.3 b and d
<b>Justification - Closed Year 4</b>	<b>PI</b>
Monitoring system for bycatch is fully functional for grenadiers, rays and any other fish species, checked by observers (COPEC) on board each vessel. Code of conduct for rays/skate supplemented with CCAMLR picture identification of wounds signs and health state of rays to guide cut off decisions. Catch figures show a decrease of the two main species of ray caught by the fishery over the past three seasons. From season 2014/15, the cut off and move on rules are mandatory. The Code of conduct was found to be valid and its application is strictly monitored and enforced. Minutes of the reports to the C3P are now public (TAAF, 2017). Catches of main retained species have remained stable. For rays in this fishery, Nowara et al. (2017) found that biomass and numbers estimated for the two species through the Poker surveys are stable. In 2017 management measures have been further strengthened by additional spatial closures and increased scientific observations for the reserve (RNN) marine extension.	2.1.1 a and c 2.1.2 a and c 2.1.3 b and d
<b>Condition 3: Targets and best practice for grey petrels.</b>	<b>PI</b>
Declines in bird mortality need to continue until all vessels are performing at the best possible level. There should be an improvement (decline) in bird mortality each year of certification, with a target at the end of Year 4 of certification of not more than 25 birds for each vessel, and/or an overall average of 20 birds/vessel at Kerguelen (all species combined). (Note: it is not possible to set quantitative targets for grey petrels specifically because the bycatch numbers are too small to make this realistic – this is explained in detail in the response to stakeholder comments, PCR Annex 6.) In addition, a monitoring system is required to identify the level of risk posed by the fishery to the Kerguelen grey petrel population, including specific bycatch targets for grey petrels. Figures for estimated bird bycatch by species and by vessel should be provided at each annual audit.	2.3.1 b

<b>Condition 3: Targets and best practice for grey petrels.</b>	<b>PI</b>
<b>Justification - Closed Year 4</b>	<b>PI</b>
<p>Transparency and discussions of individual vessel targets are taking place, and the C3P minutes are now published. In addition, A fishing company has undertaken a detailed study of risk factors for its vessels over the last four years in order to identify specific risk factors, with the aim to devise a best practice guide from the point of view of the vessels' captain and crew, to be published shortly (the audit team was communicated a draft).</p> <p>Monitoring is very detailed and confirms that all possible actions are taken, evaluated and discussed by TAAF-DCPN with the vessels at least once per year. Monitoring of the bird populations themselves has been further reinforced to inform the extension of the marine part of the RNN.</p> <p>No quantitative targets were set but the drastic reduction in numbers of birds impacted by the fishery is maintained.</p>	2.3.1 b

<b>Condition 4: Fishery management plan.</b>	<b>PI</b>
<p>Produce a management plan for this fishery, focusing on the management of the toothfish resource (i.e. Principle 1). The plan should set out for the short- term (~5-10 years), i) the objective of management; ii) how that objective will be achieved; i.e. the harvest control rules which control how decisions on the TAC will be taken, iii) what information will be used and how it will be used and iv) how the management plan will be evaluated, reviewed and revised on an on going basis. The management plan should be available to stakeholders on a transparent basis.</p>	1.2.2 3.2.1 3.2.2
<b>Justification - Closed Year 4</b>	<b>PI</b>
<p>The C3P has now published minutes, which are widely circulated (TAAF, 2017). The Groupe de Travail de la pêche australe (GTPA) brings managers (ministerial levels and TAAF), scientists and vessels owners together at least once a year, to discuss research findings and a wide range of topics, including the work plan to devise the new Fishery's Management Plan (FMP) during 2018 (TAAF, 2018). It is scheduled to meet more often to steer the revision of the Management Plan. The minutes have been communicated to the assessors in order to demonstrate the transparency of the new FMP process.</p> <p>The allocation criteria for vessel quotas will be examined as part of this exercise.</p> <p>Time will tell if collaborative processes remain in place as part of the new FMP, but in Year 4, necessary actions have been taken to fulfil the condition.</p>	1.2.2 3.2.1 3.2.2

### 3.2.2 UoA2 - Crozet

The Crozet component of the fishery was certified by MEC on the 16<sup>th</sup> December 2016 through an expedited assessment as an extension of scope of the certified SARPC toothfish Kerguelen fishery, using the same FAM version 2.0 (31<sup>st</sup> July 2009) for scoring. The assessment procedure followed the MSC Fisheries Certification Requirements (FCR) version 2.0 (1<sup>st</sup> October 2014), which were not yet in place in when the Kerguelen-UoA1 certification process was initiated. The aggregate scores for the three Principles are given Table 24.

**Table 24. Principle-level scores for the SARPC Patagonian toothfish fishery UoA2 – Crozet (MEC, 2016 and 2018)**

Principle	Initial aggregate scores	Scores after 4 <sup>th</sup> surveillance audit
Principle 1	81.3	83.1
Principle 2	83.0	83.1
Principle 3	83.1	80.0

The UoA2-Crozet fishery certification was awarded with 5 conditions, 4 of which were all lifted during the 4<sup>th</sup> annual surveillance audit for this fishery. The are summarised in Table 25. The revised scores for each Principle are indicated in Table 24.

**Table 25. Summary of previous assessment conditions on the previous assessment for UoA2-Crozet**

<b>Conditions 1 and 5: Harvest control rules and decision-making.</b>	<b>PI</b>
<p>General harvest control rules exist, expressed in the numerous measures (limited access, effort control at sea, observer coverage, dock-side monitoring, VMS) to control and limit exploitation. TAAF has the entire power to take further actions if the global objective of the strategy is threatened. However, the team did not consider that the HCRs are ‘well-defined’, in the sense that the links between scientific advice, reference points and decisions on the TAC are not clear and transparent. Rather, the TAC is determined by the TAAF and three French ministries concerned. That TAC is tested a posteriori by the MNHN with the CASAL model. The MNHN scientific advice is not publicly available until it has been presented and is published on CCAMLR website around December time. Therefore annual TAC decisions made by the TAAF in August are so far based on information and scientific advice that is not publicly explained. Likewise there is no requirement for TAAF to explain the basis and decision-making process used to vary individual vessel quotas each year. Although some explanations are provided to vessel owners on an individual basis, they are informal and not clearly linked to monitoring results, and there is no review of management actions.</p> <p>By the end of Year 3 (to coincide with Kerguelen re-certification), the fishery must have in place a set of Harvest Control Rules defined in the Management Plan, associated with established decision-making processes based on these HCRs and objectives which are clearly explained to fishery stakeholders.</p>	<p>1.2.2 a and b</p> <p>3.2.2 d</p>
<b>Justification – Closed Year 4</b>	<b>PI</b>
<p>The fishery has a set of Harvest Control Rules in place, with reference points conform to those of the CCAMLR (LRP and TRP) and more precautionary (TAAF-TRP=60%B0). The TAC follows scientific advice based on modelling and simulations peer reviewed that are found to be conform by the CCAMLR WG-FSA.</p> <p>Condition 1 is closed.</p> <p>The Management Plan, associated with established decision-making processes based on these HCRs and objectives, which are clearly explained to fishery stakeholders.</p> <p>Condition 5 is closed.</p>	<p>1.2.2 a and b</p> <p>3.2.2 d</p>
<b>Condition 2: Strategy to manage the fishery’s impacts on grenadiers and rays.</b>	<b>PI</b>
<p>By the end of Year 4, the data available on the bycatch of the fishery (main retained species – <i>Macrourus carinatus</i> and <i>Amblyraja taaf</i>) from Avistock and Avipeche should be analysed to evaluate whether the targets of the CBC (Code de Bonne Conduite - code of good conduct) in terms of bycatch reduction have been met. If the CBC has not been ‘demonstrably effective’ new or additional measures should be put in place or action otherwise taken such that the fishery is able to demonstrate that these species are within biologically-based limits or that the fishery is not hindering recovery.</p>	<p>2.1.1 a</p>
<b>Justification - Open</b>	<b>PI</b>
<p>Regarding 2.1.1, The TAAF-DCPN and MNHN confirm that, although there are no publication on the subject, catch rates and fish sizes are monitored for main retained species to ensure that these are highly likely to be within biologically based limits.</p> <p>For grenadiers, there still isn’t enough publicly available data analyses to demonstrate that they are highly likely to be within biologically based limits, but regular monitoring and POKER surveys have found no evidence to suggest that they might not be.</p> <p>For rays, Nowara et al. (2017) show that biomass and numbers estimated through the POKER surveys have remained stable. For all species, the comprehensive strategy in place to limit</p>	<p>2.1.1 a</p>

<b>Condition 2: Strategy to manage the fishery's impacts on grenadiers and rays.</b>	<b>PI</b>
<p>catches of non-target species by the fishery is demonstrably effective, as it limits the quantities of all bycatch caught over the last five years, and most of the rays caught are now cut off.</p> <p>The condition is on target. Following the milestones set and proposed Action Plan, it will need to be carried over for the fishery's re-certification of UoA2 (note that the Crozet UoA was only added to the scope of this fishery in December 2016)</p>	

<b>Condition 3: Information to manage the fishery's impacts on grenadiers and rays.</b>	<b>PI</b>
<p>The data available on the bycatch of the fishery (main retained species – <i>Macrourus carinatus</i> and <i>Amblyraja taaf</i>) from Avistock and Avipeche should be analysed to evaluate whether the targets of the CBC in terms of bycatch reduction have been met. If the CBC has not been 'demonstrably effective' new or additional measures should be put in place or action otherwise taken such that the fishery is able to demonstrate that these species are within biologically-based limits or that the fishery is not hindering recovery.</p>	2.1.3 b
<b>Justification – Closed Year 4</b>	<b>PI</b>
<p>The CBC implementation is closely monitored. The MNHN has confirmed that all species (retained or not) caught are sampled by on-board scientific observers (COPEC) including the rays that are now mostly cut off. Data for size, sex, maturity and other indicators by species are collected systematically, which allows monitoring of catch rates and the identification of hot spots. The recent extension of the RNN has meant that the TAAF-DCPN now also have specific observers on board (in addition to COPEC), who monitor the fishery's interaction with all species other than toothfish, including grenadiers and rays.</p> <p>The condition is ahead of target and closed.</p>	2.1.3 b

<b>Condition 4: Habitats information / mapping.</b>	<b>PI</b>
<p>There are no habitats maps from Crozet, and little work has been done on demersal habitats. Unlike at Kerguelen, the POKER research cruises do not (cannot) operate at Crozet, so an important source of fishery-independent data is missing. Nevertheless, habitats are monitored to the extent that VME species coming up on the lines are identified and quantified. This provides a basic understanding of the type and distribution of these vulnerable habitats. The footprint and impact of this fishing method on the benthos (even taking gear loss into account) is small, and given that significant areas of the Crozet EEZ are protected from fishing (see Figure 13 of the main report), the level of detail required to be 'relevant to the scale and intensity of the fishery' is relatively low. Nevertheless, the team noted that there has so far not been any mapping of the VME observer data in the way that has been done for bycatch: this could be used to identify VME hotspots which could then be avoided. The team considered that this lack of analysis of the existing habitat data (which is understandable since the VME rules are quite recent) precludes SG80 being met. The observer data on bycatch of VME indicator organisms should be archived, analysed and mapped on an on-going, periodic basis, so as to build up over time an improving picture of the location of VMEs in the Crozet fishing zone. This may be done by the TAAF, the MNHN or any body with suitable expertise.</p>	2.4.3
<b>Justification – Closed Year 4</b>	<b>PI</b>
<p>A vast amount of work took place in order to inform the extension of the National Reserve around Crozet (RNN). Koubbi et al. (2016) have published a typology of the marine ecosystem components into marine "ecoregions" to justify the MPA (RNN) extension, and inform its management plan. The collaborative work (TAAF, Agence des Aires Marines Protégées - AAMP, UPMC, CNRS (Chizé) and MNHN), has devised a typology based on marine benthic species and VMEs to identify biodiversity features and "hotspots" to protect.</p> <p>The condition is ahead of target and closed.</p>	2.4.3

### 3.2.3 Previous scoring both UoAs

Following the 4<sup>th</sup> surveillance audit, the scores achieved by the two UoAs prior to re-certification are given in Table 26. Past scores are not all directly comparable with the score awarded for the re-certification, because the version v2.0 of the standard is now used, which includes several key changes, such as for the categories of primary (retained) and secondary (bycatch) species under Principle 2.

**Table 26. Scores for the SARPC Patagonian toothfish fishery after the 4<sup>th</sup> surveillance audit (re-scored PIs in orange MEC, 2018). Note that the Crozet UoA was only added to the scope of this fishery in December 2016.**

Principle	Component	PI nb.	Performance Indicator	UoA1 - Kerguelen	UoA2 - Crozet
1	Outcome	1.1.1	Stock status	80	80
		1.1.2	Reference points	90	90
		1.1.3	Stock rebuilding	-	-
	Management	1.2.1	Harvest Strategy	80	80
		1.2.2	Harvest control rules and tools	80	80
		1.2.3	Information and monitoring	80	80
		1.2.4	Assessment of stock status	80*	85
2	Retained species	2.1.1	Outcome	80	60
		2.1.2	Management	80	80
		2.1.3	Information	80	80
	Bycatch species	2.2.1	Outcome	90	90
		2.2.2	Management	85	85
		2.2.3	Information	85	85
	ETP species	2.3.1	Outcome	80	95
		2.3.2	Management	90	95
		2.3.3	Information	90	85
	Habitats	2.4.1	Outcome	85	90
		2.4.2	Management	80	85
		2.4.3	Information	80	80
	Ecosystem	2.5.1	Outcome	80	80
		2.5.2	Management	90	90
		2.5.3	Information	85	85
3	Governance and Policy	3.1.1	Legal and customary framework	90	90
		3.1.2	Consultation, roles and responsibilities	85	85
		3.1.3	Long term objectives	100	100
		3.1.4	Incentives for sustainability	80	80
	Fishery-specific	3.2.1	Fishery specific objectives	80	80
		3.2.2	Decision making processes	80	80

Principle	Component	PI nb.	Performance Indicator	UoA1 - Kerguelen	UoA2 - Crozet
	management system	3.2.3	Compliance and enforcement	90	85
		3.2.4	Research plan	80	80
		3.2.5	Management performance evaluation	80	80

### 3.3 Assessment Methodologies

This assessment was conducted in accordance with the MSC Fisheries Standard v2.0 and MSC Full Assessment Reporting Template version 2.0. The default assessment tree was used. The RBF was applied to Performance Indicator 2.2.1 (Secondary species outcome).

### 3.4 Evaluation Processes and Techniques

#### 3.4.1 Site Visits

The site visit was held at in La Réunion between the 13th and 15th February 2018, in combination with the 4<sup>th</sup> surveillance audit site-visit. The team consisted of Sophie des Clers (Team Leader) and Robin Cook, supported by Henry Ernst. Stakeholders were informed of the scheduled site visit on the 11th January 2018. The RBF workshop took place on 15<sup>th</sup> February in the afternoon. The list of people met in person or via tele-conference for the on site visit is given in Table 27.

**Table 27. List of attendees at the on-site meetings and RBF workshop.**

Name	Affiliation	RBF workshop	On site or by tele-conference
Delphine Ciolek	SARPC (point of contact)	Y	On site
Laurent Pinault	SAPMER group	Y	On site
Eric Cousin	SAPMER group	Y	On site
Armelle Denoize	SAPMER group	Y	On site
Michel Beilloeil	SAPMER (skipper "Ile Bourbon")	N	On site
Patrick Péron	SAPMER (skipper "Ile Bourbon")	N	On site
Laurent Nicolle	Le Garrec / Cap Bourbon	N	On site
Graziella Jan	Cap Bourbon	N	On site
Tugdual Poirier	Cap Bourbon	N	On site
Laurent Virapoullé	Pêche-Avenir SA	N	remotely
Sylvain Raithier	COMATA – Scapêche	N	remotely
Maëlla Bourdet	COMATA – Scapêche	N	remotely
Thierry Clot	TAAF – Direction des Pêches et Questions Maritimes	N	On site
Martin Devaux	TAAF DPQM – stagiaire	Y	On site
Thibault Thellier	TAAF - Direction de l'Environnement	N	On site

Name	Affiliation	RBF workshop	On site or by tele-conference
Prof. Guy Duhamel	MNHN	Y	remotely
Nicolas Gasco	MNHN	Y	remotely
Romain Sinègre	MNHN (CASAL modelling)	Y	remotely
Charlotte Chazeau	MNHN	N	remotely
Alexis Martin	MNHN (VME)	Y	remotely
Dominique Person	CROSS Réunion	N	On site
Christophe Guinet	CNRS Chizé (Marine mammals)	N	remotely
Henri Weimerskirch	CNRS Chizé (Birds)	N	remotely
Sophie des Clers	MEC Assessment Team	Y	On site
Robin Cook	MEC Assessment Team	Y	On site
Henry Ernst	MEC Assessment Team	Y	On site

The meetings took place at the SAPMER office meeting room in Le Port. Meeting with the CROSS-RU (at sea surveillance and rescue) took place in their offices where the Director (D. Person) gave the team a tour of the facilities with demonstration of real-time satellite and radar surveillance activities. The newest vessel in the fleet (Cap Kersaint of Company Cap Bourbon) was in port and the team was given a guided tour.

The following information were obtained, facilitated by the SARPC secretariat

- CCAMLR (pre-publication) Fisheries Reports; Fish stock assessments reports (WG-FSA); CCAMLR WG-EMM reports on benthos and on ecoregionalisation;
- Individual vessel data COPEC reports by trip and summary compilation , from each fishing company, three years (2014/15, 15/16 and 16/17);
- TAAF-DPQM: anonymised vessel data and fleet totals for catch, bycatch, and interactions with birds and marine mammals; quantities of bait used by species and stock; DPQM-18-016 du 26/02/2018, Compte-rendu de la 15e réunion du groupe de travail de la pêche australe and C3P; Various legal texts, meeting minutes as evidence of consultation and reports on the FMP review and new FMP drafting process;
- TAAF-DCPN and TAAF-RNN: Various legal texts and scientific reports on the RNN extension
- MNHN (directly or through TAAF): data analyses for stock assessment including draft papers to be submitted to CCAMLR; description of new and on-going research projects (GIS, VMEs);
- CCAMLR website: Conservation measures (CMM); published fisheries reports, fish stock assessment and other scientific WG reports.

### 3.4.2 Evaluation Techniques

#### a) Media announcements

The fishery’s reassessment was announced on the MSC website on the 11<sup>th</sup> January 2018. The MSC press release targeted a wide range of stakeholders within the sustainable seafood industry. As it is not a process requirement under the MSC FCR version 2.0, the fishery was not announced in another media post.

#### b) Methodology for information gathering

Information for the assessment was gathered from the participants during the site visit, RBF workshop and through further correspondence with individual stakeholders.

#### c) Scoring

Some scoring was completed during the site visit; however due to the need for additional data provision after the site visit, the scoring was completed remotely via email exchange. Each PI was reviewed collectively and a group consensus determined.

The scores were decided as follows:

How many scoring issues met?	SG60	SG80	SG100
All	60	80	100
Half	FAIL	70	90
Less than half, most not met	FAIL	65	85
More than half, many or most	FAIL	75	95

Note that where there is only one scoring issue in the Scoring Guidepost (SG), the issue can be partially scored – in this case the team used their judgement to determine what proportion of it was met, e.g. at the 100 level, a small part met = 85, about half met = 90, nearly all met = 95.

#### d) Decision rules for final outcome

A UoA cannot be certified if:

- the weighted average score for all PIs under each Principle is less than 80 for any of the three Principles
- any individual scoring issue is not met at the SG60 level, contributing to a score of less than 60 on any PI.

The aggregate score for each Principle is the sum of the weighted score of each Performance Indicator within that Principle.

**Table 28. Scoring elements**

Component	Scoring elements	Main/ not main	Data- deficient or not
1 - Target species (UoA 1)	Toothfish (Kerguelen)	Target	No

Component	Scoring elements	Main/ not main	Data- deficient or not
1 – Target species (UoA 2)	Toothfish (Crozet)	Target	No
2.1 - Primary species (UoAs 1 and 2)	NE Atlantic mackerel (FAO area 27)	Main	No
	NW Atlantic mackerel (FAO area 21)	Main	No
	Illex shortfin squid, NW Pacific Chub mackerel	Not main	No
2.2 - Secondary species	UoA 1: Grenadier and Kerguelen sandpaper skate UoA 2: Grenadier, Blue antimora and whiteleg skate	Main	Yes
	UoA1: Blue antimora, Eaton skate UoA 2: Lantern shark, southern sleeper shark, porbeagle shark	Not main	Yes
2.3 - ETP species	Seabirds, marine mammals	N/A	No
2.4 - Habitats (UoAs 1 and 2)	For both UoAs, the commonly encountered Habitats in the fishery are 'fine sediments, with a mix of solitary epifauna (ascidians, bryozoans), crinoids, corals and mixed large erect communities' (table GSA6). Taxonomic groups identified as VME indicators for deep waters are included in the CCAMLR (2009) list of 23 groups of mostly bryozoans, crinoids, anemones and brachiopods) hard and soft corals.	N/A	No

### 3.4.2.1 Use of the RBF

Potential use of the risk-based framework (RBF) was announced on 11th January 2018 to score the PIs 2.1.1 Primary species outcome and 2.2.1 Secondary species outcome on the basis that “Stock status reference points may not be available – neither by derivation of analytical stock assessments nor by using empirical approaches” for the species concerned (MSC 2014: FCRv2. 7.7.6 Table 3). In the event, the RBF was only used for secondary species outcome because all primary (bait) species had some elements of stock assessment.

The RBF was applied to all ‘main’ secondary species marked as data-deficient in Table 28 and to some ‘minor’ secondary species, as a way to elicit scientific expertise from the stakeholders, but minor species were excluded from the evaluation under the RBF in accordance with PF4.1.4, thus limiting the overall PI score at 80.

The outputs of the RBF workshop are given in Appendix 2. Prior to the RBF workshop, which took place on the 14<sup>th</sup> February 2018, an information package was sent out to stakeholders as shown in Appendix 8. The RBF workshop participants are listed in Table 27.

## 4 Traceability

### 4.1 Eligibility Date

The Eligibility Date for the fishery is set as the date of recertification, pending the successful outcome of this evaluation. Product caught after the date of certification will be eligible to enter further chains of custody.

### 4.2 Traceability within the Fishery

Toothfish are caught in the waters around the Kerguelen and Crozet Islands using bottom-set longlines. The catch is processed and packed on board and landed frozen. Nearly all the product is landed as headed, gutted and tailed for export, with a small amount of fillet (~1% of the total) which is sold mainly on the local market. The processed catch is packed in boxes, except for very large specimens which may be packed in bags and repacked in boxes on shore.



**Figure 9. Processing area inside one of the SARPC vessels.**

There is a traceability system in place that allows the product to be tracked back to the place and date of capture. A record is kept of the weekly fishing volume in excel format. This is accompanied by the logbook, which is completed by the vessel captain. There is daily monitoring of fishing and the VMS. The observer, which accompanies all trips, records the schedule of the trip, with estimated location and time of the entry and exit of the fishing areas.

The “avistock” document is then completed. Made at sea, it contains the net weights of whole and processed product and the catch location. This is verified by both the captain and the observer. Upon landing, the unloading CEMR report is created, showing the position of products inside the respective cold stores. There is a unique lot number for one product and one fishing area. This allows different locations and types of product to be accounted for.

The product remains in the cold store until export. A *Dissostichus* Export Document is completed, accompanied by customs clearance, packing list, customer invoice, health certificate, Certificate of Origin and stuffing report of the export containers. The container number that the product is exported

in, appears on the paperwork to the customer. The catch date of the fish is the main traceability element that allows backward tracing to the vessel and trip.

The physical boxed product is labelled with the date of production, name of the fishing vessel, the species, the fishing zone and type of product (Figure 10).

All toothfish caught within the Crozet fishery is labelled separately from that caught in Kerguelen because of separate quotas and must be landed in Réunion. The vessels land at only one site: Le Port on the northwest corner of the island. On disembarkation, the catch is weighed by an authorised third party surveyor (independent of SARPC members and of TAAF). These data are provided to the fishing company and to the TAAF administration, and are checked against logbook records.



**Figure 10.** Example of boxed toothfish from the SARPC Kerguelen toothfish fishery. The same types of information is included on the Crozet products.

The individual risks to traceability have been considered by the assessment team. These are detailed in Table 29 below.

**Table 29. Traceability Factors within the Fishery**

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear to be used within the fishery	Vessels are only geared for bottom-set longline. The risk of a non-certified gear to be used is therefore extremely low.
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	There is a possibility of the vessels from the UoC fishing outside the UoC on the same trip. Trips last approximately three months and vessels will fish in both Kerguelen and Crozet. As fish come onboard, they are graded, processed, frozen and packaged into sealed and labelled boxes (see Figure 10). The labels detail species, catch area, weight and date of capture. The date and position of catch would link

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
	with the e-log to show where a vessel was fishing; this gives a high degree of security where vessels may fish different fishing zones in the same fishing trip. The separate labeled boxes provides physical separation of catch on their way to port. The holds are locked by the observer and remain so until reaching port, where they are unlocked by the observer.
Potential for vessels outside of the UoC or client group fishing the same stock	Vessels from outside the UoC are likely to fish for the same stock but will not be covered by this assessment. The area is strictly regulated by the TAAF and CAMLR. This risk is further mitigated by the inclusion of the UoA vessel list on the fishery's certificate, pending the successful outcome of this evaluation.
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	All product is processed and packaged onboard. Boxes are clearly labelled (see Figure 10 above), displaying catch area, product type, processor details, vessel name, date of capture. Most client members have their cold store for their products, all of which have CoC. Regardless, product remains packaged and clearly labelled as per previously described.
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	Risks of mixing certified and non-certified catch is now not possible. Processing occurs as the catch is hauled and is therefore limited to a single fishing zone. Fish products are packaged onboard (frozen products are boxed) and then sealed in the hold by an observer. There is a three-day voyage between fishing areas and the holds remain locked by the observer until the vessel returns to port to unload. Here the observer unlocks the holds for unloading to begin. Product is then stored in cold store in Le Port until ready for onward shipping.
Risks of mixing between certified and non-certified catch during transshipment	Transshipment does not occur in this fishery.
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	None foreseen. All SARPC vessels have MSC Chain of Custody in addition to the product handling procedure, observer programme (100% coverage) and traceability paperwork in place in the fishery. These systems are the same for both the Kerguelen area as well as Crozet Island

### 4.3 Eligibility to Enter Further Chains of Custody

During the initial Kerguelen assessment (MEP, 2013), the assessment team determined that the overall risk to traceability in this fishery was low. However, stakeholders raised concerns about this risk assessment and as a result SARPC members decided to go through individual Chain of Custody (CoC) certification for the UoA vessels. This CoC certification is currently still in place. However, based on the risk analysis presented above, the team reiterates that this is a highly regulated fishery with robust traceability systems in place. The team's determination therefore remains that toothfish (*Dissostichus eleginoides*) originating from Kerguelen and Crozet Island in the TAAF EEZ, using bottom-

set longline by the members vessels of the Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC) shown in Table 5 and landed in Le Port is eligible to enter further chains of custody with the MSC ecolabel, **pending the successful outcome of this evaluation.**

Separate Chain of Custody is required from the first change of ownership, which is when product, processed and packaged by members of the client group, is sold out of La Réunion to onward customers.

## 5 Evaluation Results

### 5.1 Principle Level Scores

The final principal scores are provided in Table 30.

**Table 30. Final Principle Scores**

Principle	Score UoA1 – Kerguelen	Score UoA2 - Crozet
Principle 1 – Target Species	85.0	83.3
Principle 2 – Ecosystem	89.7	89.7
Principle 3 – Management System	84.8	84.8

### 5.2 Summary of PI Level Scores

**Table 31. PI level scores**

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score UoA1 – Kerguelen	Score UoA2 - Crozet
One	Outcome	0.33	1.1.1	Stock status	0.5	80	80
			1.1.2	Stock rebuilding	0.5	N/A	N/A
	Management	0.67	1.2.1	Harvest strategy	0.25	95	95
			1.2.2	Harvest control rules & tools	0.25	80	80
			1.2.3	Information & monitoring	0.25	90	80
		1.2.4	Assessment of stock status	0.25	85	85	
Two	Primary species	0.2	2.1.1	Outcome	0.33	95	95
			2.1.2	Management strategy	0.33	85	85
			2.1.3	Information/Monitoring	0.33	90	90
	Secondary species	0.2	2.2.1	Outcome	0.33	80	80
			2.2.2	Management strategy	0.33	75	75
			2.2.3	Information/Monitoring	0.33	85	85
	ETP species	0.2	2.3.1	Outcome	0.33	100	100
			2.3.2	Management strategy	0.33	95	95
			2.3.3	Information strategy	0.33	100	100
	Habitats	0.2	2.4.1	Outcome	0.33	80	80
			2.4.2	Management strategy	0.33	90	90
			2.4.3	Information	0.33	80	80
	Ecosystem	0.2	2.5.1	Outcome	0.33	100	100
2.5.2			Management	0.33	95	95	

Principle	Component	Wt	Performance Indicator (PI)		Wt	Score UoA1 – Kerguelen	Score UoA2 - Crozet
			2.5.3	Information	0.33	95	95
Three	Governance and policy	0.5	3.1.1	Legal &/or customary framework	0.33	80	80
			3.1.2	Consultation, roles & responsibilities	0.33	85	85
			3.1.3	Long term objectives	0.33	100	100
	Fishery specific management system	0.5	3.2.1	Fishery specific objectives	0.25	80	80
			3.2.2	Decision making processes	0.25	80	80
			3.2.3	Compliance & enforcement	0.25	85	85
			3.2.4	Monitoring & management performance evaluation	0.25	80	80

### 5.3 Summary of Conditions

One condition was carried over for the UA2-Crozet, which was certified in December 2016, through an extension of scope three years after the initial Kerguelen assessment (UoA1).

Changes in the standard version from v1.3 to v2.0 means that the species concerned are classified as ‘secondary’ rather than ‘retained’ and hence fall under the PIs in 2.2 instead of 2.1, and that the SG are slightly different. Another important difference is that the RBF was used for the scoring of the Secondary species outcome PI, and enough information was elicited from the scientific stakeholders during the workshop for the team to be content that all main secondary species are highly likely to be above their biologically based limits. No condition remains regarding PI 2.2.1 Secondary species outcome.

However, a new scoring issue is included in the v2.0 that requires “a regular review of the effectiveness and practicality of alternative management measures” (to reduce unwanted catch of non-target species). In the light of scientific opinion expressed for the first time during the RBF workshop, that species of rays cut off would be very unlikely to survive, it seems urgent that the measures in the 2014 Code of Conduct (CBC) are re-evaluated.

This new condition is somewhat related to pre-existing ones to the extent that it is a logical process that once information are available and the species status can be determined, naturally the management measures need to be reviewed in depth, but it is not directly related to a previous condition on the same scoring issue (see Table 23, Table 25 above, and Table 32 below).

**Table 32. Summary of Conditions**

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
1.	There needs to be 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	2.2.2e	see explanation above

Condition number	Condition	Performance Indicator	Related to previously raised condition? (Y/N/NA)
	as appropriate, for both UoA1-Kerguelen and UoA2-Crozet		

## 5.4 Recommendations

Two recommendations (#1 and #2) remained open for Kerguelen and six for Crozet, and progress against them was discussed in the 4<sup>th</sup> year surveillance report (MEC, 2018).

For the new certification cycle, the team issued three new recommendations (Table 33).

**Table 33. Re-Assessment Recommendations for UoA1-Kerguelen and UoA2-Crozet**

Recom. number	Description
1 (both UoAs)	For TAAF to look into the feasibility of using CCAMLR fishing season dates, in order to make TAAF and CCAMLR data easily comparable and to increase transparency.
2 (both UoAs)	For TAAF/ the MNHN to compile annual weight equivalents of all rays caught, cut off and discarded by species and by UoA, so that the implementation of the Code of Conduct (CBC) to limit skates and rays bycatch can be monitored in greater detail.
3 (both UoAs)	For the TAAF and associated scientists, to analyse fisheries dependent and independent information available for the fishery in both UoAs regarding the survival of cut off skates.
4 (both UoAs)	It is recommended that the stock assessment reports submitted to CCAMLR for each of the two UoAs document all the input data and provide a comprehensive discussion of the model diagnostics in order to provide greater transparency.
5 (both UoAs)	For the TAAF and associated scientists to conduct a footprint analysis for each UoA, in order to build an understanding of habitat impacts and to eliminate the need to extrapolate, e.g. from HIMI information.

## 5.5 Determination, Formal Conclusion and Agreement

### (REQUIRED FOR FR AND PCR)

1. The report shall include a formal statement as to the certification determination recommendation reached by the Assessment Team about whether or not the fishery should be certified.

(Reference: FCR 7.16)

### (REQUIRED FOR PCR)

2. The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

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## Appendix 1 Scoring and Rationales

### Appendix 1.1 Principle 1

Evaluation Table for 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				
	Guidepost		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?	UoA1- Kerguelen	Y	Y	N
		UoA2-Crozet	Y	Y	N
	Justification		<p>For both UoA1-Kerguelen and UoA2-Crozet stocks CCAMLR's framework for reference points is used to evaluate stock status. The point at which recruitment is impaired is defined as 20% of the virgin (pre-exploitation) biomass (<math>B_0</math>) and is a recognized standard estimate of PRI (Parkes, 1999) as well as the MSC default (GSA 2.2.3.1).</p> <p><u>UoA1-Kerguelen</u>: The most recent assessment estimates the 2017 biomass to be at 60.7% of <math>B_0</math> with a 95% credible interval of (58.5 – 62.8) (Sinegre et al., 2017a).</p> <p><u>UoA2-Crozet</u>: The most recent assessment estimates the 2017 biomass to be 66% of <math>B_0</math> with a credible interval of (63.1-70.4) (Sinegre et al., 2017b).</p> <p>Since the estimate of the 2017 biomass is well above the 20%<math>B_0</math> value it is highly likely that the stocks are above their respective PRIs and SG80 is met.</p> <p>The assessment on which the estimates are based have a number of uncertainties:</p> <ul style="list-style-type: none"> <li>- There are no fisheries-independent data that would help to calibrate the UoA2-Crozet model;</li> <li>- Depredation rate estimates are currently still uncertain and may affect the biomass estimates;</li> <li>- The model is not able to estimate recruitment deviations without a strong assumption of stationarity.</li> </ul>		

		Therefore, it is not possible to say that there is a high degree of certainty that the stocks are above the point where recruitment would be impaired, and SG 100 is not met.		
<b>b</b>	<b>Stock status in relation to achievement of MSY</b>			
	<b>Guidepost</b>		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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	N
		<b>UoA2-Crozet</b>	Y	N
	<b>Justification</b>		<p>If <math>B_{MSY}</math> is not analytically determined, MSC defines a default level at <math>40\%B_0</math>, except for stocks with exceptionally high or low productivity (see GSA 2.2.3.1). The management plan for both stocks is set out in TAAF (2015) which establishes 50% of <math>B_0</math> as the target biomass to be consistent with CCAMLR. However, an additional precautionary measure is used by TAAF that sets the target at 60% of virgin biomass (<math>B_0</math>). Stock assessment estimates for both UoA1-Kerguelen and UoA2-Crozet placed the current SSB as above 60% <math>B_0</math> and show that the stock is fluctuating around its target value and SG80 is met.</p> <p>Due to the uncertainties in the estimations referred to above, there is no high degree of certainty that the stocks are fluctuating around, or above, its target reference points, and SG 100 is not met for the two UoAs.</p>	
<b>References</b>		<p>Parkes, G, (1999). CCAMLR's Application of the Precautionary Approach. Proceedings, 5th NMFS NSAW. 1999. NOAA Tech. Memo. NMFS-F/SPO-40</p> <p>R. Sinigre, G. Duhamel and J.B. Lecomte. 2017a. Updated stock assessment of Patagonian toothfish (<i>Dissostichus eleginoides</i>) in the vicinity of UoA1-Kerguelen Islands (division 58.5.1). CCAMLR WG-FSA-17/60</p> <p>R. Sinigre, G. Duhamel and J.B. Lecomte. 2017b. Updated stock assessment of Patagonian toothfish (<i>Dissostichus eleginoides</i>) in the vicinity of UoA2-Crozet Island (Subarea 58.6). CCAMLR WG-FSA-17/59</p> <p>TAAF, 2015c. Plan de Gestion de la pêche de la légine australe <i>Dissostichus eleginoides</i> dans les zones exclusives des Iles UoA1-Kerguelen et UoA2-Crozet. Version VF-4 du 6 août 2015, 48p.</p>		
<b>Stock Status relative to Reference Points</b>				
		<b>Type of reference point</b>	<b>Value of reference point</b>	<b>Current stock status relative to reference point</b>
	<b>UoA1-Kerguelen</b>	Sl(a) PRI Sl(b) Target biomass	20% of $B_0 = 47072$ 50% of $B_0 = 117680$	$B_{2017}/B_{20\%} = 3.03$ $B_{2017}/B_{50\%} = 1.21$

<b>UoA2-Crozet</b>	Sla) PRI Sib) Target biomass	20% of $B_0 = 11362$ 50% of $B_0 = 28405$	$B_{2017}/B_{20\%} = 3.34$ $B_{2017}/B_{50\%} = 1.33$
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA1-Kerguelen</b>			<b>80</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA2-Crozet</b>			<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

Evaluation Table for PI 1.1.2 – Stock rebuilding - not applicable, only scored if PI 1.1.1 60-80

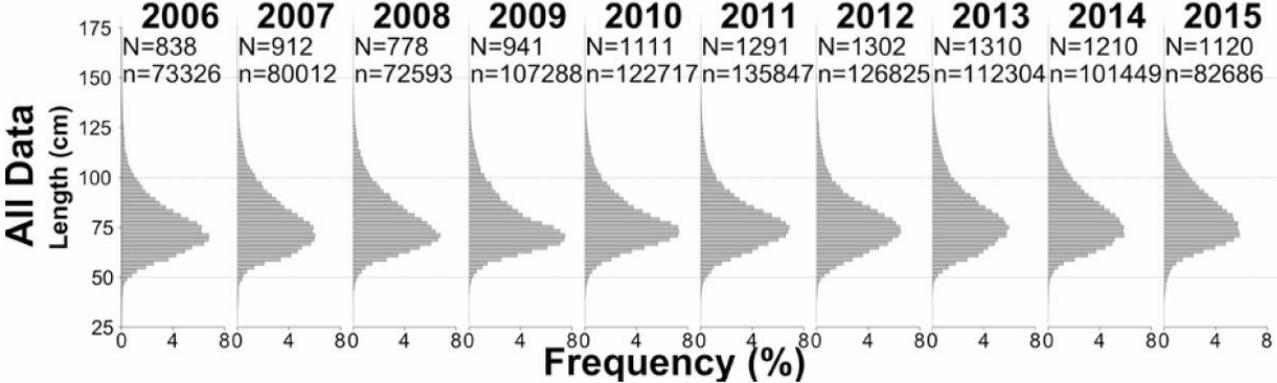
Evaluation Table for PI 1.2.1 – Harvest strategy

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				
	<b>Guidepost</b>		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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	Y
		<b>UoA2-Crozet</b>	Y	Y	Y
	<b>Justification</b>		<p>A global strategy, updated annually ("arrêté" TAAF, 2017), sets the rules of fishing activities in the French EEZs of UoA1-Kerguelen and UoA2-Crozet and defines the objective of ensuring long-term conservation and optimal use of fishing resources in the EEZs, in order to achieve the maximum sustainable yield. The fishing operations should be conducted in a way that would preserve the ecosystem living resources. A detailed management plan is set out in TAAF 2015.</p> <p>The strategy, which is the same for both UoAs, includes:</p> <ul style="list-style-type: none"> <li>- Limited entry in the fishery: only seven licensed vessels are allowed to fish in the UoA1-Kerguelen or UoA2-Crozet areas at the same time;</li> <li>- TACs and other requirements are consistent with CCAMLR decision rules, based on scientific advice and economic considerations;</li> <li>- The TACs are divided among the vessels, each allocation is a function of the performance of the vessel with regard to the regulations (quota, by-catches, etc.);</li> <li>- Strong control of illegal fishing.</li> <li>- mitigation measures to reduce interactions with marine mammals (depredation).</li> </ul> <p>The TAC is set according to scientific advice, taking economic considerations into account. The scientific advice is in agreement with CCAMLR decision rules.</p>		

		<p>Management objectives follow or exceed CCAMLR's advice, and the new management plan follows MNHN advice and CCAMLR principles.</p> <p>Technical measures are also set:</p> <ul style="list-style-type: none"> <li>- Compulsory VMS system;</li> <li>- Compulsory log-books and dock-side monitoring;</li> <li>- 100% observer coverage; each observer should verify at least 25% of each line set;</li> <li>- The fishing area is divided in 160 sectors (1° longitude x 0.5° latitude); a maximum of two vessels should be present on the same sector at the same time; a vessel cannot fish on more than two sectors; a vessel cannot fish on a sector more than 10 days;</li> <li>- Fishing at depths shallower than 500 m is prohibited;</li> <li>- Maximum number of hooks per line;</li> <li>- Compulsory use of test lines and if the proportion of undersized fish exceeds 10%, the vessel should move on at a minimal distance of 2.5 miles.</li> </ul> <p>All these elements contribute to achieving the global strategy to conserve fisheries resources. Stock assessments indicate that the biomass has not fallen below 60 % of the virgin biomass, and remained above the 50 % reference level adopted by the CCAMLR. The harvest strategy is responsive to the state of the stock because the TAC is reduced if the biomass is at a level that increases the probability of falling below B<sub>50%</sub> or B<sub>20%</sub>. Therefore, the team estimates that both SG60 and 80 are met.</p> <p>SG100 requires that the harvest strategy is 'designed'. Although it has developed over the last few years (in particular in relation to the scientific advice), the elements have been combined into a coherent whole via a FMP, and on this basis, the team concluded that SG100 is met.</p>			
<b>b</b>	Harvest strategy evaluation				
	<b>Guidepost</b>	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.	
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	N
		<b>UoA2-Crozet</b>	Y	Y	N
	<b>Justification</b>	The various measures included in the strategy have been able to keep the SSB above the reference point of 50% B <sub>0</sub> , as the SSB(2017) is above 60% of B <sub>0</sub> , according to the assessment of both stocks. The assessments show that the biomass has stabilized above the target level following a period of decline before effective management was introduced (Sinégre et al., 2017a and 2017b). The TACs for each stock are tested in a stochastic forward projection for 35 years to show that management is expected			

		<p>to result in sustainable exploitation. Due to the prohibition of fishing in the area &lt;500m, juvenile toothfish are protected, and the reproductive capacity of the stock is not impaired (see 1.1.1a). The SG 60 and 80 are met.</p> <p>However, the performance of the harvest strategy has not been fully evaluated under a range alternative conditions (e.g poor recruitment, changes to depredation, etc) hence it is not possible to show with confidence that the strategy is able to maintain stocks at target levels. SG 100 is not met.</p>		
<b>c</b>	<b>Harvest strategy monitoring</b>			
	<b>Guidepost</b>		Monitoring is in place that is expected to determine whether the harvest strategy is working.	
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	
		<b>UoA2-Crozet</b>	Y	
	<b>Justification</b>		<p>Monitoring of the fishery, which is the same for both UoAs, includes</p> <ul style="list-style-type: none"> <li>- Compulsory VMS system;</li> <li>- Compulsory log-books and dock-side monitoring;</li> <li>- 100% observer coverage; each observer should verify at least 25% of each line hauled.</li> </ul> <p>Monitoring of the stocks is done via a stock assessment based on scientific data including catch, length-frequency in catch, and, recently, catch-at-age. A sample of the catch is tagged and returns are monitored each year.</p> <p>For the UoA1-Kerguelen stock a periodic research vessel survey is conducted to obtain a swept area estimate of biomass. These assessments show that the spawning biomass remains above the target reference points. Hence SG60 is met.</p>	
<b>d</b>	<b>Harvest strategy review</b>			
	<b>Guidepost</b>			The harvest strategy is periodically reviewed and improved as necessary.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>		Y
		<b>UoA2-Crozet</b>		Y
	<b>Justification</b>		<p>A harvest strategy review took place in 2018 with the aim of making improvements as identified by the review. Improvements expected in 2018 and improved as necessary. Following the review, the following key decisions were made:</p>	

		<p>- The management plan for the fishery is extended until 31 August 2019 and is therefore applicable to the 2018-19 campaign. This decision has already been implemented through <i>Arrêté n° 2018-35 du 23 mai 2018 du préfet, administrateur supérieur des TAAF</i>.</p> <p>- A new management plan will come into effect in 2019. It will determine the management system for a period of 5 years and may be revised according to contingencies related to CCAMLR regulations. As part of the management plan, the total allowable catch (TAC) will be fixed for a triennial period.</p> <p>SG100 is met.</p>			
e	Shark finning				
	<b>Guidepost</b>		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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Not relevant	Not relevant	Not relevant
		<b>UoA2-Crozet</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>		Sharks are not a target species in this fishery.		
f	<b>Review of alternative measures</b>				
	<b>Guidepost</b>		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>biannual</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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Not relevant	Not relevant	Not relevant
		<b>UoA2-Crozet</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>		MSC define the term 'unwanted catch' as 'the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use' (see SA3.1.6 and SA2.4.8.1). The gear used in the UoA is longline and there is negligible unwanted catch of toothfish. It is not permitted to fish in waters less than 500m and this protects juvenile fish. The minimum landing size is		

		<p>60cm and length frequency data show few fish caught below this value although some fish down to 50cm are taken. Regulations require vessels to move location if the percentage of undersize fish exceeds 10%</p>  <p>On this basis, the team concluded that there is no significant 'unwanted catch' so this SI is not scored.</p>
<b>References</b>	<p>R. Sinegre, G. Duhamel and J.B. Lecomte. 2017a. and 2017b TAAF, 2017a. TAAF, 2015. Plan de Gestion de la pêche de la légine australe <i>Dissostichus eleginoides</i> dans les zones exclusives des Iles UoA1-Kerguelen et UoA2-Crozet. Version VF-4 du 6 août 2015, 48p.</p>	
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA1-Kerguelen</b>		<b>95</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA2-Crozet</b>		<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

**Evaluation Table for 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	
<b>a</b>	HCRs design and application				
	<b>Guidepost</b>		<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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	N
		<b>UoA2-Crozet</b>	Y	Y	N
	<b>Justification</b>		<p>For both UoAs the harvest control rule requires a fixed TAC to satisfy two conditions:</p> <p>a) that the risk of the SSB falling below <math>B_{20\%}</math> is less than 10% in 20 years</p> <p>b) that the probability of the SSB falling below <math>B_{50\%}</math> in 35 years is 50%</p> <p>Simulations are run to identify a TAC conditioned on the current biomass that satisfies these conditions.</p> <p>The rule is incorporated in the management plan (TAAF 2015c) and conforms to CCMALR protocols. It is well defined and will result in the exploitation rate being reduced as reference points are approached. This is because if the current SSB is declining the projected TAC will be reduced to satisfy the two conditions encapsulated in the HCR. Hence SG80 is met.</p> <p>The ecological role of the stock is not explicitly taken into account hence SG100 is not met.</p>		
<b>b</b>	HCRs robustness to uncertainty				
	<b>Guidepost</b>		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.	
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	N	

	<b>UoA2-Crozet</b>		Y	N
	<b>Justification</b>	For both UoAs the HCR takes into account recruitment variability which is the largest random effect in population change, hence SG80 is met. However, the HCR does not take into account alternative ecological conditions, (poor recruitment, changes to depredation etc) and therefore does not take into account a wide range of uncertainty, so SG100 is not met.		
<b>c</b>	<b>HCRs evaluation</b>			
	<b>Guidepost</b>	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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y
		<b>UoA2-Crozet</b>	Y	Y
	<b>Justification</b>	Current exploitation levels respect the CCAMLR's recommendation to keep biomass above 50 % of the virgin biomass. Historically the biomass has not been below 60 % of the virgin biomass for both UoA1 - Kerguelen and UoA2 - Crozet stocks according to the most recent assessments (Sinegre et al., 2017a and 2017b; see Figure 6). This provides evidence that the tools are appropriate and effective to achieve exploitation levels required by the HCR. Both SG 60 and 80 are met.  There are some important uncertainties in the assessments in relation to sensitivity tests which weakens the strength of evidence in support of the effectiveness. This includes assumptions about the level of depredation and the stationarity of recruitment. In the case of UoA2 - Crozet, there is no fishery independent data which adds to the uncertainty in the estimates of current biomass. Hence SG100 is not met.		
<b>References</b>	R. Sinegre, G. Duhamel and J.B. Lecomte. 2017a and 2017b. TAAF, 2015c. Plan de Gestion de la pêche de la légine australe Dissostichus eleginoides dans les zones exclusives des Iles UoA1 - Kerguelen et UoA2 - Crozet. Version VF-4 du 6 août 2015, 48p.			
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA1 - Kerguelen</b>				<b>80</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA2 - Crozet</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Evaluation Table for 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	
<b>a</b>	Range of information				
	<b>Guidepost</b>	Some 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 is 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.	
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	Y
		<b>UoA2-Crozet</b>	Y	Y	N
	<b>Justification</b>	<p>The information collected for both stocks includes:</p> <ul style="list-style-type: none"> <li>- Vessels number and characteristics due to the licensing system;</li> <li>- Catches and fishing effort (log-books, observers' reports, dock-side monitoring);</li> <li>- Catch-at-length (at sea sampling);</li> <li>- Catch-at-age (calculated from 2015 onwards);</li> <li>- Tagging-recaptures data.</li> </ul> <p>Information on stock structure is provided in Reilly and Ward (2002) and Appleyard et al. (2004). Tagging studies also provide information on mixing between stocks.</p> <p>The available information is used in the stock assessment model and can support the harvest strategy. Both SG60 and 80 are met for UoA2 - Crozet and UoA1 - Kerguelen.</p> <p>A fishery independent survey is conducted at UoA1 - Kerguelen that collects biological information on all species as well as environmental data (e.g POKER 4). Hence the UoA1 - Kerguelen stock meets SG100</p>			

<b>b</b>	Monitoring				
	<b>Guidepost</b>		Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are <b>regularly monitored at a level of accuracy and coverage consistent with the harvest control rule</b> , and one or more indicators 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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	N
		<b>UoA2-Crozet</b>	Y	Y	N
	<b>Justification</b>		<p>In the French EEZ, fishery removals are monitored very closely through log-books, observers and quay-side inspections. Catch data are collected for both stocks. Along with catches, data include catch-at-length and, since 2015, catch-at-age. A sample of the population is tagged each year. These data allow the estimation of stock biomass. Assessments have been performed every year since 2013. In the case of UoA1 - Kerguelen, the POKER surveys provide fishery independent data that improves the robustness of the assessment. These data support the harvest control rules and both SG60 and 80 are met for both UoA1 - Kerguelen and UoA2 - Crozet.</p> <p>The absence of a fishery independent survey for UoA2 - Crozet means that SG100 is not met for this stock. In addition for both stocks uncertainties about the level of depredation and recruitment limit the robustness of the assessment and SG100 is not met.</p>		
<b>c</b>	Comprehensiveness of information				
	<b>Guidepost</b>			There is good information on all other fishery removals from the stock.	
	<b>Met?</b>	<b>UoA1-Kerguelen</b>		Y	
		<b>UoA2-Crozet</b>		Y	
	<b>Justification</b>		<p>Other removals may come from:</p> <ul style="list-style-type: none"> <li>- IUU fisheries;</li> <li>- Orca and sperm whale depredation.</li> </ul>		

	<p>Under current surveillance programmes, IUU catches are estimated to be negligible inside national EEZs. The level of catches outside EEZs is not known and remains a concern but are believed to be small.</p> <p>Depredation is monitored and estimated for the purpose of stock assessment (Gasco et al., 2015).</p> <p>The scoring issue is met.</p>	
<b>References</b>	<p>Appleyard S.A., Williams R. and Ward R.D. 2004. Population genetic structure of Patagonian toothfish in the West Indian Ocean sector of the Southern Ocean. CCAMLR Science 11, 21-32.</p> <p>Reilly, A. and Ward R. D. 2002. Microsatellite loci to determine population structure of the Patagonian toothfish <i>Dissostichus eleginoides</i>. Molecular Ecology. 8: 1753 – 1754.</p> <p>POKER 4. 4ème campagne d'évaluation halieutique des poissons de la ZEE des îles KERGUELEN</p> <p>N. Gasco, P. Tixier, G. Duhamel C. Guinet (2015): Comparison of two methods to assess fish losses due to depredation by killer whales and sperm whales on demersal longlines CCAMLR Science, 22: 1–141</p>	
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA1 – Kerguelen</b>		<b>90</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA2 - Crozet</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

**Evaluation Table for PI 1.2.4 – Assessment of stock status**

<b>PI 1.2.4</b>		<b>There is an adequate assessment of the stock status</b>		
<b>Scoring Issue</b>		SG 60	SG 80	SG 100
<b>a</b>	Appropriateness of assessment to stock under consideration			
	<b>Guidepost</b>		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.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y
		<b>UoA2-Crozet</b>	Y	Y
	<b>Justification</b>		<p>For both UoA1 - Kerguelen and UoA2 - Crozet the same assessment method is used. The stock assessments use the CASAL statistical model, (Bull et al., 2012) as agreed by CCAMLR Scientific Committee and used to assess the stock of the Antarctic toothfish in the Ross Sea (CCAMLR divisions 88.1 and 88.2) and the stocks of the Patagonian toothfish in South Georgia (CCAMLR division 48.3) and in the Heard and McDonald Islands (CCAMLR division 58.5.2).</p> <p>The model provides an estimate of the virgin biomass (<math>B_0</math>) and the current level of spawning stock biomass (SSB) as well as a long-term (35-year) projection. The model allows testing of various catch controls to identify a TAC consistent with the harvest control rule.</p> <p>The assessment model provides a long-term projection in relation to <math>B_{50\%}</math> and <math>B_{20\%}</math> reference points. It provides a posterior distribution of the current biomass so that the probability of exceeding reference points can be quantified.</p> <p>As the assessment is appropriate for the stock and for the harvest control rules, and estimates stock status relative to reference points, SG80 is met. Relevant biology such as growth, maturity, natural mortality and stock structure are considered in the assessment for both stocks, as is the structure of the fishery, current and historical, including estimates of past IUU. Hence SG100 is met.</p>	
<b>b</b>	Assessment approach			
	<b>Guidepost</b>		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.

	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	Y	
		<b>UoA2-Crozet</b>	Y	Y	
	<b>Justification</b>		The assessment estimates stock status relative to depletion-based reference point (SSB as a proportion of $B_0$ ), that are proxies for MSY. They are conditioned on a stock recruitment relationship and consistent with MSC defaults for scoring PI 1.1.1 (see 1.1.1b). The assessment provides the information to calculate the reference points and the status of the stock in relation to these. This is an internationally agreed framework for many stocks and is appropriate for predatory species in higher trophic levels such as toothfish.		
<b>c</b>	Uncertainty in the assessment				
	<b>Guidepost</b>		The assessment <b>identifies major sources</b> of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a <b>probabilistic</b> way.
	<b>Met?</b>		Y	Y	N
			Y	Y	N
	<b>Justification</b>		<p>For both UoAs the CASAL model is a statistical model, using a Bayesian approach. Uncertainty in the modelled parameters is incorporated in the analysis. The model can estimate both estimation error (errors due to sampling) and process errors (e.g. variability in recruitment). Likelihood profiles for critical parameters involved are provided and MCMC sampling gives posterior distributions of both parameters and quantities of interest, such as biomass. Results are shown as a median of the calculations and of the credible interval. The assessment takes uncertainty into account and both SG 60 and 80 are met. This applies to both stocks as the same assessment approach is used.</p> <p>For both stocks a limited range of sensitivity testing is done (Sinagre et al., 2017a and 2017b). These tests are limited to investigating the effect of different assumptions about the number of subfleets, growth and stationarity in recruitment. Some model diagnostics indicate that recruitment cannot be estimated within the model without the assumption of stationarity and that some fleet selectivity parameters do not converge in the MCMC chains. These issues need further investigation to understand the limits of uncertainty. In addition, the operation of the HCR requires a forward projection of 35 years to assess the probability of exceeding reference points. These projections do not consider alternative states of nature such a changes to depredation and regime shifts that may be detrimental to recruitment. Consequently there is not adequate account of uncertainty on the projections used to quantify the probability of exceeding reference points and SG100 is not met.</p>		
<b>d</b>	Evaluation of assessment				

	<b>Guidepost</b>			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>		N
		<b>UoA2-Crozet</b>		N
	<b>Justification</b>	<p>For both stocks a limited range of sensitivity testing is done (Sinegre et al., 2017a and 2017b). These tests are limited to investigating the effect of different assumptions about the number of subfleets, growth and stationarity in recruitment. Some model diagnostics indicate that recruitment cannot be estimated within the model without the assumption of stationarity and that some fleet selectivity parameters do not converge in the MCMC chains. These issues need further investigation to understand the limits of uncertainty. In addition, the operation of the HCR requires a forward projection of 35 years to assess the probability of exceeding reference points. These projections do not consider alternative states of nature such a changes to depredation and regime shifts that may be detrimental to recruitment. Assessments rely on the CASAL model. While this is entirely appropriate, alternative approaches need to be investigated to understand model uncertainty, particularly in relation to recruitment and depredation. A recommendation (#4) is issued to this effect.</p> <p>As these issues apply to both stocks, SG100 is not met in both cases.</p>		
<b>e</b>	Peer review of assessment			
	<b>Guidepost</b>		The assessment of stock status is subject to peer review.	The assessment has been <b>internally and externally</b> peer reviewed.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>	Y	N
		<b>UoA2-Crozet</b>	Y	N
	<b>Justification</b>	<p>The toothfish stock assessment is carried out by MNHN and reviewed each year by the Working Group on Fish Stock Assessment of the CCAMLR. This should be regarded as an internal peer review since the assessments are carried out in the context of CCAMLR using their methodology and reference point framework. Hence SG80 is met. However, this cannot realistically be regarded as an external review since a review external to CCAMLR is required to get adequate challenge to the scientific assumptions and methodological approach. Hence SG100 is not met.</p>		
	<b>References</b>	<p>Bull, B., Francis, R.I.C.C., Dunn, A., McKenzie, A., Gilbert, D.J., Smith, M.H., Bian, R., Fu, D. 2012. CASAL (C++ algorithmic stock assessment laboratory): CASAL User Manual v2.30- 2012/03/21. NIWA Technical Report 135. 280 p.</p>		

	<p>R. Sinegre, G. Duhamel and J.B. Lecomte. 2017a. Updated stock assessment of Patagonian toothfish (<i>Dissostichus eleginoides</i>) in the vicinity of UoA1 - Kerguelen Islands (division 58.5.1). CCAMLR WG-FSA-17/60</p> <p>Sinegre, R. &amp; G. Duhamel, 2015b. Updated assessment of Patagonian toothfish (<i>Dissostichus eleginoides</i>) in the vicinity of UoA2 - Crozet Islands (Subarea 58.6). CCAMLR, WG-FSA-15/69.</p>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA1 – Kerguelen</b>	<b>85</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE: UoA2 - Crozet</b>	<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

## Appendix 1.2 Principle 2

Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	<b>Main primary species stock status</b>			
	<b>Guidepost</b>	Main primary species are likely to be above the PRI OR If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main, to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.
	<b>Met?</b>	Mackerel NEA stock FAO 27 – Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 – Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 – Y Mackerel NWA stock FAO 21 - N
	<b>Justification (both UoAs)</b>	<p><b>Bait species:</b> The only main primary species in the fishery are the species of bait (see Sections 2.4.5 and 2.4.6). The fishery has used 763 tonnes of bait per year on average (see section 2.4.4), 85% of which from two mackerel (<i>Scomber scombrus</i>) stocks in the Northern Atlantic. Over the past two years the average quantities of each stock used has been just under 5% of the total catch each, but this may vary from year to year and therefore both stocks are considered to be potentially ‘main’ species.</p> <p>Mackerel from the NE Atlantic stock (FAO area 27 – ICES subareas 1-7 and 14 and divisions 8a-e and 9a) come from a certified fishery (Acoura Marine, 2017).</p> <p>The most recent assessment for the NW mackerel stock (FAO area 21) estimated the stock to be outside biological limits, overfished and subject to overfishing. There are no MSC-certified fisheries on this stock. SSB2016 was estimated to be 98 447 t, with a total annual catch of 12 600-15 400 tonnes between 2012 and 2016 and a median SSBmsy proxy of 196 894 t (90% CIs of 108 161 – 429 551 t) (NOAA, 2018), which indicates that the 2016 biomass was still below the PRI (taken to be 0.5* SSBmsy proxy). Since the SSB all time low level of 2012, estimated fishing mortality has decreased sharply and SSB has been increasing, providing evidence of recovery. Biomass was estimated to be above its recovery target level in 2017, and the use by this fishery (300t) is negligible in relation to the TAC (NOAA,</p>		

		<p>2018). Furthermore, the fishery ensures that all imported fish from this stock used for bait carry a NOAA catch certificate attesting these are caught within the management system allowance and therefore do not hinder recovery.</p> <p>SG80 is met for both bait stocks. SG100 is met for the NE Atlantic stock based on the most recent assessment by ICES but SG100 is not met for the NW mackerel stock because the stock is still at a level below PRI and not yet fluctuating around MSY (NMFS 2018).</p> <p>The team considered unobserved mortality as a result of gear loss (through ghost fishing). Gear loss in this fishery is rare, due to the high cost involved in replacing any lost gear and the fact that all gear carry GPS-enabled radio beacons to facilitate retrieval. Hooks are also removed from any discarded fish to further prevent ghost fishing. The team did not consider that ghost fishing was a significant contributor to the UoAs' impact on primary species.</p>	
<b>b</b>	Minor primary species stock status		
	<b>Guidepost</b>		For minor species that are below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species
	<b>Met?</b>		Y
	<b>Justification (both UoAs)</b>	<p><b>Bait species:</b> The two other two bait species are managed and their quantities are small, less or around 1% of the total catch on average, making them minor primary species.</p> <p>The Illex shortfin squid (<i>Illex argentinus</i>) is an annual species. The stock is managed as separate units across its distribution range along the Patagonian shelf in SW Atlantic FAO zone 41, with a target escapement biomass of 40% minimum at the end of each fishing season. Each management unit incorporates estimates of High Seas catches. The stock is not considered to be below its PRI (Ke-Yang Chang et al., 2015) although estimated abundance levels vary greatly between years, from ocean climate variability and exploitation levels (FIG, 2018).</p> <p>NOAA-SWPFC assesses the stock production of the NW Pacific Chub mackerel (<i>Scomber japonicus</i>) every 4 years. The latest assessment show that, although the stock level remain very low, harvest levels are kept low and within the management plan HCR (Crone and Hill 2015, reviewed by Punt et al., 2015).</p> <p>None of the minor primary species are considered to be below the PRI. This scoring issue is met by default.</p>	
<b>References</b>	NMFS 2018, FIG 2018, Crone and Hill 2015, Punt et al 2015, Acoura Marine, 2017, ICES 2018		
<b>Score Mackerel NEA stock FAO 27</b>			<b>100</b>
<b>Score Mackerel NWA stock FAO 21</b>			<b>80</b>

<b>Score minor species</b>	<b>100</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE</b>	<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

Evaluation Table for 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	<b>Management strategy in place</b>			
	<b>Guidepost</b>	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 point where recruitment would be impaired.	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 point where recruitment would be impaired.	There is a <b>strategy</b> in place for the UoA for managing main and minor primary species.
	<b>Met?</b>	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - N Mackerel NWA stock FAO 21 - N Minor primary species - N
	<b>Justification</b>	<p><b>Bait species:</b> Both stocks of mackerel have management strategies to ensure that they are maintained above PRI (see Sections 2.4.6.1 and 2.4.6.2), The quantities used as bait are very small in relation to the corresponding annual stock productions of the main primary species used as bait (section 2.4.6). They come from fisheries on the other side of the planet from this fishery. The only involvement of this fishery is through its buying policy. Companies in the fishery have put in place a strategy to ensure that bait species are sourced from fisheries that are either MSC-certified (NEA mackerel) or from fisheries that are managed in order to maintain or not hinder rebuilding of the stock. Catch certificates were communicated to the audit team by some fishing companies as an illustration. This constitutes a partial strategy, SG80 is met for both main primary species.</p> <p>In the absence of an SARPC-wide published commitment to explain the strategy behind the sourcing of all bait species, SG100 is not met.</p>		
b	<b>Management strategy evaluation</b>			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Mackerel NEA stock FAO 27 - Y	Mackerel NEA stock FAO 27 - Y	Mackerel NEA stock FAO 27 - Y

		Mackerel NWA stock FAO 21 - Y	Mackerel NWA stock FAO 21 - Y	Mackerel NWA stock FAO 21 - N Minor primary species - N
	<b>Justification (both UoAs)</b>	<p><b>Bait species:</b> The buying strategy of the SARPC fishing companies has taken account of the importance of sustainable management of the stocks used as bait since a recommendation issued during the certification the UoA1-Kerguelen, which was closed after the Year 2 surveillance audit. For some years now, the provenance and diagnostic of bait sourced are checked regularly, providing an objective basis for confidence that the partial strategy will work; SG80 is met for all stocks.</p> <p>The scientific advice and stock assessment are not readily available except for products coming from MSC-certified stocks, which make about 50% of the quantities sourced. SG100 is only met for NEA mackerel.</p>		
<b>c</b>	<b>Management strategy implementation</b>			
	<b>Guidepost</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a).
	<b>Met?</b>		Y	N
	<b>Justification (both UoAs)</b>	<p><b>Bait species:</b> The combination of management measures on the stocks of bait species and of the fishery's buying strategy ensure that the bait are sourced from stocks that are managed in order to be maintained, or to not hinder rebuilding of the main primary species, at/to levels which are highly likely to be above the point where recruitment would be impaired. SG80 is met. For the minor bait species, no evidence was collected or produced by the SARPC to document management areas, fleet of origin, or allowed catches. Clear evidence is therefore lacking and SG100 is not met.</p>		
<b>d</b>	<b>Shark finning</b>			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification</b>	<p>Directed fishing for sharks is prohibited in the CCAMLR convention area since 2006 (Conservation Measure 32-18 - CCAMLR, 2017). No sharks are primary species in this fishery. The scoring issue is not directly relevant and therefore not scored.</p>		
<b>e</b>	<b>Review of alternative measures</b>			

	<b>Guidepost</b>	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.
	<b>Met?</b>	Not relevant	Not relevant	Not relevant
	<b>Justification (both UoAs)</b>	MSC define the term 'unwanted catch' as 'the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use' (see SA3.1.6). There is no 'unwanted catch' of bait, since SARPC member companies purchase what they need. This scoring issue is therefore not relevant and is not scored.		
<b>References</b>		Acoura Marine 2017, CCAMLR 2017		
<b>Score Mackerel NEA stock FAO 27</b>				<b>85</b>
<b>Score Mackerel NWA stock FAO 21</b>				<b>80</b>
<b>Score minor species</b>				<b>80</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE</b>				<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for 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
a	Information adequacy for assessment of impact on main species			
	Guidepost	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main primary species with respect to status. OR If RBF is used to score PI 2.1.1 for the UoA: 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. OR If RBF is used to score PI 2.1.1 for the UoA: 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?	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y
	Justification	<b>Bait:</b> Information is available on both the stock of origin for the mackerel species used, and on their state (ICES 2017, NOAA 2018). Even in the case of the NWA stock (FAO 21), which is currently assessed to be overfished and subject to overfishing, the catch allowed through the US mackerel fishery management agency and evidence of its certification through NOAA, ensure with a high degree of certainty, that the relatively small quantities used by the fishery do not hinder recovery and that the SARPC is aware of it. SG100 is met.		
b	Information adequacy for assessment of impact on minor species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			N
	Justification	<b>Bait:</b> Quantitative information exist on the state of the stocks for both minor primary species (Chang et al., 2016; NPFC 2018). No evidence was collected or produced by the SARPC to document management areas, fleet of origin, or allowed catches. Therefore it could not estimate the impact of the UoA. The SG100 is not met.		

<b>c</b>	Information adequacy for management strategy			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - Y	Mackerel NEA stock FAO 27 - Y Mackerel NWA stock FAO 21 - N Minor species - N
	<b>Justification</b>	<b>Bait:</b> The SARPC keeps records of the origin and seeks information on the stock status of the main primary species used for bait. This constitutes a partial strategy; SG80 is met. The information is adequate to ensure that the quantities of all primary species used for bait have a minimal impact of the their stock status. A high degree of certainty is only achieved for the one stock out of four that comes from a MSC-certified fishery. SG100 is not met for the other primary stocks.		
<b>References</b>		ICES 2017, NOAA 2018, Chang et al., 2016, NPFC 2018		
<b>Score Mackerel NEA stock FAO 27</b>				<b>100</b>
<b>Score Mackerel NWA stock FAO 21</b>				<b>90</b>
<b>Score minor species</b>				<b>80</b>
<b>OVERALL PERFORMANCE INDICATOR SCORE</b>				<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biological 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			
	<b>Guidepost</b>	<p>Main Secondary species are <b>likely</b> to be within biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are <b>highly likely</b> to be above biologically based limits</p> <p>OR</p> <p>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.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a <b>high degree of certainty</b> that main secondary species are within biologically based limits.</p>
	<b>Met?</b>	Scored using RBF for both UoAs	Scored using RBF for both UoAs	Scored using RBF for both UoAs
	<b>Justification UoA1-Kerguelen</b>	<p><b>Main secondary species</b> are the grenadier (<i>Macrourus carinatus</i>) RBF PSA score = 89 and Kerguelen sandpaper skate (<i>Bathyraja irrasa</i>) RBF PSA score = 86 (see Section 2.4.7). Scored using RBF – see Appendix 2. Overall RBF score of 85.</p> <p>The team considered unobserved mortality as a result of gear loss (through ghost fishing). Gear loss in this fishery is rare, due to the high cost involved in replacing any lost gear and the fact that all gear carry GPS-enabled radio beacons to facilitate retrieval. Hooks are also removed from any discarded fish to further prevent ghost fishing. The team did not consider that ghost fishing was a significant contributor to the UoAs’ impact on secondary species.</p>		

	<b>Justification UoA2-Crozet</b>	<p><b>Main secondary species</b> are the grenadier (<i>Macrourus carinatus</i>) RBF PSA score = 89, Blue antimora (<i>Antimora rostrata</i>) RBF PSA score = 89 and whiteleg skate (<i>Amblyraja taaf</i>) RBF PSA score = 86 (see Section 2.4.7). Scored using RBF – see Appendix 2. Overall RBF score of 85.</p> <p>The team considered unobserved mortality as a result of gear loss (through ghost fishing). Gear loss in this fishery is rare, due to the high cost involved in replacing any lost gear and the fact that all gear carry GPS-enabled radio beacons to facilitate retrieval. Hooks are also removed from any discarded fish to further prevent ghost fishing. The team did not consider that ghost fishing was a significant contributor to the UoAs' impact on secondary species.</p>		
<b>B</b>	<b>Minor secondary species stock status</b>			
	<b>Guidepost</b>			For minor species that are below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	<b>Met?</b>			N/A (RBF)
	<b>Justification (both UoAs)</b>	<p><b>Minor secondary species</b> : In accordance with PF4.1.4 ' The team may elect to conduct a PSA on 'Main' species only when evaluating P.I. 2.2.1. In accordance with PF5.3.2.1, where the team has only considered "main" species in the PSA analysis, the final PI score shall not be greater than 80.</p>		
<b>References</b>		<p>MHNH 2018, Duhamel, G., N. Gasco and P. Davaine, 2005. Nowara et al., 2017., 2<sup>nd</sup> Symposium on the Kerguelen Plateau (to be published); RBF Table 36, Table 37 and Table 38 for 'main' species and Table 39 for 'minor' ray species; RBF scoring given in Appendix 2.</p>		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80 (both UoAs)</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for 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			
	Guidepost	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 within 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 within 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?	Y	Y	Y
	Justification	The Fishery Management Plan (FMP) and annually updated technical provisions provide a strategy to manage all main and minor species caught. The number of vessels licensed to fish, the gear used, closed seasons and closed areas all aim to minimise the catch of secondary species. Catches are observed and analysed in real time with an obligation to move on in case of bycatch hot spots. Specifically for rays, hot spots are defined when catches are greater than 50 rays per 1 000 hooks, as observed on 25% of the line by the on-board observer (TAAF, 2017a). Sharks and rays caught incidentally must be cut off unless there are obvious signs that they will not survive. SG100 is met.		
b	Management strategy evaluation			
	Guidepost	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?	Y	Y	N
	Justification	The effectiveness of current measures was discussed during the RBF workshop for both UoAs. The RBF workshop participants (Table 27) confirmed that all ‘main’ secondary species are productive enough to withstand the current fishing pressure from the managed fishery in		

		both UoAs, based on knowledge of their biology and the impacts of the fishery (total catch, size). SG80 is met. Until there formal analyses of biomass indicators are presented, there is no testing of the strategy, SG100 is not met.		
<b>c</b>	Management strategy implementation			
	<b>Guidepost</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .	There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a).
	<b>Met?</b>		Y	N
	<b>Justification</b>	There is extensive evidence to show that the catch of all non-target species is tightly controlled, and that the Code of Conduct is implemented with an increasing number of rays cut off. Information (Nowara et al., 2017 and MNHN, pers.com. to be published for Crozet) on CPUE trends and length distributions over time also provide on objective basis of scientific evidence that the biomass levels of secondary species have remained stable over the year, or for some have increased. SG80 is met.  Until the MNHN analyses are published and updated regularly, the evidence is not clear, SG100 is not met.		
<b>d</b>	Shark finning			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Directed fishing for sharks is prohibited in the CCAMLR convention area since 2006 (Conservation Measure 32-18 - CCAMLR, 2017). Sharks are only caught accidentally in the fishery, mostly getting entangled in the line; they are not species which are desirable for their fins (Fields et al., 2017). They are cut off to avoid being brought on board causing additional stress to the sharks and to avoid causing injury to the crew. Fishery controllers (COPEC) control 25% of the lines hauled but they reconcile all products kept on board from the e-logbook and factory's log records (Avistock, Observer reports). There is a high degree of certainty that shark finning does not take place.		
<b>e</b>	Review of alternative measures to minimise mortality of unwanted catch			
	<b>Justification</b>	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	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.

			species and they are implemented as appropriate.	
	<b>Met?</b>	Y	N	N
	<b>Guidepost</b>	<p>There are two dimensions to the strategy in place: 1) bycatch reduction for all fish species and 2) cut-off of rays species to increase post-capture survival. Over the years and across toothfish longline fisheries in the CCAMLR area, a number of alternative strategies have been tried (CCAMLR, 2017a). The current mix of unwanted bycatch reduction measures is now widespread. For both UoAs, the TAAF reviews the effectiveness of measures in place very regularly, and updates provisions as needed. Alternative measures are discussed at least annually at CCAMLR WG meetings. Importantly, the Code of conduct (CBC) to minimise the catch of rays has been gradually implemented since 2014, and at present nearly all skates/rays are cut off instead of being brought on board. Crew members verify that individual rays do not show obvious signs of morbidity before cutting them off. On this basis, since this issue is incorporated into the strategy, SG60 is met.</p> <p>Mortality from fishing is analysed to be within sustainable limits for all 'main' (and 'minor') species (MNHN, pers. comm.). But during the RBF workshop the MNHN stated that the survival of all species of cartilaginous rays cut off is probably zero because of damage to the cartilage caused by being brought up from great depths on the longlines. A regular review of the effectiveness cut-off measures is therefore needed. SG80 is not met.</p>		
	<b>References</b>	TAAF, 2015 ; TAAF, 2017a, Nowara et al. 2017 ; Fields et al., 2017, MNHN Code of Conduct (CBC), 2014. MNHN, pers. Comm.		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>75 (both UoAs)</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>1</b>

Evaluation Table for 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	
a	Information adequacy for assessment of impacts on main secondary species				
	Guidepost	Qualitative information is <b>adequate to estimate</b> the impact of the UoA on the main secondary species with respect to status. OR If <u>RBF is used to score PI 2.2.1 for the UoA</u> : Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	Some quantitative information is available and <b>adequate to assess</b> the impact of the UoA on main secondary species with respect to status. OR If <u>RBF is used to score PI 2.2.1 for the UoA</u> : Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	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.	
	Met?	<b>UoA1-Kerguelen</b>	Grenadier - Y (RBF) Kerguelen sandpaper skate - Y (RBF)	Grenadier - Y (RBF) Kerguelen sandpaper skate - Y (RBF)	Grenadier - N (RBF) Kerguelen sandpaper skate - N (RBF)
		<b>UoA2-Crozet</b>	Grenadier - Y (RBF) Blue antimora - Y (RBF) Whiteleg skate - Y (RBF)	Grenadier - Y (RBF) Blue antimora - Y (RBF) Whiteleg skate - Y (RBF)	Grenadier - N (RBF) Blue antimora - N (RBF) Whiteleg skate - N (RBF)
	Justification	A PSA has been conducted for all 'main' secondary species. Not all key information on the species life history strategies (esp. ages) is well known, but adequate qualitative and quantitative information are available to estimate productivity, and a large amount of information are available to estimate the species susceptibility to the fishery (see refs and Appendix 2). SG80 is met.  The RBF is used, there is no high degree of certainty. SG100 is not met.			
B	Information adequacy for assessment of impacts on minor secondary species				
	Guidepost			Some quantitative information is adequate to estimate the impact of the	

				UoA on minor secondary species with respect to status.
	<b>Met?</b>	<b>UoA1-Kerguelen</b>		Y
		<b>UoA2-Crozet</b>		Y
	<b>Justification</b>	Information is regularly collected to estimate the impact of the UoAs on the minor secondary species that are mostly caught, or caught in association with others (see Nowara et al., 2017). Regarding an estimation of productivity, the information collected by the COPEC and validated by the MNHN would need to be analysed and published, but quantitative information from surveys (in addition to POKER for UoA1) of offshore Banks, and fishery-dependent data all reveal stable or increasing CPUE trends (MNHN, Duhamel pers. com.). SG100 is met.		
<b>c</b>	Information adequacy for management strategy			
	<b>Guidepost</b>	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> .
	<b>Met? (both UoAs)</b>	Y	Y	N
	<b>Justification</b>	Information is available from various international and French research cruises on and around the Kerguelen Plateau (UoA1 - POKER: MNHN 2018; Koubbi et al. 2016a) and Crozet (UoA2 - Marion Dufresne: Duhamel et al., 2005 ; Koubbi, 2013 ; Koubbi et al., 2016b) and several areas of the Southern Indian Ocean. All these information, combined with expert knowledge on the species likely productivity shared during the RBF workshop by MNHN scientists (Duhamel et al, 2005) are more than adequate to support the current avoidance policy. SG80 is met. However, as the RBF is used for the main secondary species only, it is not possible to claim a high degree of certainty. SG100 is not met.		
<b>References</b>		Duhamel, G., N. Gasco and P. Davaine 2005, Koubbi 2013, Koubbi et al. 2016a&b, Nowara et al. 2017, MNHN 2018 POKER 4		
<b>Secondary species</b>		<b>UoA 1 (Kerguelen)</b>	<b>UoA 2 (Crozet)</b>	
<b>Grenadier</b>		<b>x</b>	<b>x</b>	<b>80</b>
<b>Kerguelen sandpaper skate</b>		<b>x</b>		<b>80</b>

Blue antimora		x	80
Whiteleg skate		x	80
Minor species	x	x	90
<b>OVERALL PERFORMANCE INDICATOR SCORE</b>			<b>UoA 1: 85</b> <b>UoA 2: 85</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		<p>The UoA meets national and international requirements for the protection of ETP species</p> <p>The UoA does not hinder recovery of ETP species</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guidepost	Where national and/or international requirements set limits for ETP species, the effects of the UoA 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?	N/a	N/a	N/a
	Justification (both UoAs)	The fishery interacts with seabirds and marine mammal ETP species (see Section 2.4.8). There are strict requirements from CCAMLR, the French and the fishery-specific and environmental protection TAAF legislation (TAAF protected species list) to keep impacts as low as possible. Any incident is closely monitored on each vessel by the COPEC. However, formal 'limits' (national or international) which trigger management action are not in place for any of these species groups. This scoring issue was therefore not scored.		
b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not <b>hinder recovery</b> of ETP species.	Known direct effects of the UoA are <b>highly likely</b> to not <b>hinder recovery</b> of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	Y	Y	Y
	Justification (both UoAs)	<p>Direct effects come essentially from interactions with the fishing vessel (birds only) and fishing gear (hooks and lines), that can lead to morbidity and mortality.</p> <p>For <b>seabirds</b>: Three emblematic species of Southern Ocean seabirds have experienced mortality from the fishery in the past, the white-chinned petrel (<i>Procellaria aequinoctialis</i>), grey petrel (<i>Procellaria cinerea</i>) and giant petrel (<i>Macronectes</i> spp.). Mortality numbers have been drastically reduced to just a few individuals in both UoAs over recent years (CCAMLR, 2016b) through the implementation of avoidance measures during both setting and hauling of the lines. The replacement of two vessels out of the seven in the fleet with vessels hauling the line through a moon pool will reduce the fishery's impacts on seabirds even further. Based on recent data (Section 2.4.8.1) the fishery interacts with grey petrels (<i>Procellaria cinerea</i>) and white-chinned petrels (<i>Procellaria aequinoctialis</i>). The numbers of breeding pairs and</p>		

		<p>breeding success are regularly surveyed, and have shown that the current low levels of fishery's induced mortality have no detectable effects on the populations (N. Gasco, H. Weimerskirch pers. Comm.).</p> <p><b>Marine Mammals:</b> Direct interactions with longline fishing gear may result in drowning if a whale or seal becomes entangled in a line while it is set at the bottom. Direct interactions with marine mammals are vary rare. In 2016/17, one elephant seal (<i>Mirounga leonine</i>) was found dead entangled in a longline and reported immediately (COPEC report). This is a very rare incident. The population in the TAAF is the second largest in the world. It is regularly monitored and its status is stable or increasing (TAAF, 2016a).</p> <p>The most frequent impact on marine marine mammals is indirect, from the depredation caused by sperm whales (UoA1) and orca (UoA2) of fish caught on the lines (see section 2.3.3 and SIc below).</p> <p>There are presently no concerns about the status of any of the relevant populations (birds, marine mammals) and impacts are now considered highly likely to be within acceptable limits (H. Weimerskirch, N. Gasco and TAAF, pers. com.), therefore SG80 is met.</p> <p>The team considered unobserved mortality as a result of gear loss (through ghost fishing). Gear loss in this fishery is rare, due to the high cost involved in replacing any lost gear and the fact that all gear carry GPS-enabled radio beacons to facilitate retrieval. Hooks are also removed from any discarded fish to further prevent ghost fishing. The team did not consider that ghost fishing was a significant contributor to the UoAs' impact on ETP species.</p> <p>A large number of projects are on-going, which were presented at the 2017 Symposium on the Kerguelen Plateau (publication expected 2018). Numerous studies on the status of seabird and marine mammal population status and their interactions with the fishery have now been published to support the National Reserve extension (see TAAF, 2016), which ensures a "high degree of certainty", SG100 is met.</p>	
c	Indirect effects		
	<b>Guidepost</b>	Indirect effects have been considered and are thought to be <b>highly likely</b> to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	<b>Met?</b>	Y	Y
	<b>Justification (both UoAs)</b>	<p><b>Seabirds :</b> The fishery has a number of provisions to keep potential indirect impacts as low as possible, such as through the controlled discharge of offals, ban on the disposal of hooks, nylon lines and any plastic rubbish (CM 26-01 (2015) CCAMLR 2017).</p> <p><b>Marine mammals:</b> Indirect effects of the fishery on orcas and whales are monitored in both UoAs using photo-identification (see Labadie et al., 2015). The effect of "artificial food provisioning" on the survival and higher population growth rate of degrading vs. non-degrading pods of orcas in UoA2-Crozet has been demonstrated (Tixier et al., 2015). However, depredation behaviour in the pod of orca in question has been linked to significant direct interactions with IUU fishing vessels to the north of Crozet and does not exist in other pods or in Kerguelen (Tixier et al., 2017).</p> <p>For both seabirds and marine mammals, there is a high degree of confidence that indirect effects caused by the fishery are presently not significantly detrimental to the populations of ETP species. SG100 is met.</p>	

<b>References</b>	Protected species in the TAAF area <a href="http://www.taaf.fr/Liste-des-especes-protegees">http://www.taaf.fr/Liste-des-especes-protegees</a> TAAF, 2016, CCAMLR 2016b, CCAMLR 2017, CCAMLR, 2018a, b and c. Fisheries reports ; SCS 2017, Labadie et al., 2015, H. Weimerskirch, N. Gasco and TAAF, pers. com., Gasco et al., 2016, Tixier et al., 2010, 2015 and 2017.
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>	<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>	<b>N/A</b>

Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2		<p>The UoA has in place precautionary management strategies designed to:</p> <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> <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guidepost	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?	Y	Y	Y
	Justification (both UoAs)	There are CCAMLR conservation measures (CCAMLR, 2017) in place, in the French legislation for the TAAF national reserve (RNN) and as ministerial decrees to protect all TAAF indigenous species of birds (arrêté ministériel du 14 août 1998) and all species of marine mammals (arrêté ministériel du 1er juillet 2011). These have also been translated into measures specific to this fishery (TAAF fishery regulations, TAAF 2017a: art.10 Annexe II), which are highly likely to achieve the highest level of protection requirements of both national and international levels. Specifically, the TAAF fishery’s technical measures incorporate all relevant CCAMLR conservation measures, including for the protection of seabirds: mandatory night fishing, sinking longlines, streamer lines and bird exclusion devices, prohibition of discards and offal dumping while the line is being set (24-02 (2014); 25-02 (2016)), closed seasons and closed areas and TAAF, 2017a: 2). For marine mammals: protection and scaring and avoidance measures (TAAF 2017a: Annexe II- 1f)), together with comprehensive reporting obligations. Altogether, these constitute a strategy, SG80 is met. The recent extension of the RNN and of its remit, now extending to the entire Kerguelen and Crozet EEZs and therefore including both UoAs, ensures that monitoring, analyses, and management measures and responses are now linked up, to make a ‘comprehensive strategy’, SG100 is met.		
b	Management strategy in place (alternative)			

	<b>Guidepost</b>	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
	<b>Met?</b>	N/A	N/A	N/A
	<b>Justification (both UoAs)</b>	Not applicable (N/A) : Among the ETP species directly or indirectly impacted by the fishery, none have depleted populations, scoring issue a was used instead (FCR SA3.11.2).		
<b>c</b>	Management strategy evaluation			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification Met? (both UoAs)</b>	We noted that the comprehensive sets of measures do amount to a comprehensive strategy. In addition, the large amount of historical and recent information and quantitative scientific population census and analyses already available (Nicolas Gasco, pers. comm., Henri Weimerskirch, pers. comm.) support high confidence that the strategy to protect ETP species has been working and will work. SG100 is met.		
<b>d</b>	Management strategy implementation			
	<b>Guidepost</b>		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 is achieving its objective as set out in scoring issue (a) or (b).
	<b>Met?</b>		Y	Y
	<b>Justification (both UoAs)</b>	There is ample evidence that the measures / strategy are implemented successfully, from the COPEC reports and the CCAMLR Fishery's reports (2018 a and b). Bird fatalities have greatly decreased to low levels and marine mammals fatalities are extremely rare. SG80 is met. Historical monitoring, recent investigations of seabird and marine mammal populations in both Kerguelen and Crozet, and numerous on-		

		going research projects in support of the extended RNN (Koubbi et al., 2016 a and b) combine to provide clear evidence that the measures introduced have been implemented successfully and are achieving their protection objective. SG100 is met		
<b>e</b>	Review of alternative measures to minimize mortality of ETP species			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	N
	<b>Justification (both UoAs)</b>	<p>The fishery's potential risks to ETP species are closely monitored by the COPEC observer on-board on each vessel on behalf of the TAAF, now often complemented by a scientific observer for the National reserve (RNN). There are annual reviews of the measures effectiveness and the practicality of alternatives measures of seabird and marine mammal scaring have been discussed regularly at CCAMLR, and by TAAF with a presentation and discussions with the vessel captains at the annual C3P meeting. SG80 is met.</p> <p>Presently, there are numerous project specific research collaborations, although data exchange remains limited between the MNHN and the TAAF and SARPC, and even more with the research scientists outside the MNHN who work on the seabirds and marine mammals populations, which may limit more frequent reviews. There is no strategic provision to undertake biennial reviews. SG100 is not met.</p>		
<b>References</b>	CCAMLR 2017, CCAMLR 2018 a and b, TAAF 2017a, Nicolas Gasco, pers. Comm., Henri Weimerskirch, pers. Comm., Koubbi et al., 2016 a and b			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <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		
Guidepost	<p>Qualitative information is <b>adequate to estimate</b> the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is <b>adequate to estimate productivity and susceptibility</b> attributes for ETP species.</p>	<p>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.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>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.</p>
Met?	Y	Y	Y
Justification (both UoAs)	<p>For all fisheries in the CCAMLR Area, the numbers of birds and marine mammals caught and released or killed must be reported on a monthly basis (CM 23-04 (2016) - CCAMLR, 2017) . Although this does not apply to fisheries in the French EEZs, monthly data are reported by the TAAF for both UoAs (CCAMLR, 2018 a and b). Any incident, has to be reported in the logbooks and to the COPEC. Wounded or dead birds have to be examined by the COPEC (TAAF, 2017a : Annexe II). The observer coverage from COPEC is extensive (25% of all lines hauled) and now complemented by observers for the RNN as well, is more than adequate to assess impacts on seabird and marine mammals, including mortality of all ETP species. SG80 is met.</p> <p>Detailed quantitative information is available from the fishery (as above) and the populations (e.g. periodic census, tagging or fin identification; see Section 2.4.8) to evaluate the magnitude of the fishery’s impact, with high certainty. SG100 is met.</p>		
b	Information adequacy for management strategy		

	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification (both UoAs)</b>	There is a large and diverse amount of information from the fishery's operations and from ecosystem research and monitoring projects, as well as from other CCAMLR fisheries and jurisdictions, which is used to inform and support the conservation strategy for ETP species (TAAF (2017a). SG80 is met. Presently with activities deployed in support of the forthcoming extended RNN new management plan, the information available is more than adequate to support of a comprehensive strategy. SG100 is met.		
<b>References</b>		CCAMLR 2017, CCAMLR, 2018 a and b, COPEC reports (pers.comm.), TAAF 2017a		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for 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(s) covered by the governance body(s) responsible for fisheries management.		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guidepost	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?	Y	Y	N
	Justification	<p>Also see Section 2.4.9. Following the extension of the TAAF national reserve (RNN - TAAF, 2016 and 2017c) the managed areas to consider are the two French EEZs around the archipelagos of Kerguelen and of Crozet in their entirety.</p> <p>On the basis of the substratum, geomorphology, and (characteristic) biota (SGB) characteristics (FCR GSA3.13.2), the habitats most commonly encountered in both fisheries are ‘fine sediments, with a mix of solitary epifauna (ascidians, bryozoans), crinoids, corals and mixed large erect communities’ (table GSA6). For both UoAs, the epifauna is mostly solitary; and colonial epifauna is considered in the next SI under VMEs.</p> <p>Impacts of demersal longline gear have been described in detail for other certified toothfish fisheries using video cameras rigged to the longlines to describe the « fine furrows » left by the lines during hauling (Acoura, 2018b, SCS, 2017) and very light substrate imprint ( Welsford, Sumner &amp; Ewing, 2014).</p> <p>The overall footprint of demersal longlines is increasingly well known. For the HIMI fisheries on the Kerguelen Plateau, Australian scientists estimate that less than 0.1% of their EEZ between 400m and 2 000m depth was impacted, up to 0.6% between 1 600m and 1 800m (Welsford, Sumner &amp; Ewing, 2014). The spatial footprint of the fishery is likely to be of the same order of magnitude for UoA1-Kerguelen and UoA2-Crozet. On this basis, it is highly unlikely that the UoAs fishing activities reduce habitat structure and function for commonly-encountered habitats to the point of serious or irreversible harm. SG80 is met.</p> <p>However, the evidence is not directly collected for the fisheries SG100 is not met. A recommendation (#5) is issued, for the TAAF and associated scientists to conduct a footprint analysis for each UoA, as part of building an understanding of habitat impacts and to eliminate the need to extrapolate from evidence built for other fisheries.</p>		
b	VME habitat status			

	<b>Guidepost</b>	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.
	<b>Met? (both UoAs)</b>	Y	Y	N
	<b>Justification</b>	<p>Also see Section 2.4.9. The specific location, biodiversity importance and biogeography of the fisheries UoAs are such that a large amount of data collection and research have gone into the description of VME habitat indicators since the fishery has first been certified. The MNHN team has developed a specific data acquisition protocol, based on the collection, weighing and photographing of samples of benthic macroinvertebrates with subsequent identification by taxonomic experts since 2015. The protocol has been tested for forth UoA1-Kerguelen and for UoA2-Crozet and was presented at the CCAMLR Ecosystem Monitoring WG (WG-EMM) in 2017. It aims to assist in producing presence and abundance data for benthic macro-invertebrates caught during fishing in order to provide additional information on the distribution of VMEs and assist in the development of MPAs by improving habitat mapping (see Martin et al., 2017) and ecoregionalisation for both UoAs (Koubbi et al., 2016 a and b). Catch rates are low and observations provide evidence suggesting that the fishery is highly unlikely to reduce habitat structure and function to the point of serious or irreversible harm. SG80 is met.</p> <p>For the HIMI fisheries on the Kerguelen Plateau, Australian scientists estimate that less than 0.1% of their EEZ between 400m and 2 000m depth was impacted, up to 0.6% between 1 600m and 1 800m (Welsford, Sumner &amp; Ewing, 2014). For the New Zealand longline fishery in the Ross Sea, Sharp et al. (2009) estimate that 0.008% of stony coral populations have been impacted by fishing gear, increasing to 0.088% in the most heavily fished areas. Impacts at Kerguelen and Crozet should be of similar orders of magnitude, recalling that only a limited number of vessels are permitted to operate in a large area. However, the evidence is not directly related to the fisheries is both UoAs do not SG100 is not met.</p>		
<b>c</b>	<b>Minor habitat status</b>			
	<b>Guidepost</b>			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.
	<b>Met?</b>			N
	<b>Justification</b>	The comprehensive data accumulated by the MNHN, reinforced by data collection protocols developed of the years and just published providence enough evidence of what minor deep reef habitats may be. The same evidence was used to justify the full protection of most of		

		the Skiff Bank as part of the extended RNN. As a result, it is highly likely that the fishery cannot reduce structure and function of minor habitats in both UoAs, but further analyses are needed for both UoAs . SG100 is not met.
<b>References</b>		TAAF, 2016; TAAF, 2017c; Sharp et al. 2009; Welsford, Sumner & Ewing, 2014; Martin et al., 2017; Koubbi et al., 2016 a and b; SCS, 2017; Acoura, 2018b
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation Table for 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
a	Management strategy in place			
	Guidepost	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?	Y	Y	Y
	Justification	One of the Fishery's Management Plan (FMP) objectives is "to devise a spatial and temporal management system to preserve areas of representative marine biodiversity, avoid a concentration of fishery's catches and a significant modification of habitats" (TAAF 2015, CU Pesca own translation). The fishery's impacts on habitats are minimised through two main management measures to control its spatial footprint: i) the permanent (coastal waters, all areas shallower than 500m, the Skiff Bank inside the extended RNN) and temporary (limited fishing seasons) closure and ii) a mandatory 2nm 'move-on' rule if the line brings up more 10kg VME/1 000 hooks (TAAF, 2017a). Other technical measures include the prohibition of non-organic waste dumping at sea including hooks and other fishing gear components. Together these measures ensure that the Habitat Outcome performance level achieve 80 or more, so SG80 is met. Gear loss in this fishery is rare, due to the high cost involved in replacing any lost gear and the fact that all gear carry GPS-enabled radio beacons to facilitate retrieval. Hooks are also removed from any discarded fish to further prevent ghost fishing. Within the overarching scope of CCAMLR Conservation measures (CCAMLR, 2017) 22-06 (2017) and 22-07 (2017) on bottom fishing, which do not apply to the French EEZs but are applied nonetheless, the fishery-specific measures described above are complemented by biodiversity conservation measures aimed at marine species and habitats inside the extended RNN. Altogether, they constitute a multi-tier strategy. There are no other MSC UoAs/non-MSC measures for fisheries in the French EEZs of UoA1-Kerguelen and UoA2-Crozet, SG100 is met.		
b	Management strategy evaluation			
	Guidepost	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?	Y	Y	N
	Justification	The measures in place for the fishery are considered very likely to work, on the basis of the COPEC reports, which notes every encounter with VME elements from 25% of all lines hauled. For each UoA. SG80 is met. It is still early days, and the analyses of VME collected on the basis of		

		a standardised protocol (Martin et al., 2017) are have recently now begun. Therefore there has been no testing of the strategy yet, SG100 is not met.		
<b>c</b>	<b>Management strategy implementation</b>			
	<b>Guidepost</b>		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).
	<b>Met?</b>		Y	N
	<b>Justification</b>	The MNHN has an extensive collection and information database of VME elements collected by the fishery in both UoAs. There is some quantitative evidence that the the measures to protect habitats are successfully implemented. SG80 is met. However the strategy has no quantitative targets at present, and available quantitative evidence hasn't been used to test its implementation yet. SG100 is not met.		
<b>d</b>	<b>Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs</b>			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	Both UoAs have the same data collection and on board control regime with a COPEC on board each vessel, examining and collecting VME elements from 25% of all lines hauled, and checking compliance with the move on rules. No instances of non-compliance has been noted (see section 2.5.7. SG100 is met		
<b>References</b>		CCAMLR 2017; TAAF 2015, 2017a, 2017b; Martin et al., 2017, COPEC reports (pers. Comm.)		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>90</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for PI 2.4.3 – Habitats information

<b>PI 2.4.3</b>		<b>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.</b>		
<b>Scoring Issue</b>		<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
<b>a</b>	Information quality			
	<b>Guidepost</b>	The types and distribution of the main habitats are broadly understood. OR If CSA is used to score PI 2.4.1 for the UoA: Qualitative information is adequate to estimate the types and distribution of the main habitats.	The nature, distribution and vulnerability of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA. OR If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The COPEC reports evaluate catches of ‘VME taxa’ (hard and soft corals, anemones, bryozoans, crinoids and brachiopods are mentioned). The types and distribution of the main habitats have been described within ecoregions, for both UoA1-Kerguelen and UoA2-Crozet (Koubbi et al., 2016 a and b). VME indicator specimen collection has been going on since 2014 are identified to the species level and with precise gps coordinates. The current level of detail, scale and intensity corresponds to CCAMLR recommendations and best practice (CCAMLR, 2018 - CM 22-06). SG80 is met. Given the large extent of both UoAs fishing grounds, it is not possible to say that “all” habitats are known over their range until the fine mapping exercise planned by TAAF RNN is completed. SG100 is not met.		
<b>b</b>	Information adequacy for assessment of impacts			
	<b>Guidepost</b>	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear. OR If CSA is used to score PI 2.4.1 for the UoA:	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 and on the timing and location of use of the fishing gear. OR	The physical impacts of the gear on all habitats have been quantified fully.

		Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	If CSA is used to score PI 2.4.1 for the UoA: Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The nature of the main impacts from longline gear has been documented in detail in the HIMI fishery, through the use of underwater cameras (Welsford et al., 2014). For this fishery, the main habitats have been described into bioregions (Koubbi et al, 2016 a and b). The precise location of the lines, their length and soak date and times are recorded precisely. The information is complemented by the taxonomic identification and quantification of VME elements brought up by the lines and collected by the COPEC and crew (Martin et al, 2017). SG80 is met. Given the large extent of both UoAs fishing grounds, it is not possible to say that physical impacts of the gear on “all” habitats have been quantified fully. SG100 is not met.		
<b>c</b>	<b>Monitoring</b>			
	<b>Guidepost</b>		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	<b>Met?</b>		Y	N
	<b>Justification</b>	As a routine on-going process on board each vessel during the whole fishing season, every year, the information on VMEs is collected from 25% of all lines hauled by the COPEC. The crew also collect any significant VME element for the COPEC to inspect. The team finds the information more than adequate to detect any increase in risk to the main habitats. SG80 is met. The RNN is planning to progressively map out all benthic habitats inside its perimeter. Until this is done, changes in habitats distributions over time cannot be measured. SG100 is not met.		
<b>References</b>		CCAMLR 2018; Koubbi et al., 2016 a and b, Martin et al., 2017		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Evaluation Table for PI 2.5.1 – Ecosystem outcome**

<b>PI 2.5.1</b>		<b>The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.</b>		
<b>Scoring Issue</b>		<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
<b>a</b>	<b>Ecosystem status</b>			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	<p>The fishery direct and indirect impacts on the ecosystem are mainly:</p> <ul style="list-style-type: none"> <li>• Removal of toothfish and non-target species (grenadier, antimore, rays) biomass</li> <li>• Interactions with the foraging behaviour of some predators, seabirds and marine mammals, which could alter some predator-prey relationships</li> <li>• Interactions on VMEs</li> <li>• Addition from lost gear and rubbish to the ecosystem.</li> </ul> <p>Management is in place to deal with all these interactions (see 1.2.1, 1.2.2, 2.2.2, 2.3.2 and 2.4.2 for details). The footprint of the fishery on the ecosystem is small, by function of the small number of vessels authorised to fish in a large area and the limited range of species that are targeted. Therefore it is highly likely that the UoAs are effectively managed to avoid disrupting key elements of the ecosystem structure and function. SG80 is met. Numerous studies provide evidence of the richness and extent of the ecosystems around Kerguelen and Crozet and more will be published that were presented at the 2<sup>nd</sup> Symposium on the Kerguelen Plateau in November 2017. Evidence is also available from the MNHN and other research teams presentations at CCAMLR, and from the TAAF RNN monitoring programme of bird colonies and marine mammal populations for (TAAF, 2018a), for both UoAs. SG100 is met.</p>		
<b>References</b>		TAAF, 2018a; Tixier et al., 2010, 2015, 2017; MNHN, 2014; Nowara et 2017; Gasco et al., 2015, 2016a and b; Koubbi et al. 2016 a and b		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for 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
a	<b>Management strategy in place</b>			
	<b>Guidepost</b>	There are <b>measures</b> in place, if necessary which take into account the <b>potential impacts</b> of the fishery 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.
	<b>Met?</b>	Y	Y	Y
	<b>Justification</b>	The TAAF FMP has provisions to minimise all the impacts listed above, in particular through the restricted number of vessels, closed seasons and extended protected areas; fishing operations at night and devices to limit interactions with seabirds; move-on rules to limit bycatch and interactions with marine mammals species and VMEs; and the strict control of rubbish disposal. The fishery is being managed in accordance with the requirements of CCAMLR for precautionary ecosystem-based management of fisheries, and with the exception of depredation, there are no major impacts documented, on the target species, bycatch species, ETP species, or on habitats. Depredation monitoring and measures are in place (short lines, move-on, interruption of hauling activities) to minimise their occurrence. SG80 is met. The TAAF RNN Management Plan complement the FMP to address all main ecosystem impacts. SG100 is met		
b	<b>Management strategy evaluation</b>			
	<b>Guidepost</b>	The <b>measures</b> are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ 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
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The FMP measures are implemented on a continual basis, and their effectiveness is scrutinised at least once a year during the C3P (TAAF, 2017b). Based on the information collected by the COPEC on board each vessel in both UoAs, the statistics on catch, bycatch, interactions with ETP species and their report to CCAMLR (2018 a and b) and the RNN annual report (TAAF, 2018a) provide an objective basis to be		

		confident that the strategies (FMP and RNN MP) work. SG80 is met. However, the current FMP does not include regular testing, SG100 is not met.	
<b>c</b>	<b>Management strategy implementation</b>		
	<b>Guidepost</b>		There is <b>some evidence</b> that the measures/partial strategy is being <b>implemented successfully</b> .
	<b>Met?</b>		Y
	<b>Justification</b>	The COPEC reports and annual Fisheries reports to CCAMLR (2018 a and b) provide clear evidence that the management plans (FMP and RNN M) are implemented systematically and to good effect. SG80 is met. The success of measure to reduce impacts on all key elements of the ecosystems of both UoAs is visible from the decrease in bird mortality achieved over the course of the first certification period and the remaining low levels of impacts and interactions with the other ecosystem components. SG100 is met.	
<b>References</b>	COPEC reports (pers.comm.) CCAMLR (2018 a and b); TAAF 2017a, 2018a		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

Evaluation Table for 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
a	<b>Information quality</b>			
	<b>Guidepost</b>	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.	
	<b>Met?</b>	Y	Y	
	<b>Justification</b>	There are no recent ecosystem model for UoA1-Kerguelen or UoA2-Crozet, but there is information on the various key components of the ecosystem separately, including i) fishery- dependent data on fish, mammals and VMEs; and ii) population estimates for toothfish, birds and marine mammals, including some demographic analysis. It is possible to evaluate the role of these various elements in the ecosystem, as has been done for top predators (Delors et al., 2013). Some other sub-Antarctic ecosystems are better understood, and research conclusions can be to some extent extrapolated. Overall, the team considered that this information is sufficient to broadly understand they key elements of the ecosystem. SG80 is met.		
b	<b>Investigation of UoA impacts</b>			
	<b>Guidepost</b>	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> .
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The main impacts of the fishery can be inferred from the above information; notably from the fishery-dependent data and the RNN monitoring programs of birds, marine mammals and VMEs. Some issues have been investigated in detail (e.g. the impact on toothfish via a stock assessment, ecology and demographics of marine mammals) and others less so (e.g. impacts on VMEs). Overall, information is sufficient to conclude that the fishery is not at all likely to be having a significant impact on any of the ecosystem elements (trophic structure and function etc.), SG80 is met. The gear impact on habitats and main trophic interactions between the UoAs and key ecosystem elements have not been presented in detail, SG100 is not met.		
c	<b>Understanding of component functions</b>			

	<b>Guidepost</b>		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are <b>known</b> .	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are <b>understood</b> .
	<b>Met?</b>		Y	Y
	<b>Justification</b>	<p>The ecology of the Patagonian toothfish is relatively well known and continues to be investigated, via the POKER research cruises at Kerguelen and via tagging. The ecology of retained species is less well known, although various research cruises in Kerguelen (POKER – MNHN 2018) and Crozet (Marion Dufresne) cruises have collected enough information to devise a bioregionalisation and prioritise habitats to protect for the RNN extension (Koubbi et al., 2016a and b, TAAF 2016) for example on species species determination, aging (otoliths), stomach contents, size-frequency by zone and depth etc. Likewise, the ecology of the birds and mammals is understood and have been studied in detail at Kerguelen and Crozet; some rays and shark species may be less well known, but in any case, the impact of the fishery on these species is very small. Habitats and VME species are increasingly better known, with VME species for the most part filter feeders (corals, crinoids, bryozoans , brachiopods); some may be a food source for other demersal species but most likely their key ecosystem role is to provide structure. Overall, therefore, the main functions of the components in the ecosystem are known or can be inferred with reasonable confidence – SG80 is met. The main functions of these components are understood and the impacts of the UoA on each can be evaluated or inferred (e.g. see 1.1.1, 2.2.1, 2.3.1, 2.4.1). SG100 is met.</p>		
<b>d</b>	Information relevance			
	<b>Guidepost</b>		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.
	<b>Met?</b>		Y	Y
	<b>Justification</b>	<p>The fishery's UoAs impacts on the ecosystems components (P1 target species, primary, secondary and ETP species and Habitats) and their key specific elements (direct and indirect effects on species, VME elements) are followed in detail as part of the FMP and the RNN MP. SG100 is met.</p>		
<b>e</b>	Monitoring			
	<b>Guidepost</b>		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.

	<b>Met?</b>		Y	Y
	<b>Justification</b>	Data collected by the COPEC and the RNN observers on board the vessels are detailed and precise for all the various components. Significant changes in the impacts of the fishery on ecosystem components could easily be evaluated for both UoAs. The information collected for the FMP (TAAF, 2015) and the RNN MP and the various associated long-term research projects associated to it (see TAAF, 2016) are more than adequate to support both strategies. SG100 is met.		
<b>References</b>	Koubbi et al., 2016a and b, TAAF 2016; MNHN 2018; COPEC report (pers.comm.); TAAF, 2015, 2016; Delors et al., 2013			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>95</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

### Appendix 1.3 Principle 3

#### Evaluation Table for PI 3.1.1 – Legal and/or customary framework

PI 3.1.1	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> <li>• Is capable of delivering sustainability in the UoA(s); and</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		
Guidepost	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?	Y	Y	N
Justification	<p>The fishery takes place in the EEZs of the French islands territories of Kerguelen (UoA1) and Crozet (UoA2) in the CCAMLR Convention area. France is a member of CCAMLR and has transposed or extended all relevant CCAMLR conservation measures into the French legal system. The fishery is managed by the French local government office of the TAAF ('terres australes et antarctiques françaises' – French Southern and Antarctic lands) based in La Réunion. The French Fisheries legislation (France, 2018) provides the overall framework for the management of the vessels, crew welfare and compliance with key international obligations and voluntary measures such as the FAO Code of Conduct, Port State measures, fight against IUU (MSC Principle 1) and International Plans of actions (MSC Principle 2). There is also an ongoing active research collaboration between scientists, in particular with the Australian and New Zealand scientific teams, through CCAMLR and with a second international symposium of the Kerguelen Plateau (and other Antarctic territories) held in Tasmania in 2017. The SARPC is also an active member of COLTO, the Coalition of Legal Toothfish Operators, which shares best practice and aims to reduce longline toothfish fisheries ecosystem impacts.</p> <p>At national level, there are presently four ministries collaborate in the management of the fishery with vessel owners and environmental NGO through a recently reformed Consultative Committee (GTPA) advising the préfet before decisions are taken.</p> <p>Locally, the fishery's management system is formalised as a Fishery's management plan (FMP) set out in TAAF Arrêté n° 2015-102 of 1<sup>st</sup> September 2015 for 3 years, which is currently being revised. The FMP gives the TAAF administrator (the Préfet) the ultimate decision-making role in the fishery, including: setting the level of the TAC in each UoA and dividing it into vessel quotas; giving authorisations to fish; determining the rules and technical regulations of fishing activities in waters under its jurisdiction. Licences to fish and shares of the TACs are awarded to a limited number of fishing</p>		

	<p>companies and specific fishing vessels on an annual basis and are non-transferrable. They can be suspended or removed in case of infraction, and are not automatically transferrable if a vessel is upgraded or replaced. The FMP defines the terms of its cooperation with the MNHN who provides scientific advice.</p> <p>The management measures are consistent with that set out by CCAMLR: the stock assessment uses CCAMLR tools and follows the CCAMLR process, the harvest strategy is evaluated in relation to CCAMLR precautionary reference points (Principle 1). Regarding Principle 2, CCAMLR measures for minimising incidental mortality of seabirds are fully implemented, and measures are also in place in relation to interactions with non-target species, marine mammals and Vulnerable Marine Ecosystems (VMEs). TAAF has also introduced additional specifications that reinforce those of CCAMLR, such as for the toothfish harvest strategy (60%B<sub>0</sub>) and numerous obligations to reduce the fishery's potential impacts on the ecosystem. The TAAF cooperation with other parties takes place through several advisory bodies : CCTA, GTPA and C3P, with increased transparency over the years. SG80 is met.</p> <p>However, there are currently no binding obligations for TAAF to consider the SARPC demands to evaluate the effectiveness of the multitude of measures that may prove antagonistic, and the arrangements between ministries and the TAAF have not been entirely formalised as the fishery has developed. For example, the TAAF do not yet have access to the MNHN database based on the data they collect, including through the COPEC. In addition, the scientists collaborating with RNN on monitoring seabird and marine mammal populations do not have access to the MNHN database. Therefore, some of the binding procedures to deliver management outcome consistent with P1 and P2 are missing. SG100 is not met.</p>			
<b>b</b>	<b>Resolution of disputes</b>			
	<b>Guided ost</b>	The management system incorporates or is subject by law to a <b>mechanism</b> for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution 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.	The management system incorporates or is subject by law to a <b>transparent mechanism</b> for the resolution of legal disputes that is appropriate to the context of the fishery and has been <b>tested and proven to be effective</b> .
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>There has been no international dispute in the fishery, which takes place entirely within the French EEZs of Kerguelen and Crozet. Regarding national disputes, the French fisheries management system comes under the administrative legal system, which has specific tribunals with transparent mechanisms that are considered to be effective in most cases, SG80 is met.</p> <p>The system was tested in 2016-2017 when the TAAF allowed an additional vessel to fish in both UoAs, in contradiction with the provisions of the FMP, which had fixed the maximum number of vessels allowed to fish at the existing number of 7. However, in response to the threat of legal challenge, the TAAF subsequently amended the FMP, to allow a maximum of 7 vessels « at any one time ». Therefore although the system has been tested and can be considered to be effective in dealing with most issues, it cannot be said that this particular dispute resolution was appropriate, so SG100 is not met.</p>		

<b>c</b>	<b>Respect for rights</b>			
	<b>Guided ost</b>	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 s 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.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	There are no indigenous people at Kerguelen or Crozet. The rights of SARPC members are assured by the limited licensing system and on the basis of clearly defined criteria and conditions (France, 2009, 2018. Chapitre 1er, décret n° 2009-1039 and TAAF 2015). Licences cannot be removed without just cause and without due process. SG80 is met. Details of the criteria used by TAAF to decide annual variations in individual vessel quotas have been communicated to the SARPC (and the audit team) for the first time during the re-certification audit in 2018. The criteria have been modified to force a gradual decrease of the importance given to the vessels' track record (or historical involvement) in the fishery. This is in contrast with the French national, European and international practices. Clearly the TAAF do not formally commit to the legal rights established by custom. SG100 is not met.		
<b>References</b>	France, 2009, 2018; TAAF, 2015.			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring Issue	SG 60	SG 80	SG 100
a	Roles and responsibilities		
Guidepost	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?	Y	Y	Y
Justification	<p>Seven vessels take part in the fishery, the vessel owners are locally organized into the “Syndicat des armements réunionnais de palangriers-congélateurs” (SARPC), the client group for this re-assessment. They coordinate their contributions and collaborate to the information collection for research, fishing activities monitoring and surveillance, and fisheries management, and also contribute to the financing of the POKER research surveys.</p> <p>Institutions involved in the management process are as follows:</p> <ul style="list-style-type: none"> <li>• CCAMLR: Conservation Measures and annual reports (Working Groups, Scientific Committee and Plenary Report)</li> <li>• TAAF – DCPN: management of the RNN, scientific observation, research and monitoring , COPEC training</li> <li>• TAAF – DPQM: fishery’s vessel access and quota management, technical measures</li> <li>• MNHN: Stock assessment, scientific advice, COPEC data validation</li> <li>• Vessels: VMS, e-Logbooks and monitoring and research data collection and reporting</li> <li>• COPEC: Observer reports and scientific data</li> <li>• CROSS-RU: Monitoring, Control and Surveillance of fishing and potential IUU activities</li> <li>• Certified controllers: quayside catch certification</li> </ul> <p>The functions, roles and responsibilities of all involved are well understood for all key areas, SG80 is met.</p> <p>The fishery is managed by the territorial administration of the TAAF from the small island territory of La Réunion in the Indian Ocean, and therefore the main actors know each other well. Should a person, a group of individuals or special interest group be concerned, there are opportunities to be heard</p>		

		<p>through the current participants in the management systems, the offices of the local and sub-national (regional) governments, the members of French parliament elected representatives, and directly through the TAAF services that are in charge of fisheries management, environmental conservation and foreign affairs for Kerguelen and Crozet.</p> <p>The organisations involved in management and their roles and responsibilities, are given in an updated list (see Table 20 of this report). They are common to UoA1-Kerguelen and UoA2-Crozet. Their roles and responsibilities are clear, defined in the Management Plan (TAAF, 2015c) and other legislation, and are fully understood by all participants for all areas of responsibility and interaction, SG100 is met.</p>		
<b>b</b>	<b>Consultation processes</b>			
	<b>Guidepost</b>	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> .
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The final decision on the level of the TAC, as well as other regulations, is the responsibility of the administrative head of the TAAF (the “préfet”), taking into account the scientific advice of MNHN, as well as the views of the ministries of fisheries, overseas territories, environment and foreign affairs. The préfet decision is also informed by a Consultative Council that brings together scientists and other persons nominated by the various ministries (also advising on Nature Conservation and the management of the National Nature Reserve RNN) that meets twice a year. Information from SARPC vessels is taken into account (e-logbooks, COPECs etc.) as part of the scientific assessment process, and the companies are also represented on the French delegation to CCAMLR every year. Local knowledge from the vessel skippers and fishing companies is taken into account, regarding activities of suspected IUU vessels, which are successfully kept out of the fishery through close industry-government (CROSS-RU) collaboration.</p> <p>The fishing companies have been fully informed and involved in discussing the scientific basis of the management measures. However, the TAAF and MNHN have not clearly explained how some of the information was used in setting the TAC in the past. The decision-making process that leads to TAC changes is not always clear either, although it relates to scientific advice, and is eventually validated by the CCAMLR after the fact. The management system includes consultation processes, including through the Austral Fisheries Working Group (TAAF, 2017b), and the C3P (2018b) that presents how some of the information regarding individual vessels environmental impacts is used to compute changes in annual vessel quotas, although it does not explain exactly how it is used or not used. Only SG80 is met.</p>		
<b>c</b>	<b>Participation</b>			
	<b>Guidepost</b>		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.
	<b>Met?</b>		Y	N
	<b>Justification</b>	<p>There are relatively few stakeholders in the combined Kerguelen and Crozet toothfish longline fishery, because of its small size (7 vessels) and remote location. Most are involved in the management system in some way, as set out above. The engagement of NGOs is facilitated via participation in CCAMLR (with observer status), and for example, were mobilised by the Australian and French SARPC industry associations (see COLTO, 2015) and others in the region, to fight against IUU activities and the marketing of illegally caught toothfish. There are several forms of consultation, through the C3P, Working groups and Consultative committee meetings, which provide opportunities and for all interested and affected parties to be involved, and at least to be informed and voice concern. SG80 is met.</p> <p>The current review of the FMP and the extension of the RNN to include previously fished and currently grounds and its protection perimeter to extend to the entire EEZs for both UoAs is leading to a more inclusive and participatory process. Until now, however, consultation process with the vessel owners has been rather limited, and mostly shared limited information, usually after decisions have been made . Therefore SG100 is not met.</p>		
	<b>References</b>	TAAF, 2015c, 2017b, 2018b , COLTO, 2015		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

**Evaluation Table for PI 3.1.3 – Long term objectives**

<b>PI 3.1.3</b>	<b>The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.</b>		
<b>Scoring Issue</b>	<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
<b>a</b>	<b>Objectives</b>		
<b>Guidepost</b>	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are <b>implicit</b> within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are <b>explicit</b> within management policy.	Clear 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.
<b>Met?</b>	Y	Y	Y
<b>Justification</b>	<p>Long-term objectives exist for each decision-making level, regional (CCAMLR), national (France) and local (TAAF). France is a signatory to CCAMLR's key long-term conservation objectives; including the precautionary reference points (implementation of paragraph a), and the ecosystem approach to fisheries management and the bird mortality action plan (implementation of paragraphs b and c), as set out in the rationales for Principle 2.</p> <p>The EU Marine Strategy Framework Directive has been transposed into the French Environment Code (articles L. 219-9 à L. 219-18 et R. 219-2 à R. 219-17) that set out two priorities, an integrated management of the sea and coastal areas, and the protection and conservation of marine environment. France published its national integrated maritime policy at the end of 2009, the Blue Book - A national strategy for the sea and oceans (France, 2009). The French strategy is built around four priorities, i) Invest in the future – research, education, awareness; ii) Develop a sustainable economy of the sea (sustainable resource use, fisheries, shipbuilding, shipping, ports, marine recreation); iii) Promote the maritime dimension of the overseas territories – local authorities and stakeholders, assets and responsibilities, marine resources and economic development; and iv) Assert France's place on the international scene (international governance, contribution to EU integrated maritime policy, responsibilities, defence and security. The Strategy applies to all French overseas territories including (explicitly) the TAAF (also art. L219-2 of the Code de l'Environnement). Therefore, overarching objectives of the European directives apply, even though the TAAF are not part of the EU but only associated as an overseas territory.</p> <p>The team concludes that clear, long-term objectives to guide decision-making, are explicit in the management system SG80 is met. These long-term objectives are 'required by' the management system and SG100 is met in full.</p>		
<b>References</b>	CCAMLR, 1980, France, 2009, TAAF, 2016		
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>100</b>
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>

**Evaluation Table for PI 3.2.1 Fishery-specific objectives**

<b>PI 3.2.1</b>	<b>The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</b>			
<b>Scoring Issue</b>	<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>	
<b>a</b>	<b>Objectives</b>			
	<b>Guidepost</b>	<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 explicit within the fishery-specific management system.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	<p>The long-term objective defined by CCAMLR fish stock assessment (fsa) working groups is that the long-term (35-year) standing stock biomass stays above 50% of the estimated initial stock biomass <math>B_0</math> for both UoAs (Sinègre et al., 2017 a and b). Long-term objectives for the management of the fishery are set out in the French national legislation for the TAAF management of its fisheries already mentioned (France, 2009). These are to ensure the resource conservation and its optimal exploitation (Principle 1) and specifically for fishing activities to preserve marine ecosystems where the resources are found (Principle 2). The annual TAAF fisheries regulation (TAAF, 2017a) sets the same long-term objectives, which have been included in the FMP since 2015. Other objectives are to support long-term involvement of vessel owners and their contribution to data collection and research are indicated by the annual licence renewal criteria (art. 8 and 9). These are now complemented by the objective to maintain ecosystem functionalities of the TAAF trophic webs for the extended marine extension of the national Reserve (RNN), which now covers the entirety of Kerguelen and Crozet EEZs (TAAF, 2016).</p> <p>Since the publication of the Management Plan (TAAF, 2015), the short and long-term objectives are now explicit (section 1-4) and concern the conservation, optimal sustainable resource use, and minimization the fisheries' impacts on the ecosystems to avoid any risk of over-exploitation of the stocks (Crozet and Kerguelen). In relation to Principle 2, objectives are set out in the management plan for birds and the code of good conduct for bycatch and interactions with orca (depredation). Principle 2 short-term objectives also focus on gathering more information. Not all P2 objectives are, however, quantitatively measurable. SG80 is met, because short- and long-term objectives are explicit for Principles 1 and 2, but they are not all measurable, SG100 is not met.</p>		
<b>References</b>	Sinègre et al. (2017 a and b) ; France, 2009 ; TAAF 2015, 2016, 2017b			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>			<b>80</b>	
<b>CONDITION NUMBER (if relevant):</b>			<b>N/A</b>	

Evaluation Table for PI 3.2.2 – Decision-making processes

<b>PI 3.2.2</b>	<b>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.</b>		
<b>Scoring Issue</b>	<b>SG 60</b>	<b>SG 80</b>	<b>SG 100</b>
<b>a</b>	Decision-making processes		
<b>Guidepost</b>	There are some 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.	
<b>Met?</b>	Y	Y	
<b>Justification</b>	<p>There are clearly established decision-making processes in this fishery. For Principle 1 issues, the current Management Plan establishes that the TAC is fixed by the French government representative Head of TAAF (the préfet) from the scientific recommendations issued by the MNHN, on the basis of models presented and validated by the CCAMLR fish stock assessment working group (WG-FSA).</p> <p>MNHN provides advice including stock assessment. The four ministries (ministries in charge of fisheries, environment, foreign affairs and overseas territories) and vessel owners provide opinions for the préfet of the TAAF to decide. In her /his decisions, the préfet is supported by a Consultative Council that meets twice a year and the Austral Fisheries Working Group, that are able to discuss and make recommendations.</p> <p>Likewise for Principle 2 issues, there is a process for taking and implementing decisions – for example in relation to the recent code of good conduct for bycatch, advice is provided by MNHN, based on their own research and on CCAMLR good practice, following which TAAF takes the decision to incorporate the code into the regulations.</p> <p>These and other decisions have resulted in measures and strategies to achieve the objectives defined in particular through the 1<sup>st</sup> version of a Fishery Management Plan (TAAF, 2015) – even if some of the objectives are somewhat vague, SG80 is met.</p>		
<b>b</b>	Responsiveness of decision-making processes		
<b>Guidepost</b>	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.

	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Decisions have been made in response to serious issues identified in research, and annually within CCAMLR working groups – stock management, bird mortality, bycatch, VMEs etc. The fishery managers (TAAF DCPN and DPQM, and French ministries) collaborations within CCAMLR and with other fisheries in the region, and the extension of the TAAF-RNN to protect all marine area within Kerguelen and Crozet EEZ ensure that wider issues are taken into account. Decision-making has not always been transparent, but this has certainly improved greatly over the last few years – for example in relation to the peer review of the stock assessment by CCAMLR WG-FSA since 2011, the widened GTPA and the publication of the C3P minutes in 2018. SG80 is met. Transparency is not yet achieved for all issues covered by the FMP, as illustrated by the confusion created by a new entrant in 2016/17. SG100 is not met		
<b>c</b>	Use of precautionary approach			
	<b>Guidepost</b>		Decision-making processes use the precautionary approach and are based on best available information.	
	<b>Met?</b>		Y	
	<b>Justification</b>	The CCAMLR WG-FSA has confirmed that the TACs of UoA1-Kerguelen and UoA2-Crozet satisfy CCAMLR decision rules for the last few years, and is therefore precautionary. In addition, the TAAF choses an even more precautionary approach by using a target biomass of 60% of $B_0$ to guide its choice of TAC for each UoA ahead of each season. Potential fisheries ecosystem impacts are also monitored comprehensively through 100% observer coverage, and decisions such as fishing areas, new gear (e.g. traps), or depredation avoidance are evaluated scientifically as pilots before changes are introduced. The extension of the RNN protection perimeter to the entire EEZs is also precautionary (TAAF, 2017c). SG80 is met.		
<b>d</b>	Accountability and transparency of management system and decision-making process			
	<b>Guidepost</b>	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.
	<b>Met?</b>	Y	Y	N

	<b>Justification</b>	<p>A change of calendar following a recommendation from the previous certification period for both UoAs since the 2016/17 season means that scientific advice is now presented and validated at CCAMLR WG-FSA and circulated before TAC decisions are made for the next fishing season.</p> <p>The Groupe de Travail de la pêche australe (GTPA) brings managers (ministerial levels and TAAF), scientists and vessels owners together to discuss research findings and a wide range of topics, including the workplan to devise the new Fishery's Management Plan (FMP) during 2018 (TAAF, 2018b). It meets at least once a year and is scheduled to meet regularly to steer the revision of the Management Plan. The minutes have been communicated to the assessors in order to demonstrate the transparency of the new FMP process. TAAF territories are uninhabited, and the fisheries' management performance is closely scrutinised during the annual CCAMLR meetings, notably by scientists and environmental NGOs concerned with the fisheries' ecosystem impacts. Locally, information requests could be addressed to the TAAF and the RNN offices in Saint Pierre de la Réunion, also via their Facebook page. SG80 is met.</p> <p>A fully transparent and collaborative process is being initiated. Future practice will tell if the collaborative process between management, science and fishing companies remains effective, for the time being TAAF reporting to SARPC has mainly concerned the fishery's compliance with regulations, but the effectiveness of regulation and management actions has not been examined in detail. SG100 is not met .</p>		
<b>e</b>	<b>Approach to disputes</b>			
	<b>Guidpost</b>	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.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	Disputes relating to management of the fishery, including fishing rights for instance to challenge a suspension following an infringement, would be taken up through the French legal system, which prevails and has a specific "administrative" legal system to resolve disputes that individuals or companies may have with government decisions. The French system is considered effective and has been tested repeatedly in 2016/7 in relation to the additional vessel allowed in the fishery. However, the current management system has not acted proactively to avoid disputes, so only SG80 is met.		
<b>References</b>	TAAF, 2017c, 2018b			
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>				<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>				<b>N/A</b>

Evaluation Table for 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
a	MCS implementation			
	Guidepost	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?	Y	Y	Y
	Justification	<p>The fishery operates over a very large area of remote waters. The seven SARPC vessels are equipped with VMS and submit e-logbooks. As part of its fishing licence obligations, each fishing vessel has on board at all times a ‘contrôleur de pêche’ (fisheries controller COPEC) in charge of enforcement of the TAAF regulations as well as the collection of scientific data (TAAF, 2017a). COPECs report on the vessels’ respect for TAAF fisheries regulatory obligations, international, national and territorial (Title I art. 3 TAAF, 2001), although they do not hold enforcement powers. They also report on any suspected IUU activities from vessels seen in the zone (art. 5), as do the vessel’s captain and crew on permanent watch. COPECs submit a weekly report and a final report and data files at the end of each trip to TAAF for onward communication to the MNHN. Position information is also used in real-time to move away from interactions with species caught incidentally (rays), undersized toothfish, birds, orcas, whales and VMEs. VMS and reports of fishing information are also submitted to CCAMLR. The team found no evidence of contraventions other than minor.</p> <p>The catch is frozen, weighed and labelled on board, and weighed by an independent third-party surveyor upon landing. The data are provided to TAAF and MNHN and cross-checked against the fishing logbooks.</p> <p>Any potential IUU activities from the fleet or from non-authorized vessels are policed by the national fisheries surveillance (and sea rescue) organisation, with a regional office in La Réunion, the CROSS-RU. The CROSS-RU relies on satellite and radar surveillance of the UoA1-Kerguelen and UoA2-Crozet EEZ, patrols by the French navy and the fisheries surveillance vessel Osiris. They report no infringement from the fleet and an active and crucial cooperation to monitor and keep away foreign vessels that may try to fish illegally. They also have a regional MCS collaboration with joint surveillance activities with Australia and South Africa. France submits an annual report to CCAMLR and has reported no IUU fishing within the TAAF EEZs for some years, although IUU fishing still takes place to a small extent at the edge of the zones (MEDDE-DMSOI, 2015 and CROSS-RU pers. comm.). The system is comprehensive, SG100 is met.</p>		

<b>b</b>	Sanctions			
	<b>Guided post</b>	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.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	There are two systems for all TAAF fisheries, the national French system, which rules all international and national rules and regulations. It relies on a mix of penal and administrative sanctions linked to a point system. For the fishery, the TAAF issues additional fishery-specific regulations that are enforced through administrative sanctions, the most important one being a variation of the tonnage allocated annually as individual vessel quotas. The criteria behind TAAF's discretionary quota variations have been communicated to the team, but the calculations are not published and the vessels have complained repeatedly over the years that it is becoming increasingly difficult to understand what deterrence effect these are supposed to have. The issue has been examined in 2018 by a specific ministerial-level task force, which recommendation will be incorporated into the new FMP (TAAF, 2018b and pers. comm.). Until then, only SG80 is met.		
<b>c</b>	Compliance			
	<b>Guided post</b>	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.
	<b>Met?</b>	Y	Y	N
	<b>Justification</b>	The CROSS-RU (pers. comm.) have a high degree of confidence that fishers comply and collaborate closely with the fisheries MCS. Variations in compliance with TAAF regulations exist and lead to penalties (and bonuses) in the vessels' annual quota allocations. Until the detail of infringement to TAAF regulations are published, it is not possible to conclude about compliance with TAAF regulations with a 'high degree of confidence'. Only SG80 is met.		
<b>d</b>	Systematic non-compliance			
	<b>Guided post</b>		There is no evidence of systematic non-compliance.	
	<b>Met?</b>		Y	

	<b>Justification</b>	Both CROSS-RU and TAAF confirm that there is no evidence of systematic non-compliance whatsoever, SG80 is met
<b>References</b>	CROSS-RU, pers. comm.; MEDDE-DMSOI, 2015 ; RNN Management review (on-going); TAAF, 2001, 2017a, 2018b and pers. comm.	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>85</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation (both UoAs)

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	
a	Evaluation coverage			
	Guidepost	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?	Y	Y	N
	Justification	<p>TAAF and the French ministries in charge of this fishery review the performance of the management system and regulations every year through the GTPA (TAAF, 2018b) and as part of the licensing process and for presentation at CCAMLR. Fishing activities may also be modified on the basis of scientific advice, and most recently through the extension of the National Reserve (RNN), which has closed previously fished grounds on the Skiff Bank.</p> <p>During the fishing season, a fishery controller (COPEC) on board every vessel examines 25% of all lines hauled to check compliance with existing regulations, and the RNN may also place a scientific observer on board. The fishery management performance are presented and discussed with the vessel captains every year with the Consultative Committee (C3P TAAF, 2017b).</p> <p>The TAC may be reviewed on the basis of the MNNH stock assessment models and advice. The model and recommendations are also now reviewed by CCAMLR-fsa. Information on impact of the fishery on ecosystem components are also presented and discussed as part of the French report to CCAMLR, including Principle 1 (stock status) and key aspects of Principle 2 (e.g. bycatch, birds, marine mammals). SG80 is met.</p> <p>Until recently, not all parts of the management system were evaluated, such as the possibility of an additional vessel in the fishery or the basis for annual changes in individual vessel quota allocation. A review was conducted in 2017, which has now reported to the ministries in confidence. SG100 is not met.</p>		
b	Internal and/or external review			
	Guidepost	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</b> and <b>external</b> review.
	Met?	Y	Y	N

	<b>Justification</b>	<p>The CCAMLR annual meetings and TAAF annual activities have provided regular internal and occasional external reviews. SG80 is met.</p> <p>The new TAAF Management Plan for the fishery (FMP), expected to be published by the end of 2018, should incorporate the independent review findings as well as contributions from the ministerial departments. Until the new FMP is publicly available, and the new RNN management plan is published, SG100 is not met.</p>
<b>References</b>	<p>GTPA minutes : TAAF 2018b, C3P minutes TAAF 2017b, Mission interministérielle (confidential report), FMP review (on going), RNN Management review (on-going), CCAMLR 2018 a and b,</p>	
<b>OVERALL PERFORMANCE INDICATOR SCORE:</b>		<b>80</b>
<b>CONDITION NUMBER (if relevant):</b>		<b>N/A</b>

## Appendix 2 Risk Based Framework (RBF) Outputs

A possible use of the RBF was announced on 11th January 2018 for PIs 2.1.1 Primary species outcome and 2.2.1 Secondary species outcome. The workshop took place on the 14<sup>th</sup> February 2018, attended by the stakeholders listed in Table 27 (either present in the meeting room or taking part via teleconferencing). Prior to the workshop, the Information presented in Appendix 8 was sent to the stakeholders. Once information for the most recent years was examined, none of the primary species were deemed to be data-deficient. Therefore the RBF was only used for PIs 2.2.1 Secondary species outcome.

The Productivity-Susceptibility Analysis (PSA) combines an evaluation of the productivity of the species and the susceptibility of the population or stock to fishing activities. The scores were reached through consensus during the RBF workshop with a lead participation from the MNHN scientific team (pers. com. see Table 27), and direct references made to the MNHN Guide to Fishes of Kerguelen and Crozet (Duhamel, Gasco and Davaine, 2005).

Productivity considers and scores a series of attributes of the life history of the species and aggregates the scores into an arithmetic mean score. The scoring table for productivity is provided by MSC (Table 34), and includes density-dependence for invertebrate species, which are not examined here.

**Table 34. MSC PSA scoring table for productivity**

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

Susceptibility scores have four attributes for each species and/or stock. The scoring table provided by MSC (Table 35). The aggregate score is the the geometric mean.

**Table 35. MSC PSA scoring table for susceptibility**

	Low susceptibility / low risk – score 1	Medium susceptibility / medium risk – score 2	High susceptibility / high risk – score 3
Areal overlap	Overlap < 10%	Overlap 10-30%	Overlap >30%
Vertical overlap	Low overlap with fishing gear (strong depth refuge from fishing)	Medium overlap with fishing gear (small depth refuge from fishing)	High overlap with fishing gear (little or no depth refuge from fishing)
Selectivity	Individuals < size at maturity are rarely caught	Individuals < size at maturity are regularly caught	Individuals < size at maturity are frequently caught
	Individuals < size at maturity can escape or avoid gear	Individuals < half the size at maturity can escape or avoid gear	Individuals < half the size at maturity are retained by gear

	Low susceptibility / low risk – score 1	Medium susceptibility / medium risk – score 2	High susceptibility / high risk – score 3
Post-capture mortality	Evidence of post-release survival	Evidence of some released postcapture and survival. Released alive	Retained or majority dead when discarded

Using the two tables above, the scores and rationales for productivity and susceptibility established during the RBF workshop for the main secondary species in Table 28 are given in Table 36 to Table 39.

**Table 36. PSA Rationale Table – Grenadiers UoA1 and UoA2 (MNHN pers. com and Duhamel, G., N. Gasco and P. Davaine, 2005)**

PI number	2.2.1 Outcome (both UoAs)	
<b>a. Productivity</b>		
Scoring element (species)	<b>Grenadier (<i>Macrourus carinatus</i>)</b>	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Average age at maturity	Age at maturity not known, as usual for deep water species, but based on what is known about life span and life history the intermediate category (5-15 years) seems to be a precautionary score	2
Average maximum age	More than 25 years in any case for all Grenadier species	3
Fecundity	Very high fecundity (>20 000 eggs per female), based on observations from research cruises	1
Average maximum size	The maximum Total Length (TL) observed is 1.05m (PECHEKER database from MNHN) so a precautionary score is 2 (100-300 cm).	2
Average size at maturity	Approx. size is about 42cm for 1 <sup>st</sup> maturity; 2 is a precautionary score (40-200cm)	2
Reproductive strategy	Broadcast spawners	1
Trophic level	Benthic or pelagic feeder, including opportunistic predation, but not a top predator	2
<b>b. Susceptibility</b>		
Fishery only where the scoring element is scored cumulatively	For UoA1-Kerguelen and UoA2-Crozet, there are no other fisheries to consider for cumulative catch as per PF4.4.3	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Areal Overlap	The fishery potentially overlaps with more than 30% of the adult distribution range between 1 000 to more than 2 000m. Taking the entire stock into consideration, juveniles are found on the slope between 300-400m. Therefore they are protected because fishing is prohibited in areas shallower than 500m and in other MPAs.	3
Encounterability	Overlap with longline gear is low to medium, because the depth distribution of adult grenadiers, this species included, is mostly deeper than 1 000 m down to 2 000m and more.	UoA1: 2
		UoA2: 2

Selectivity of gear type	Grenadier juveniles are rarely found at the depths fished for toothfish (1 200m) and toothfish hook size means a low capturability.	1
Post capture mortality	Mortality expected to be 100% because of depth	3

**Table 37. PSA Rationale Table – Blue antimora (*Antimora rostrata*) ‘main’ in UoA2- (MNHN pers. com and Duhamel, G., N. Gasco and P. Davaine, 2005)**

PI number	2.2.1 Outcome (both UoAs)	
<b>a. Productivity</b>		
Scoring element (species)	<b>Blue antimora (<i>Antimora rostrata</i>)</b>	
Attribute	Rationale	Score
Average age at maturity	Age not known, but based on what is known about life span and life history the intermediate category (5-15 years) seems to be a precautionary score	2
Average maximum age	More than 25 years	3
Fecundity	Very high fecundity (>20 000 eggs per female)	1
Average maximum size	The maximum Total Length (TL) observed less than 1m (90cm form PECHEKER database from MNHN)	1
Average size at maturity	Approx. size at 1 <sup>st</sup> maturity is most likely intermediate (>40cm)	2
Reproductive strategy	Demersal eggs	2
Trophic level	Opportunistic scavenger (probably TL around 3)	2
<b>b. Susceptibility</b>		
Fishery only where the scoring element is scored cumulatively	For UoA1-Kerguelen and UoA2-Crozet, there are no other fisheries to consider for cumulative catch as per PF4.4.3	
Attribute	Rationale	Score
Areal Overlap	The fishery potentially overlaps with between 10% and 30% of the adult distribution range between to more than 3 000m. Juveniles are protected because fishing is prohibited in areas shallower than 500m and other MPAs.	2
Encounterability	Overlap with longline gear maybe considered high (>30%), because the depth distribution of adult antimora is similar to those at which longlines are set (700m to 1 500m)	UoA2: 3
Selectivity of gear type	Antmora juveniles are rarely caught at the depths fished for toothfish (1 200m) and toothfish hook size are large compared to antimora juvenile sizes means a low capturability	1
Post capture mortality	Mortality expected to be 100% because of depth difference	3

**Table 38. PSA Rationale Table – Kerguelen sandpaper skate - *Bathyrāja irrasa* - UoA1-Kerguelen only (MNHN pers. com and Duhamel, G., N. Gasco and P. Davaine, 2005)**

PI number	2.2.1 Outcome (UoA1 only)	
<b>a. Productivity</b>		
Scoring element (species)	<i>Bathyrāja irrasa</i>	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Average age at maturity	Between 5 and 15 years	2
Average maximum age	10-25 years	2
Fecundity	Very low fecundity (<100 eggs per female) ) - oviparous (based on logical argument for the species ecology)	3
Average maximum size	The maximum Total Length (TL) observed less than 1.3m (PECHEKER database, MNHN)	2
Average size at maturity	Approx. size at 1 <sup>st</sup> maturity is most likely interdmediate (>40cm) (86.5cm from PECHEKER database from MNHN)	2
Reproductive strategy	Demersal eggs	2
Trophic level	Opportunistic feeder	2
<b>b. Susceptibility</b>		
Fishery only where the scoring element is scored cumulatively	For UoA1-Kerguelen, there are no other fisheries to consider for cumulative catch as per PF4.4.3	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Areal Overlap	The fishery potentially overlaps with between 10% and 30% of the adult distribution range to more than 3 000m. Juveniles are protected because fishing is prohibited in areas shallower than 500m and other MPAs.	2
Encounterability	The Kerguelen sandpaper skate is found between 300m and 1500m, overlap with gear is taken to be medium.	2
Selectivity of gear type	Juveniles are not caught at the depths fished for toothfish (1200m) and toothfish hook size are large compared to juvenile mouth size means a low capturability	1
Post capture mortality	Mortality expected to be 100% because of depths at which the cartilage is pulled along	3

**Table 39. PSA Rationale Table – Whiteleg skate - *Amblyraja taaf* - UoA2-Crozet only (MNHN pers. com and Duhamel, G., N. Gasco and P. Davaine, 2005)**

PI number	2.2.1 Outcome	
<b>a. Productivity</b>		
Scoring element (species)	<b>Amblyraja taaf</b>	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Average age at maturity	Medium productivity: Between 5 and 15 years	2
Average maximum age	10-25 years	2
Fecundity	Low productivity: Very low fecundity (<100 eggs per female) – oviparous, based on ecology	3
Average maximum size	Medium productivity: Maximum Total Length (TL) observed less than 1m (113cm from PECHEKER database from MNHN)	2
Average size at maturity	Medium productivity: Approx. size at 1 <sup>st</sup> maturity is most likely interdimediate (>40cm)	2
Reproductive strategy	Medium productivity: demersal eggs	2
Trophic level	Medium productivity: Opportunistic scavenger	2
<b>b. Susceptibility</b>		
Fishery only where the scoring element is scored cumulatively	For UoA2-Crozet, there are no other fisheries to consider for cumulative catch as per PF4.4.3	
<b>Attribute</b>	<b>Rationale</b>	<b>Score</b>
Areal Overlap	The fishery potentially overlaps with between 10% and 30% of the adult distribution range beyond the shelf edge. Juveniles are protected because fishing is prohibited in areas shallower than 500m and by other MPAs (East of Crozet Archipelago).	2
Encounterability	The Whiteleg skate is found mostly between 30m and 650m, rarely deeper. Overlap with gear is taken to be medium as a precaution.	2
Selectivity of gear type	Juveniles are very rarely caught at the depths fished for toothfish (1 200m) and toothfish hook size are large compared to juvenile mouth sizes means a low capturability	1
Post capture mortality	Mortality expected to be 100% because of depths at which the cartilage is pulled along	3

**Table 40. RBF PSA spreadsheet for UoA1-Kerguelen**

Only main species scored?				0					Productivity Scores [1-3]							Susceptibility Scores [1-3]					Cumulative only									
Scoring element	First of each scoring element	Species Grouping only ID 'At Risk' species by selecting associated species group	Species Grouping only Number of species in species group which this species represents (N/2)	Family name	Scientific name	Common name	Species type	Fishery descriptor	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level	Density Dependence	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	Catch (tons)	Weighting	Weighted Total	Weighted PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost
1	First			Macrouridae	Macrourus carinatus	Rattail	Non-invertebrate	Demersal longline	2	3	1	2	2	1	2		1.86	3	2	1	3	1.43	2.34					89	Low	≥80
2	First			Afrynchobatidae	Bathyraja irrasa	Kerguelen Sandpaper sf	Non-invertebrate	Demersal longline	2	2	3	2	2	2	2		2.14	2	2	1	3	1.28	2.49					86	Low	≥80

**Table 41. RBF PSA spreadsheet for UoA2-Crozet**

Only main species scored?				0					Productivity Scores [1-3]							Susceptibility Scores [1-3]					Cumulative only									
Scoring element	First of each scoring element	Species Grouping only ID 'At Risk' species by selecting associated species group	Species Grouping only Number of species in species group which this species represents (N/2)	Family name	Scientific name	Common name	Species type	Fishery descriptor	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level	Density Dependence	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	PSA Score	Catch (tons)	Weighting	Weighted Total	Weighted PSA Score	MSC PSA-derived score	Risk Category Name	MSC scoring guidepost
1	First			Macrouridae	Macrourus carinatus	Rattail	Non-invertebrate	Demersal longline	2	3	1	2	2	1	2		1.86	3	2	1	3	1.43	2.34					89	Low	≥80
2	First			Moridae	Antimora rostrata	Blue antimora	Non-invertebrate	Demersal longline	2	3	1	1	2	2	2		1.86	2	3	1	3	1.43	2.34					89	Low	≥80
3	First			Rajidae	Amblyraja taaf	Whiteleg skate	Non-invertebrate	Demersal longline	2	2	3	2	2	2	2		2.14	2	2	1	3	1.28	2.49					86	Low	≥80

## Appendix 3 Conditions

One condition was carried over for the UA2-Crozet, which was certified through an extension of scope three years later than the Kerguelen UoA1. Changes in the standard version from v1.3 to v2.0 means that the PI concerned is now PI 2.2 instead of 2.1, and that the SG are slightly different.

Another important difference is that the RBF was used to determine the status of the ‘main’ secondary species, and enough information was elicited from the scientific stakeholders during the workshop for the team to be content that all ‘main’ secondary species are highly likely to be above their biologically based limits. Therefore no condition remains regarding PI 2.2.1 Secondary species outcome.

However, a new scoring issue is included in the v2.0 that requires “a regular review of the effectiveness and practicality of alternative management measures (to reduce unwanted catch of non-target species)”. In the light of information discovered during the RBF workshop, by which species of rays cut off and very unlikely to survive, it seems urgent that alternatives to measures in the 2014 Code of Conduct are explored. This new condition is somewhat related to pre-existing ones to the extent that it is a logical process that once information are available and the species status can be determined, naturally the management measures need to be reviewed in depth, but it is not directly related to a previous condition on the same/equivalent PI (Table 32).

**Table 42. Condition 1**

Performance Indicator	Secondary species management strategy
Score	75
Rationale	<p><u>Scoring issue e (SG80)</u>: 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.</p> <p>There are two dimensions to the strategy in place: 1) bycatch reduction for all fish species and 2) cut-off of rays species to increase post-capture survival. Over the years and across toothfish longline fisheries in the CCAMLR area, a number of alternative strategies have been tried (CCAMLR, 2017a). The current mix of unwanted bycatch reduction measures is now widespread. For both UoAs, the TAAF reviews the effectiveness of measures in place very regularly, and updates provisions as needed. Alternative measures are discussed at least annually at CCAMLR WG meetings. Importantly, the Code of conduct (CBC) to minimise the catch of rays has been gradually implemented since 2014, and at present nearly all skates/rays are cut off instead of being brought on board. Crew members verify that individual rays do not show obvious signs of morbidity before cutting them off.</p> <p>Mortality from fishing is analysed to be within sustainable limits for all ‘main’ (and ‘minor’) species (MNHN, pers. comm.). But during the RBF workshop the MNHN stated that the survival of all species of cartilaginous rays cut off is probably zero because of damage to the cartilage caused by being brought up from great depths on the longlines. A regular review of the effectiveness cut-off measures is therefore needed. SG80 is not met.</p>
Condition	By the Year 4 audit, the fishery should establish a process for regular review of the effectiveness and practicality of measures to minimise the mortality of rays (‘main’ species – <i>B. irrassa</i> at Kerguelen and <i>A. taaf</i> at Crozet).
Milestones	<p>Year 1: Improved monitoring of bycatch species and of the cut-off practices for rays. Score 75.</p> <p>Year 2: Improving scientific knowledge and data by conducting at-sea experiments or via other means as appropriate (feasibility and preparation phase). Score 75.</p> <p>Year 3: Improving scientific knowledge and data by conducting at-sea experiments or via other means as appropriate (implementation phase). Score 75.</p> <p>Year 4: Improving scientific knowledge and data by conducting at-sea experiments (data analysis phase) and submission of new and improved practices resulting from these studies. Score 80.</p> <p>Throughout: annual updates to the “code de bonne conduite” (CBC - code of conduct), including updates on maps and practices as required.</p>

<p>Client action plan English</p>	<p><u>Year 1:</u> <b>SARPC:</b></p> <ul style="list-style-type: none"> <li>- Collection, analysis and regular monitoring of bycatch data, and of ray cut-off methods/practices (per trip).</li> <li>- Further analysis of existing data (POKER reports).</li> <li>- Any scientific and technological developments pertinent to this topic will be followed.</li> <li>- Communication with the scientific community around other fisheries that interact with rays (South Georgia, Australia, even the North Sea).</li> <li>- Communication of any findings with the captains.</li> <li>- Creation of an internal working group specific to rays to exchange good practices, and to discuss catch reduction goals and objectives.</li> <li>- Requests to the TAAF will be made to include good practice indicators in the COPEC reports, such as: exceeding the limits set in the code of conduct, exceeding 50 individuals per 1000 hooks, successful implementation of the move-on rule in case the 50 ind/1000 hooks limit is exceeded.</li> </ul> <p><b>MNHN:</b></p> <ul style="list-style-type: none"> <li>- Designation of a point of contact/scientific referent for rays in the MNHN BOREA team;</li> <li>- Updating the maps in the code of conduct</li> </ul> <p><b>TAAF:</b></p> <ul style="list-style-type: none"> <li>- Structured redaction of the code of conduct, dissemination in the form of a PDF to all stakeholders.</li> <li>- Further analysis of the results of the following thesis “Analyse des captures accessoires et accidentelles et perspectives de gestion de la pêche palangrière à la légine dans les eaux de Kerguelen et de Crozet” (AgroCampus West, 2018) (analysis of the bycatch data, and potential management perspectives of the toothfish longline fishery in Kerguelen and Crozet waters).</li> </ul>
	<p><u>Year 2:</u> <b>MNHN:</b></p> <ul style="list-style-type: none"> <li>- Updating of the maps in the code of conduct.</li> <li>- Summary of the results stemming from the implementation of the code of conduct (comparison of bycatch and cut-off numbers before and after the establishment of the code of conduct).</li> </ul> <p><b>SARPC-MNHN-TAAF:</b></p> <ul style="list-style-type: none"> <li>- Creation of a ray tagging programme, with a protocol designed by the MNHN (tag-recapture system, pop-up satellite tags, etc.). The specifics are to be determined (for example: is this work to be carried out by the COPEC or additional scientific observers).</li> <li>- A feasibility study will be conducted for a programme assessing the survival rate of cut off rays.</li> <li>- Funding will be sought: linked to the actions listed in the “Enjeu 5” (issue 5) of the natural reserve management plan (TAAF) – see Appendix 9.</li> <li>- The “foundation des mers australes” will contribute financially.</li> </ul>

	<p><u>Year 3:</u>  <b>MNHN:</b>  - Updating the maps of the code of conduct.  <b>SARPC-MNHN-TAAF:</b>  - Implementation of the programmes established in years 1 and 2.</p> <p><u>Year 4:</u>  <b>MNHN:</b>  - Updating the maps of the code of conduct.  - Data analysis of the programmes implemented in year 3  <b>SARPC-MNHN-TAAF:</b>  - Implementation of the programmes,  - Discussion of the results obtained by the MNHN  - Updating of “good practices” in the code of conduct.</p>
Client action plan French	<p><u>Année 1 :</u>  <b>SARPC :</b>  - Recueil, analyse et surveillance réguliers des données de captures accessoires et de la pratique du cut-off pour les raies, à l'échelle de la marée.  - Exploitation des données existantes (rapports POKER).  - Veille scientifique et technologique sur le sujet.  - Prise de contact avec les scientifiques d'autres pêcheries en interaction avec les raies (Géorgie du Sud, Australie, voire Mer du Nord...).  - Bulletin d'information aux capitaines.  - Mise en place d'un groupe de travail en interne spécifique aux raies pour échanger sur les bonnes pratiques et discuter des objectifs de diminution des captures.  - Discussion avec les TAAF pour inclure des indicateurs de suivi des bonnes pratiques dans les rapports des COPEC, comme par exemple :  - dépassement des seuils du CBC ;  - dépassement du seuil de 50 individus /1000 hameçons ;  - application de la « move-on rule » en cas de dépassement du seuil de 50 individus /1000 hameçons.  <b>MNHN :</b>  - Désignation d'un référent « Raies » au sein de l'équipe BOREA du MNHN ;</p>

	<p>- Mise à jour des cartographies du CBC.</p> <p><b>TAAF :</b></p> <p>- Mise en page structurée du CBC, diffusion sous format PDF aux parties prenantes.</p> <p>- Exploitation des résultats du mémoire de stage intitulé : « Analyse des captures accessoires et accidentelles, et perspectives de gestion de la pêche palangrière à la légine dans les eaux de Kerguelen et de Crozet » (AgroCampus Ouest 2018).</p>
	<p><u>Année 2 :</u></p> <p><b>MNHN :</b></p> <p>- Mise à jour des cartographies du CBC.</p> <p>- Bilan de la mise en place du CBC : comparatif des captures et du cut-off avant/après la mise en place de CBC.</p> <p><b>SARPC-MNHN-TAAF :</b></p> <p>- Montage d'un programme de marquage de raies dans le cadre d'un protocole établi par le MNHN (par exemple : marquage-recapture, marque-archive pop-up par satellite...). Modalités à déterminer (exemple : si les expérimentations seront réalisées par des COPEC ou des scientifiques supplémentaires embarqués).</p> <p>- Etude de faisabilité d'un programme relatif au taux de survie des raies relâchées.</p> <p>- Recherche de financement : notamment en lien avec les actions prévues dans le chapitre « Enjeu 5 » du plan de gestion de la Réserve naturelle nationale des TAAF.</p> <p>- Contribution de la Fondation des mers australes via un soutien financier.</p>
	<p><u>Année 3 :</u></p> <p><b>MNHN :</b></p> <p>- Mise à jour des cartographies du CBC.</p> <p><b>SARPC-MNHN-TAAF :</b></p> <p>- Mise en oeuvre des programmes retenus.</p>
	<p><u>Année 4 :</u></p> <p><b>MNHN :</b></p> <p>- Mise à jour des cartographies du CBC.</p> <p>- Analyse des données issues des programmes.</p> <p><b>SARPC-MNHN-TAAF :</b></p> <p>- Mise en oeuvre des programmes.</p>

		<ul style="list-style-type: none"> <li>- Discussion des résultats obtenus par le MNHN.</li> <li>- Mise à jour des bonnes pratiques figurant dans le CBC.</li> </ul>
Consultation condition	on	The Fondation des mers australes (Southern Ocean Foundation), TAAF and MNHN have indicated their support for this action plan (see Appendix 9)

## Appendix 4 Peer Review Reports

### Appendix 4.1 Peer Review 1

#### Summary of Peer Reviewer Opinion

<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</b>	<b>YES</b>	<b>CAB Response</b>
<u>Justification:</u> The scores for each Principle are over 80 and for each Performance Indicator are over 60. There are some omissions from the overarching narrative or in the scoring rationales for four indicators that would provide greater clarity for some of the justifications given in the scores. However, resolving these is unlikely to reduce the scores to a level that would reduce the PI scores to below 60 or the Principle scores to below 80.		Thank you – please see our responses to your comments below.
<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</b> <b>[Reference: FCR 7.11.1 and sub-clauses]</b>	<b>YES</b>	<b>CAB Response</b>
<u>Justification:</u> The single condition raised is written clearly with direct reference to the relevant scoring issue with an accompanying rationale. Milestones from Years 1 to 4 set clear expectations and set out the scores that will be achieved as each milestone is passed. Achieving the SG80 milestone in the specified timeframe appears to be very achievable.		Thank you – no response required.
<b>Do you think the client action plan is sufficient to close the conditions raised?</b> <b>[Reference FCR 7.11.2-7.11.3 and sub-clauses]</b>	<b>YES</b>	<b>CAB Response</b>
<u>Justification:</u> The client action plan is comprehensive and detailed, setting out what the client organisation will do and how the relevant research and governing agencies may contribute to and collaborate on the actions planned over the four years. The plan notes that letters of support from the agencies are forthcoming. Given the evidence of prior collaboration on issues related to the subject of the condition (P2 ray species) set out in the report, there is little reason to believe that letters of support will not be forthcoming. On this basis, the plan appears to be sufficient to close the condition raised.		Letters of support have now been received from all parties concerned.

For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes, probably	NA	<p>The uncertainties in the model are listed as justification for not achieving SG100 on Scoring Issues (SI) a. and b., which is appropriate.</p> <p>However, in the body of the report (Section 2.3.4 on Stock Assessment) the robustness of the models for both UoAs is listed as cause for concern. The narrative in the body of the report does not explain why the Assessment Team is confident that the model outputs are sufficiently robust to score 80 on Sis a. and b. (see General Comments section of this Peer Review for further explanation).</p>	Additional text has been added to section 2.3.4 to clarify the role of the CCMLAR working group on stock assessment and why despite reservations about the exploration of uncertainty, the assessments are considered robust enough to judge stock status.
1.1.2	NA	NA	NA	NA	No response required.
1.2.1	Yes	Yes, probably	NA	SI f. is not scored. The justification states that 'unwanted' catch of toothfish is negligible therefore there is no 'unwanted' catch of toothfish.	Additional text has been added in Section 2.3.7 to explain this.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				Section 2.3 of the report, on Target Species provides neither overview nor detail about what might be considered 'unwanted' (e.g., toothfish under MLS), how much there is or what happens to it, including whether discard or retention is optional or mandatory. A referenced sentence or two in the overview would support the justification given for not scoring this SI.	
1.2.2	Yes	Yes	NA	NA	No response required.
1.2.3	Yes	Yes	NA	NA	No response required.
1.2.4	Yes	Yes	NA	NA	No response required.
2.1.1	Yes	Partially	NA	The rationale is inadequate in reference to Mackerel NWA stock FAO 21 scoring 80 on Sla. (Main Primary Species Stock Status). The justification states the NW mackerel stock status is unknown, but the fish carry a NOAA catch certificate stating they don't hinder recovery. This does not adequately explain or justify either: "main primary species are highly likely to be above the PRI" or "...there	The background information (page 36) and the scoring rationale have been updated.  Both texts are now in agreement and use the language of the SG – making a clear connection between the Team's rationale and what is

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				<p>is evidence of recovery or an effective strategy in place between all MSC UoAs ...etc"</p> <p>The justification (rationale) needs use the language of the SG – making a clear connection between the Team's rationale and what is actually being scored. E.g., referencing whether (or not) NOAA issues these certificates to fisheries/on species that are below/above PRI or hindering/not hindering recovery etc., and how they (the Team) know this (references).</p> <p>Furthermore, the statement that NW mackerel status is unknown is somewhat contradicted in the overview narrative in the main body of the assessment report, and under PI 2.1.3 SI a.: "NWA stock (FAO 21), which is currently assessed to be overfished and subject to overfishing" which tends to suggest that some stock status conclusions have been made or may in fact be 'known'.</p>	actually being scored. The overall score was not changed.
2.1.2	Yes	Yes	NA	NA	No response required.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.1.3	Yes	Yes	NA	NA	No response required.
2.2.1	Yes	Yes	NA	See Table 2 – RBF	No response required.
2.2.2	Yes	Yes	NA	NA	No response required.
2.2.3	Yes	Yes	NA	NA	No response required.
2.3.1	Yes	Yes	NA	NA	No response required.
2.3.2	Yes	Yes	NA	NA	No response required.
2.3.3	Yes	Yes	NA	NA	No response required.
2.4.1	Yes	Yes	NA	NA	No response required.
2.4.2	Yes	Yes	NA	NA	No response required.
2.4.3	Yes	Yes	NA	NA	No response required.
2.5.1	Yes, probably	Yes, probably	NA	See comment on context in General Comments section below.	Some text has been added to the main report section 2.4.10 Ecosystem.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
2.5.2	Yes	Yes	NA	NA	No response required.
2.5.3	Yes	Yes	NA	NA	No response required.
3.1.1	Yes	Yes	NA	NA	No response required.
3.1.2	Yes	Yes	NA	NA	No response required.
3.1.3	Yes	Yes	NA	NA	No response required.
3.2.1	Yes	Yes	NA	NA	No response required.
3.2.2	Yes	Yes	NA	NA	No response required.
3.2.3	Yes	Yes	NA	NA	No response required.
3.2.4	Yes	Yes	NA	NA	No response required.

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process(es)	Are the RBF risk scores well-referenced? Yes/No	Justification:	CAB Response:
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	applied to determine risk using the RBF has led to the stated outcome? Yes/No		Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	
1.1.1			NA	No response required.
2.1.1			NA	No response required.
2.2.1	Yes	Yes	NA	No response required.
2.3.1			NA	No response required.
2.4.1			NA	No response required.
2.5.1			NA	No response required.

### Optional: General Comments on the Peer Review Draft Report

The following general comments point to omissions, inconsistencies or editorial issues in the Peer Review Draft Report. None of the comments in and of themselves suggest that the overall conclusion to re-certify the fishery is unjustified or that the condition is incorrect.

#### Executive Summary

2<sup>nd</sup> paragraph – acronym SIOFA not given in full, nor is it listed in the Glossary.

Corrected, thanks.

#### Section 2.3 Target Species

2.3.4 Stock Assessment; 2.3.5 Stock Trends; 2.3.6 Reference Points (pp. 23-27)

The stock assessments for both UoAs, including the underlying data and information, appear to be sophisticated. Yet concerns are raised by the Assessment Team about the transparency of the reports: *“reports are very limited in their content and do not present the data input or full diagnostic model output. Hence the robustness of the assessments is not transparent.”* (p.23) The Team further states: *“The assessments are reviewed internally by CCAMLR and this provides the adequate quality assurance checks.”*

For whom are the quality assurance checks considered “adequate”? The Assessment Team? On what basis does the Team make this judgement? Is the CCAMLR process a “peer review” in the MSC-sense? Is the internal review process in CCAMLR set out somewhere the Team has seen; or is there a CCAMLR report that confirms the adequacy of the stock assessment models and their outputs?

These questions become important because the Assessment Report narrative goes on in the subsequent sections to clearly lay out the uncertainties in the stock assessments for both UoAs, but does not explain or justify how then the Assessment Team can be confident that the model outputs, and therefore relevant conclusions in Stock Trends and/or Reference Points sections are sufficiently robust to enable a score of 80 against:

PI 1.1.1 SI a. – On what basis does the Assessment Team think the stock assessment’s results show it is *“highly likely the stock is above the PRI”* and

PI 1.1.1 SI b. – *“The stock is fluctuating around a level consistent with MSY”*?

It seems simply to be a disconnect between the narrative in the body of the report and the scoring justifications. The justifications under PI 1.2.4 SI a., b. and c. appear to set out the case clearly and logically. The narrative in Section 2.3.4 would benefit from the inclusion of this kind of explanation to bridge the gap. Otherwise the overview presents a picture that suggests the assessments are inadequate due to the uncertainties and fails to explain why the Team is confident enough about the model outputs to justify the scores they have given.

Some text added to address this concern in section 2.3.4.

#### Section 2.2.10 Ecosystem Impacts (p. 45)

*“Some key features of the ecosystems were presented in the 1<sup>st</sup> certification reports (MEP 2013, MEC 2016) and are not repeated here.”* As a peer reviewer for this fishery assessment report who does not have the benefit of the ‘1<sup>st</sup> certification reports’, I am unable to judge whether there is adequate information for scoring the outcome PI. As a full re-assessment for this fishery, the results of which will stand for five years, the report should outline the key features of the ecosystem as a minimum.

The omission of a description of key ecosystem features leaves the scoring and justifications in the evaluation table for PI 2.5.1 without context.

[Some text has been added to section 2.4.10 of the main report \(Ecosystem\).](#)

Section 3.4.2 Evaluation Techniques - Table 28 – Scoring Elements (pp 64-65)

Component – 2.2 Secondary species – Grenadier only listed under UoA1 as ‘main’, but not under UoA2. This is inconsistent with Tables 14 and 16, 1<sup>st</sup> paragraph under 2.4.7 (p.37) – where it is designated ‘main’ for both UoAs. I note that it is indeed scored as ‘main’ under 2.2.1 for UoA2 Crozet. So a simple oversight/typo to correct in Table 28.

[Yes, this was an oversight, Table 28 now corrected, thank you.](#)

## Appendix 4.2 Peer Review 2

### Summary of Peer Reviewer Opinion

<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</b>	<b>Yes/No Yes, overall</b>	<b>CAB Response</b>
<u>Justification:</u> For almost all scoring issues, the reviewer concurs with the team's view on scoring. The overall points of difference may be able to be clarified by expanding the rationale provided, using information the assessment team already has.		Thank you – please see our responses to your comments below.
<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</b> <b>[Reference: FCR 7.11.1 and sub-clauses]</b>	<b>Yes/No Yes</b>	<b>CAB Response</b>
		No response required.
<b>Do you think the client action plan is sufficient to close the conditions raised?</b> <b>[Reference FCR 7.11.2-7.11.3 and sub-clauses]</b>	<b>Yes/No Yes</b>	<b>CAB Response</b>
		No response required.

For reports using one of the default assessment trees:

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	Yes	Yes	NA	<p>There are important uncertainties apparent in the stock assessment that preclude a higher score here, as per the team's rationale. Further work to resolve these uncertainties is highly recommended to increase confidence in use of the stock assessment over time. Increasing transparency around how data are used by the model is also essential for increased confidence.</p> <p>It is suggested that the team consider creating a Recommendation focused on exploring and resolving uncertainties and increasing transparency of data use. A review of stock assessment approaches conducted for selected other toothfish fisheries is due for release later this year, and is also likely to provide useful learnings relevant to the assessment of the UoAs considered here.</p>	A recommendation has been drafted.
1.1.2	NA	NA	NA	NA	No response required.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.2.1	No (f)	Yes	NA	<p>For (a), can the team provide any comment about how economic considerations are taken into account when setting TACs, and what the results of such considerations might be in terms of TACs?</p> <p>For (f), the team implies that juveniles could be considered "unwanted catch" but that the fishing depth restriction at 500 m protects these fish. While ontogenetic changes in depths inhabited are well documented for this species, length-frequency information in the Kerguelen and Crozet fishery reports from CCAMLR (2017) suggest not insignificant numbers of juveniles (TL&lt;60 cm) are caught by these fisheries. Can the team explore this further, or clarify their approach in reaching their conclusion about juveniles?</p>	<p>TACs are set according to CCAMLR criteria which are related to biological considerations.</p> <p>Additional text has been added to 1.2.1f to clarify the rationale.</p>
1.2.2	Yes	Yes	NA	NA	No response required.
1.2.3	Yes	Yes	NA	NA	No response required.
1.2.4	Yes	Yes	NA	The reviewer notes the lack of transparency around the robustness of the assessment,	A recommendation to this effect has been added.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				and that the peer review is not documented in detail in a publicly accessible location currently. As mentioned under PI 1.1.1, a Recommendation to increase transparency around the model is suggested.	
2.1.1	Yes?	Yes?	NA	(a and b) The justification paragraph on the NW mackerel stock (FAO 21) states that the stock status is unknown (p 95). However, the introductory text at 2.4.6.2 references the stock as outside biological limits, overfished, and subject to overfishing. With these two areas aligned, the information and rationale will become consistent.	The background information (page 36) and the scoring rationale (2.1.1a) have been updated.  Both texts are now consistent.
2.1.2	Yes	Yes	NA	Under the rationale for (b), the NOAA 2018 reference may not be in "simple terms", but is publicly available.	Text has been amended.
2.1.3	Yes	Yes	NA	NA	No response required.
2.2.1	Yes	Yes	NA		No response required.
2.2.2	Yes	Yes	Yes	For 2.2.2 (a), can the team please clarify how the short-line test applies to secondary	2.2.2 (a) This was an error, a specific catch rate (50 rays/ 1 000

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				species? Previously it has been discussed in the context of moving on from areas of juvenile catch, or depredation. This is the first time it has been referred to as part of the toolkit for avoiding secondary species bycatch.  2.2.2 (d) on shark finning mentions stress to rays (suggest deleting this part of the rationale given the scope of this issue).	hooks) applies for the move on rule, but as noted shorter lines are for juvenile toothfish catches and depredation. The background text (page 39) and scoring rationale have been corrected.  2.2.2 (d) corrected, thank you.
2.2.3	Yes	Yes	NA	NA	No response required.
2.3.1	Yes	Yes	NA	NA	No response required.
2.3.2	Yes	Yes	NA	NA	No response required.
2.3.3	Yes	Yes	NA	NA	No response required.
2.4.1	Yes	Yes	NA	It appears that a footprint analysis has not been done for the UoAs (though the fishing locations are known – e.g. figures 3 and 4 in Appendix 8). Conducting this analysis is recommended as part of building an understanding of habitat impacts and would	A recommendation (#5) has been added to this effect, thank you.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				eliminate the need to extrapolate, e.g. from HIMI information.	
2.4.2	Yes	Yes	NA	NA	No response required.
2.4.3	Yes	Yes	NA	NA	No response required.
2.5.1	Yes	Yes	NA	NA	No response required.
2.5.2	Yes	Yes	NA	NA	No response required.
2.5.3	Yes	No	NA	Under (c), this reviewer would not score at 100 for secondary species given knowledge gaps on ecosystem functions for some of these species.	Ecosystem functions of some secondary species are only inferred or partially known, as noted from the RBF workshop (Appendix 2). This knowledge gap for secondary species has been scored under 2.2.3(a). The quantities caught for these species in each of the Kerguelen and Crozet EEZs are small enough that no effects are discernable at population levels, and therefore ecosystem-level effects are also assumed to be very small. Score unchanged.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
3.1.1	Yes	Yes	NA	NA	No response required.
3.1.2	Yes	Yes	NA	NA	No response required.
3.1.3	Yes	Yes	NA	NA	No response required.
3.2.1	Yes	Yes	NA	NA	No response required.
3.2.2	No	No	NA	For (b), the information provided supports the score given. However, under 3.2.3 (b) the issue of a lack of transparency around discretionary quota allocations is identified. This appears to be an important issue that is part of a response to the findings of monitoring. (It's importance appears to be highlighted by its examination by a ministerial task force). If (as described in 3.2.3(b)) there is not transparency around quota decisions, it appears to this reviewer that 3.2.2 (b) is not met at SG80.	3.2.2 (b) SG80 is found to be met because the existing decision-making processes respond to serious and other important issues. The ministerial task-force could appear out of proportion, but this is due to the specificity of the TAAF territories, which consist of uninhabited islands. Their administration therefore has a very small decision making chain, from the Préfet locally directly to three ministerial departments. The scoring was not changed.

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
				<p>For (c), the rationale provided emphasises a precautionary approach to the TAC of the target stock. Can the team add rationale showing evidence of a precautionary approach relating to other management elements (e.g. for secondary species, ETP, habitats, etc.)?</p> <p>Under (d), can the team provide information on how requests for information would be dealt with? The GTPA and FSA are two mechanisms for sharing information and discussion, however, the scope and potential audience reflected by the scoring guidepost are broader.</p>	<p>3.2.2 (c) Elements added to the rationale.</p> <p>3.2.2 (d) Elements added to the rationale.</p>
3.2.3	Yes	Yes	NA	NA	No response required.
3.2.4	Yes	Yes	NA	NA	No response required.

For reports using the Risk-Based Framework:

Performance Indicator	Does the report clearly explain how the process(es) applied to determine risk using the RBF has led to the stated outcome? Yes/No	Are the RBF risk scores well-referenced? Yes/No	Justification: Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response:
1.1.1			NA	No response required.
2.1.1			NA	No response required.
2.2.1	Yes	Yes	NA	No response required.
2.3.1			NA	No response required.
2.4.1			NA	No response required.
2.5.1			NA	No response required.

Optional: General Comments on the Peer Review Draft Report

The report very effectively communicates a large body of information in a highly readable way.

Thank you

## Appendix 5 Stakeholder submissions

### Appendix 5.1 Prior to PCDR publication

The following stakeholder submission was received on behalf of COPECMA SAS. The comments and CU Pesca responses are shown below.

Assessment Stage		Fishery	Date	Name of Individual/Organisation Providing Comments
<input checked="" type="checkbox"/>	Fishery announcement of RBF	SARPC toothfish longline fishery	3 February 2018	COPECMA SAS
Performance Indicator	Nature of Comment	Justification		
RBF announcement		<p>P 4 . If the client group is the SARPC, you have other eligible fishers and write NONE is not true . (3 Feb.)</p> <p>If i understand your first comments this means that it is not the fishery which is certified but the eligible fishers . Isn't it ? (6 Feb)</p>		
<b>CUP response</b>				
<p>The term 'Other eligible' fishers only applies to situations where a certificate sharing agreement is in place with parties outside the unit of certification as per Section 7.4.12 of the FCRv2.0.</p> <p>We are assessing the SARPC group, and nothing else.</p>				
RBF announcement		<p>P 7 . I understand that the stock given is for 2017 /18 : 5363 ( 5050 + 313) for KERGUELEN and 1627 ( 1100 + 527 ) for CROZET . The second number in the bracket for KERGUELEN and CROZET is the estimate quantities for the depredation . Can you explain the evaluation? (+14,6% in KERGUELEN and + 50% in CROZET in one year ) .</p>		
<b>CUP response</b>				
<p>For Crozet, a previous estimate of 28% of the total catch was used for 2016/17, then corrected to be 21%. (CCAMLR FSA-17-59_CRO). The numbers come from the Fisheries reports and also the FSA (fish stock assessment reports), up to 2016/17. We do not have copies of the latest 2017 FSA reports, but the format used is that the Total Allowable Catch (TAC) = catch allowed + an allowance for depredation.</p> <p>At the 2017 C3P, it is noted that a "forte déprédation conjuguée des orques et des cachalots, le taux de prélèvement est évalué entre 35 à 40 % à Crozet". The figure of 527 tonnes corresponds to <math>527/1627=32\%</math> of the TAC, or as noted, 48% of maximum vessel catch.</p>				

**Appendix 5.2 After PCDR publication**

## Appendix 6 Surveillance Frequency

Only one condition was raised in this assessment. Considering this fishery is now in its second certification cycle and taking into account the availability of information from public sources (e.g. CCAMLR) the team proposes to reduce the surveillance level to 4, requiring 2 on-site and 2 off site visits. As the condition relates to Principle 2 alone, a team of 1 auditor may be used (see 7.23.4.2, FCR v2.0). The proposed surveillance schedule is shown below.

Subject to stakeholder availability, no deviation from the standard surveillance schedule is foreseen (i.e. in line with each annual certificate anniversary date).

**Table 43 Timing of surveillance audit**

Year	Anniversary date of certificate	Proposed date of surveillance audit	Type surveillance
1	TBC	Anniversary date	Off site
2	TBC	Anniversary date	On-site
3	TBC	Anniversary date	Off site
4	TBC	Anniversary date	On-site surveillance and re-certification site visit

## Appendix 7 Objections Process

[REQUIRED FOR THE PCR IN ASSESSMENTS WHERE AN OBJECTION WAS RAISED AND ACCEPTED BY AN INDEPENDENT ADJUDICATOR]

The report shall include all written decisions arising from an objection.

*[Reference: FCR 7.19.1]*

## Appendix 8 RBF information pack sent to stakeholders prior to site visit.



### MSC assessment of SARPC Toothfish fishery

#### Background information for the Risk-Based Framework (RBF) workshop

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Week of the 13<sup>th</sup> February 2018

Le Port, Ile de La Réunion

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#### Contents

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## Summary

The fishery under re-assessment is the demersal longline fishery for toothfish (*Dissostichus eleginoides*). Syndicat des Armateurs Réunionnais de Palangriers Congélateurs (SARPC) vessels fish in the Kerguelen and Crozet EEZ, under the French jurisdiction and specific provision for the TAAF overseas territories, in conformity with the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR).

The target species (Principle 1) is the only managed species in Kerguelen and in Crozet. None of the bycatch species are managed. They are therefore considered as Secondary species (Principle 2). Bycatch is actively avoided by the vessels and strictly regulated by the TAAF administration. An analysis of the detailed data available confirms the findings of the initial fishery certification for Kerguelen and for Crozet, that bycatch species are Grenadier, Antimora and a few ray species. Most of the rays caught incidentally are said to be released alive.

The most recent information and expertise of the stakeholders and scientist at the workshop will help determine the final list of 'main' species, on the basis of their resilience, especially for antimora, which makes up less than 5% of the catch (but more than 2% in Crozet), and the rays species that make up less than 2% of the catch, but probably more than 2% if the individuals released that may not survive are factored in.

The RBF may thus be used for the MSC performance indicators: 2.2.1 (Secondary species outcome). The reasons for RBF use are twofold:

- Catch and observer (COPEC) data sometimes fails to disaggregate skate species in the datasheets provided. Therefore, the RBF workshop will first be used to finalise the list of 'main' secondary species;
- For those secondary species, there are no stock status reference points available, either derived from analytical stock assessment or using empirical approaches.

Available data sources include logbook catch data as well as COPEC data. Some of the grenadiers (*Macrourid spp.*) caught are landed, whereas blue antimora (*Antimora rostrata*), several ray species (*Bathyraja irrasa*, *B. eatonii*, and *Amblyraja taaf*) and lantern sharks (*Etmopterus spp.*) are cut off the lines hauled at sea.

Stakeholders are invited to assist in the identification of the species that are affected by the fishery, and to score the Susceptibility risk factors for each species.

## Résumé

La pêcherie palangrière de légine (*Dissostichus eleginoides*) est évaluée pour un renouvellement de sa certification. Les navires du Syndicat des Armateurs Réunionnais de Palangriers Congélateurs (SARPC) pêchent dans les ZEE de Kerguelen et de Crozet, sous juridiction française et régime particulier des territoires ultramarins des TAAF, en conformité avec la Convention pour la Conservation de Ressources Marines vivantes antarctiques (CCAMLR).

L'espèce ciblée par la pêcherie (Principe 1) est la seule espèce dont le stock est géré sur la base de points de références et de règles d'exploitation déterminés par un modèle quantitatif. Aucune des espèces captures accessoires ne sont gérées ainsi. Elles sont donc toutes considérées comme espèces secondaires (Principe 2). Les captures accessoires sont évitées le plus possible par les navires, et sont étroitement réglementées par l'administration des TAAF. Une analyse de données détaillées confirme celle qui avait été faite pour la pêcherie de Kerguelen et celle de Crozet lors de leur certification initiale. Les espèces accessoires sont les grenadiers, l'antimora et quelques espèces de raies.

L'approche RBF doit être utilisée pour l'indicateur de performance MSC 2.2.1 (prises accessoires – espèces "secondaires") pour les deux raisons suivantes :

- Les données de captures annuelles et les données des rapports des observateurs scientifiques (COPEC) dont nous disposons ne différent pas toujours les différentes espèces de raies. Le workshop RBF permettra donc tout d'abord de finaliser la liste des espèces secondaires 'principales (main) ;
- De plus, il n'y a pas de point de référence pour les stocks des espèces des prises accessoires qui permette d'établir l'impact de la pêcherie de manière quantitative.

Les données existantes des logbooks et des rapports COPEC permettent de déterminer que les grenadiers (*Macrourid spp.*) capturés sont débarqués, alors que les antimores (*Antimora rostrata*), plusieurs espèces raies (*Bathyraja irrasa*, *B. eatonii*, et *Amblyraja taaf*), et les sagres (*Etmopterus spp.*) sont coupés des lignes lors du halage des lignes en mer.

Les parties prenantes sont invitées à contribuer à l'identification des prises accessoires affectées par cette pêcherie, et à la détermination des scores de susceptibilité par facteur de risque pour ces espèces.

## 1 Description of the fishery

The fishery under re-assessment is the Syndicat des Armateurs Réunionnais de Palangriers Congélateurs (SARPC) demersal longline fishery for Patagonian toothfish (*Dissostichus eleginoides*). The fishery takes place in the Southern Ocean, within the 200nm EEZ around the French territories of the islands of Kerguelen and Crozet, within the jurisdiction of CCAMLR (Convention for the Conservation of Antarctic Marine Living Resources). The fishery around Kerguelen was certified as sustainable in 2013, and the fishery around Crozet in 2015.

The SARPC fleet has seven vessels setting lines (baited with mackerel, horse mackerel or squid) at depths from 500m down to around 2000m, always deployed at night to mitigate bird mortality. All boats fish continuously for several months at a time before landing the catch at Le Port in La Réunion. Fishing is forbidden in territorial waters, waters shallower than 500m and in protected areas.

The toothfish stocks around Kerguelen and Crozet are considered to be distinct from one another with no geographical overlap or mixing. The scope of re-certification will cover the Kerguelen UoA and the Crozet UoA (Table 1).

**Table 1. Units of Assessment (UoAs) in the SARPC toothfish fishery**

<b>Species</b>	Toothfish ( <i>Dissostichus eleginoides</i> )
<b>Geographical range</b>	UoA1: TAAF EEZ Kerguelen UoA2: TAAF EEZ Crozet
<b>Method of capture</b>	Bottom-set longline
<b>Stock</b>	UoA1: Kerguelen toothfish stock UoA2: Crozet toothfish stock
<b>Management system</b>	Commission on the Conservation of Antarctic Marine Living Resources (CCAMLR), France, TAAF
<b>Client group</b>	Syndicat des Armements Réunionnais de Palangriers Congélateurs (SARPC)
<b>Other eligible fishers</b>	None

## 2 Use of the RBF (Risk-Based Framework)

The MSC standard version 2.0 has introduced a new process that uses a Risk Based Framework (RBF, Annexe PF) to evaluate the fishery's impacts on outcome indicators for data deficient situation in accordance with The FAO Guidelines on Eco-labelling for Fisheries and Fisheries Products from Marine Capture Fisheries published in 2005. In its version 2.0, the MSC standard also separates species according to criteria illustrated in Table 2.

'Primary' species are those for which management tools are in place, such as stock status limit or target reference points derived either from analytical stock assessment or using empirical approaches, the others are 'secondary'.

Table 2. MSC standard definitions for species impacted by the fishery

New Terms/Definitions		
<p><b>Primary</b></p>  <p>Only in-scope species that are managed according to either target or limit reference points</p>	<p><b>Secondary</b></p>  <p>Unmanaged and contains a large variety of species incl. out-of scope sp.(amphibians, birds, reptiles and mammals)</p>	<p><b>ETP</b></p>  <p>Specific set of species recognized by national legislation and specific international agreements, or in case of out of scope, IUCN red-list.</p>
		<p><b>Outcome status</b></p> <p>Primary species are <i>likely/highly likely/highly certain</i> above a <b>Point of Recruitment Impairment (PRI)</b></p> <p>Secondary species are <i>likely/highly likely/highly certain</i> above <b>Biologically based limits</b></p> <p>Impacts on ETP species are either within national limits or direct effects on ETP species are not likely to hinder recovery.</p>

In the fishery, toothfish is the target species. All other species are caught incidentally and therefore examined individually under Principle 2 ('P2 species'). Principle 2 also evaluates the sustainability of each species stocks used as bait, which often represent large quantities for longline fisheries. For this fishery, all bait species are sourced from managed stocks, so the RBF will not be used.

In addition, a species is defined as 'main' if its catch makes up 5% or more by weight of the total catch of all species; or 2% or more if it is classified as 'less resilient'. Less resilient is defined as having low to medium productivity or species for which resilience has been lowered due to anthropogenic or natural changes to its life history.

The RBF will be used for the performance indicator 2.2.1 (Secondary species outcome). For the Secondary species in this assessment with no sufficient stock status reference points available, the team will carry out a Productivity Susceptibility Analysis (PSA).

The PSA requires information about the productivity and susceptibility of each species in a given performance indicator (PI). The information is used to individually score a set of attributes using pre-established PSA tables. Any attribute for which there is insufficient data is automatically assigned the highest risk score. Therefore some information is needed to demonstrate low risk in the fishery. The species Productivity scores can be established from published research, the Susceptibility scores are more fishery-specific as they depend on the interaction between the species ecology and the fishing methods. The RBF workshop aims to involve stakeholders to assist in the determination of the susceptibility scores.

### 3 Supporting information

In line with Annex PF of the MSC Fisheries Certification Requirement v2.0, the following information should be provided to stakeholders, prior to the RBF workshop taking place:

- Management arrangements in place together with any specific strategies, such as bycatch mitigation or recovery strategies
- Descriptions of any monitoring strategies in place, including at-sea observer programmes (coverage, duration, objectives).
- Maps of the distribution of fishing effort within the jurisdictional boundaries of the fishery
- Maps of distribution of all fishing effort on the target stock outside the fishery being certified
- Species, habitat and community distributions (including depth ranges)

#### 3.1 Management system

Fisheries management in the waters of France and its overseas territories is framed by the Code Rural et des Pêches Maritimes (Livre IX), which has a specific section (Titre V) for overseas territories. The archipelagos of Kerguelen (and Crozet) are uninhabited and part of the French austral and Antarctic territories (Terres Australes et Antarctiques Françaises - TAAF).

The islands of Kerguelen (CCAMLR sub-area 58.5.1) and Crozet (CCAMLR sub-area 58.6, Figure 1) are 1 420 km apart (767 nautical miles). They are situated inside the Antarctic Convergence Current, which delimits the CCAMLR area. CCAMLR, the Commission on the Conservation of Antarctic Marine Living Resources, was established under the Convention of the same name, which came into force in 1982, as part of the Antarctic Treaty System.

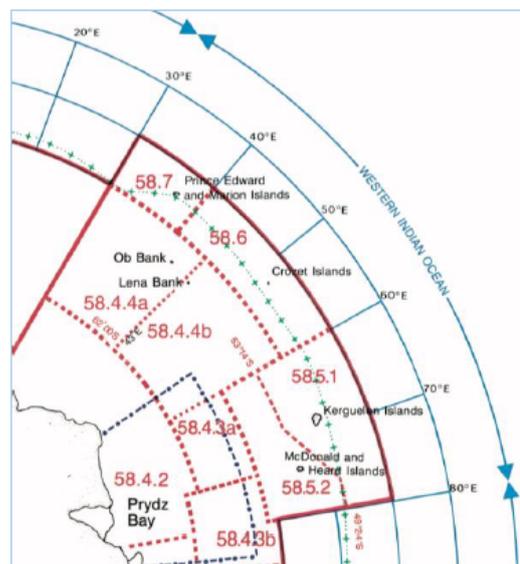


Figure 1. CCAMLR Statistical areas for Kerguelen and Crozet



CCAMLR has a Scientific Committee made up of scientific representatives from the member countries of the Commission, divided into Working Groups (WG) which deal with different topics (e.g. WG-FSA for fish stock assessment, WG-IMAF for incidental mortality associated with fisheries etc.). The Scientific Committee and the Commission meets annually; working groups may meet annually or more or less often, as required. France has generally implemented the CCAMLR conservation measures in the TAAF fisheries.

The two toothfish stocks of Patagonian toothfish (*Dissotichus eleginoides*) have been managed and assessed separately through annual total allowable catch levels (TACs Table 3), which are now justified by quantitative assessment models, reference points and associated Harvest Control Rules (HCR).

**Table 3. TAC including + depredation (tonnes) for the SARPC toothfish fishery in Kerguelen and Crozet**

Stock and CCAMLR sub-areas	Kerguelen (58.5.1)	Crozet (58.6)
2015/16	5 300	1 000
2016/17	5 323 (5 050 + 273)	1 650 (1 300 + 350)
2017/18	5 363 (5 050 + 313)	1 627 (1 100 + 527)

Numerous technical measures are aimed at protecting target, non-target, and ETP species with which the fishery interacts. These include among others:

- Closed seasons
- Closed areas
- Minimum toothfish landing size
- Seabird avoidance measures while shooting and hauling lines
- Move on rules to minimise interactions with marine mammals through depredation
- Obligate cut-off of sharks and rays caught incidentally
- Comprehensive reporting obligations and 100% scientific observation programme.

The main tool for management of bycatch is a code of conduct (code de bonne conduite (CBC)) prepared by the MNHN (Gasco and Duhamel 2011) and integrated into the TAAF fisheries regulations in 2012. The Code was revised in 2014 for all bycatch species (Gasco et al.), and is based on a temporal and spatial analysis of haul-by-haul CPUE (catch per hook) for macrourids, rays and antimoras (as well as juvenile toothfish below the 60cm minimum size), with the assist vessel skippers in deciding when and where to fish in order to reduce bycatch.

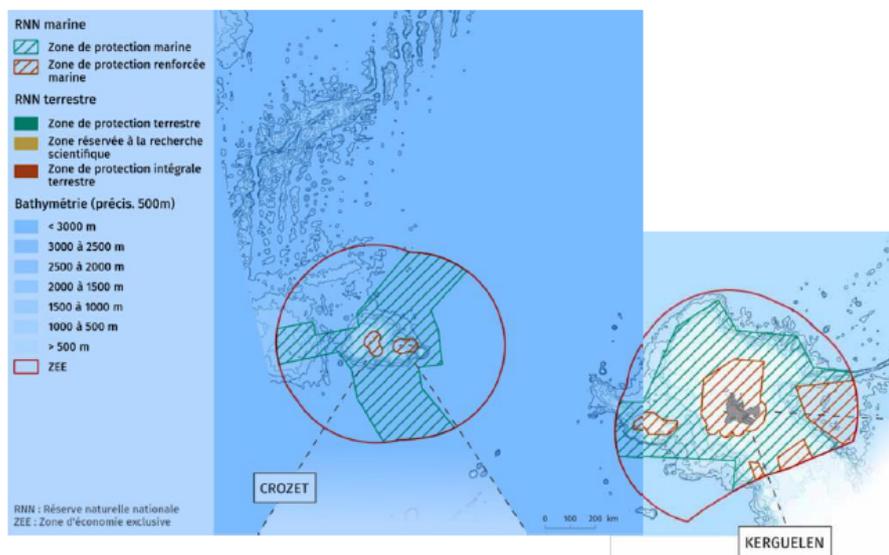
The CBC sets objectives and measures for reducing bycatch of grenadiers and rays. The observers evaluate and report on whether the CBC is being respected and report that it generally is (with some caveats as described in the main report associated mainly with the need to avoid orca depredation). In addition to this, the fishery has introduced new cut-off requirements for rays, based on CCAMLR CM 33-03, which requires them to be de-hooked and discarded carefully if they are alive. Again, observers report on the implementation of these requirements and note that they are generally respected except (again) in cases where rapid hauling is required to minimise depredation. The TAAF reportedly take total catch of rays into account in adjusting quota allocations.

### 3.2 Monitoring strategies

The fishery benefits from a number of long-standing and comprehensive programmes of scientific investigations. The French Natural History Museum (Muséum National d'Histoire Naturelle - MNHN) based in Paris is the scientific organisation responsible for providing management advice to the TAAF for this fishery. The MNHN research team focuses on the marine and fisheries ecology and maintains the PECHEKER database, which contains all the fisheries data available for Kerguelen and Crozet, including historic data going back several decades. It also operates the POKER marine biodiversity research cruise and trawl surveys (POKER I – 2006, POKER II – 2010, POKER III – 2013, POKER IV - 2017), which contribute fishery-independent information on toothfish recruitment around Kerguelen.

The ecosystems of and around Kerguelen and Crozet are also researched, in support of the extensive protected areas that cover both archipelagos and surrounding waters. The réserve naturelle nationale (RNN) des Terres australes françaises was extended at the end of 2016<sup>1</sup>, around Kerguelen, the MPA now covers 68% of the EEZ (397 084km<sup>2</sup>) and 44% of the ZEE around Crozet (255 780 km<sup>2</sup> Figure 2 from TAAF, 2017<sup>2</sup>).

The RNN has a five-year management plan, which is currently being revised. Activities include French and international collaborative marine research programmes that cover physical and biological oceanography and the entire trophic systems, including marine mammals and seabirds.



**Figure 2. Marine protected areas around Kerguelen and Crozet (TAAF, 2017). Red striped polygons are no-take zones, green striped area the MPA where regulated fishing activities may take place**

<sup>1</sup> Décret interministériel n°2016-1700 du 12 décembre 2016 portant extension et modification de la réglementation de la réserve naturelle nationale des Terres australes françaises

<sup>2</sup> Terres australes et antarctiques françaises, 2017. Bilan d'activités 2016 de la réserve naturelle des Terres australes françaises, 76p.

Finally, the seven vessels in the fishery have 100% on-board observer coverage. This ensures a steady collection of scientific information on the fishery's catch from 25% of all lines hauled. In addition to scientific observation, the 'COPEC' also control compliance with the reporting obligations and technical measures.

The observer reports are very detailed, and provide, among other things:

- Catch and discard data
- Details of operations of the vessel;
- Length-frequency measurements;
- Details of any tagged fish found, and any tagging carried out;
- Details of any bird interactions and their outcome (dead, injured, unharmed) and how they came about; also what bird avoidance devices were in place and whether they were deployed correctly;
- Interactions with marine mammals (depredation, entanglement);
- Respect for the rules (bycatch code of conduct, VME catches and regulations, requirements to limit orca depredation, respect of the rules for occupying zones, treatment and discharging of rubbish and offal);
- Various helpful comments on, for example, the attitude of the captain, contrôleur de pêche and crew, the practicality of implementing regulations, the weather, problems in collecting data or filling out the forms and so on.

### 3.3 Primary and secondary species

Detailed catch information to evaluate all target and bycatch species is kept in the MNHN database, together with biodiversity and stock assessment research survey information. Currently, the data are not directly available to the audit team.

#### 3.3.1 Catch data

The longline fishery is the only commercial fishery that takes place in the Kerguelen and the Crozet EEZ at this stage; apart from the scientific research trawl survey, which takes place every three to four years around Kerguelen. Therefore, the longline fishery catches constitute the largest pressure on the stocks of target and bycatch species. There were sizeable IUU catches estimated by CCAMLR for Kerguelen and for Crozet until the 2010. Although the risk remains, IUU activities have been greatly reduced by coordinated actions from the CROSS La Réunion, international MCS activities coordinated with Australia for Kerguelen and South Africa for Crozet and active cooperation from the fishing vessels.

SARPC members have made their copies of the COPEC reports available to the auditors each year during the previous certification cycle. The Avipêche data from 2013/14 and 2014/15 (some numbers were not clearly legible in the reports for 2015/2016) have been compiled in Table 4.

The catches (in tonnes) show a large predominance of toothfish, the target species, with bycatch of grenadier, antimora and some ray species examined in more detail below. Apart from toothfish, all other fish species that are either retained on-board or discarded in this fishery are 'unmanaged' and therefore are considered as Secondary species.

**Table 4. Catches (tonnes) including discards for 2013/14 and 2014/2015 in the Kerguelen and Crozet UoAs (species weighed only, from COPEC Avipêche reports)**

Species	2013/14 KER	2014/15 KER	2013/14 CRO	2014/15 CRO
Légine	4,686	3,574	711	677
Grenadier	657	541	50	79
Antimore	56	62	19	21
Raie irrasa	85	4		
Raie eatonii	31	3	0	-
Raie taaf			31	7
Etmopterus	2	1		
Spectrunculus	0	-		
Lepidion	0	-	0	-
Centroscymnus	0	0		
Lithodes	0	0	-	0
Muraenolepis	0	0		
<b>Total</b>	<b>5,518</b>	<b>4,184</b>	<b>812</b>	<b>784</b>

The data are presented as percentages (for the two years together) in Table 5. From these, only grenadier represents 5% or more of the total catch weight and qualifies as a 'main' species (as defined in the section on the Use of the RBF (Risk-Based Framework) for both Kerguelen and Crozet. Antimora catches do not exceed 5%, but they are greater than 2%. It will be asked during the workshop whether it should be considered as a 'less resilient' species and therefore included in the final RBF analysis.

**Table 5. Average percentages composition of catch weighed (including discards) for the Kerguelen and Crozet UoAs (from COPEC reports)**

Species common name	Nom commun	Latin name	% Catch KER	% Catch CRO
Toothfish	Légine	<i>D. eleginoides</i>	85.1%	87.0%
Grenadier	Grenadier	<i>Macrourus carinatus</i>	<b>12.3%</b>	<b>8.1%</b>
Antimora	Antimore	<i>Antimora rostrata</i>	1.2%	2.6%
Whiteleg Skate	Raie épineuse	<i>Amblyraja taaf</i>		<b>2.3%</b>
Kerguelen Sandpaper Skate	Raie rugueuse	<i>Bathyraja irrasa</i>	<b>&gt;&gt;0.9%</b>	
Eaton's Skate	Raie d'Eaton	<i>Bathyraja eatonii</i>	<b>&gt;&gt;0.4%</b>	0.0%
Lantern Sharks	Sagres	<i>Etmopterus spp.</i>	0.0%	
Porbeagle shark	Requin taupe	<i>Lamna nasus</i>		0.0%
Cusk-eel	Donzelle broche	<i>Spectrunculus spp.</i>	0.0%	
Morid cod	Lepidion	<i>Lepidion spp.</i>	0.0%	0.0%
Dogfish	Pailona	<i>Centroscymnus spp.</i>	0.0%	
King crab	Crabe royal	<i>Lithodes spp.</i>	0.0%	0.0%
(Marbled) eel cod	Gadomurène	<i>Muraenolepis spp.</i>	0.0%	

Only the *Amblyraja taaf* catch is greater than 2% of the total catch for Crozet in Table 5, but most of the rays caught are cut-off and therefore not weighed. On this basis, it is proposed to also consider *Bathyraja irrasa* in Kerguelen and *Bathyraja eatonii* in both Kerguelen and Crozet as 'main' on the basis that their catches most likely

amount to 2% or more of the total catch, and that they should be considered as 'less resilient' on the basis of their endemicity and overall rarity.

According to the CCAMLR 2016 Fisheries Reports:

- For Kerguelen, bycatch species are mostly grenadiers (macrourids) – mainly *Macrourus carinatus* (grenadier à gros yeux, ridge-scaled rattail), rays – mainly *Bathyraja irrasa* and *B. eatonii* (Nowara et al. 2009), and *Antimora* spp. – mainly *A. rostrata* (antimora or blue antimora);
- For Crozet, by-catch species are the same as for Kerguelen with the ridge-scaled grenadier (*Macrourus carinatus*) and blue antimora (*Antimora rostrata*), in addition to the rajid whiteleg skate (*Amblyraja taaf*).

Both fisheries fully discard *Antimora*, while the other species listed may be partly or totally retained, and most of the rays are indicated as released alive.

### 3.3.2 Fishing activities

Maps of cumulative line sets over the years are available from various scientific publications to study interactions with marine mammals and birds in particular. In both Kerguelen and Crozet EEZ, lines are sent between the depths of 500m and 2000m. In Kerguelen, fishing takes place between the depths of 500m and 1500m to 2000m, fishing in shallower waters where young fish may be caught is prohibited (Figure 3).

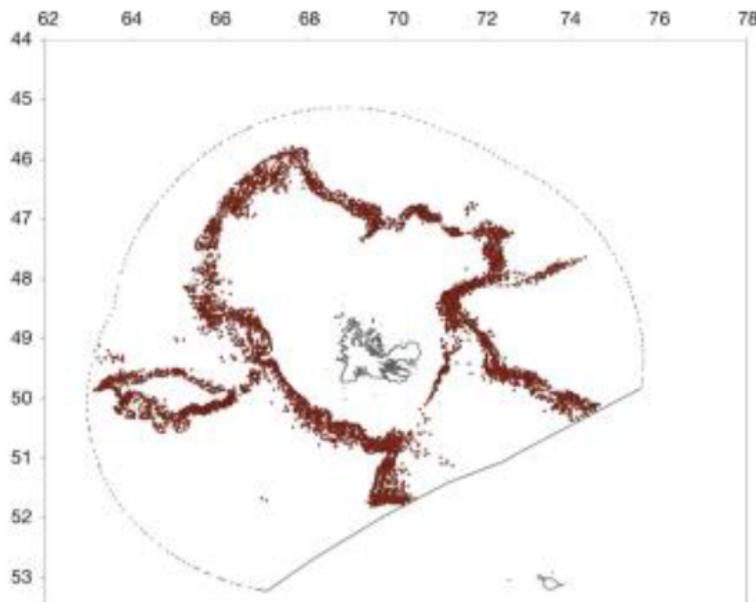


Figure 3. Longline fishing grounds around Kerguelen from 1999 to 2009 (Duhamel et al., 2011).

In Crozet, the grounds are more restricted due to the steeper bathymetry (Figure 4).

These maps will need to be updated, to show any changes in the distribution of fishing effort around Kerguelen and Crozet following the extension of the RNN MPA boundaries in 2016.

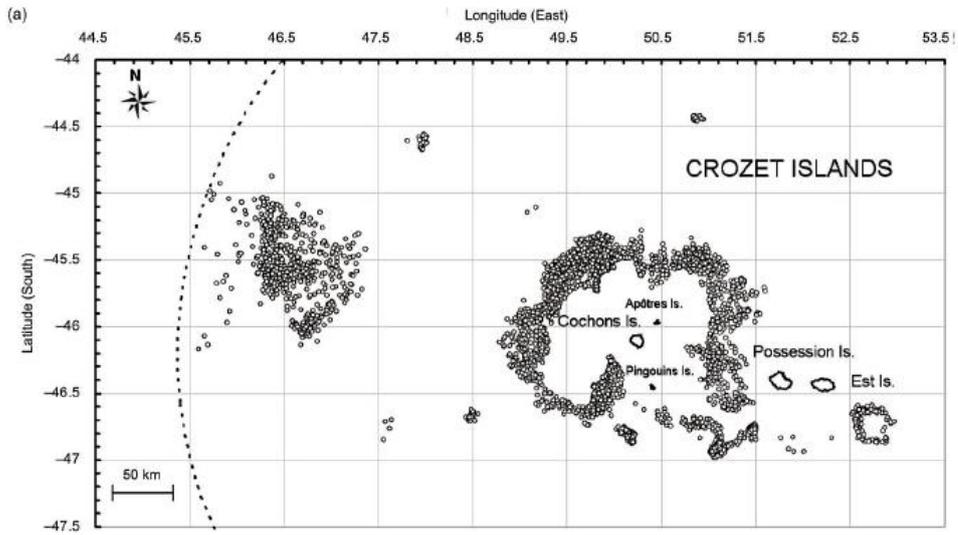


Figure 4. Longline fishing grounds around Crozet and del Cano Rise to the West, from 2003 to 2008 (Tixier et al., 2010).

### 3.3.3 Species distribution

Kerguelen and Crozet are both in the sub-Antarctic zone, between the Antarctic Polar Front in the South and the Sub-Antarctic front in the North, while the Australian island of Heard is in the Antarctic Zone on the other side of the Polar front (Figure 5 Koubi et al 2016<sup>3</sup>).

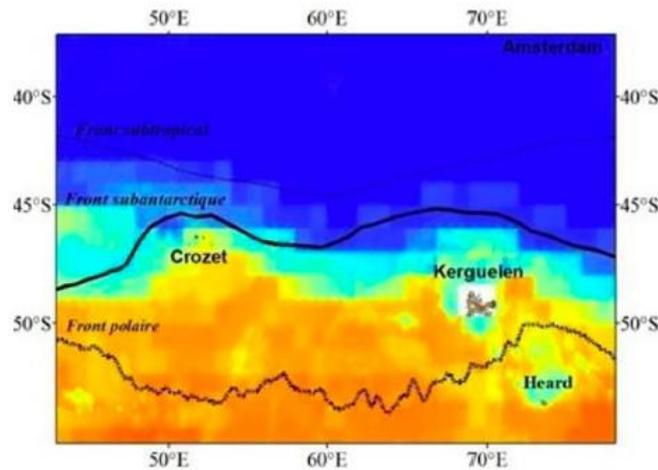


Figure 5. The South Polar and Sub-Antarctic oceanic fronts and simulated habitat of the Antarctic lantern fish (*Electrona antarctica*) (source: Koubi et al 2016)

<sup>3</sup> Koubbi, P., Guinet, C., Alloncle, N., Ameziane, N., Azam, C. S., Baudena, A., Weimerskirch, H. (2016). Ecoregionalisation of the Kerguelen and Crozet islands oceanic zone. Part I: Introduction and Kerguelen oceanic zone. CCAMLR Document WG-EMM-16/43.

Off the main secondary species that will be examined during the workshop, the grenadiers caught by the longline fishery appear to be mostly *Macrourus carinatus*, but this will need to be confirmed by the workshop.

According to Fishbase, **grenadiers** are a benthic species found on the continental slope usually found between 600 - 1500m, with a more patchy distribution for *Macrourus carinatus* (Figure 6) than for *Macrourus whitsoni* (Figure 7). Their life history of this species is not well known, they are not thought to be resilient to overfishing – the estimated population doubling time is >14 years. They are thought to feed on crustaceans, polychaetes and fish, based on the stomach contents of three specimens examined. IUCN status is not evaluated.



Figure 6. Global distribution of *Macrourus carinatus* (source: Fishbase.org)



Figure 7. Global distribution of *Macrourus whitsoni* (source: Fishbase.org)

The **Blue antimora** (*Antimora rostrata*) according to Fishbase are a globally distributed epibenthic / benthopelagic species found predominantly on continental slopes, with a depth range mostly between 1300 and 2500 m. The life history of this species is not well known. Blue antimora is thought to be somewhat resilient to overfishing, with population doubling times estimated between 1.4 and 4.4 years. They feed predominantly on benthic invertebrates. IUCN status: Least Concern.

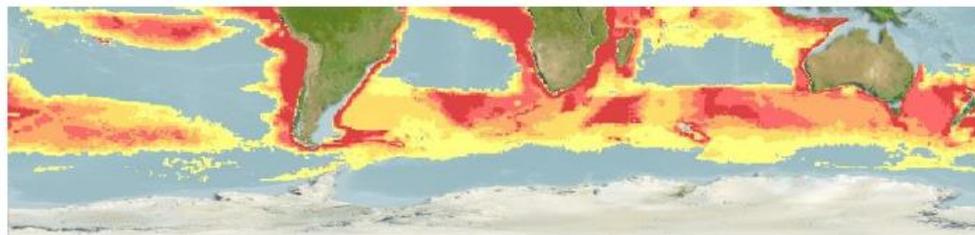


Figure 8. Global distribution of Blue antimora (*Antimora rostrata*) (source: Fishbase.org)

Of the three ray species analysed as 'main, this is the only one to have a widespread distribution, **Eaton's skate** (*Bathyraja eatonii*), according to Fishbase (Figure 9). Little is known about this species demersal depth range, though it is commonly caught in fisheries operating on the shelf slopes in the Southern Ocean. They are

known to lay paired eggs, which feed solely on yolk. Their diet is not known. Population doubling times are estimated between 4.5 and 14 years, making them vulnerable to overfishing. These are very rarely landed in this fishery. They are cut-off but their survival is not well known. IUCN status: Data Deficient.



Figure 9. Global distribution of Eaton's skate (*Bathyraja eatonii* source Fishbase.org)

Around Kerguelen, the highest catch rates (CPUE) appear to be in the shallower part of the fishing grounds (Figure 10).

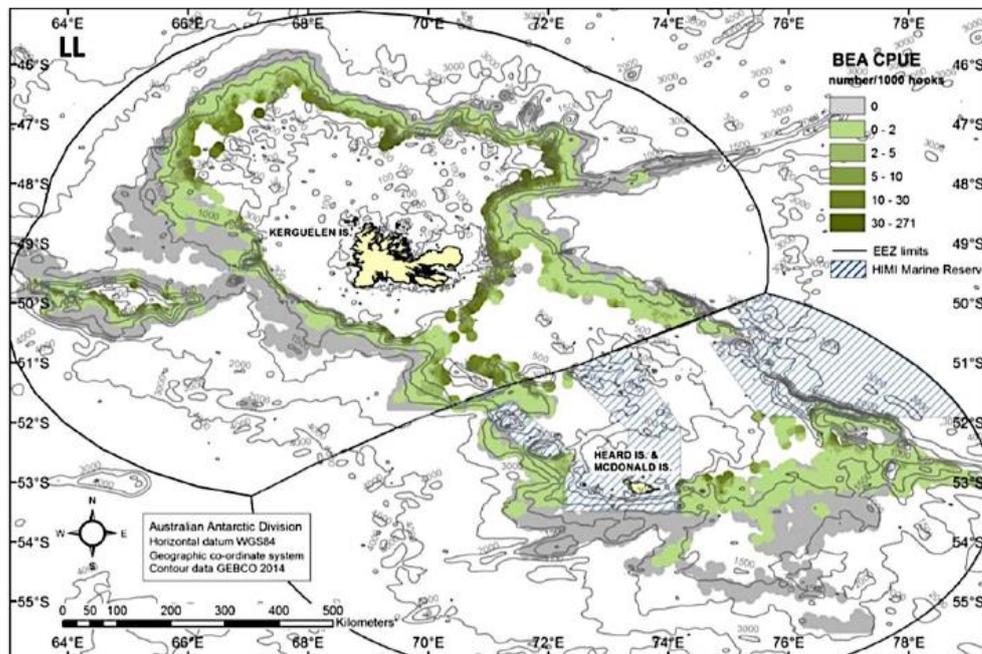


Figure 10. Distribution and abundance of *B. eatonii* taken in the toothfish fisheries between 1997 and 2017 (Nowara et al, 2017)

The Kerguelen sandpaper skate (*Bathyraja irrasa*) is a demersal ray found solely in waters around the Kerguelen Plateau, at depths between 300m and 1218 m (Figure 11 Fishbase). They lay paired eggs, which feed on yolk. Their diet is unknown. Population doubling times are thought to be between 4.5 – 14 years, making them vulnerable to overfishing – especially given their extreme endemism. Due to their extreme endemism to the Kerguelen plateau, the IUCN status for this species is Near Threatened.

Recent research shows that the highest bycatch CPUE have indeed been in the shallower ranger of fishing activities (Figure 12).



Figure 11. Global distribution of the Kerguelen Sandpaper skate (*Bathyraja irrasa*, source Fishbase.org)

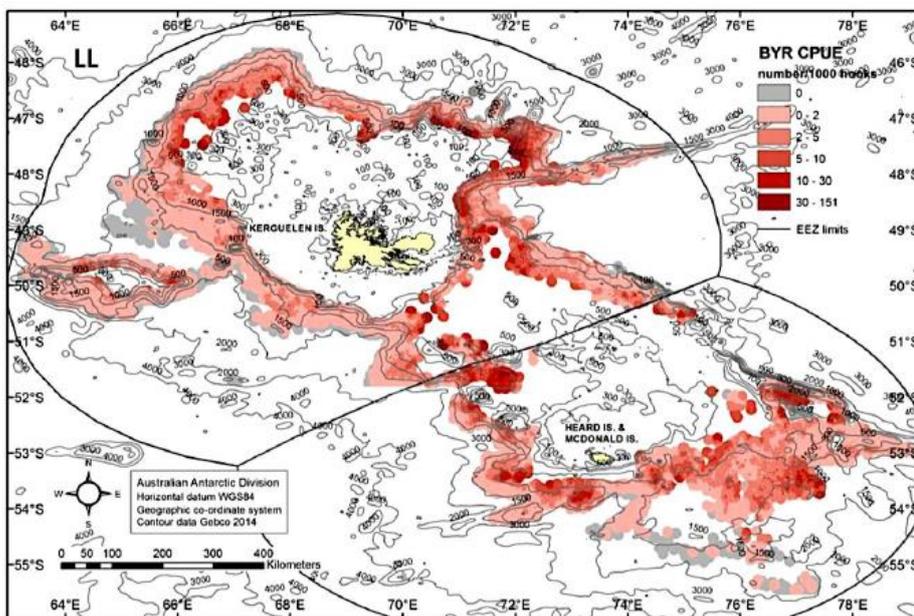


Figure 12. Distribution and abundance of *B. irrasa* taken in the toothfish fisheries between 1997 and 2017 (Nowara et al, 2017)

The **Whiteleg skate** (*Amblyraja taaf*) is only caught by the fishery around Crozet. According to Fishbase, it is a demersal species exclusively found in the sub-Antarctic region of the Indian Ocean, at depths between 300m and 500m, but the extensive MNHN database, it is not found around Kerguelen, and not found by the Australian toothfish fishery around Heard and McDonald Islands (MSC PCR, 2017).

The feeding habits and life cycle of *Amblyraja taaf* are poorly known but, as for the Kerguelen sandpaper skate, they are believed to be more vulnerable to overfishing than the average rajid due to their endemism. It is worth noting that their common depth range is shallower than the areas in which this fishery is allowed access. IUCN status: Data Deficient.

#### 4 Guide to Susceptibility attributes and scores

A few guidance notes are given below, to assist stakeholders in the completion of the susceptibility questionnaire, which will be done collectively during the RBF Workshop session. Please note that this guidance is not exhaustive and stakeholders are

encouraged to consult the MSC Fisheries Certification Requirements v2.0 (Annex PF<sup>4</sup>).

Four attributes will need to be scored, Areal overlap, Encounterability, Selectivity of gear type to retain species, and Post-capture mortality. Where there is limited information available to score a susceptibility attribute, the more precautionary score shall be awarded (Table 6).

**Aerial overlap:**

- Where the impacts of fisheries other than the UoA are taken into account, the areal overlap shall be scored as the combined overlap of all listed fisheries with the areal concentration of a stock
- The scoring of areal overlap shall consider the concentration of species and the overlap of the fishing gear with the concentration species

**Table 6. PSA susceptibility attributes and scores (from MSC FCRv2.0, Annex PF)**

Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility (high risk, score=3)
Areal overlap (availability). Overlap of the fishing effort with a species concentration of the stock	<10% overlap	10-30% overlap	>30% overlap
Encounterability The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with fishing gear (high encounterability)
Selectivity of gear type Potential of the gear to retain species	a Individuals < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear	b Individuals < half the size at maturity can escape or avoid gear	b Individuals < half the size at maturity are retained by gear
Post-capture mortality (PCM). The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival	Evidence of some released post-capture and survival	Retained species or majority dead when released - Default score for retained species (P1 or P2)

<sup>4</sup> <https://www.msc.org/documents/scheme-documents/fisheries-certification-scheme-documents/fisheries-certification-requirements-version-2.0>



**Encounterability:**

- Where the impacts of fisheries other than the UoA are taken into account, encounterability shall be scored as the combined encounterability of all listed fisheries
- The scoring of encounterability shall consider the concentration of species and the overlap of the fishing gear with the concentration species
- The deployment of fishing gear in relation to each species adult habitat is the main aspect to be considered for each species

**Gear selectivity:**

- ‘Rarely’ means that the capture of individuals smaller than the size at maturity occurs in less than 5% few gear deployments.
- ‘Regularly’ means that the capture of individuals smaller than the size at maturity occurs in 5% to 50% of the gear deployments.
- ‘Frequently’ means that the capture of individuals smaller than the size at maturity occurs in more than 50% of gear deployments.

**Post-capture mortality:**

- The team shall use its knowledge of species biology and fishing practice together with independent field observations to assess the chance that, if captured, a species would be released and that it would be in a condition to permit subsequent survival
- In the absence of observer data or other verified field observations made during commercial fishing operations that indicate the individuals are released alive and post-release survivorship is high, the default value for the PCM of all species shall be high

## 5 Susceptibility analysis

For each secondary species/ stock analysed as main, the information briefly reviewed above, and any additional scientific evidence that the TAAF, MNHN and other stakeholders may share before or during the workshop, will be referred to in the following tables, in order for the scores to be determined.

The scores range from 1 to three for each of the attributes, with a score of 1 for a low risk, and three for the higher risk or susceptibility.

**Life history**

Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility high risk, score=3)
<b>Areal overlap (availability)</b> Overlap of the fishing effort with a species concentration of the stock	<10% overlap	10-30% overlap	>30% overlap



Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility high risk, score=3)
<b>Encounterability</b> The position of the stock/species within the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with fishing gear (high encounterability)

Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility high risk, score=3)
<b>Selectivity of gear type</b> Potential of the gear to retain species	a Individual < size at maturity are rarely caught	a Individuals < size at maturity are regularly caught	a Individuals < size at maturity are frequently caught
	b Individuals < size at maturity can escape or avoid gear	b Individuals < half the size at maturity can escape or avoid gear	b Individuals < half the size at maturity are retained by gear

Susceptibility attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (medium risk, score=2)	High susceptibility high risk, score=3)
<b>Post-capture mortality (PCM).</b> The chance that, if captured, a species would be released and that it would be in a condition permitting subsequent survival	Evidence of majority released post-capture and survival	Evidence of some released post-capture and survival	Retained species or majority dead when released - Default score for retained species (P1 or P2)

## Appendix 9 Letters of support to Client Action Plan

### Appendix 9.1 Southern Ocean Foundation



**FONDATION  
D'ENTREPRISES  
DES MERS AUSTRALES**  
SOUTHERN OCEAN FOUNDATION  
POUR UNE MEILLEURE CONNAISSANCE

Le Port, le 12 septembre 2018

**Monsieur le Président  
du SARPC  
Magasin 20 - Port Ouest  
97 420 - LE PORT**

Monsieur le Président,

La Fondation d'entreprises des mers australes a été informée par vos soins du processus de re-certification MSC de la pêcherie de légine dans les ZEE de Kerguelen et de Crozet portée par le SARPC.

Elle a pris note en particulier de l'existence d'une condition à lever relative aux prises accessoires.

Etant donné que la problématique des captures accessoires de raies a d'ores et déjà été identifiée par le Conseil d'administration de la Fondation comme un sujet d'intérêt, je vous confirme l'accord de la Fondation à participer à la conception et la mise en œuvre d'un plan d'action proposées par le SARPC.

En effet, ce sujet entre parfaitement dans les lignes directrices de la Fondation, figurant à l'article 4 de ses statuts, à savoir :

« La FONDATION D'ENTREPRISES DES MERS AUSTRALES a pour objet d'initier, supporter, promouvoir, financer ou participer au financement :

- de toute étude ou action de recherche liées à la mer dans les zones australes, notamment celles ayant trait aux écosystèmes marins (fonds marins, faune et flore) et aux pêcheries (...) »

Je vous prie d'agréer, Monsieur le Président, mes salutations distinguées,

Le Président,  
  
Laurent NICOLLE



**FONDATION  
D'ENTREPRISES  
DES MERS AUSTRALES**  
SOUTHERN OCEAN FOUNDATION  
POUR UNE MEILLEURE CONNAISSANCE

Magasin 20 - Port Ouest - 97420 Le Port - LA REUNION

**Appendix 9.2 MNHN**

MINISTÈRE DE L'ÉDUCATION NATIONALE, DE L'ENSEIGNEMENT SUPÉRIEUR  
ET DE LA RECHERCHE  
MINISTÈRE DE L'ÉCOLOGIE ET DU DÉVELOPPEMENT DURABLE  
MUSEUM NATIONAL D'HISTOIRE NATURELLE  
DÉPARTEMENT ADAPTATION DU VIVANT  
UMR BOREA - CP 26  
57, Rue Cuvier  
75231 PARIS CEDEX 05

Patrice Pruvost

TEL : 01 40 79 37 60  
FAX : 01 40 79 37 71

Destinataire : Mme la Secrétaire générale du SARPC  
Copies : CROSS Réunion  
Directeur des pêches et des questions maritimes des TAAF

Paris, le 10/09/2018

Chère Madame,

Suite à vote courriel, en date du 31 août 2018, nous vous confirmons que le Muséum national d'Histoire naturelle met tout en œuvre, en collaboration avec les TAAF, pour suivre et participer au processus de demande d'accréditation MSC mené par le SARPC.

Nous sommes informés des demandes de reconduction et de renouvellement de la certification engagés par le SARPC.

Le MNHN est informé de la volonté du SARPC de rédiger un plan d'action en concertation avec notre établissement.

Le MNHN va poursuivre son implication dans le suivi scientifique de la pêche en soutien aux administrations et au SARPC dans l'objectif d'améliorer les connaissances et les avis scientifique en veillant au maintien d'une pêche durable.

Nous vous prions, Madame, d'agréer l'expression de nos sentiments distingués

Guy Duhamel  
Responsable scientifique

Patrice Pruvost  
Responsable programme

Programme d'Observation Ecosystémique des Pêcherie Australes du MNHN

**Appendix 9.3 TAAF**

Liberté • Égalité • Fraternité

RÉPUBLIQUE FRANÇAISE

**TERRES AUSTRALES  
ET ANTARCTIQUES FRANÇAISES**

Rue Gabriel Dejean - B.P. 400  
97458 SAINT-PIERRE CEDEX

Saint-Pierre, le 19 septembre 2018

Affaire suivie par : Marion Kauffmann  
Tél : 02 62 96 78 28  
Courriel : marion.kauffmann@taaf.fr

Réf. : TAAF/DPQM-18-60

M. le directeur des pêches et des questions  
maritimes des Terres australes et  
antarctiques françaises

à

Mme Delphine Ciolek,  
Secrétaire générale du SARPC

Objet : soutien au programme de renouvellement de certification MSC

Madame la Secrétaire générale,

En tant qu'organisme gestionnaire des pêcheries dans les ZEE de Kerguelen et Crozet, les TAAF ont pour objectif de garantir la durabilité de ces pêcheries dans le strict respect des écosystèmes qui lui sont liés. A ce titre, nous nous engageons à accompagner le SARPC, avec le soutien scientifique et la collaboration du MNHN, dans toute démarche d'amélioration des critères de durabilité établis par le MSC.

Nous apporterons donc notre soutien à l'établissement et la réalisation du plan d'action visant au renouvellement de la certification MSC des pêcheries ciblant la légine. Nous mettrons en œuvre le cadre réglementaire et les moyens humains nécessaires afin que le SARPC puisse répondre aux conditions et recommandations émises par l'organisme certificateur MSC afin de maintenir les standards environnementaux de ces pêcheries à un niveau internationalement reconnu.

Je vous prie d'agréer, Madame la Secrétaire générale, l'expression de ma considération distinguée.

Thierry CLOUTIER

1/2

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