# Marine Stewardship Council Full Assessment

# Public Certification Report

***For The***

# Chile Austral hake *(Merluccius australis*) industrial trawl and longline

***Facilitated By the***

# Federación de Industrias Pesqueras Del Sur Austral

**Assessors:** Dr. Ivan Mateo
Dr. Virginia Polonio
Ms. Edith Saa

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**SAI Global**
Block 3, Quayside Business Park,
Mill Street, Dundalk,
Co. Louth, Ireland.
**T**: + 353 42 932 0912
**F**: + 353 42 938 6864
www.saiglobal.com

## Foreword

The MSC Fisheries Standard sets out requirements that a fishery must meet to enable it to claim that its fish come from a well-managed and sustainable source. The standard applies to wild-capture fisheries that meet the scope requirements. The MSC Fisheries Standard comprises three core principles:

**Principle 1: Sustainable target fish stocks**
A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

**Principle 2: Environmental impact of fishing**
Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

**Principle 3: Effective management**
The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

A full description of the MSC Fisheries Certification Requirements and Processes followed during this assessment can be found in MSC Fisheries Certification Requirements and Guidance. This assessment uses the version of the MSC Standard and follows the processes outlined in the MSC Fisheries Certification Requirements (FCR) v2.0 re-released on 1st October 2015. The definitive version of all documents is maintained on the MSC's website www.msc.org. Any discrepancy between copies, versions or translations shall be resolved by reference to the definitive English version.

Readers should verify that they are using the copy of the MSC FCR (and other documents) that are relevant to this assessment. Updated documents, together with a master list of all available MSC documents, can be found on the MSC's website.

  

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# Glossary

| Term | Definition |
|---|---|
| ABC | Acceptable Biological Catch |
| Blim | Limit Reference Point for Biomass |
| $B_0$ | Virgin biomass or initial biomass when there is no fishing |
| Bpa | Precautionary reference point for spawning stock biomass |
| BRP | Biological Reference Point |
| CFA | Commercial Fisheries Area |
| CIAMT | Captura incidental de aves, mamiferos y tortugas-logbook information |
| CITES | Convention on International Trade in Endangered Species of Wild Flora |
| EBSA | Ecological and Biological Sensitive Areas |
| EEZ | Exclusive Economic Zone |
| ENGO | Environmental Non-Governmental Organization |
| F | Fishing Mortality |
| FAO | FAO Food and Agriculture Organisation of the United Nations |
| HCR | Harvest Control Rules |
| IFOP | Institute for Fisheries Research |
| ITQ | Individual Transferable Quota |
| IFMP | Integrated Fisheries Management Plan |
| IQ | Individual Quota |
| IOE | Interacciones con otras especies-logbook information |
| LGPA | Ley General Pesca y Acuacultura (General Law on Fisheries and Aquaculture) |
| LODs | Limits of Detection |
| LPs | Local Populations |
| LRP | Limit Reference Point |
| MPs | Management procedures |
| MPA | Marine Protected Area |
| MSC | Marine Stewardship Council |
| MSE | Management Strategy Evaluation |
| MSY | Maximum Sustainable Yield |
| NMFS | National Marine Fisheries Service |
| P1, P2, P3 | MSC's Guiding Principles |
| PA | Precautionary Approach |
| PI | Performance indicator |
| PSA | Productivity Susceptibility Analysis |
| PRI | Point of Recruitment Impairment |
| RBF | Risk Bases Framework |
| SFF | Sustainable Fisheries Framework |
| RCC | Rules Catch Control |
| SE | Scoring element |
| SG | Scoring guidepost |
| SSB | Spawning Stock Biomass |
| STC | Scientific Technical Commitee |
| TAC | Total Allowable Catch |
| UoA | Unit of Assessment |
| UoC | Unit of Certification |
| VME | Vulnerable Marine Ecosystem |
| VMS | Vessel Monitoring System |
| WWF | World Wildlife Fund |

# 1. Executive Summary

This report includes the details of the MSC assessment of Chile Austral hake *(Merluccius australis*) industrial trawl and longline against the MSC Principles and Criteria for Sustainable Fishing. The report includes an introduction to the fishery, the results of the assessment, the rationales that substantiate the scores for each performance indicator (PI) and a recommendation as to whether the fishery is eligible for Certification. The applicant fishery had not previously been assessed against the MSC Principles and Criteria for Sustainable Fishing.

This assessment was initially announced on 30th October 2017 and a site visit was conducted in November 2017. During that initial site visit it became apparent that there were issues relating to the UoAs as originally defined due to the industrial trawl fleet's commonly switching from bottom trawl to midwater trawl on the same fishing trip and not separating their catches by gear type. Therefore, and following the acceptance of a Variation Request by MSC, the UoAs and proposed UoCs were re-defined to include both bottom and midwater trawls as scoring elements within the same Unit of Assessment (UoA). Following a revised announcement in August 2018, a second on-site visit took place in September 2018.

When originally announced, this assessment was carried out by a SAI Global Assessment Team consisting of Dr. Ivan Mateo (Team Leader), Cynthia Fernandez, Dr. Gonzalo Macho and Edith Saa. This was the Assessment Team that was present during the first on-site visit. In August 2018, the Assessment Team was modified with Dr. Virginia Polonio replacing Mrs Fernandez and Dr. Macho.

The assessment process began in October 2017. This assessment was conducted according to requirements laid out in MSC Fisheries Certification Requirements (FCR) v.2.0, using the information and documents collected during desktop review, two on-site visits and through emails and calls with stakeholders involved in the fishery. The below MSC Scheme Documents and report template were used during the assessment.

| MSC Scheme Document | Version | Issue Date | Implementation |
|---|---|---|---|
| MSC Fisheries Certification Requirements | 2.0 | 1st October 2014 | Standard and Process |
| General Certification Requirements | 2.1 | 20th February 2015 | Process |
| General Certification Requirements | 2.2 | 1st March 2018 | Process |
| General Certification Requirements | 2.3 | 31st August 2018 | Process |
| Full Assessment Reporting Template | 2.0 | 8th October 2014 | Process |

SAI Global would like to thank all management and scientific agencies, industry bodies and stakeholders for their collaboration and for providing the information and data necessary to carry out this assessment.

## 1.1. Main strengths and weaknesses of the fishery under assessment

**Table 1.** UoA 1 Industrial trawl – Strengths and Weaknesses.

| Strengths | Weaknesses |
|---|---|
| • Well-defined reference points and harvest control rules are in place<br>• Robust Habitat Management Strategy is Demonstrated<br>• Robust governance and policy is demonstrated. | • Austral hake SSB is below target Spawner Stock Biomass ($SSB_{MSY}$)<br>• Strategies to reduce fishing mortality have not demonstrated that they can be effective in raising some identified main primary species abundances to healthy biological limits (Hoki). |

**Table 2.** UoA 2 Longline – Strengths and Weaknesses.

| Strengths | Weaknesses |
|---|---|
| • Well-defined reference points and harvest control rules are in place<br>• Robust Habitat Management Strategy is Demonstrated<br>• Robust governance and policy is demonstrated. | • Austral hake SSB is below target Spawner Stock Biomass ($SSB_{MSY}$) |

## 1.2. Overall conclusion

A rigorous assessment of the MSC Principles and Criteria was undertaken by the assessment team and a detailed, fully referenced scoring rationale is provided in Appendix 1 of this report. The two Units of Assessment (UoAs) achieved the minimum required score of 80 or above on each of the three MSC Principles independently and did not score less than 60 against any Performance Indicator. Final Principles scores are shown in the Table 3 below.

**Table 3.** Final Principle Scores.

| Unit of Assessment | Principle | Score | PASS/FAIL |
|---|---|---|---|
| UoA 1– Industrial trawl | Principle 1 – Target Species | 84.2 | Pass* |
| | Principle 2 – Ecosystem | 82.7 | Pass* |
| | Principle 3 – Management System | 90.0 | Pass |
| UoA 2 – Longline | Principle 1 – Target Species | 84.2 | Pass* |
| | Principle 2 – Ecosystem | 83.3 | Pass |
| | Principle 3 – Management System | 90.0 | Pass |

*Although the overall score is above 80, two Performance Indicators (PIs) scored less than the unconditional pass mark (<80). Consequently, two conditions were raised to the fishery, which must be addressed within specified timeframes. On MSC evaluations, conditions are applied to fisheries in assessment in order to improve the performance of the fishery so the performance indicators without the minimum score (80) can obtain at least an unconditional pass mark within a period set to the certification body.

The table below (Table 4) presents a summary of the conditions raised during the assessment. Note: This table is for summary purposes only and a complete listing of conditions, rationales and their associated corrective actions are presented in Appendix 1.3.

## 1.3. Certification recommendation

On completion of the scoring process, the assessment team has recommended that Chile Austral hake (*Merluccius australis*) industrial trawl and longline is eligible to be certified according to the MSC Principles and Criteria for Sustainable Fishing subject to the Conditions and related corrective actions outlined in this report.

## 1.4. Conditions and Recommendations

Two Performance Indicators (PIs) were assessed as scoring less than the unconditional pass mark. Therefore, two conditions were raised to the fishery, which must be addressed within specified timeframes.

On MSC evaluations, conditions are applied to fisheries in assessment in order to improve the performance of the fishery so the performance indicators without the minimum score (80) can obtain at least an unconditional pass mark within a period set by the certification body

The table below presents a summary of the conditions raised during the assessment. Note: This table is for summary purposes only and a complete listing of conditions, rationales and their associated corrective actions are presented in Appendix 1.3.

**Table 4.** Conditions found during the assessment.

| Condition number | Performance Indicator | Applicable to | Condition |
|---|---|---|---|
| **1** | PI 1.1.1<br>Stock Status | UoA 1 – Industrial trawl<br>UoA 2 – Longline | By the 4th surveillance audit after reassessment, the Assessment Team shall be provided with evidence that the stock (i.e. Chile Austral hake) is at or fluctuating around a level consistent with MSY in the Industrial Trawl and Longline Fishery |
| **2** | PI 2.1.1<br>Primary Species (Outcome) | UoA 1 – Industrial trawl | By the 4th surveillance, the assessment team shall be provided with evidence that Main primary species (i.e. hoki) in the Industrial Trawl Fishery (UoA 1) 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 |

An additional recommendation was added during the consultation phase of the objections process as follows (refer to Evaluation Results for further details):

**Recommendation 1:**
The Assessment Team recommends that measures recognised as “best practice” in mitigating the fishery’s impacts on seabirds (e.g. as recommended by ACAP) be implemented as soon as is practicable; furthermore, the Team recommends that studies be undertaken to examine the effectiveness of any new measures.

# 2. Authorship and Peer Reviewers

## 2.1. Assessment Team

When the assessment was originally announced and for the first on-site visit, the Assessment Team was made up of Dr. Ivan Mateo (Team Leader), Cynthia Fernandez, Dr. Gonzalo Macho and Edith Saa. When the assessment was re-announced in August 2018, the Assessment Team was modified with Dr. Virginia Polonio replacing Mrs Fernandez and Dr. Macho for the second on-site visit. The contents of the report as well as the conclusions and recommendations contained herein are reflective of the work of the Assessment Team for the second on-site visit; their skills and experience are summarised below.

**Dr. Ivan Mateo (Lead Assessor, primary responsibility for Principle 1 and Traceability)**

Dr. Mateo has over 20 years' experience working with natural resources population dynamic modelling. His specialization is in fish and crustacean population dynamics, stock assessment, evaluation of management strategies for exploited populations, bioenergetics, ecosystem-based assessment, and ecological statistical analysis. Dr. Mateo received a Ph.D. in Environmental Sciences with Fisheries specialization from the University of Rhode Island. He has studied population dynamics of economically important species as well as candidate species for endangered species listing from many different regions of the world such as the Caribbean, the Northeast US Coast, Gulf of California and Alaska. He has done research with NMFS Northeast Fisheries Science Center' Ecosystem Based Fishery Management on bio-energetic modeling for Atlantic cod. He also has been working as environmental consultant in the Caribbean doing fieldwork and looking at the effects of industrialization on essential fish habitats and for the Environmental Defense Fund developing population dynamics models for data poor stocks in the Gulf of California. Recently, Dr. Mateo worked as National Research Council postdoc research associate at the NOAA National Marine Fisheries Services' Ted Stevens Marine Research Institute on population dynamic modelling of Alaska sablefish.

**Dr. Virginia Polonio (Assessor, primary responsibility for Principle 2 and RBF)**

Dr. Polonio has a degree in Environmental Sciences (B.S.c. University of Cádiz). She has a Master degree (M.Sc. University of Cádiz) in Fisheries Management and Aquaculture and obtained her PhD in Biodiversity and Natural resources at the University of Oviedo, gaining experience in the field of research of fisheries and how protect the Vulnerable Marine Ecosystems (VMEs) as coral reefs versus fishing activities. She wrote several articles describing new species of corals under her thesis and she developed skills in the fields of benthic ecology and management of ecosystems. Before Virginia's PhD, she was contracted as technician in the Spanish Oceanographic Institute where she realized work at sea and gained field experience to assessment fisheries stocks. She participated in the Spanish National Basic Plan of Data to collect and evaluate the fishing in the ICES and CECAF areas where Spanish fleets realize their activities. During this period, she carried out feeding habit and age/size studies of *Pagellus Bogaraveo* and others commercial species (hake, anchovy, sharks, mackerel, squid, etc.) to know how the trophic level and predation could affect the ecosystems and the distribution of the species in the Gulf of Cadiz and the Strait of Gibraltar. Virginia has extensive experience working on MSC assessments both as a team member and leader and is a full-time employee of SAI Global.

**Mrs. Edith Saa (Assessor, primary responsibility for Principle 3)**

Mrs. Saa is a fisheries engineer. She obtained her degree at the Universidad Católica de Valparaíso. She worked between 1976- 1991 at Servicio Nacional de Pesca. After that through 1993 to 2006, she developed her work at Subsecretaria de Pesca. First as manager of the Departamento de Estudios. After that, Mrs. Saa worked as manager of División de Desarrollo Pesquero. She has participated on the elaboration of several laws regarding to fisheries activities which they were set between 1991 and 2014. She worked as consultant for the Ministerio de Economía throughout 2008 to 2010 with her participation on the Salmon workshop. There, she collaborated to modify the fishery law and the normative regarding to fishing, aquaculture and impacts on the environmental. Nowadays, she is working as an independent assessor of fisheries activities.

## 2.2. List of peer-reviewers

The Peer Review of this fishery was conducted through the MSC's Peer Review College.  compiled a shortlist of potential peer reviewers to undertake the peer review for Chile Austral hake (*Merluccius australis*) industrial trawl and longline which is in its first assessment process with the Conformity Assessment Body SAI Global. Two peer reviewers were selected from the following list posted on MSC website on February 5th, 2019:

- David W. Japp
- Geoff Tingley
- Nancie Cummings
- Tom Jagielo

Peer Reviews are anonymized in this report.

# 3. Description of the Fishery

## 3.1. Unit(s) of Assessment (UoA) and Scope of Certification Sought

### 3.1.1. Confirmation that the fishery is within the scope

The fishery is eligible for certification and able to be assessed within the scope of the MSC Principles and Criteria for Sustainable Fishing (MSC FCR 7.4) as:

- The target species is not an amphibian, a reptile, a bird, or a marine mammal;
- The fishery is not conducted under a controversial unilateral exemption to an international agreement;
- Fishing operations do not use destructive fishing practices such as fishing with poisons or explosives;
- The fishery applying for certification is not the subject of controversy and/or dispute;
- There is a mechanism to resolve possible disputes
- The fishery does not include an entity that has been successfully prosecuted for violations against forced labor laws.
- The fishery has not previously failed an assessment or had a certificate withdrawn;
- The Client Group is prepared to consider how other eligible fishers may share the certificate;
- There are no catches of non-target stocks that are inseparable or practicably inseparable (IPI) from the target stock.

### 3.1.2. Description of the UoA

**Table 5.** Units of Assessment (UoAs) for the fishery under assessment.

| | |
|---|---|
| **UoA 1 – Industrial trawls** | |
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Industrial trawls including:<br>▪ Scoring element 1 – Bottom Trawl<br>▪ Scoring element 2 – Midwater Trawl |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group and other eligible fishers*** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES)<br><br>Four of the five fishing companies (Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.) who participate in the Austral hake Industrial fishery are represented by FIPES. Therefore, other eligible fishers are those vessels operated by the remaining company (Pesca Cisne S.A.) which is not part of the client group. |
| **UoA 2 – Longline** | |
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Longline |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group and other eligible fishers*** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES)<br><br>Four of the five fishing companies (Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.) who participate in the Austral hake industrial fishery are represented by FIPES. Therefore, other eligible fishers are those vessels operated by the remaining company (Pesca Cisne S.A.) which is not part of the client group. |

***Includes both those Client Group members initially intended to be covered by the Certificate and other eligible fishers that might potentially share the certificate at a later date under a certificate sharing agreement.**

### 3.1.3. Rationale for choosing the UoA

MSC Guidance defines the Unit of Certification (UoC) and the Unit of Assessment (UoA) in G7.4.7 – G7.4.9. The UoC (i.e., the unit entitled to receive an MSC certification) is defined as follows:

> *"The target stock or stocks (biologically distinct unit) combined with the fishing method/gear and practice (vessel(s) pursuing that stock and any fleets, groups of vessels, or individuals of other fishing operators."*

The UoA defines the full scope of what is being assessed and is therefore equal to or larger than the UoC. If it is larger, it means it will include other eligible fishers. Other eligible fishers are those who are not members of the client group and fish for the target species using the same fishing gear under the same management system. Accordingly, the UoAs and UoCs for the fishery are as defined in Table 5 and Table 6.

**Definition of the stock in the UoAs**

Chile Austral hake (*Merluccius australis*) stock unit definition is based by Chilean fisheries management authorities on the assumption that there is only one self-sustained stock distributed in all of the exclusive economic zone in Chilean waters (Quiroz and Wiff., 2012; Paya., 2014 a,b; Quiroz., 2017). The assumption is supported by genetic studies on early life history stages of Chile Austral hake (Chong and Galleguillos., 1993; Daza *et al*., 2004; Machado-Shiaffino *et al*., 2009). This assumption is the basis for all scenarios in the stock assessment conducted by Instituto Fomento Pesquero (IFOP) and has been accepted by the Scientific Technical Committee (Quiroz and Wiff., 2012), and SUBPESCA/IFOP management committee (Quiroz *et al*., 2013).

There is documentation of an only single spawning area of great extension located between isla Guafo (43 ° 37 completo) and the Taitao Peninsula (47 ° S), where the timing of the spawning process shows interannual differences of few weeks during the period of maximum reproductive activity, that occurs towards the end of winter (Aguayo *et al.,* 2001a). There is also scientific information that supports the existence of areas of nursery grounds in inland waters of the Austral zone, with higher prevalence in the channels and Fiords of the X and XII regions (Rubilar *et al*., 2000). Larval distribution shows a greater presence of small sizes in fjords and channels in the Austral area, without major differences detected between the macrozone North and macrozone South (Lillo *et al.,* 1996; Bustos *et al.,* 2007)

It has been proposed a migratory pattern between inland and offshore waters with displacement of the adult fraction between macrozones, and a very restricted and limited exchange of individuals between the Atlantic and Pacific continental platforms in the southernmost part of Chile (57° S) (Aguayo *et al,.* 1995, Aguayo *et al,.* 2001). Although there is no scientific backgroundthat makes possible to quantify the magnitude of the exchange between Chile and Argentina, the fleet dynamics of the fishery shows that there is little interest in fishing for Austral hake in this southern part of the country. This suggests that the scale of this migration process must be of a very reduced scale and limited compared to the migratory routes for reproductive purposes in the channels and fjords of the Chilean Austral zone. Furthermore, recent studies suggest negligible gene flow between individuals caught in Chile and Argentina (i.e. less than one migrant per generation (Machado-Shiaffino *et al.,* 2009) suggesting significant genetic differentiation that occurred in recent years resulting in major spatial discontinuities in M. australis distribution around Chile and Argentina. For this reason, the Chile Austral hake stock assessment model has not integrated any migration process in its structure to date (Quiroz and Wiff, 2012; Paya., 2014; Quiroz., 2017).

There is some considerable information on *Merluccius australis* fisheries on other areas outside Chilean waters but very small in scale (Brickell *et al*., 2016; Giusi *et al.,* 2016; FIG., 2018). Two commercial species of hake occur in the Southwest Atlantic; the common hake *Merluccius hubbsi* and Chile Austral hake *Merluccius australis*. These two species are morphologically very close and are difficult to separate from catches. Of the two species, common hake is the most abundant hake accounting for 99% of all hake catches on the Southwest Atlantic (Giusi *et al.,* 2016;FIG., 2018). Given the higher abundance and relative importance of the common hake , it is likely that at least some of the Chile Austral hake catches are reported as common hake.

Chile Austral hake in the Southwest Atlantic fisheries is taken as a bycatch in the finfish trawl fleet as low abundance prevent it from being targeted (FIG., 2018). Absolute abundance of M. australis on the Southwest Atlantic was estimated to be only around one-tenth of the Pacific stock (Giussi *et al*., 2016).

MSC requires that fishing activity on Principle 1 species be assessed at a level that is sustainable for the stock. Unit(s) of Assessment (UoA(s)) for an MSC assessment shall be defined based on the target stock(s). In the first instance stocks normally be either different species, or different biologically distinct units within a species. However, the MSC also recognizes that the application of the "stock" concept may vary depending on the knowledge available and complexity in management and also allows for the consideration of different 'more or less isolated and self-sustaining' groups within a species as different "stocks".

Generally speaking, from a fisheries management point of view, a unit stock can be defined as a group of fish that can be treated as a stock and managed as an independent unit, as long as the results of the assessment and the impact of management measures do not differ significantly from what they would be in the case of a truly independent stock.

The assessment team assessed whether Chile Austral hake stock unit is based on one or more local populations (LPs) or on a metapopulation as a whole using table G2 from MSC 2.0. Figure 1 shows the Table G2 from MSC 2.0: Level of assessment expected and considerations when scoring the stock outcome and harvest strategy components of a unit stock for different forms of metapopulations. Based on the characteristics of the fishery mentioned above the assessment team concluded that the Chile Austral hake possess the characteristics of a Single population [Stock Structure A]. Populations of Structure A are characterized by being completely isolated, self-contained with no emigration or immigration of individuals, self-sustaining with a well-defined spatial range and is independent of other neighboring populations.

In the case of Chile Austral hake (i.e. Austral hake in Chilean waters), the Assessment Team determined that the stock represents an isolated, independent and self-sustaining population within the species such that it may be considered a unit stock; this determination is based on these facts:

1. The only known major spawning areas occur within Chilean waters. Chilean waters therefore, represent a source rather than a sink of Australal hake.
2. The vast majority of hake remain within Chilean waters as evidence by the fact that the stock outside the UoA has been estimated to represent approximately 10% of the total stock biomass.
3. There is negligible emigration of Chilean hake to waters outside the UoA and no net immigration of individuals from outside the UoA (while individuals may immigrate back into the UoA to spawn these represent returning individuals) [less than one migrant per generation (Machado-Shiaffino *et al*., 2009).

Given the above neither; 1) the results of the Chilean stock assessment, nor; 2) the impact of management measures implemented solely within Chilean waters; would be expected to differ significantly from what they would be in the case of a truly independent stock. In practical terms, this means that the Assessment Team is confident that defining that group of Austral hake within Chilean waters as a unit stock and assessing and managing that "stock" at the level of the UoA will ensure that fishing activity on the species is assessed and managed at a level that is sustainable for the stock. To find more details on definition of the stock unit please go to section 3.3.1.

Figure 1 presents the Table G2 from MSC 2.0: Level of assessment expected and considerations when scoring the stock outcome and harvest strategy components of a unit stock for different forms of metapopulations.

**Table G2: Level of assessment expected and considerations when scoring the stock outcome and harvest strategy components of a unit stock for different forms of metapopulations**

| Stock structure | Description (degree of connectivity and self-recruitment) | Implications for management of the Stock (assessment of Outcome and Harvest Strategy) |
|---|---|---|
| A.<br>Single population | Completely isolated.<br>Self-contained with no emigration or immigration of individuals from or to the stock.<br>Occupies a well-defined spatial range and is independent of other stocks of the same species. | Whole population.<br>Fishing on the population has no effect on the dynamics of neighbouring populations.<br>Normal expectations may apply for reference points. The fishery must manage the stock above the point of recruitment impairment (PRI) to ensure recruitment is sustained. |
| B.<br>Local population with partial isolation | Partially isolated and minimal connectivity.<br>Self-sustaining.<br>The degree of connectivity with other LPs in the metapopulation is so weak that, for management purposes, it can be considered a self-sustaining population. This may be true even if occasional larval exchanges between LPs are enough to maintain a certain degree of genetic flow and homogeneity. | Local population.<br>Fishing on the local population appears to have no effect on the dynamics of neighbouring populations.<br>Normal expectations may apply for reference points. The fishery must manage its own local unit stock above a point of recruitment impairment (PRI) to ensure recruitment is sustained.<br>Requires information on the biology of the species, larval dispersal, source-sink dynamics, and oceanographic conditions supporting management at a local level.<br>Information and uncertainties related to stock structure need to be scored in PIs 1.2.2, 1.2.3 and 1.2.4 |
| C.<br>Local population (s) with moderate connectivity within the meta-population | Moderate connectivity.<br>The degree of connectivity between LPs is enough to maintain genetic flow and some degree of homogeneity.<br>Source-sink dynamics with variable degree of self-recruitment. Sources of recruits act as core areas in the species range where the species occurs in all years and where the typical age composition exhibits regular recruitment patterns with multiple age classes present.<br>There may be **sinks** where occasional individuals or low densities usually occur and | Local populations(s).<br>Fishing on local populations affects the dynamics of neighbouring populations. Fishing and the management decision affecting upstream populations will have impacts on the components downstream. Local populations are not entirely in control of their productivity.<br>The fishery must manage its own local unit stock above a PRI to ensure recruitment is sustained, but reference points also need to take into account connections with and dependences on neighbouring local populations.<br>Per recruit reference points (e.g., percentage spawners per recruit) may confirm the good management of the fishery to contribute to the wider surrounding populations.<br>Separate monitoring of absolute reference points (either of incoming recruitment or of local population |

| | | |
|---|---|---|
| | where populations typically consist of only one or a few age groups, often of old individuals. | levels) may also be needed to confirm that the inputs of external recruitment are being sustained.<br>Requires information on the biology of the species, larval dispersal, source-sink dynamics, and oceanographic conditions supporting management at local level.<br>Information and uncertainties related to stock structure need to be scored in PIs 1.2.2, 1.2.3 and 1.2.4. |
| D<br>Local populations with maximum connectivity within the metapopula tion | Maximum connectivity.<br>Metapopulation is panmictic (mating is random within the entire metapopulation).<br>Subpopulations are arbitrary.<br>Well-mixed larval pool. | Whole metapopulation.<br>Fishing on local populations affects the dynamics of neighbouring populations.<br>The fishery must manage the whole metapopulation (unit stock) above a PRI to ensure that recruitment is sustained. Special attention may be needed in setting reference points to ensure that the LP structure is not impacted by fishing.<br>Scored against the whole metapopulation.<br>Information and uncertainties related to stock structure need to be scored in PIs 1.2.2, 1.2.3 and 1.2.4. |

**Figure 1.** Table G2 from MSC v2.0 where different levels of assessment expected and considerations for scoring the stock outcome and harvest strategy components of a unit stock are detailed.

### 3.1.4. Description of proposed UoC and other eligible fishers

**Table 6.** Units of Certification (UoCs) for the fishery under assessment.

| | |
|---|---|
| **UoC 1 – Industrial trawls** | |
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Industrial trawls including:<br>▪ Scoring element 1 – Bottom Trawl<br>▪ Scoring element 2 – Midwater Trawl |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group**** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES) including the fishing companies Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.. |
| **UoC 2 – Longline** | |
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Longline |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group**** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES) including the fishing companies Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.. |

****Includes those Client Group members initially intended to be covered by the Certificate.**

There are other eligible fishers who are not members of the client group and who fish for the target species using the same fishing gear under the same management system. These other eligible fishers are those vessels operated by the remaining company involved in the industrial Austral hake fishery (Pesca Cisne S.A.) which is not part of the client group.

It is also noteworthy to mention that for the trawl UOC, which is a mixed species fishery,there are catch hauls in a same fishing trip in the industrial trawl fishery addressed to other target species not subject of this certification (i.e. Hoki, Pink Cusk eel and Southern blue whiting), where Chile Austral hake is caught as accompanying fauna, representing < 2% of total weight catch of each fishing haul and in some cases, being absent). So, when trawler fishing vessels addressed fishing operations to other target species, Chile Austral hake caught by client companies as accompanying fauna will be sold as under-assessment fish and then as MSC fish subsequently once the source fishery is certified. However, in the case of industrial longline where there are two directed fisheries targeting exclusively for Chile Austral hake and Chilean Seabass using also distinct sets of longline gear [i.e. Chile Austral hake=Traditional Industrial Longline/Palangre Tradicional; Chilean Seabass Sperm Whale Longline/Palangre Cachalotera] , any catch of Chile Austral hake as non-target on the Chilean Seabass fishery won't be certified

In accordance with FCR 7.8.3.3 and FCR 7.4.12.2 the client has prepared and published a statement of their understanding and willingness for reasonable certificate sharing arrangements and has informed other eligible fishers of the above to the extent practicable.

### 3.1.5. Final UoC(s)

The UoC(s) at the time of certification are as outlined in Table 7 below. There have not been any changes to the proposed UoC(s) in "Description of proposed UoC and other eligible fishers" above.

**Table 7.** Final Units of Certification (UoCs) for the fishery at the time of certification.

| **UoC 1 – Industrial trawls** | |
|---|---|
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Industrial trawls including:<br>▪ Scoring element 1 – Bottom Trawl<br>▪ Scoring element 2 – Midwater Trawl |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group**** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES) including the fishing companies Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.. |
| **UoC 2 – Longline** | |
| **Target species** | Austral hake/Southern hake (*Merluccius australis*) |
| **Geographic area** | FAO 87 (Pacific, Southeast) – Chile Fishing Areas X, XI and XII |
| **Stock** | Chile Austral hake |
| **Fishing gear** | Longline |
| **Management system** | Gobierno de Chile – Subsecretaría de Pesca y Acuicultura |
| **Client group**** | Federacion De Industrias Pesqueras Del Sur Austral (FIPES) including the fishing companies Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.. |

****Includes those Client Group members initially intended to be covered by the Certificate.**

#### 3.1.5.1 Final other eligible fishers at the time of certification

There are other eligible fishers at the time of the certification who are not members of the client group and who fish for the target species using the same fishing gear under the same management system. These other eligible fishers are those vessels operated by the remaining company involved in the industrial Austral hake fishery (Pesca Cisne S.A.) which is not part of the client group.

### 3.1.6. Total Allowable Catch (TAC) and Catch Data

**Note.** While the MSC Full Assessment Reporting Template v2.0 specifies that a separate table should be provided for each gear if possible, the TACs are not spilt by gear type. Therefore, the TACs and catches have been presented in Table 8 below with catches being presented by UoC.

**Table 8.** TAC and Catch Data.

<table>
<tr><td>Overall TAC</td><td>Industrial and Artisanal fisheries combined</td><td>Year</td><td>2017</td><td>Amount</td><td>19,010 t</td></tr>
<tr><td>UoA 1 – Industrial trawl<br>UoA 2 – Longline</td><td>Combined share of TAC</td><td>Year</td><td>2017</td><td>Amount</td><td>11,078.9 t</td></tr>
<tr><td>UoC 1 – Industrial trawl<br>UoC 2 – Longline</td><td>Combined share of TAC</td><td>Year</td><td>2016</td><td>Amount</td><td>10,021.1 t</td></tr>
<tr><td rowspan="2">UoC 1 – Industrial trawl</td><td rowspan="2">Total green weight catch</td><td>Year (most recent)</td><td>2017</td><td>Amount</td><td>8,003.6 t</td></tr>
<tr><td>Year (second most recent)</td><td>2016</td><td>Amount</td><td>10,139.1 t</td></tr>
<tr><td rowspan="2">UoC 2 – Longline</td><td rowspan="2">Total green weight catch</td><td>Year (most recent)</td><td>2017</td><td>Amount</td><td>648.6 t</td></tr>
<tr><td>Year (second most recent)</td><td>2016</td><td>Amount</td><td>1,489.8 t</td></tr>
</table>

### 3.1.7. Scope of Assessment in Relation to Enhanced Fisheries

Not Applicable. The fishery under assessment is not an enhanced fishery.

### 3.1.8. Scope of Assessment in Relation to Introduced Species Based Fisheries (ISBF)

Not Applicable. The fishery under assessment is not based on an introduced species and as such is no an Introduced Species Based Fisheries (ISBF).

## 3.2. Overview of the fishery

### 3.2.1. Description of the Chile Austral Hake Industrial Fishery

Austral hake is one of the species most intensely exploited in Chilean waters along with other demersal fish of the genus Merluccius, such as *M.capensis*, *M. paradoxus, M. bilinearis*, *M. Merluccius* (FAO., 2003). The Chile Austral hake fishery are conducted by five distinct fleets: factory trawlers, freezer trawlers, factory longliners, freezer longliners, and the artisanal longline fleet (Paya and Earhardt., 2005). The industrial fleets are legally authorized to operate only on the platform and continental shelf, while the artisanal fleet fishes for Chile Austral hake in the protected waters of channels, fjords, and coves that are legally reserved for small-scale fishing fleets. The Chile Austral hake fishery began in 1976 with the incorporation of fleets and processing plants established through joint ventures with Asian and European interests. In Chile, *M. australis* fishery is a targeted fishery with annual quotas for industrial and artisanal fleets.

### 3.2.2. Fishery location

The fishery under assessment here takes place in the South Pacific Ocean within FAO Major fishing area 87 (South Pacific Ocean) between the parallel 41° 28.6' S and the extreme south of the country. Fishing activity by the industrial fleet is limited legally to outside waters (i.e. waters outside the straight baselines) and may extend offshore from the baselines up to 60 miles and 80 miles in the Northern Fisheries Unit (41° 28.6' to 47° S) and Southern Fisheries Unit (47° to 57° S) respectively. In general, the industrial fishery takes place in depths of between 50 and 300 meters. The fishery does not cover the full extent of the distribution of the Chile Austral hake stock. In terms of local fisheries management areas, the fishery takes place in the Chile Fishing Areas X, XI and XII. Figure 2 below is included for illustrative purposes only; the industrial fleet can operate offshore within the areas shaded green up to 60 miles offshore north of 47° and up to 80 miles offshore south of 47°. The archipelago of Juan Fernández for which Chile claims an EEZ is part of Chile’s Valparaiso Region (Region V). The artisanal fleets fishes for Southern hake in the protected waters of channels, fjords, and coves that are legally reserved for small-scale fishing fleets (Paya and Erhardt 2005)

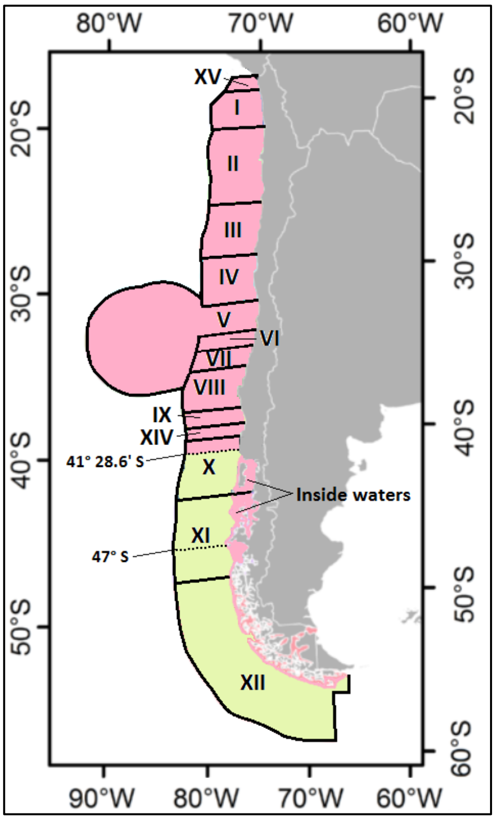



**Figure 2.** Chile Fishing Areas (Areas in which the industrial fleet are eligible to fish are shaded in green) (Source: SAI Global, 2018).

### 3.2.3. History of the Chile Austral Hake Industrial Fishery

There are observed six well- defined periods in this fishery (Figure 3) (IFOP, 2016). The first stage is framed within the period 1978 to 1985, in which only Japanese industrial trawlers operated in offshore areas with an average harvest around 37 thousand tons (Figure 3). In the second stage, from 1986 to 1990, the fishery expands to inshore and begin to operate in outer sea, jointly with industrial trawlers, and freezer trawlers associated with processor plants in land located in the X and XI regions, adding finally industrial longline ships and freezer longliners. Simultaneously an artisanal fishery developed in 1985 operating in internal waters, fjords and channels. This fishery doubled the landing of hake in the South at the end of the 1980 decade.

The third stage, from 1991 to 1993, which coincided with the entry into force of the new law of Fisheries and aquaculture, is characterized by the onset of a scheme of management that define five administrative areas of the fishery, two in offshore areas (Northern and Southern Units) and two in nearshore areas X, XI and XII land waters), each one with their global share. In addition, seasonal closures oriented to protect spawning grounds and nursery areas started to being implemented in 1996. The fourth stage defined from 1994 to the 2007, is characterized by a strong adjustment of the fishing effort, diversification of fisheries operations, and the reduction of the capacity of the fishing fleet. In terms of fisheries management, this fourth stage has been characterized by: i) a very rigorous control to access in extractive units; ii) distribution of quota in the equivalent form for each sector (50%) from the 2003; iii) between 2000 and 2007 the landings reached approximately 30 tons which means a significant increase to what was recommended around that time.

From 2008 to 2013 the fishery enters a fifth stage with quotas way above to what was recommended. However, these quotas were reduced gradually from 28 thousand to 21 thousand tons in 2013. Finally in 2014, the six stage starts with the enactment of the new revised fisheries law LGPA along with the formation of the Technical Scientific Committee and management committees. From this time scientifically revised quotas were recommended, which resulted in a reduction of 43% with respect to the year 2013.

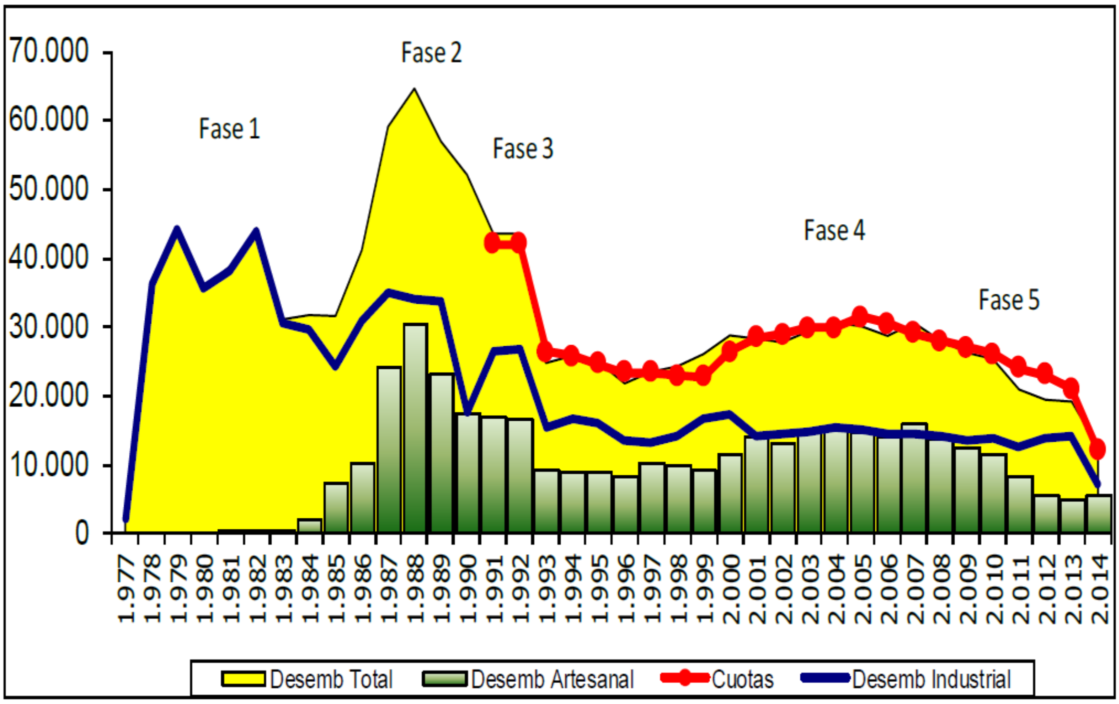



**Figure 3.** Historical landings of the Chile Austral Hake from 1977 to 2014. Source: SERNAPESCA 2014. Landings are expressed in thousands of tons. [Desemb Total=Total Landings; Desemb Artesanal=Artisanal Landings; Cuotas=Quotas;Desemb Industrial= Industrial Landings]

### 3.2.4. Fishing methods and fleet description

Three different fishing gears; mid-water trawls, bottom trawls and longlines are included in this assessment within two Units of Assessment; UoA 1 – Industrial trawls and UoA 2 – Longline. The industrial trawl fleet accounts for the majority of landings(~ % annually). In 2017 a total of 10 industrial fishing vessels operated in the industrial Austral hake fishery: 4 factory trawlers, 3 freezer trawlers and 3 longline fishing vessels. These fishing vessels operate year-round apart from a temporary closure in August. In general, the operations of the freezer trawl fleet are concentrated in Commercial Fishing Areas (CFAs) X and XI while the operations of the factory trawl and longline fleets are focused in CFAs XI and XII. In this assessment fishing vessels are not named individually, instead the 'catching units' included in the UoA/UoCs are represented by the 3 fishing companies included in the Client Group.

**UoA 1 – Industrial trawls**

Trawl catches are not separated on board and vessels may operate both mid-water and bottom trawls on the same trip. There are no systems in place that would allow eligible catch to be traced back to the correct UoC were both trawl gears to be assessed separately. Consequently, mid-water and bottom trawls will be assessed as separate scoring elements within the same UoA (UoA 1 – Industrial trawls).

The trawl fleet consists of four ships that are differentiated according to characteristics such as length, storage capacity and engine power. The fishing expeditions (mareas) have a duration of 2 to 10 days, depending on the effectiveness of the fishing sets. The specific trawl net model used on midwater trawl fishing is model "Gloria" and for bottom trawling is the model "Carmen". Bottom trawling operates between 200 and 400 meters deep, depending on the target species: Austral hake (250 to 400 m), Hoki (200 to 400 m) and Southern promfret (100 to 300 m deep). Duration of the haul ranges from 10 minutes up to 6 hours depending on the season (high and low).

The trawl fishing operation consists of searching for a fishing ground, drag, haul and repeat the operation to until it meets the goal of catch/process/requirement of the fishing expedition and its operation projected to the consumption of the assigned individual quota.

Given that that industrial trawler operates with both mid and bottom trawl nets., the decision to use one or the other will depend on the strategies for fishing of each owner, seasonal target species abundance, spatial and temporal projection of operations linked to allocations of quotas, trade agreements, closing and opening new markets, oscillation of prices affecting operating strategies.

Scoring element 1 – Bottom Trawl:

The demersal trawl is a large, usually cone-shaped net, which is towed across the seabed and referred to as a mobile gear (MG) (Figure 4). The forward part of the net – the 'wings' – is kept open laterally by otter boards or doors. Fish are herded between the boards and along the spreader wires or sweeps, into the mouth of the trawl where they swim until exhausted. They then drift back through the funnel of the net, along the extension or lengthening piece and into the cod-end, where they are primary. The mesh size for the two compartments can be altered according to the size of the adult fish being targeted. Insertion of square mesh panels also improves selectivity of the net because square meshes, unlike the traditional diamond shape meshes, square mesh panels do not close under strain when the net is towed. Rubber- covered bridles 45.7 m - 54.9 m in length are between the doors and trawl, depending on the trawl design. The only parts of the gear that touch the bottom are the trawl door keels, bottom bridles between the net and doors and the rock skipper gear that bounces off the bottom as the gear is towed.

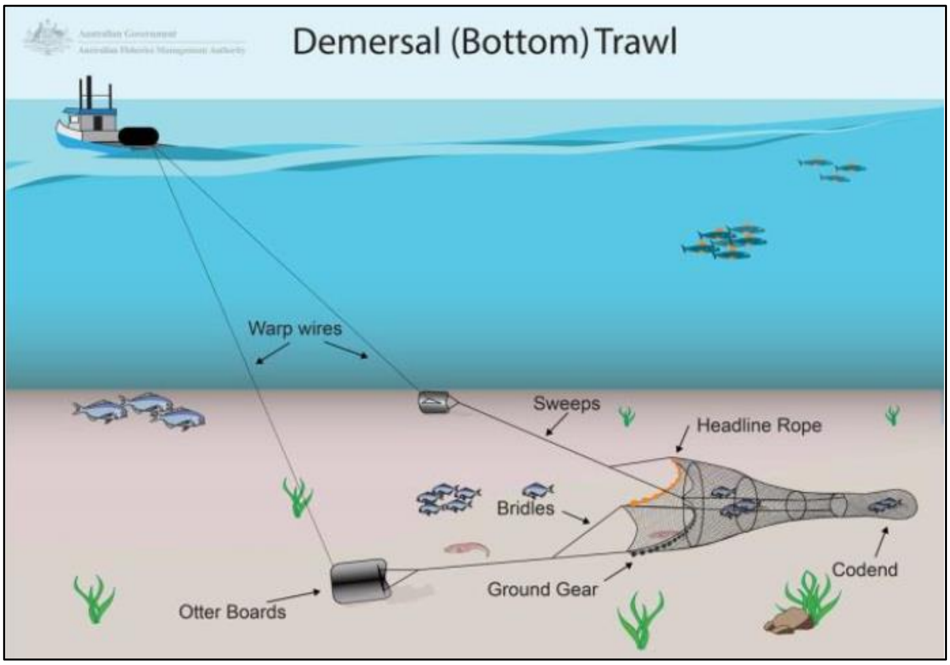



**Figure 4.** Demersal trawl. Source: **https://www.aussiefarms.org.au**

<u>Scoring element 2 – Midwater Trawl</u>:
A midwater trawl consists of a cone shaped body, normally made of four panels, ending in a codend with lateral wings extending forward from the opening (Figure 5). It is usually much larger than a bottom trawl and designed and rigged to fish in midwater, including in the surface water. The front parts are sometimes made with very large meshes or ropes, which herd the targeted fish inwards so that they can be overtaken by smaller meshes in the aft trawl sections. The horizontal opening is maintained either by otter boards or by towing the net by two boats (pair trawling). Floats on the headline and weights on the groundline often maintain the vertical opening. Modern large midwater trawls, however, are rigged in such a way that floats are not required, relying on downward forces from weights to keep the vertical opening during fishing.

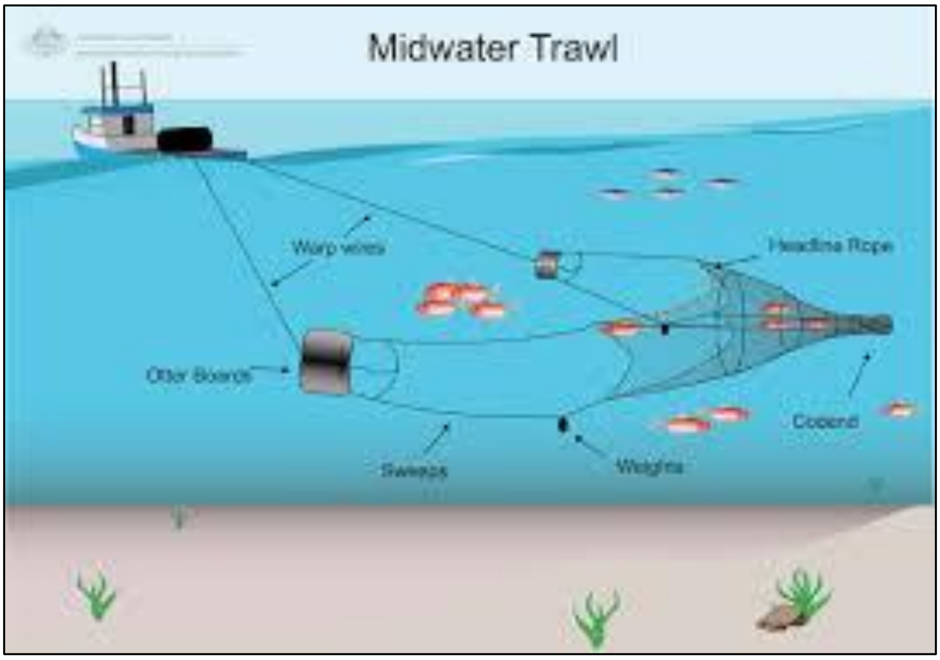



**Figure 5.** Midwater trawl. Source: https://www.aussiefarms.org.au.

**UoA 2 – Industrial Longline**
Long-lining is one of the most fuel-efficient catching methods. This method is used to capture both demersal and pelagic fishes including swordfish and tuna. It involves setting out a length of line, possibly as much as 50-100 km long, to which short lengths of line, or snoods, carrying baited hooks are attached at intervals. The lines may be set vertically in the water column, or horizontally along the bottom. The size of fish and the species caught are determined mainly by hook size and the type of bait used although location of set is also important.

The industrial longline fleet consists of 3 ships that differ according to characteristics such as length, capacity of storage and engine power, etc., attributes that generate significant differences in intra operation fleet performance due to its power of fishing.

The traditional longline or demersal used for Austral hake is of simple configuration and construction. The longline operates in a way that hooks do not touch bottom, except its calamento which possess the anchors, to avoid drift material. The industrial fishing longline gear is composed of long lines ranging ~8.000 to 30,000 m, with a number of hooks ~5.000 distanced 20,000 between if each ~ 2 meters, both the length of the main line as the number of longline hooks depends directly on the weather, currents and species objective to capture (Figure 6).

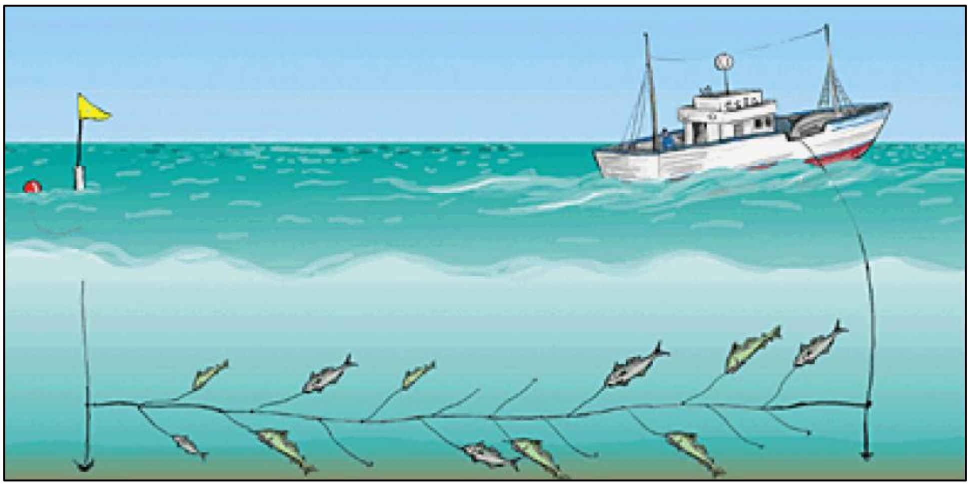


**Figure 6.** Demersal Industrial longline (Palangre). Source: https://www.afma.gov.au/

### 3.2.5. Market Information
In terms of the value of exports, Chile's most important wild caught main seafood products for direct consumption include: horse mackerel, Chile Austral hake, common hake and cod, among others; finding the Chile Austral hake within the 10 main fish species export. In commercial terms *M. australis* is exported almost in its entirety to Spain, sending a minimum percentage to the United States. In recent years there has been a decline in production by the decrease in catch quotas. There have been also declining revenues in relation to the exported processed fish (SUBPESCA.,2012). In terms of market from 2010 to date, the fishery is characterized by a drop in demand especially from its most important market for the product (Spain). This was generated mainly to the artisanal sector balance fees and trade associations deals between the artisanal and industrial (2010-2014) fisheries (FIFG., 2015). The value of the 2015 Industrial catch (Precio Playa) was approximately 3.2 million (US Dollars) (IFOP., 2016).

## 3.3. Principle One: Target Species Background

### 3.3.1. General Biology

Austral hake (*Merluccius australis*) is a demersal gadiform fish species found in the southern hemisphere between Argentina in the Atlantic Ocean (Tingley *et al*., 1995) and New Zealand in the Pacific Ocean (Aguayo-Hernandez., 1995; Colman., 1995) (Figure 7). This species supports important industrial and artisanal fisheries in Chile, Argentina, and New Zealand, which supply overseas markets in Japan, USA, Spain and Portugal (Sylvia., 1995).

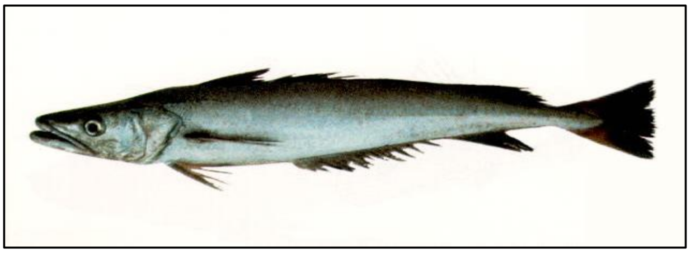


**Figure 7.** Chile Austral hake (*Merluccius australis*) specimen. Source: http://www.fishbase.se

**Taxonomy**

Austral hake, *Merluccius australis* (Hutton 1872), belong to the Class Actinopterygii, Subclass Neopterygii, Order Gadiformes and Family Merluccidae (Figure 7). Other common names include Australian hake, New Zealand hake, Tiikati, Maltona, merluza austral.

**Distribution and Migration**

Two distinct geographical populations are recognized, one from New Zealand (New Zealand population) and the other from southern South America (Patagonian population) (IFOP., 2016). The New Zealand population occurs around Chatham Rise, Campbell Plateau and South Island northward to the East Cape. The Patagonian population extends from 40°S (Chiloe Island) in the Pacific, southward around the southern tip of South America, to the continental shelf north to 49°S and the slope north to 38°S in the Atlantic. Chile Austral hake occur along the Chilean coast in the eastern Pacific south of 40° S, around Cape Horn, and on the Patagonian Shelf north to 49° S. (IFOP., 2016).

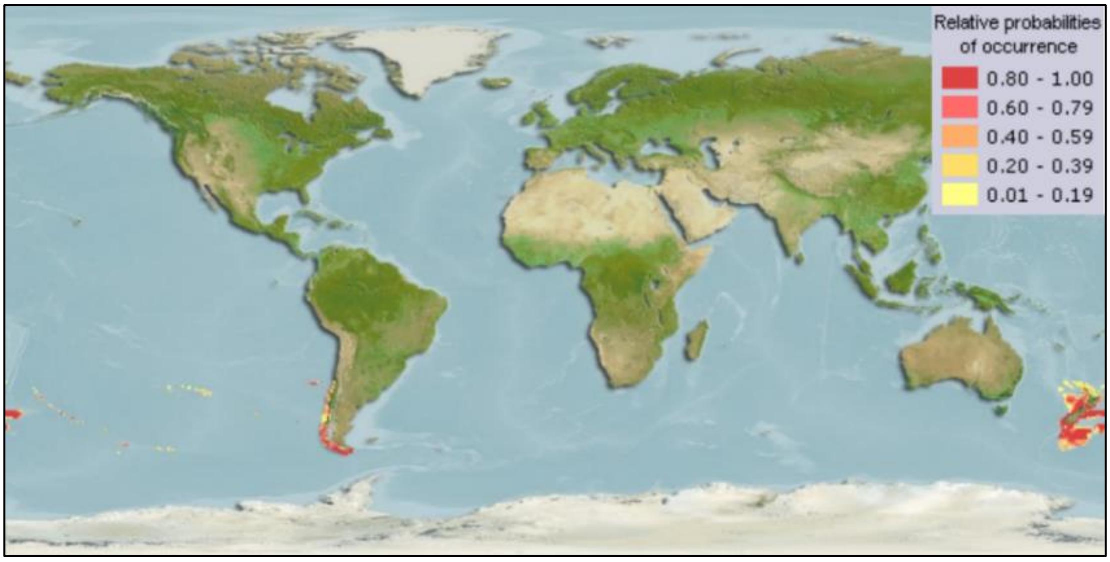



**Figure 8.** Geographical Distribution Chile Austral hake. Source: FishBase: http://www.fishbase.se/

*M. australis* has two clearly identifiable migratory pathways (Aguayo., 1994; Lawns and Adasme., 2000): a) latitudinal spawning migrations in July/August months from the centers of abundances of the North and of the South to the area of island Guamblin and Peninsula of Taitao. Then, from October onwards, hake migrate to the South and North, finding more disperse.; and (b) migrations between offshore-interior waters towards the end of the process of spawning in spring and summer, that would occur with a significant migration of individuals copies, mainly adults, from the outer sea to the inland sea possibly looking for adult feeding grounds (SUBPESCA., 2012).

**Stock Structure**

Chile Austral hake stock unit definition is based by Chilean fisheries management authorities on the assumption that there is only one self-sustained single stock distributed in all of the exclusive economic zone in Chilean waters. The basis to consider the stock as a single one is detailed below:

**Evidence from genetic markers**

The first study on Chile Austral hake stock structure definition units was conducted by IFOP in 1993 through three techniques: genetic markers, analysis of the parasite load and morphometric studies. 670 specimens were analyzed with genetic markers, 400 corresponding to external waters and 270 to inland waters. This analysis carried out through protein electrophoresis indicates that there are no significant differences within the samples from external and inland waters of the PDA (Chong and Galleguillos., 1993). This is consistent with the results obtained through composition and magnitude of the parasite load and morphometry of the southern hake that indicate high qualitative similarity between fishing zones of the PDA.

Futher, Chong (1993), through a multivariate analysis of otolith concludes that although morphological variables support the existence of local groups, discriminant variables show a significant overexposure, suggesting a high degree of mixing that prevents them to be considered as discrete units, basic requirement to define a stock unit.

In recent years and under the frame of the FONDEMA study "Diagnosis southern hake and king clip, inland waters, XII Region", genetic, parasitological, morphometric and meristic studies were conducted with the aim of determining the existence of stock units and resident populations of southern hake in the XII Region (Daza *et al*., 2005). In order to verify the existence of a pure or genetic stock, segments of mitochondrial (D-Loop, NADH, Cyt B) and nuclear (Calmoduline and ITS) DNA were used as molecular markers in this study. Results obtained suggested very low values of genetic differentiation that do not allow establishing more than a stock of southern hake. In the same study, no significant differences in the abundance of parasites according to the sex of the fish and to the temporal season were obtained from the determination of ecological stocks (resident populations) through parasitological, morphometric and meristic analyses.

Finally, Machado-Shiaffino *et al.*,(2009) showed Maximum-likelihood (ML) dispersal estimates among Argentina and Chile Austral hake populations based on microsatellite loci variation to be very low (less than one migrant per generation), suggesting one stock with neglible gene flow.

**Evidence from Reproduction and Early Life History**

Regarding the spawning grounds, Aguayo *et al.,* (2001) state that the main spawning ground of southern hake is located between Guafo Island (43º37'S) and the Taitao Peninsula (47ºS). The highest values of Gonadosomatic Index (GSI) I for the 1985-1998 period are reported in this area. A secondary spawning ground, with intermediate values of GSI and located between San Pedro bay (41ºS) and Guafo Island was also documented. A reproductive area for this species has not been detected in the South West Atlantic (Giussi *et al.,* 2016). Based on studies of distribution and abundance of postlarval stages, it has been documented that *M. australis* reproduces mainly in Chile (47°S) (Lillo *et al.,* 1996; Bustos *et al.,* 2007; Lillo *et al.,* 2011; Landaeta *et al.,*2018).

Information on the distribution of eggs and larvae of Chile Austral hake, come from an acoustic research survey of the spawner stock conducted in 1995 in the Chile Southern Austral zone (Lillo *et al*., 1996). This survey covered the zone from the north of Guafo Island (43º20'S) up to Raper Cape (46º20'S). Only one positive focus was identified from all the stations northeast of Guafo Island. It is stated that the egg contribution was scarce with a density not higher than 8 eggs/10 mn2 and showed a reduced latitudinal distribution, with presence between the area near Raper Cape and Garrido Island (45º12'S). More recently Paya´ and Ehrhardt (2005) suggested that after spawning, an unknown but large proportion of eggs and larvae is advectively transported from coastal spawning grounds to estuarine waters within the Patagonian Fjords and Channels System. Remnant eggs and larvae would remain in oceanic nursery areas (Bustos *et al.,* 2007; Lillo *et al*., 2008, 2011).

On the other hand, the existence of secondary spawning areas within the Patagonian Fjords and Channels System has been documented (Bustos *et al.,* 2007; Medina *et al.,* 2014; Brickle *et al*., 2016), and confirmed by the presence of eggs and early larvae in these estuarine waters (Bustos *et al*., 2007; Lillo *et al.,* 2011; Landaeta *et al*.,2018).

Rubilar *et al*., (2000) pointed out that the proportion of juveniles in the catches of Chile Austral hake in the regions X, XI and XII, presents a clear seasonal variation, with large increases in winter and spring. This trend is reflected in other indicators such as mean catch at length and age. On the inland waters of the X region, the greater presence of juveniles is recorded in the Reloncaví sound, highlighting the area of Contao where the presence of juveniles is permanent throughout the year. In Region XI, it was observed a similar dynamic, where there are areas where the proportion of juveniles is permanent throughout the year as in the area between the Casma Island and Costa channel coast. As for the XII region, there is an increase in the proportion of juvenile's catches towards autumn and winter, but the proportion is clearly inferior to that found in the X and XI regions. Similar results for the areas and periods of concentration of juveniles were reported by Aguayo (1995).

Rubilar *et al*., (2000) also noted that the increase of abundance juveniles of Chile Austral hake in the catch during the winter and spring months, would be product of migratory behavior of the species between interior and offshore waters. In this sense, Rubilar *et al.,* (2000) have hypothesised that part of the adult fraction of Chile Austral hake in inland waters migrate into offshore waters. Thus the population of Chile Austral hake that remains in inland waters is characterized by a strong presence of juveniles. This hypothesis is supported by Aguayo (1995) and Céspedes *et al.,* (1996), by means of observations obtained from the program of monitoring of the fishery.

Based on previous research by IFOP for at least 10 years previous to the 2014 Biological Reference Points workshop (Paya., 2014), it was concluded that future stock assessments of Chile Austral hake will assume a single stock distributed in the shelf and continental slope of the Pacific Southeast will be made. This assumption was accepted by the members of the Scientific Technical Committee of the Southern Austral Demersal Fisheries (Quiroz., 2017). In addition, the assumption of a single stock was considered as valid during the processes of expert reviews (external peer-review) in 2011 and 2017 (Ianelli., 2011; Garcia *et al.,* 2017).

**Evidence of Migration**

Little information is available on *M. australis* migrations and how they impact population structure across the species range (Arkhipkin *et al.,* 2003). Direct studies of migration have proven to be difficult due to high mortality of tagged fish (Brickel *et al.,* 2016). Therefore, migrations have been studied indirectly by analyses of the seasonal distribution of the catch and effort of the hake fleet. Aguayo (1995) identified two types of migration patterns.

***Latitudinal migration***, where it is documented that from July to October of each year there is a migration prompted by spawning activities, where individuals move from nursery grounds and the areas of most of abundance toward towards isla Guamblin (44º85 'S). From October onwards this species migrates northward, possibly in search of food.

***Longitudinal migration***, where there is an important migration in late spring and early summer from offshore waters to inland waters. In autumn individuals begin to move into offshore waters, where adults would begin their migration to spawning grounds that starts at the end of winter and early spring.

Based on parasitological and morphological studies, George-Nascimiento and Arancibia (1994) suggested that *M. australis* migrate from their inshore spawning grounds at 49°S along the Chilean coast to their feeding grounds, via Cape Horn, in the southern Atlantic. Arkhipkin *et al.,* (2003) examined patterns in fisheries and observer data in the Falkland Islands and showed that *M. australis* occurred on the southern shelf of the Falkland Islands south of 51°S and that during the spawning period from July to September they are largely absent, suggesting that fish from both Chile and the South Atlantic represent one inter breeding population. Finally, trace element signatures of otolith cores and edges of austral hake collected in Chilean and Falkland Islands' waters (Brickle *et al.,* 2016) were used to evaluate if it can provide potential insights into stock discrimination and migrations. In this study, discrimination between sites in otolith edges(i.e.,proxy of locations where fish were caught) was not possible due to poor classification. The study make inferences of a stock discrimination and migration using results of elemental fingeprints on the otolith core of one year of study. However,the study did not account for separation of samples (1-2 months) collected on how it can affect trace element incorporation due differences in temperatures and size at capture(Falkland Islands specimens were larger than the ones from Chile). There is no information available on the precision estimates of the elemental concentrations by otolith section(ie LOD, relative standard deviation). With this information is difficult to interpret if the chemical signatures can be associated to a particular location or if they reflect ontogenetic changes in element incorporation.

It is important to say here that it is almost certainly incorrect to consider use elemental fingerprints as stock discriminators, since genetic differences are not implied and spatial heterogeneity in the stock environment can result in different fingerprints for different stock components (Campana.,1999; Campana and Thorrold., 2001) For example,ontogenetic effects and age-related differences in exposure history can result in very different fingerprints for fish of different size classes from the same population (Campana., 1999; Campana *et al.,* 2000). Studies by Ruttenberg *et al.,* (2005) and Brophy *et al.,* (2004) demonstrate that ontogenetic shifts and maternal effects may influence the levels of Mn, Mg, Ba in the otolith core. Furthermore, Increasing maternal investment (e.g. egg size) may lead to increases in core concentration, at least for some elements. Based on the above further studies should be conducted in order to develop a better understanding of the dynamics and biological processes of *M. australis.*

**Evidence of Fisheries information outside Chilean waters**

Information is available on *M. australis* fisheries outside of Chilean waters which are minor in scale (Giussi *et al.,* 2016, Brickell *et al.,* 2016, FIG., 2018). In the Falkland Islands there is a multispecies groundfish trawl fishery targeting a range of finfish species including hakes (*Merluccius spps*), kingclip (*Genypterus blacodes*), red cod (*Salilota australis*), hoki (*Macruronus magellanicus*), southern blue whiting (*Micromesistius australis*) and rock cod (*Patagonotothen ramsayi*). Two commercial species of hake occur in Falkland waters, common hake *Merluccius hubbsi* and Chile Austral hake (*M. australis*). These two species are morphologically very close and are difficult to separate from catches. In 2015, there was a mandate to fishing industry to report their catch by species. Of the two species, common hake is the most abundant hake accounting for 99% of all hake catches in 2017 (FIG., 2018) (Common hake =15570 tons; Chile Austral hake=170 tons from a total volume of catch of 168,200 tons). Austral hake in Falkland Islands fisheries is taken as a bycatch in the finfish trawl fleet as low abundance prevents it from being targeted. Absolute abundance of *M. australis* in the Southwest Atlantic was estimated to be only around one-tenth of the Pacific stock (Giussi *et al*., 2016).

**Habitat**

Austral hake is a benthopelagic fish that inhabits fjords and channels of the coastal area of the South of Chile as juveniles, later inhabiting deep water habitats such as the continental shelf and slope as adults. The Chile Austral hake inhabits nearshore waters between 70 and 100 m deep, while in offshore waters the depth distribution takes place between 60 and 800 m (Ojeda and Aguayo., 1986; Lillo et al., 2009) concentrating most of the biomass of this resource between 200 and 500 meters below the surface. Temperatures in these areas of habitat tend to be between 3.8 ° C and 9,0° C (FAO., 1990) associated to sub-Antarctic waters provided by Cape Horn, of the Chilean Pacific current.

**Age and Growth and Natural Mortality**

The maximum length in females is 120 cm and males is 105 cm, with sizes on average ranging from 60 and 100 cm. Chile Austral hake is a long-lived species where individuals on both sexes can reach 30 years of age. Chile Austral hake displays sexual dimorphism in growth, in which the females possess older age classes and sizes larger than males (Ojeda and Aguayo., 1986). Estimates of natural mortality calculated from empirical formulasfor this species have been estimated corresponding to M=0.26 for males and M=0.17 in females (Aguayo et al., 2000).

The first published account of the main life history traits of Chile Austral hake (Ojeda and Aguayo, 1986) suggests that von Bertalanffy growth parameters of males are $L_\infty$ = 110.2cm TL, K = 0.096 year−1, and t0=−0.853 year, and those of females are $L_\infty$ = 121.4cm TL, K = 0.0827 year−1, and t0 = −1.295 year.

**Reproductive Biology**

Austral hake is a species with serial spawning (i.e., having eggs at varying stages of development in the ovaries- they are serial spawners with protracted spawning season). Size at 50% maturity occurs in females at 69.4 cm TL (Balbontín & Bravo., 1993). Age at 50% maturity occurs at 9 years of age(Paya and Earhardt., 2005). The area described for Chile Austral hake spawning comprises the foreign waters near the Islands Guafo and Guamblin (Rubilar et al., 2002) in the period of winter (July, August and September) (Balbontín & Bravo., 1993). However, Bustos et al., (2007) recorded an important activity of spawning and presence of eggs of Austral hake in the fjords and channels (inner waters), which suggests the existence of a resident adult spawning population in the fjords. Fertility increases with size with a relative fecundity of 334 oocytes per gram

**Early life history**

Chile Austral hake main spawning area is located along the shelf break and canyons in the northern area of Chilean Patagonia, close to Guafo and Guamblin Islands (43–45◦S), and spawning occurs in Austral winter from July to September (Balbontín and Bravo., 1993). Nonetheless, in the last decade, a large number of eggs and larvae have also been reported in spring (give months) in some inshore areas of the northern Patagonia (Bustos et al., 2007; Castro et al., 2011). Growth and hatching dates of field-caught larvae of southern hake, Chile Austral hake have been documented by Bustos *et al*.,(2015) - Linear regression estimated growth rates of 0.22 ±0.01 mm d−1 for larval Chile Austral hake.

Several studies report that changes in Austral hake M. australis distribution and abundance of its early stages in the inner sea of Northern Patagonia over the past two decades (Balbontín and Bernal., 1997; Bustos et al., 2007, 2008b), suggesting spatial changes in spawning grounds. Bustos et al., (2015) found that abundances of larval M. australis were low in the inner sea ascompared to other species, as well as to other recent larval abundance estimates (Bustos et al., 2007, 2008b; Castro et al., 2011). More recently, differences in the fatty acids of female Chile Austral hake from the inner sea and offshore areas have been detected; while females from the inner sea have large proportion of docohexanoic acid (DHA), females from the offshore have large proportion of eicosapentanoic acid (EPA) (Medina *et al.,* 2014). These results support the hypothesis of two different spawning areas in southern Chile, as suggested by Bustos *et al.* (2007).

**Feeding**

Chile Austral hake general diet is composed preferably of Teleost fishes being the Hoki (Merluza de Cola) their main food (Bahamonde., 1953, Aguayo *et al.,* 1986) but it will feed opportunistically on several species of fish, crustaceans and molluscs, depending on the availability of prey at different times of the year. Some of the fish which feeds Chile Austral hake are Southern Blue Whiting (Merluza de tres aletas), sardines (SUBPESCA., 2012) and Pink cusk eel (Congrio Dorado) (FAO, 2003). In addition, there are reports documenting cannibalism of their early juveniles.

**Recruitment**

Two areas of recruitment (juveniles about 30 cm in total length) have been identified for this species, located in the area of inland of the X and XI region, Seno de Reloncaví and areas south of Seno de Aysen, respectively (Céspedes *et al.,* 1996). Both areas are associated with the SubaAntartic water mass that is modified by the contribution of fresh water flow. Both regions have low salinities and lower values of oxygen concentrations. There are also records collected in research cruises of the existence of areas of recruitment in waters close to shore and exterior.

### 3.3.2. Chile Austral hake stock assessment

**Background**

Chile Austral hake fishery management conduct annual stock assessments to set annual total allowable catches (TAC) of each stock, usually based on biological reference points (RPs) and the associated risk of noncompliance with management objectives (Wiff *et al.,* 2016). Since 1991, fisheries management in Chile has been framed by "Ley General de Pesca y Aquacultura" (LGPA) which includes a system for quota allocation based on individual transferable quotas (ITQs) from 2001 to 2012 (Wiff *et al.,* 2016). However there were some problems with this system. For example, it lacked a specific procedure to establish a TAC using RPs. This often resulted in fishery managers setting TACs based only on political and/or social criteria, instead of emphasizing the associated risk of not fulfilling the conservation objective associated to the RPs. This approach by management to setting TACs contributed to the current overfishing and depletion of many Chilean fisheries managed by TACs (SUBPESCA., 2013, Wiff *et al.,* 2016).

In December 2012, several amendments to the general fishing law in Chile were made. One of the most important amendments was the ownership of the fishing licenses in those fisheries governed through TACs (Wiff *et al.,* 2016). In this case, ITQs were given to a small group of industrial fishermen for 20 years with prorogation. Legislators also wanted to make sustainability the core of the new legal framework and indicated that management must explicitly consider the guidelines of the precautionary and ecosystem approaches (Wiff *et al.,* 2016).

In this new framework, maximum sustainable yield (MSY) became the cornerstone by playing two main roles: it is a target RP for fishing management, and it also defines the threshold upon which the remaining surplus quota may be auctioned, allowing new actors into the fishery market. The mandate of using MSY in the new fishing law was introduced to align fishery management, imposing greater specificity and less flexibility in the way TACs are set every year. During 2013, these modifications to the general fishing law came into effect, which triggered a demand for estimating MSY-based RPs in each fishery resource managed by TAC.

In 2012, the Instituto de Fomento Pesquero (IFOP) during the workshop called "Convenio de Estatus y Posibilidades de Explotación Biológicamente Sustentables de los Principios Recursos Pesqueros Nacionales developed a matrix to explore the potential knowledge gaps of distinct fisheries. The Workshop gathered many experts on the field, managers from many institutions such as IFOP, SUBPESCA, and CEPES. Among some of the gaps that were found included estimates of capture, discards, impact of predation mortality, ghost fishing, stock structure, identification of spawning grounds and nursery areas as well as recruitment indices, and connectivity between spawning grounds and recruitment areas.

During 2014, the Instituto de Fomento Pesquero (IFOP) conducted an evaluation project on biological reference points in Chilean fisheries subjected to annual quotas (Payá., 2014a). The project included extensive work to first classify stocks in tiers (groups) according to quantity and quality of the data available (poor, medium and rich data), and then selecting the best method to estimate MSY-based RPs in each tier. Most of the stocks including Chile Austral hake, were classified in such tier in which proxy quantities are used as reference points. This was considered necessary since although these stocks contain enough information to conduct an age-structured stock assessment estimates of MSY based RPs were not considered reliable or feasible.

**Incorporation of Fishery/Biological Data**

i. ***Fishery Information***

The stock assessment process explicitly incorporates three sources of fishing information (Quiroz 2017):

a) The first corresponds to the reported landings in official statistics, which represent the levels of removal of the stock by fishing coming from official statistics of quota control regulated by the national fisheries and aquaculture services agency (SERNAPESCA). This quota control system defines the relative importance of the different ports of landings and, therefore, is of administrative or commercial interest of the activity. Specifically in this evaluation, the data of landings for the period 1977-2018 was reviewed and updated.
b) Discards and under-reporting represent the second fisheries source incorporated in the stock assessment process. Although, to date there is no overall consensus on the methods and levels of omission of catch, in the 2014 stock assessment (Paya., 2015), it was agreed by the Committee scientific technical of resources demersal zone South Austral (CCT-RDZSA) to use a set of weighted values of discards/under-reporting levels by fleet. Based on these weighted values, series of official annual landings were corrected by researchers from IFOP and adjusted on the stock assessment model.
c) Finally, the third piece of information incorporated in the stock assessment procedure corresponds to fishing yields disaggregated by fleet. This information is used for the construction of abundance indices derived from catch per unit of effort (CPUE) for industrial trawl and longline fleets, and also, for the construction of a nominal capture rate indicator representative of the fishing activity carried out by the artisanal fleet.

ii. ***Biological information***

The Chile Austral hake fishery monitoring is carried out by the [Proyecto de Investigación Situación Pesquerías de Peces Demersales y Aguas Profundas(Status of fisheries in Demersal and Deep waters Research Investigation)], which is part of the monitoring program of the main national fisheries which is required annually by SUBPESCA to IFOP. This project provides indicators such as age/size structure, age length keys, mean size/weight at age , which make up the core of the biological information used in the stock assessment process. In this framework, the following biological indicators are included:

a) Catch at age: Corresponds to the expansion of the catch by fleet (Industrial trawl, Industrial longline and artisanal), area (North and South of parallel 47° S) and sex (males - females) by means of an age/length key built based on ageing information of otoliths collected during the fishing season (Quiroz., 2017). Otolith collections are based on a sampling design stratified by size class, which makes it possible to build a matrix of crossvalidated information that represents the distribution of individuals present in the catch at specific age group and by stratum of size. While an age structure is available by area, sex and fleet, for the purpose of the evaluation of stock, this information is combined by sex and areas for the purpose of an overall estimate by unit of fishery fleet. This information is used with the purpose to evaluate the estimates of mortality due to fishing for different age groups, as well as providing information of year class strengths that sustain the fractions of the populations vulnerable for each fishery.
b) Weighted mean age values: The intra-annual growth of Austral hake is collected in three matrices of weighted averages at age, which respectively correspond to estimated half-year after the allocation of the age calculated for industrial trawling and longline fleets and artisanal fisheries, respectively

(Quiroz.,2017). Weighted averages are used to generate estimates of landings and vulnerable biomass for each fleet, as well as the spawner biomass from acoustics research surveys in August of each year conducted in he Southern Austral region of Chile. Aside from the disaggregation of weighted mean age values, the STC determined that scientific advice based on stock assessment procedure, should use an weighted average vector as a constant over time giving continuity to the assumptions and criteria used in previous consultations.

iii. ***Life History parameters***

For the implementation of the stock assessment procedure, information from scientific and technical studies related to parameters of the life cycle of the species such as as natural mortality, growth, and maturity are referred. In this way, the project has a role of integration of information from all programs and research projects to model the dynamics of the resource.

iv. ***Spawner stock biomass estimates from acoustics surveys***

Fishery independent data used in the stock assessment of Austral hake corresponds to the hydroacoustic research survey cruises conducted during the spawning aggregation time (Quiroz.,2017). These cruises provide information on age length keys necessary to generate data of abundance by age, which are included in the assessment for the period 2000-2018 model. In addition research survey provide estimates of spawner biomass for the same period, whcich for inclusion in the model are considered relative spawner biomass values

**Assessment Model Description**

The evaluation of stocks in Chile has been developed and perfected by IFOP for the past 15 years and whose methodology is generally in line with existing international standards. As a way to maintain this standard, IFOP also incorporated the recommendations emanated from technical scientific committees as well as the guidelines provided by the team of international experts in the framework of the project "Revisión de los puntos biológicos de referencia (Rendimiento Máximo Sostenido) en las pesquerías nacionales" (Paya.,2014a;Paya *et al.,* 2014; Quiroz., 2017).

The new assessment framework used a statistical catch-at-age (SCA) model to assess the stock status and to evaluate the impact of a suite of harvest strategies on the biomass/population trends and landings (Paya.,2014a;Paya *et al.,* 2014; Quiroz., 2017).

The statistical catch-at-age (SCA) model consists of a statistical population model, which uses survey and fishery data to generate a historical time series of population estimates, and a projection model, which uses results from the population model to predict future population estimates and recommended harvest levels.
The statistical catch-at-age (SCA) model estimates historical biomass, fishing mortality, recruitment and biological reference points. The assessment model (SCA) currently depict similar dynamics of Austral hake growth, mortality, and at-sea discarding of under-sized fish in the Industrial and Artisanal fisheries. Therefore, the assessment takes into account the major features relevant to the biology of the species and the nature of the UoA. The Chile Austral hake(SCA) model is based on the the Assessment Model for Alaska (AMAK) which is used in Alaska walleye pollock and Atka mackerel stock assessments (Ianelli., 2011).

The stock assessment model for Chile Austral hake assumes that in Chilean waters a unique self-sustainable stock distributed in all of the exclusive economic zone (Quiroz., 2017). The annual cycle of the model begins with the entry of new recruits of age 1 (at the beginning of the year) that originated from a single spawning stock population. Migration/immigration processes are not considered on the model. It is assumed on the model there is observation error in the catches using the Baranov catch equation and where the fishing mortalities are estimated as parameters in the model. Biomasses are calibrated using relative abundance series based on Commercial Fisheries Standarized CPUE and hydroacoustic cruises estimates.

During the implementation of the stock assessment population model of Chile Austral hake, elements of structural uncertainty are considered based on the level of knowledge and the information or data available, as well as the uncertainty of generated estimate of its application to the a set of available data. In this sense, the stock assessment model is based on the statistical analysis of the dynamics of annual age structure and average weight at age , by means of the following components:

**Initial Conditions**

It is assumed that the Chile Austral hake stock at the beginning of the year 1977 was in equilibrium conditions with no fishing occurring. Under this assumption, the recruitment of year 1977 corresponds to a Virgin recruitment ($R_o$) consistent with a Virgin spawner biomass ($S_o$), while in subsequent years (> = 1977) is dependent on a Beverton-Holt stock recruit relationship (as a function of SSB, $B_o$, $R_o$ and h) that is sensible to deviations obtained from a normal probability distribution. While this assumption simplifies the structure of the model, it is a highly likely scenario Chile Austral hake stock. In this way, the number of individuals at age $a$, at the beginning of the year 1977 is defined as,

$$N_{a,1977} = \begin{cases} R_0, & a = 1 \\ N_{a-1,1}e^{-M}, & a > 2, \cdots, m-1. \\ \dfrac{N_{a-1,1}}{(1-e^{-M})}, & a = m \end{cases}$$

Virgin Spawner Stock Biomass is obtained as:

$$S_0 = e^{-\frac{9M}{12}} \sum_{a=1}^{m} N_{a,t} ms_a w_a, \quad t = 1977,$$

where $m_{sa}$ y $w_a$ corresponds to the proportion of mature females and average weights corresponding to the ages *a* respectively.

**Recruitment**

In order to estimate recruitment (specified at the age 1), a Beverton –Holt stock-recruitment model with a lognormal error structure was used. The BH model incorporates a variance function that reduce the bias during the scale transformation where $St$ is spawner biomass in the year $t$, $\epsilon t$ is the deviation of the recruitment in the year $t$, and $\sigma R2$ is the standard deviation of deviations from the recruitment on a logarithmic scale.

$$R_t = \frac{S_{t-1}}{a + bS_{t-1}} e^{\left(\epsilon_t^R - \frac{\sigma_R^2}{2}\right)}$$

The relationship between virgin recruitment and spawner abundance levels, and $a$ and $b$ of the Beverton-Holt model parameters is given by:

$$a = S_0 \frac{1-h}{4hR_0}, \qquad b = \frac{5h-1}{4hR_0},$$

Where $h$ is a parameter that defines the strength of the density dependence, so is Spawner Stock Virgin biomass, and $Ro$ is the average recruitment produced when the population is in equilibrium with no fishing occurs (Virgin recruitment). The $h$ term, defined as the steepness parameter, represents the recruitment level relative to Virgin recruitment, which occurs when the spawner biomass has been reduced to 20% of its Virgin level. As in the last assessment (Quiroz ., 2016), it was assumed h = 0.5.

**Temporal dynamics of cohorts**

The abundance of Chile Austral hake stock at age at time $t$, is modelled by,

$$N_{a,t} = \begin{cases} R_{a,t}, & a = 1 \\ N_{a-1,t-1}e^{-Z_{a-1,t-1}}, & a > 2, \cdots, m-1, \\ N_{a-1,t-1}e^{-Z_{a-1,t-1}} + N_{a,t-1}e^{-Z_{a,t-1}}, & a = m \end{cases}$$

And

$$Z_{a,t} = M + \sum_{i=1}^{g} S_a^g F_t^g,$$

where $M$ is the instantaneous rate of natural mortality for the age $a$ at the time $t$, $m$ is the group plus and $Za,t$ is the age-specific total mortality. In this sense, it arises that the population dynamics of the abundance $Na,\, t$ at age $a$ at the $t$ time, it can be represented by a survival model where the fishing mortalities per year, $Ftg$, for each $g$ fishing fleet, are applied continuously during the season of fishing for every age according to a selectivity ogive Sg.

**Selectivity**

The selectivity curve implemented on the model for the industrial trawl and longline fleets as well as the artisanal fleets and research hydroacoustic survey vessels, corresponds to a double-normal function defined for all the ages range. The double-normal function takes three parameters, the maximum age of selectivity ($k$) and variances of the right side ($vr$) and left ($vl$) of the selectivity curve. These three parameters provide considerable flexibility to the functionality of the selectivity, defined as,

$$S_a^g = \begin{cases} 2^{-\left[\frac{a-k}{v^l}\right]^2}, & a \le k \\ 2^{-\left[\frac{a-k}{v^r}\right]^2}, & a > k \end{cases}.$$

The selectivity curve is asymptotic when the right variance right ($vr$) has high values and forms a dome shaped curve when it adopts low values. It is considered constant among years and also on the parameters of position (age at 50% of exploitation) and dispersion (slope of the curve). The justifications for this assumption are based on the low variability of the age class compositions of the catch originated from the fisheries and to a lesser extent from research cruise ships. Furthermore in this fishery there is no evidence that very old individuals are outside of the area where the fishery operates the fishery in the case of asymptotic selectivity curves.

**Predicted values**

The annual indices of relative abundance ($Itg$) for each fleet $g$, including estimates of hydroacoustic research survey vessels, are assumed to be proportional to the vulnerable biomass estimated at half of the year, according to:

$$I_t^g = q_g e^{-0.5M}\left(\sum_t \sum_a S_a^g N_{a,t} w_{a,t}\right) e^{\epsilon_t},$$

where $qg$ corresponds to the coefficient of catchability of crafts or fishing gear.

In the case of hydroacoustic research survey vessels it is assumed that the estimates represent a fraction of the available spawner biomass, which in other words means that the index of proportionality or catchability is estimated in the model subject to an established priori distribution following lognormal distribution with a mean = 0 and standard error = 0.4. The rationale for this assumption is that given that the process of spawning aggregation event of Chile Austral hake is possibly more extended than it is prospected, the cruise uses a coefficient of variation of 40% in terms of the precision of estimation.

The proportion of observed ages of Chile Austral hake among each fishing fleets ($\overline{p}a, tg$) and cruises ($\overline{p}a, tcru$) were obtained by:

$$\bar{p}_{a,t}^{g} = \frac{C_{a,t}^{g}}{\sum_a C_{a,t}^{g}}, \qquad \bar{p}_{a,t}^{cru} = \frac{N_{a,t}^{cru}}{\sum_a N_{a,t}^{cru}},$$

where $Ca,tg$ corresponds to the matrix of the catch at age observed for fleet g whereas na ,Tg correspond to the abundance of the age classes estimated from the hydroacoustic surveys.

The total annual landings per fleet $Ytg$, is modelled assuming observation errors in the catch. Thus the landings are estimated as:

$$\hat{C}_{a,t}^{g} = N_{a,t} w_a \frac{F_{a,t}^{g}(1-e^{-Z_{a,t}}}{-Z_{a,t}}$$

$$\hat{Y}_t^g = \sum_g \sum_a \hat{C}_{a,t}^{g} \ .$$

The total catches in the model, correspond to the levels of annual landings made by (trawl and longline) industrial fishing fleets and artisanal fishing fleets

**Goodness of fit and robustness on the evaluation model**

In order to ensure the application of the best model for evaluation, as well as their robustness, accuracy and resulting uncertainty, the following procedure is be considered:

- The robustness of the stock assessment model is evaluated through retrospective analyses, on the basis of the same set of data used.
- It is graphically presented the fit of the model to the data and the goodness of fit of the different models used, when appropriate. This is accompanied with analysis of residuals of the main sources of data.
- The comparison of results with previous versions of the model or other alternative models is included to assess the consistency of the present evaluation (empirical retrospective analysis).

On the basis of these analyses, opportunities for improvements in the implementation of the assessment procedure, as well as will identify gaps of knowledge and information will be identified

**Population Projections and Risk Analysis**

The performance of the variables in the model regarding management measures, is dependent on the assumptions of recruitment used in the projections of the population (Quiroz.,2017). Although the ABC for 2018 is not affected by the projected recruitment conditions, the levels of risk of not achieving the goal of conservation or any other measure of performance of future population could be affected . For example, a level of ABC 2018 can be consistently projected with the $F_{MSY}$, but the level of risk of that in the medium term (e.g. 15 years) the biomass does not reach the goal of management could be likely to be less in scenarios where the recruitment is lower than in other alternative scenarios. Differences in terms of risk for different scenarios of recruitment, also are dependent of other parameters that modulate the population dynamics, as well, as the spread of the uncertainty associated with the estimation of the parameters.

Population projections were simulated under two recruitment scenarios in order to assess the impact on stock status in a horizon of 12 and 24 years (Quiroz., 2017). Performance measures evaluated for this period are:

1. the probability that projected spawner stock biomass is less than the $SSB_{MSY}$.
2. the probability that projected spawner stock biomass is less than the $SSB_{2016.}$
3. ABC against different levels of risk of exceeding the applied exploitation strategy.

The two scenarios correspond to the average estimated between the last 5 years of the series, projecting a constant equal to the average recruitment. The first scenario corresponds to the average of the 2006-2012, whereas a period of low recruitment and the second stage covers the period 2011-2016, which presents a higher average recruitment, this scenario represents the levels of most recent productivity of the population.

**Management Strategy Evaluation**

Management strategies evaluation (MSE) has as main goal to determine which set of management procedures (MP) allows the goals of conservation and management, under the premise that the efforts of management combine political and technical aspects (Quiroz., 2017). An MP is comprised of three elements: i) biological points of reference (BPR), ii) rules of catch (RCC) control and iii) possible scenarios modeling based on a model of estimation of parameters (MEP), in other words, a stock assessment model. The process of comparison of the different MPs in terms of performance measures (e.g. $P$ (SSB $\leq SSB_{MSY}$) is called an MSE.

Based on the BPRs, the RCCs provide temporary routes to achieve management objectives (Quiroz.,2017). In this regard, under the criteria established by Chile law of fisheries and aquaculture on the MSY, the BPRs represent the technical procedure of handling component because they integrate conservation aspects which lie behind the MSY-based BPR. While the RCC should represent the political aspects already that its shape and dimension they should incorporate the economic, social and environmental requirements that regulate the fishery. In effect, a set of BPR without RRC (adequate and well agreed) not constitute a MP, and it lies rather in a simulation exercise under the BPR which not necessarily are reactive in the future periods

In this context, simulations were conducted on populations of Austral hake under stochastic conditions in terms of productivity, the BPRs and RCC options, evaluating the performance of state variables over a period of 50 years. This approach is not focused on the ability to estimate of the MSE with respect to population variables, but focuses on the comparison of the different MPs under the precise information that feeds the MES in each year's iteration comes from information perfect drift of an operating model (MO) with the same characteristics in terms of the error model (process and observation in state variables and the data generated) included in the MSE.

**Source of data for stock assessment**

For the 2018 stock assessment, fishery information for the years 1977-2018 was used along with the hydroacoustic survey results that extends upon year 2018 (Quiroz., 2017; SUBPESCA., 2017; IFOP., 2018a; IFOP., 2018b). The information databases included:

- Landings, discards (Landings corrected by discards adjustment factors)
- Standarized CPUE Indices from industrial trawl and longline
- Nominal Catch data from the artisanal fisheries
- Age structure from the catch on the industrial and artisanal fisheries
- Biomass and abundance by age from the estimates of hydroacoustics survey
- Trends and observed average weights form the fishing fleets as auxiliary data for sensitivity analyses

In the 4th session of the CST-RDZSA held in December 2018 (IFOP., 2018b), IFOP fisheries scientists presented an update on the stock assessment to complement the scientific advice 2018 (aimed at determining Aceptable Biological Catch for the year 2019) through the implementation of at least 3 alternative assessment scenarios to those exposed on the first initial meeting held in October 2018 (IFOP., 2018a).

**Base Model**
The base model used for this complementary analysis correspond to the model0.9a that was defined by the CZT-RDZS as the base model for the scientific advice in 2017 (SUBPESCA., 2017, IFOP 2018b) . In this model, there were new changes/improvements in the estimation of CPUE from all of the fleet and on the coefficients of variation. In this model the weighting of the age structure collected from the acoustic cruise was reduced to values with less relevance than those obtained from the fishery.

**Scenario 1**: Updated data for the years 1979-2017 and partial data from the fishery and acoustic cruise for 2018 was used on the model . In addition, the catchability coefficient for trawl gear was modified for years 1997 2001 and 2011. The catchability coefficient for longline was modified for years 1997 and 2011.

**Scenario2** : Modifications of the coefficient of variation for the indices of abundance of industrial fleets and cruise acoustic were included on scenario2 . With respect to the baseline scenario used in the recommendation of CBA for the year 2019, weights for the indexes of the trawl and longline fleets were doubled, while the ones from the acoustic cruise were reduced to half. The CPUE of the artisanal fleet index was not modified, maintaining a weight of low importance with respect to the remaining indices of abundance.

**Scenario3**:
Finally, data on the proportion of sexually mature individuals found on the acoustic survey were included on scenario 3. For this, maturity ogives from each cruise from period 2000-2018 were used. It is noteworthy to say that only maturity ogives for females were used as it was assumed they were the same for males also. For years with no data (2000 and 2018), maturity ogives for 2001 and 2017 were used respectively. For year 2003 where there was no adjustment, the average between 2002-2004 was used.

After the review of the 3 scenarios the scientific technical committee recommended to use Model 3 for Science advice for setting the TACs for year 2019. Thus, the information on the report comes from the data output from model 3 (IFOP 2018b) and Quiroz (2017).

### 3.3.3. Chile Austral hake Abundance Indices – 2018 Stock Assessment Update

#### 3.3.3.1 Fishery-Independent Indices

**Biomass Estimates from Hydroacoustics Surveys**
Independent data for the stock status evaluation of Chile Austral hake comes from research survey vessels that conducted hydroacoustics surveys during the spawning aggregation periods (Lillo *et al.,* 2017; IFOP., 2018b). Data from these surveys is used for calculating age length keys that will be used subsequently for age class abundance matrices on the stock assessment model evaluation for the period 2000-2018 (Quiroz., 2017; IFOP., 2018b). Research vessels report estimates of spawning biomass for inclusion in the model which then are considered as relative biomass values.

Inter-annual changes in biomass from the hydroacoustics survey suggest a small decline from 2011, while abundance showed a stable trend for the same period (Figure 9). The biomass and abundance have very similar decreasing trends, xcept for the years 2008 to 2013, when the average weights were lower due to the increased presence of fish of younger ages.

For the years 2014 to 2018 Chile Austral hake biomass showed a significant increase. For year 2017 the Chile Austral hake had a biomass of 96.082 t (95%CL=5%= 88.998 -103.165), estimated with geostatistical methods (SUBPESCA., 2017). The 2017 biomass estimate is 42, 87% higher than the 2016 biomass estimate. Abundance was estimated as 33.988 individuals on which 10.73 (32%) were males and 23.215 (68%) were females. The 2017 abundance was 54% higher than the one estimated for year 2016 (SUBPESCA., 2017).

Preliminary partial results for year 2018 showed that the Chile Austral hake had a biomass of 115.06 t (95%CL=5%= 107.718 -122.41) (SUBPESCA., 2018). The 2018 biomass estimate is 20% higher than the 2017 biomass estimate. Abundance was estimated as 41.61 individuals on which 11.23 (27%) were males and 30.215 (73%) were females. Although preliminary, the biomass for year 2018 is the largest of the 2010's decade and 2nd largest of the time series (2000-2018).

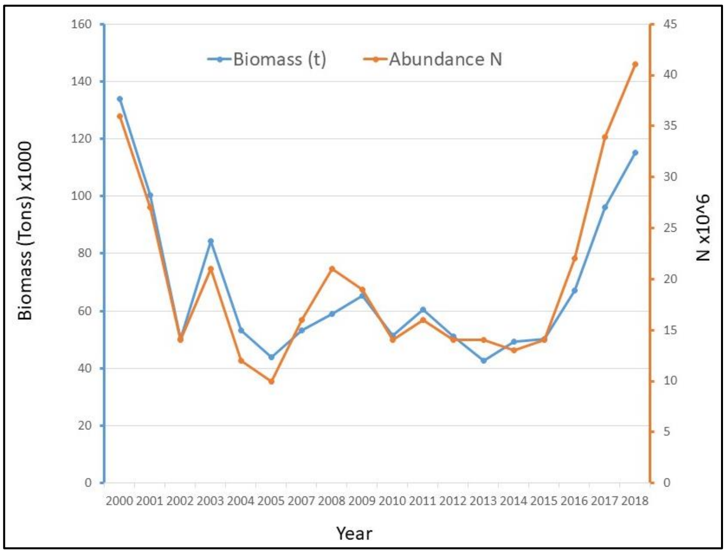



**Figure 9.** Spawning Biomass (tons, blue) and abundance (millions, orange) estimated at the spawning grounds with hydroacoustics (Modified from Quiroz., 2017, and SUBPESCA., 2018).

Age class distribution has been stable except for year 2008, 2013 and 2016 where it was observed a major proportion of younger individuals under 9+ age (Figure 10). The mean trend line shows a notable decline in 2008, 2013 and 2016. It seems that there has been a reduction of younger year classes given that the monitoring efforts and sampling have been the same through this period (Quiroz., 2017). For year 2015, it shows a reduction on mean age of the spawning population which it is reflected on the mean weight estimates from the cruise surveys. The age distribution is smaller than 2014. Finally year 2016 presents the average age as smaller than 2015 with a more broad distribution of age classes and ranges. Size class distribution was multimodal with a principal size class mode around 76 cm (Quiroz., 2017). There is also an important presence of a size class of individuals below 70cm.

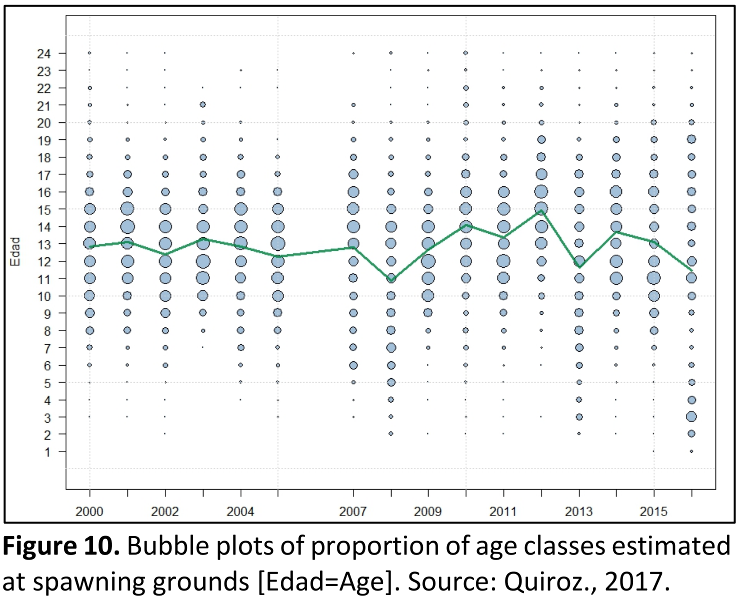



**Figure 10.** Bubble plots of proportion of age classes estimated by annual hydroacoustic surveys on *M. australis* at spawning grounds [Edad=Age]. Source: Quiroz., 2017.

### 3.3.3.2 Fishery-Dependent Indices

**Commercial Fishery CPUE:**

The standardized trawl CPUE shows two periods, first with a steady decline until the mid-90s and the second with a progressive increase until reaching maximum values in the year 2015 (Figure 11) (IFOP., 2018a ). As for the longline, this begins with values relatively constant until 1999-2000 where it reaches the maximum values of the series. Index for artisanal espinel this reached maximum values in 2000 to then progressively decline until today. Abundance data from hydroacoustic surveys shows a steady decrease since 2000 but there are signs of small improvement in 2016 (IFOP., 2018a).

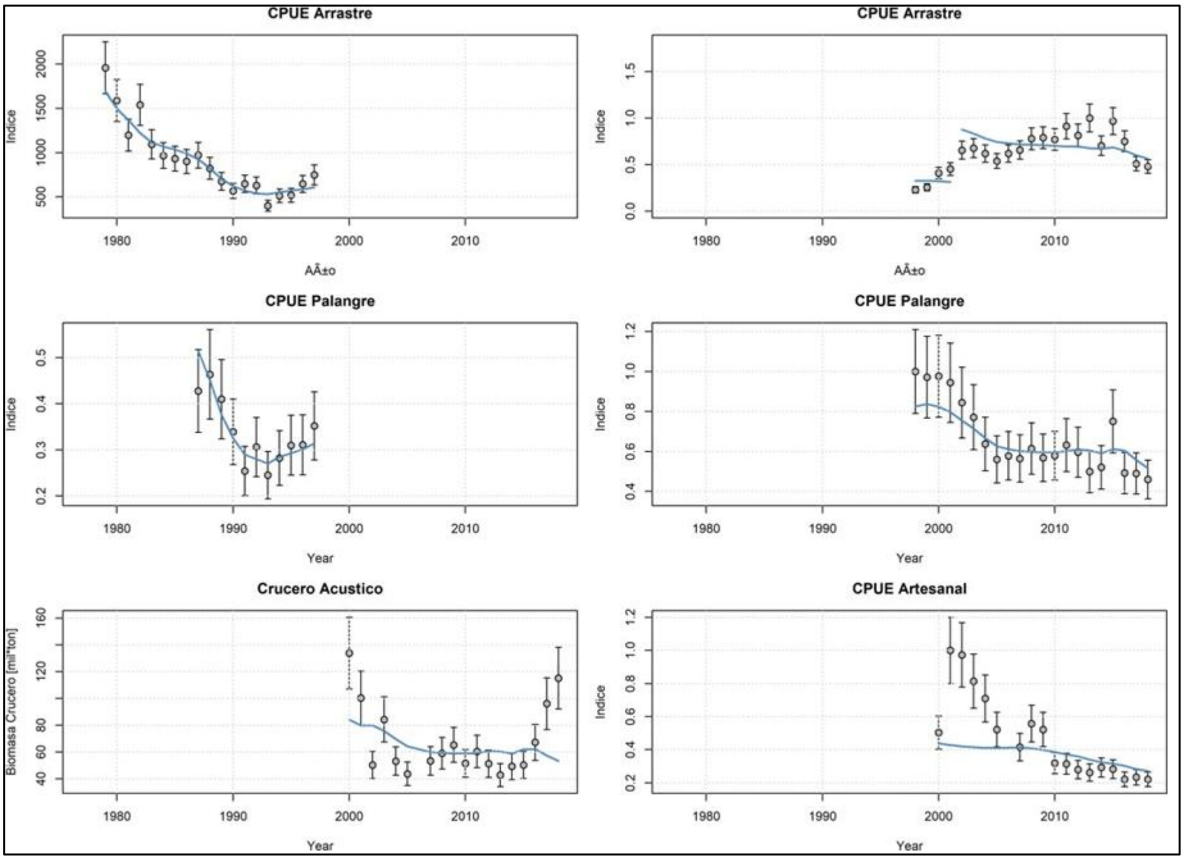



**Figure 11.** Indices of abundance observed (points) and estimated (Line) of Industrial Trawl fleet [Upper left (1979-1997) Upper Right;1998-2018),Industrial Longline Fleet [Middle left(1987-1997), Middle Right (1998-2018)], Artisanal fisheries[Lower right,(2000-2018)] and Estimates of Hydroacosutics surveys[Lower Right,(2000-2018). Source: Perez and Quiroz 2018a.

**Catch**

The volumes of landings of Chile Austral hake are shown in (Figure 12). These values correspond to the sum of official landings in waters of the Northern and Southern fishery units between the period 1977 and 2018 for the industrial trawler fleet, period 1987-2018 in the case of the industrial longline fleet, and finally for the Artisanal fleet craft the sum of landings reported between the X-XII regions for the period 1981 and 2018 (IFOP., 2018a).

However, it is known that fleets have incentives to discard (mainly the industrial fleet) and underreporting (by the artisanal fleet), driven mainly by the market restrictions and limitations on the levels of catch quotas. The estimates of total catch as well as the retained and discards proportions are obtained by statistical models and in the case of Austral hake, these estimates are very informative. For example, for years 2015 and 2016, a total 325 t and 79 t of Austral hake was discarded accounting for 3.9% and 0.7 % of the total volume of the catch respectively (Table 9,Table 10)(Quiroz., 2017).

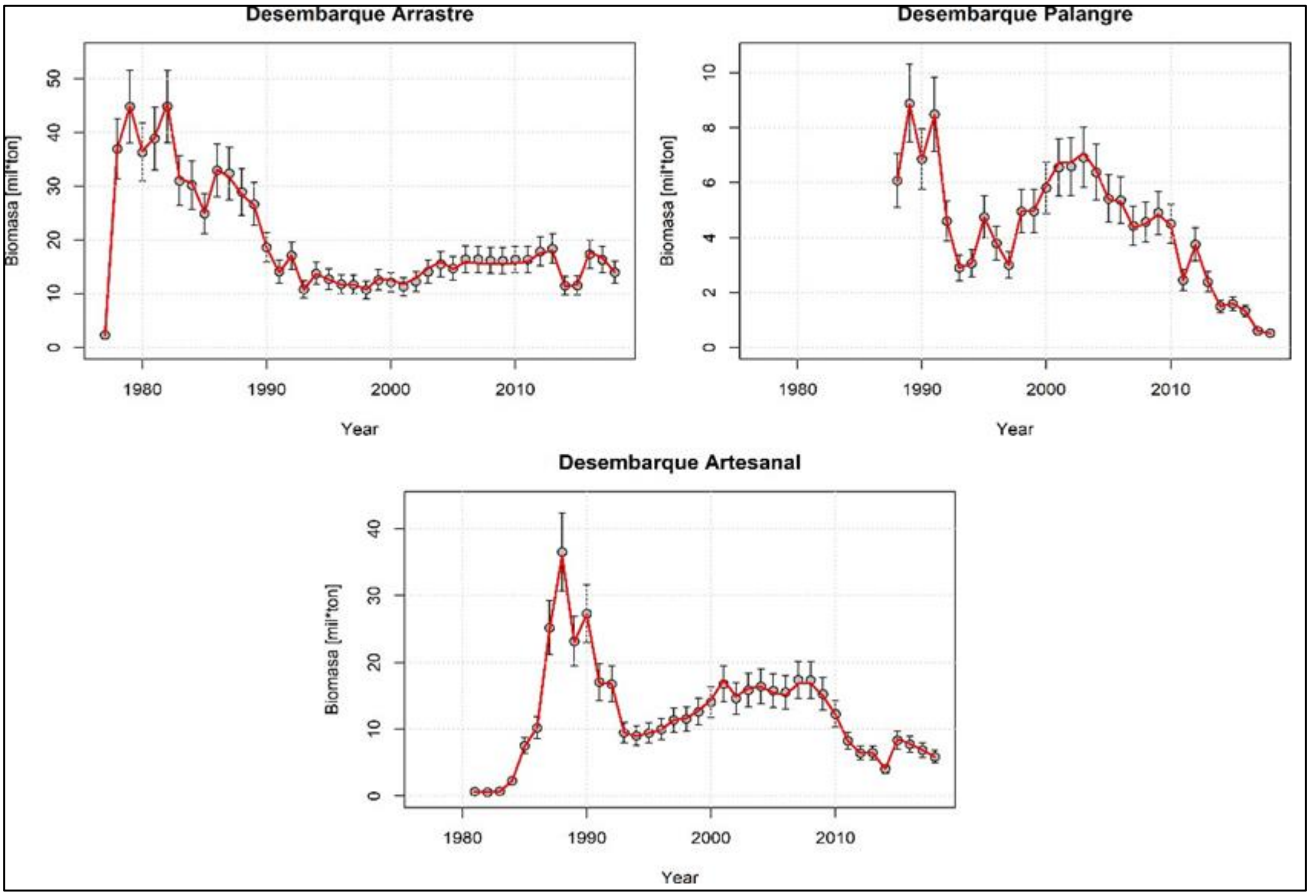



**Figure 12.** Observed (points) and estimated (lines) landings with their respective standard deviations of *M. australis* reported by Industrial (Trawl and Longline) and Artisanal for the period 1977-2018. Source: Perez and Quiroz., 2018a.

**Table 9.** Estimates Retained Catch, Discards of the principal species in the South Austral demersal fisheries for year 2015. Source: Quiroz ., 2017**.**

| Species | Retained Catch (t) | Discards (t) | Total Catch (t) | %Discarded/Total Discards | % Discarded/ Total Catch |
|---|---|---|---|---|---|
| Jumbo squid | - | 823 | 829 | 43.7 | 9.9 |
| Hoki | 3680 | 666 | 4346 | 35.1 | 7.9 |
| Austral hake | 2319 | 325 | 2645 | 17.2 | 3.9 |
| Other Species | 514 | 75 | 589 | 3.9 | 0.9 |
| | 6514 | 1895 | 8409 | 100 | 22.5 |
| Kmsur= 1.14107 | | | | | |

**Table 10.** Estimates Retained Catch, Discards of the principal species in the South Austral demersal fisheries for year 2016**.** Source: Quiroz, 2017.

| Species | Retained Catch (t) | Discards (t) | Total Catch (t) | %Discarded/Total Discards | % Discarded/ Total Catch |
|---|---|---|---|---|---|
| Jumbo squid | - | 927 | 927 | 58.9 | 8.1 |
| Hoki | 7064 | 442 | 7505 | 28 | 3.9 |
| Austral hake | 2371 | 79 | 2450 | 5 | 0.7 |
| Other Species | 444 | 128 | 572 | 8.1 | 1.1 |
| | 9879 | 1576 | 11455 | 100 | 13.8 |
| Kmsur= 1.14107 | | | | | |

**Age Structure from Commercial Catch**

Information on age structure that is included in the stock assessment model includes records of three fleets: (i) industrial trawlers operating in foreign waters, (ii) industrial longline vessels with fishing mainly in the area extreme south, and finally (iii) craft ships that use background unattended deployed mainly in the Interior waters.

Industrial fleet

As it was documented in previous reports, the age structure information indicates that between the years 1981-1985 the trawl fleet captured significant levels of long-lived fish, which resulted in a significant decline in the average age of capture (Figure 13) between 1995 and 2005, the proportions of long-lived fish in both fleets were reduced in comparison with the initial years. However, since 2007 the average age has shown signs of increase in the average age. With respect to recruitment of young year classes to the population, the age structure information cannot show a proper follow-up, except for the strong year class cohorts born in the years 1980 and 1986 that possibly sustained catches during the 90's.

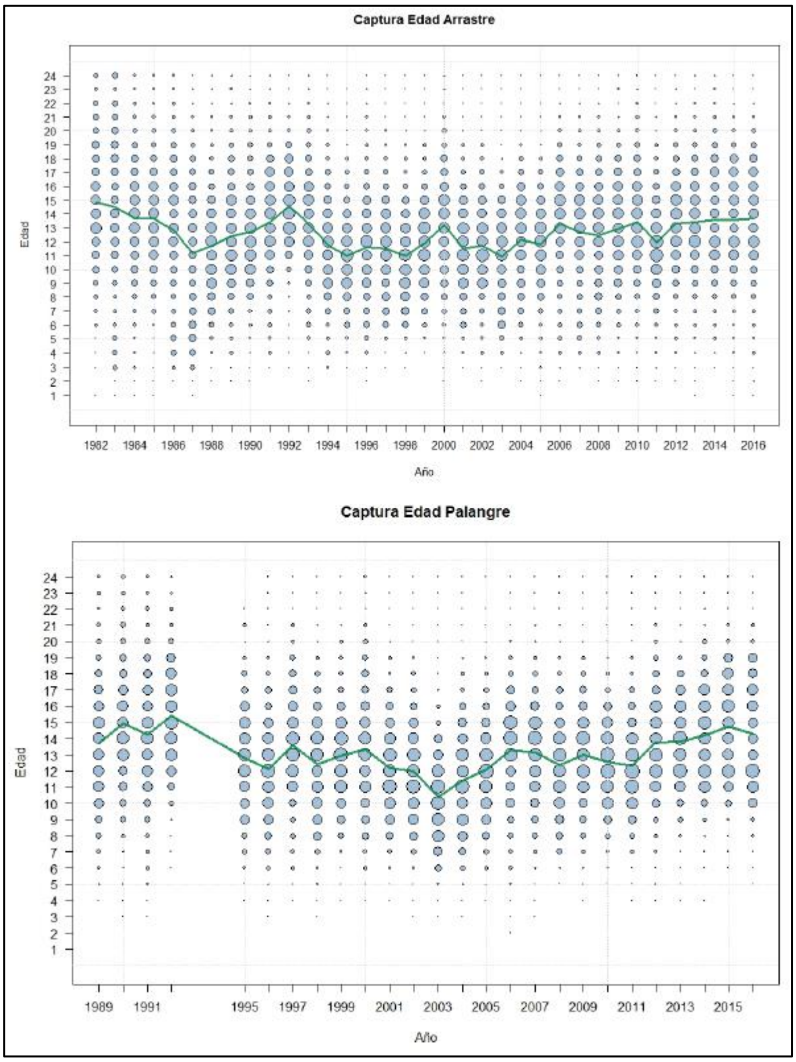



**Figure 13.** Bubble plots of proportion of Age Classes of *M. australis* from Industrial Trawl Fleet (above) and Industrial Longline (under) Source: Quiroz, 2017. Edad =Age

<u>Artisanal fishery</u>

For the artisanal fishery available information included the periods 1987-1988, 1995-1997 and 1999-2016 (Figure 14). Age structure encompasses a range of ages younger than the trawl and longline industrial fleets and a mean age at capture around 10 years (compared to 12-14 years on industrial fleets). The first two years of data (1987 and 1988) correspond to the years with large artisanal catches (20 to 30 thousand t), but then there is data for the period 1989-1995, where catches were still high, but the downward trend. The 1995-1999 period, can be seen a shift the on the age structure to older ages. From 2000 to 2004, there was a relatively stable age structure. From 2005 to 2009 recruitment of young age classes increased. For year 2016 the average age at capture increased to 11 years**.**

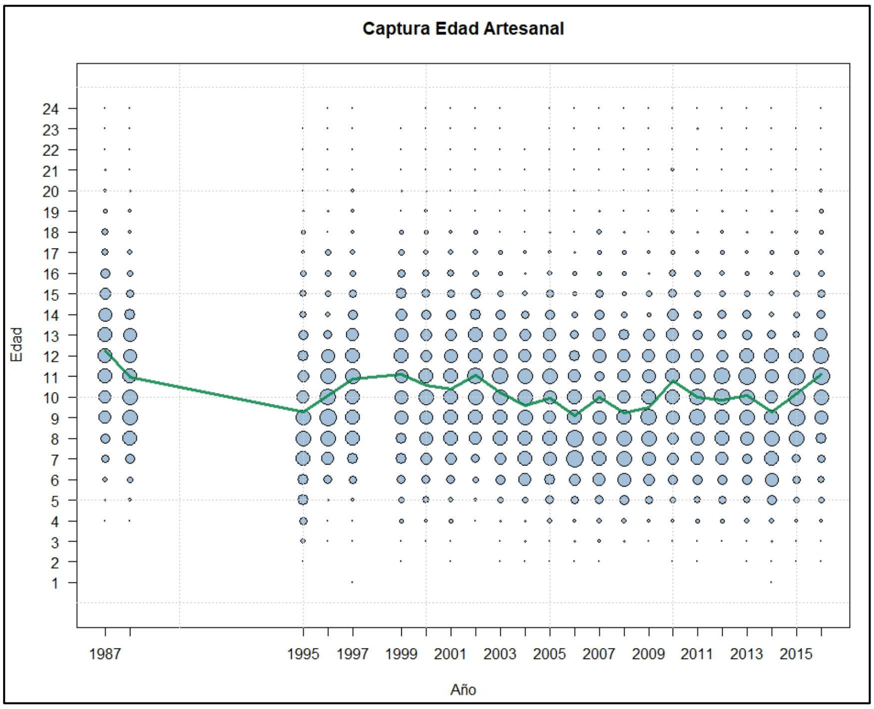



**Figure 14.** Bubble plots of proportion of Age Classes of Chile Austral hake from artisanal fleet. Source: Quiroz, 2017. Edad =Age

**Estimates of Spawning Stock Biomass,**

For year 1977, it was estimated a spawner stock biomass of 449 thousand tons. For year 2018 the estimates of spawner stock biomass (SSB) of 144 tons which corresponds to a reduction of the 32% of the initial Virgin spawner stock biomass estimate (Perez and Quiroz., 2018b). Spawner biomass show a gradual decrease during the entire series, with a slight stabilization during the last 4 years in the spawner stock biomass (Figure 15).

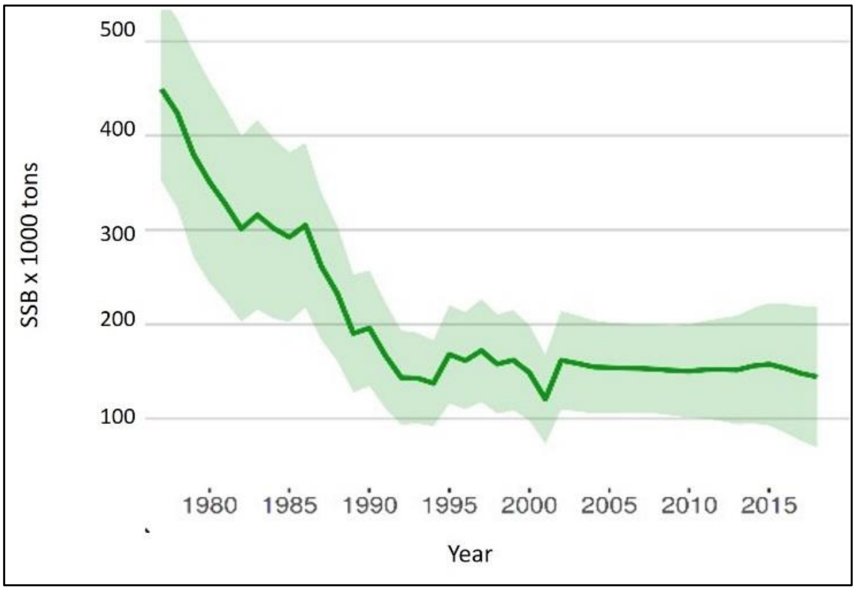



**Figure 15.** Estimates of Annual SSB from scenario3 Source: Perez and Quiroz., 2018b.

The estimated recruitment is presented in Figure 16. During the first 20 years recruitment is approximately 150 million individuals and then decreased to 84 million individuals in 2009. That recruitment levels trends were stabilized on the last 10 years. Thus, the stabilization of total biomass and the slight increase on the SSB and juvenile biomass is possibly attributed to the reduction of the fishing pressure on recent years.

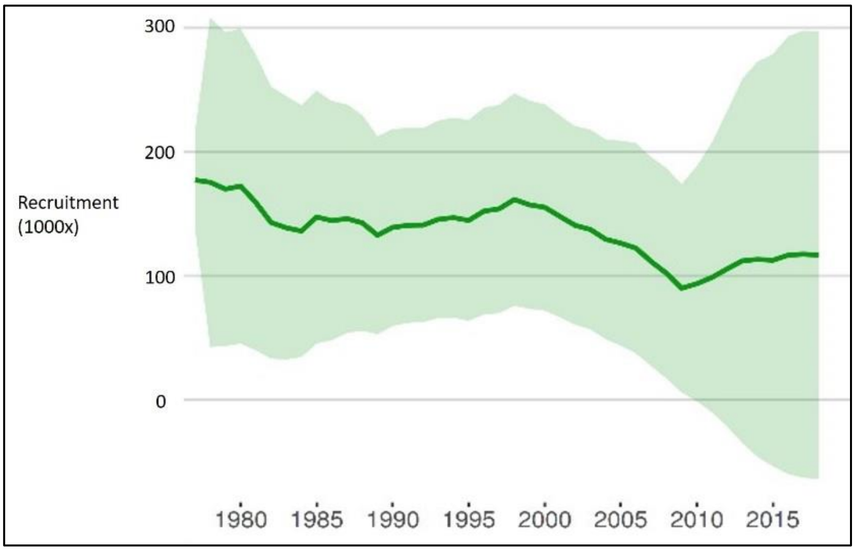



**Figure 16**. Estimates of recruitment for Chile Austral hake from scenario 3 . Source: IFOP., 2018b.

**Estimates of Fishing Mortality**

The highest fishing mortality rates comes from the industrial trawl fleet followed by the industrial longline fleet (Figure 17). However during the last 6 years the longline fishery have reduced significantly its exploitation levels. In all fleets, it is shown a marked reduction in fishing mortality since 2014 as a result of the reductions in catch individual quotes (Figure 17).

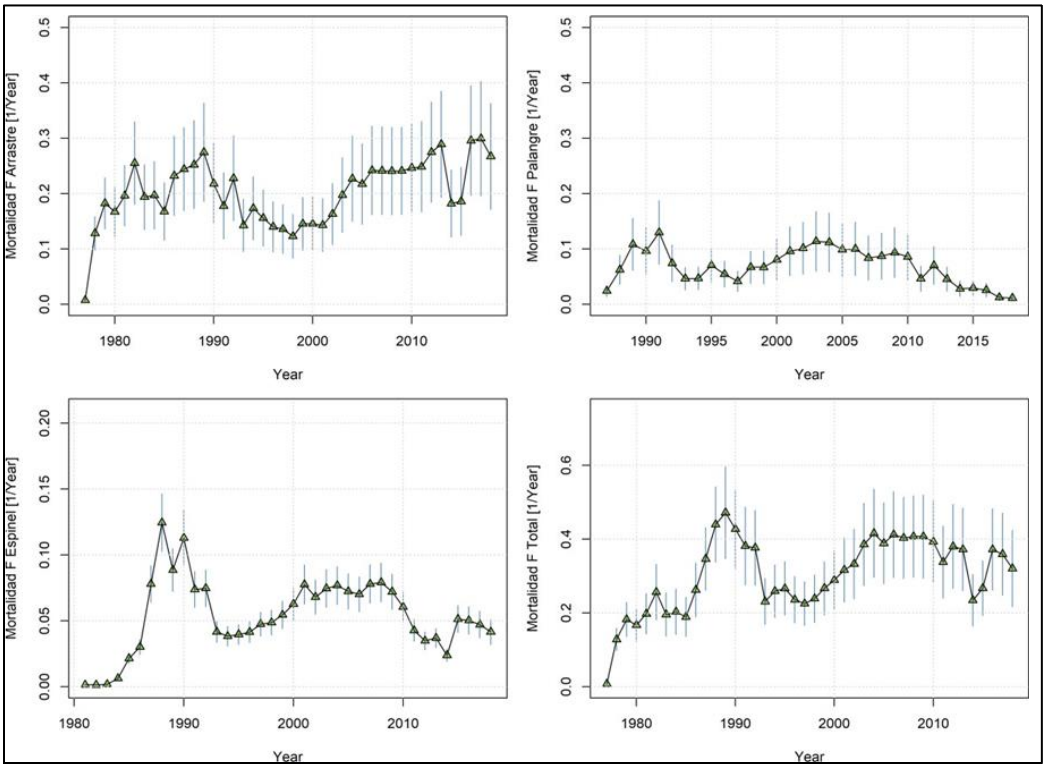



**Figure 17.** Annual Fishing Mortality Estimates by Fleet and Annual Total Fishing Mortality. All fleets combined (B). [Mortalidad F Arrastre= Fishing Mortality Trawl; Mortalidad F Palangre= Fishing Mortality Industrial Longline; Mortalidad Pesca F Espinel= Fishing Mortality Artisanal longline/dropline;Mortalidad F Total=Total Fishing Mortality] Source: Perez and Quiroz., 2018a.

**Estimates of Fishing Selectivity**

Figure 18 shows fishing selectivity's by gear. It seems that industrial fisheries are catching relatively mature individuals. However, apparently the artisanal fishery is fishing a large proportion individuals that are below the age at maturity. Age at recruitment is approximately 20 years for Industrial trawl and longline whereas ages at recruitment for artisanal fisheries and the hydroacoustic survey is 12 and 21.8, respectively.

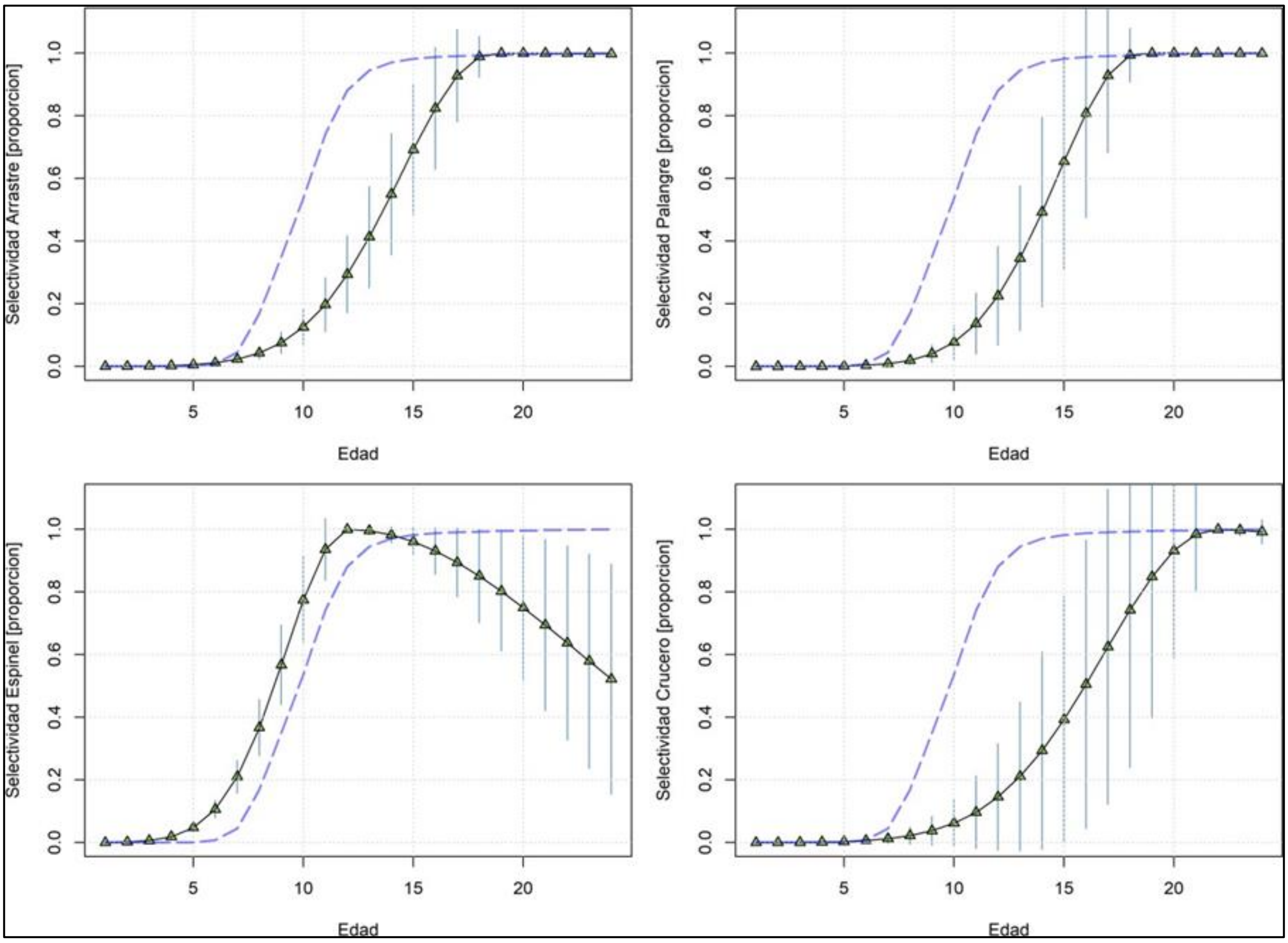



**Figure 18.** Estimates of fishing selectivity by fleet for all years pooled. Size at maturity curve is shown for comparisons. Source: (Perez and Quiroz, 2018a). [Selectividad (proporcion) Arrastre= Selectivity(proportion) Trawl; Selectividad (proporcion) Palangre= Selectivity (proportion) Industrial Longline; Selectividad (proporcion) Espinel= Selectivity (proportion) Artisanal longline/dropline;Selectividad (Proporcion) Crucero=Selectivity (proportion) Acoustic Cruise; Edad =Age]

**Retrospective analyses**

This analysis is used to assess the consistency of the evaluation of stock in an iterative way. Using the same set of data allow to evaluate the robustness of the model against new pieces of information allowing to assess patterns of bias in the estimation of state variables.

This analysis consists of a cross-validation of a systematic nature that is sequentially removes the last year of information and assesses its impact on population trends. The performance of the retrospective process shown for total biomass, spawner biomass, fishing mortality total and recruitment (Figure 19, Figure 20), from which shows consistency in the estimates both at the level of biomass and fishing mortality.

However, for the most previous years the model presents a pattern of over-estimation of recruitment, which is evident in 2011 when the model with more recent information tends to reduce the levels of recruitment for that year Figure 20).

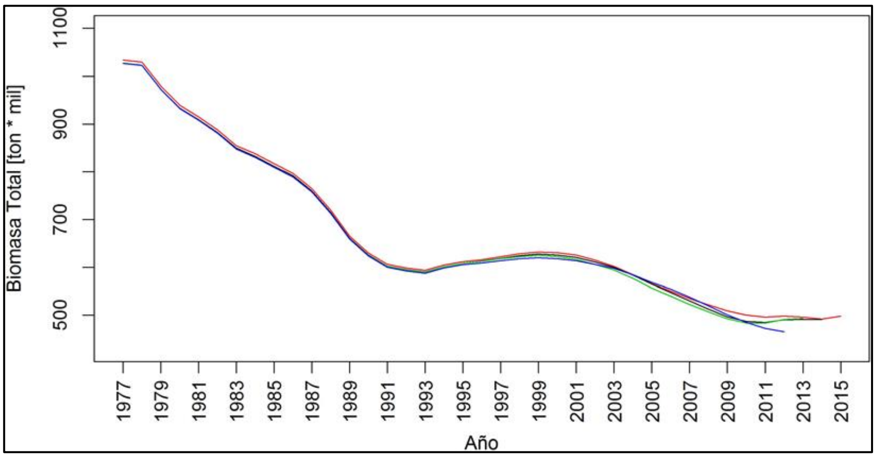



**Figure 19.** Traditional retrospective analysis of total biomass for period 2012 – 2015 (Quiroz, 2017)

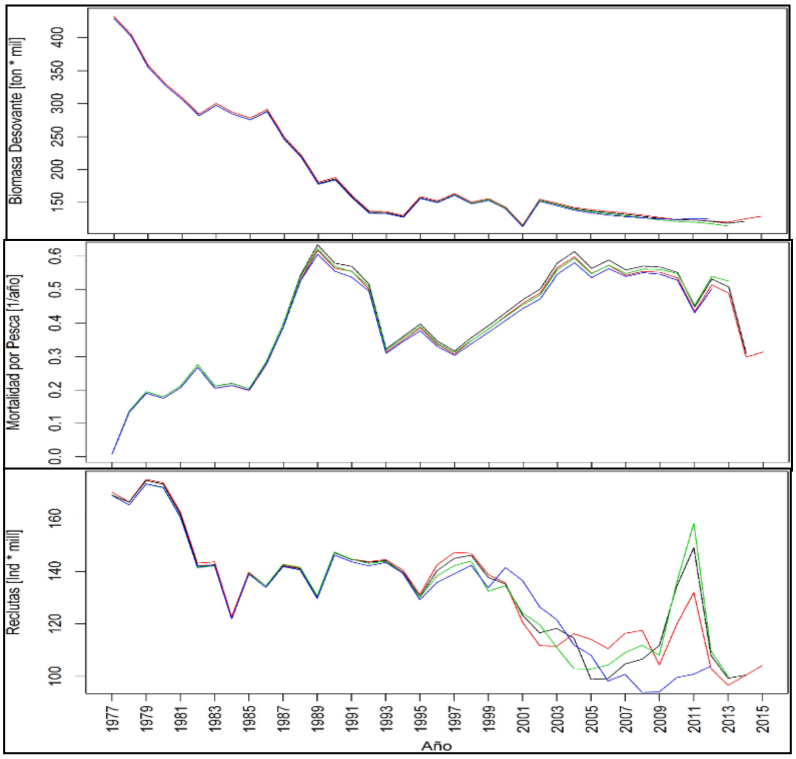



**Figure 20.** Traditional retrospective analysis of spawner biomass, fishery mortality and recruitment for period 2012 -2015. (Source: Quiroz, 2017)

**Empirical Retrospective Analyses**

Empirical retrospective analysis is illustrated in (Figure 21) , of which highlights consistency in the estimates at the level of biomass, particularly since the year 2000 onwards. The first noteworthy point is that the magnitudes in the biomass (total, spawning and juvenile) are similar to the period 1978 to 2014, indicating that the performance of the model tends to be consistent when new biological/fisheries information is added to the model.

Similar to the behavior of the traditional model based retrospective analysis, major discrepancies arise in recruitment. Model-based retrospective analysis indicated a bias over-estimation in recruitment, which is consistent with the estimated recruitments among the scientific consultancy of the year 2015 and 2016, at least for values from the year 2010 onwards.

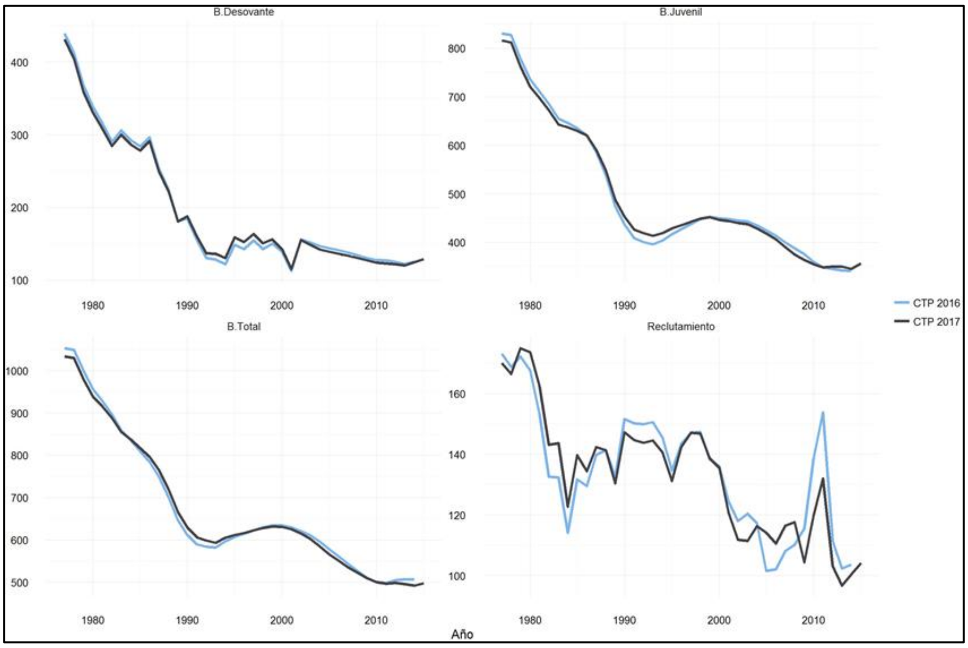



**Figure 21.** Empirical restrospective analyses for SSB (Upper Left), Juvenile Biomass (Upper Right), Total Biomass( Lower Left), Recruitment (Lower,Right) Source: (Quiroz, 2017).

### 3.3.4. Chile Austral hake stock status relative to reference points

**Stock Status**

During the 2014 Chile Austral hake Assessment data evaluation framework workshop, some candidate reference points were evaluated to describe the stock status of Chile Austral hake and adopted eventually (Paya., 2014b; Quiroz., 2016;Quiroz.,2017).

**Limit Reference Point**

The limit reference point $B_{LIM}$ is defined as 0.5 $B_{MSY}$ = $SSB_{20\%}$ [a level of spawning biomass close to 20% of the virginal spawning biomass ($SSB_{20\%}$)].It is estimated to be 89,117 mt (IFOP., 2018b).

**Target Reference Point**

Target Reference point is as follows:

BMSY = $SSB_{40\%}$ [a level of spawning biomass close to 40% of the virginal spawning biomass ($SSB_{40\%}$]. $B_{MSY}$ = $SSB_{40\%}$. It is estimated at: 179,834. (Perez Quiroz., 2018b).

**Fishing Mortality Target Reference ($F_{MSY}$) =F $_{45\%}$=0.24**

$F_{MSY}$ = $F_{45\%}$ [fishing mortality rate that decreases Biomass per recruit spawning to a level of 45% of the Virgin Biomass.It is estimated at: $F_{45\%=}$0.24

Stock status inferred from a Kove plot shows a Spawning stock biomass declining trend (Figure 22), where a condition of an unfished $SSB_o$ existed as at the beginning of the time series period. Then, higher fishing mortality levels in the 90´s produced a steep decline in the reproductive potential of the population, reducing the SSB to a point below the target reference point in 1991. Currently, Chile Austral hake SSB for 2018 is located at 32% of the initial condition. The current state of this fishery is that $SSB_{2018}$ is above the Limit reference point ($SSB_{2018}$ >0.5$SSB_{MSY}$) but below the target reference point ($SSB_{2018}$<$SSB_{MSY}$). However, the kove plot also shows a steady reduction in fishing mortality as F is nearing the $F_{MSY}$ in recent years. $F_{MSY}$ is 0.24 year-1 and the value of mortality from fishing to 2018 is 0.23 year-1.

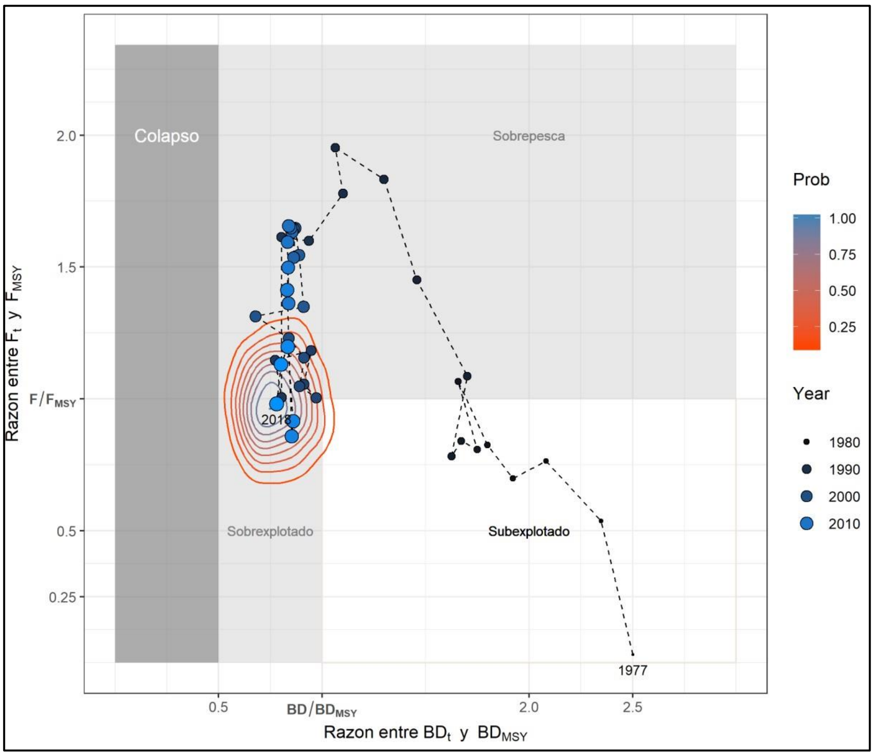



**Figure 22.** Stock status and exploitation ratios for Chile Austral hake for the period 1977-2018. $SSB_{YEAR}/SSB_{MSY}$ are described in the x axis while $F_{Year}/F_{MSY}$ is shown in in the y axis from Scenario3 (Perez Quiroz, 2018b).

### 3.3.5. Harvest Strategy, Harvest Control Rules and Tools

A fishery management plan for Chile Austral hake was established in October 2016 (SUBPESCA., 2016). The purpose of the management plan is to contribute to the "***conservation and sustainable use of Chile austral hake resource, providing it the greater social and economic value over time***". This statement is in line with article 1º (B) which states that the objective of the Law of Fisheries and Aquaculture is the conservation and sustainable use of hydrobiological resources, through the application of the precautionary approach, an ecosystem approach in fisheries regulation and the safeguarding of marine ecosystems in which those resources exist.

The fulfillment of the purpose set out above requires considering different dimensions to address both aspects of conservation as also to give continuity to the fishing industry in a sustainable way. Three areas were considered: biological/ecological, economic, and social. According to the above, the following goals were established for the biological/ecological goal:

*"To bring and maintain the population size towards the MSY with taking into account the biological characteristics of the resource and its sustainable use, as well as seeking to obtain the highest level of annual removals from Chile Austral hake stocks".*

Considering the overarching goal of the ecological/biological for this plan 6 principal objectives were established. The first objective is related to bring the spawning stock biomass to 40% of the virgin biomass Bo, which is related to the fisheries law mandate that says that the fishery should be developed in levels that allow to maintain the stock to MSY. The second objective is related to the sustainability of the extractive activity, which is related to obtaining the highest level of annual removals from the stock. These two objectives are linked to establishing a strategy of exploitation rates and catch quotas.

The third and fourth objective are linked to protect biological processes such as recruitment (juvenile growth) and the reproductive stock, for which it plans to establish spatial/seasonal closures for the artisanal sector or review and temporal expansion (if this applies) of the seasonal closure.

The fifth objective is linked to discards and incidental fishing. The fulfilment of this goal is directly linked to the results of the research programme study of bycatch. Finally a last goal in development, is related to the proper management of resources or species that generate an impact in availability of the target species (Trophodynamics and ecological interactions).

Elements of the harvest strategy contained in the Chile Austral hake are as follows: (SUBPESCA., 2016).

***Biological Reference Points***
As outlined in the section on stock assessment above, target reference points for stock biomass (Bmsy) and fishing mortality (Fmsy) and a biomass limit reference point (Blim) have been defined for this fishery.

***Harvest Control Rules***:
Based on the ratio of the $(SSB_t/SSB_{B0})*100$, where SSBt is Spawning Biomass at time (t) and $SS_{B0}$: Virgin Stock Biomass, these are the control rules:

a) If the indicator is ≥ 20%, apply a constant fishing mortality of $F=F_{MSY}$
b) If the indicator is ≥ 10% and <20, apply a constant fishing mortality of $F=0.8_{FMSY}$
c) If the indicator is <10%, apply a constant fishing mortality of $F=0.5F_{MSY}$

***Risk of Exceeding FMSY***
An average level of risk will be applied to the fishery according to Law 20.657 implemented in February 2013. A risk level have been applied since 2013 that consist of maintaining the fishing mortality to a level where there is 36% probability that will not exceed the $F_{MSY}$ (Law 20.657 of February 2013) (SUBPESCA., 2017).

***Recovery Timeframe***:
Consistent with the population dynamics of the resource and in accordance with the corresponding strategy the maximum recovery time is 16 years.

***Regulations***
Fishery Access
The Fishery units of Chile Austral hake are under fully exploitation. There is a suspension of registration of new fishermen who wants to enter the fishery on the industrial sector. New entries of fishermen from the artisanal fishery in X-XII regions are also suspended. Outside of fisheries units the Chile Austral hake fishery has general access.

Bycatch Limits on other demersal fisheries:
Artisanal: 20 tons (for pink cusk eel (Congrio Dorado) or skate (raya).
Industrial: 21 tons (pink cusk eel, hoki).
Industrial: 28 tons (pink cusk eel, hoki, Southern Blue Whiting).

Seasonal closures
Chile Austral hake has a seasonal closure on the month of August with the purpose to protect the peak period where most of spawning occurs on all fisheries units including inland waters.

Minimum legal size
Minimum legal size for Chile Austral hake is 60 cm total length (TL). It is allowed to capture individuals with 20% below that limit in proportion of the total number of captured individuals.

Gear Regulations
Trawls and Longline can only be used by the industrial fishery fleet
Minimum Mesh size is 130 mm for trawl nets
Artisanal fishery can only operate with artisanal longline (espinel)

Quotas
Annual Global Quota is divided 60% by Industrial and 40% Artisanal Fishery
Industrial: Quota is fractioned by fishery units: UPN and UPS. On the UPN fishery unit these quota is divided by freezer trawler and longline from January February to December
Artisanal: Quota is divided by administrative regions (X-XI, XII) and by period: January March, April-Julio, September- October November and December.

***Monitoring***
A key element of the harvest strategy is that the above regulations are underpinned by a comprehensive monitoring programme as outlined below:

- All industrial vessels must record fishing position through a mandatory Vessel Monitoring System (VMS).
- Catches must be recorded for each tow of the gear on electronic log books.
- An observer programme covering approximately 70% of all fishing trips records species composition including bycatch, total catch composition, length frequency, sex and reproductive status for the target species and collects biological samples.
- Fishery-independent stock surveys are conducted annually.
- 100% dockside monitoring of landings.
- Processors must keep mandatory data records on amounts of each species processed.

SERNAPESCA is the fisheries agency responsible for monitoring and enforcement activities. Some of the SERNAPESCA enforcement and monitoring activities consist of monitoring landings and quotas, and collecting fisheries data. SERNAPESCA monitor compliance with the regulations by examining fishing vessel logbooks records, dockside landings, transport documentation and processors' records.

***Advice***
Projections for year 2018
Projections of reduction in percentages of (SSBt/SSBo) spawner stock biomass under scenarios of high and low average recruitment to different weighted values of $F_{MSY}$ are presented in Figure 23. When using a high recruitment, SSB reduction stabilizes after 10 years as opposed to the screening with low recruitment begins to be higher after this period. The objective biological point,(ie. the target reference point) $SSB_{MSY}$ (40%SSBo) is reached after 5 years with both recruitment scenarios considering the actual $F_{MSY}$. When the 2016 fishing mortality (F = 0.36 year-1) is considered, the biological target reference point (SSBMSY=40%SSBo) is reached after 6 years . As for spawner stock biomass (Figure 24) it reaches minimum if we apply the value of morality by fishing of the year 2016. As with the previous figure, the spawner biomass stabilizes after 10 years if we use a high average recruitment and decreases after this period if we consider a lower recruitment period.

Regarding the levels of risk, it is evident that spawner biomass increases is highly dependent on the assumptions associated with the projected recruitment. For example, Table 11 shows that risks of reducing spawner biomass to a level below the MSY, increases when the projected recruitment periods are low, such as those associated with the period 2011-2016 (Quiroz., 2017). A similar scenario occurs with the risk of the spawner biomass being below the biomass levels estimated for the year 2016. Therefore, if the decisions of ABCs are based on risks evaluated in a horizon of medium (12 years) and long term (24 years), it becomes necessary to determine which level of projected recruitment should be consistent with the substitute BRP (proxies) for the amounts related to the MSY (Quiroz, 2017).

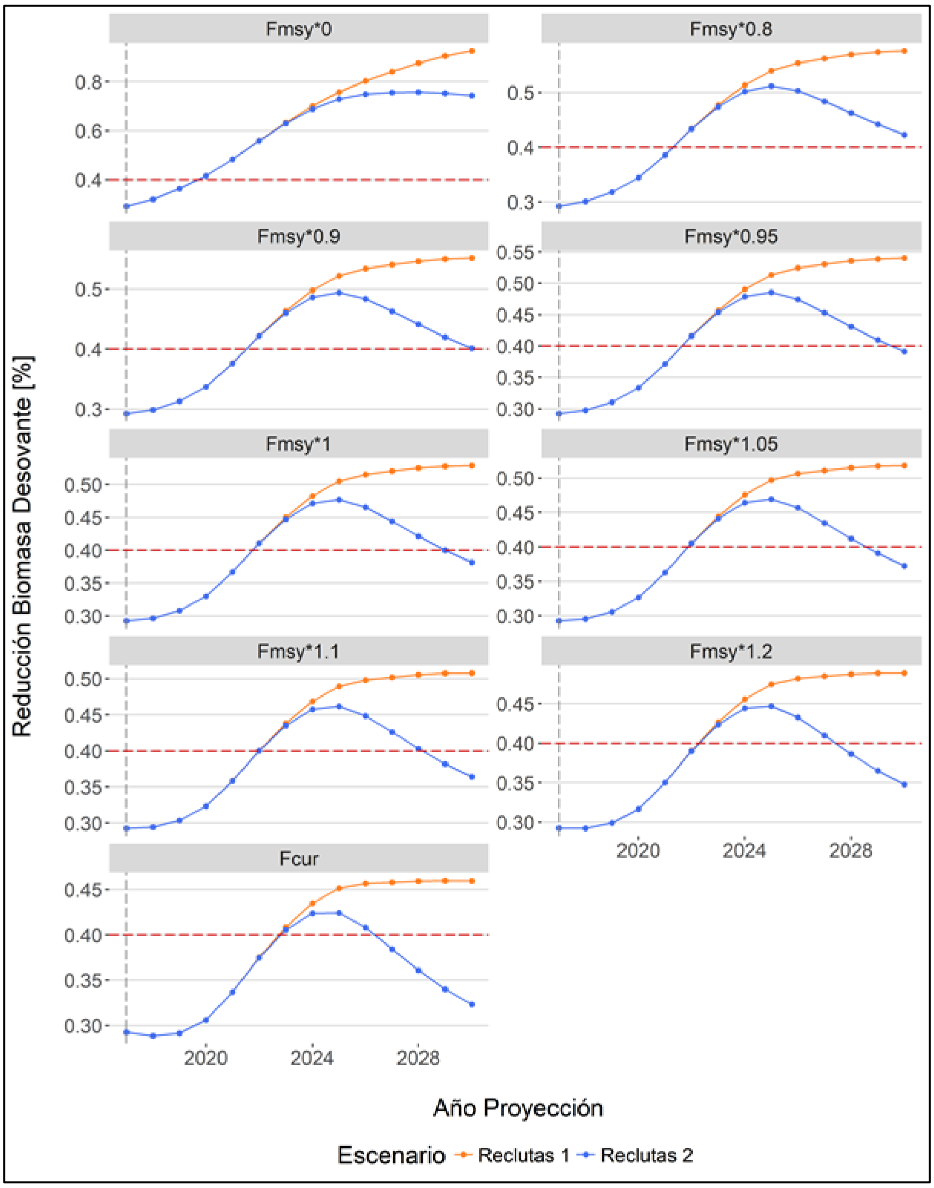



**Figure 23.** Proyections of percentage of SSB depletion under two recruitment scenarios bajo dos escenarios de reclutamiento proyectado. Recruit1: average recruitment 2010-2016 (high) and Recruit 2: average recruitment:2006-2012(low). $SSB_{MSY}$ = 0.4SSBo is dotted redline. (Source: Quiroz, 2017)

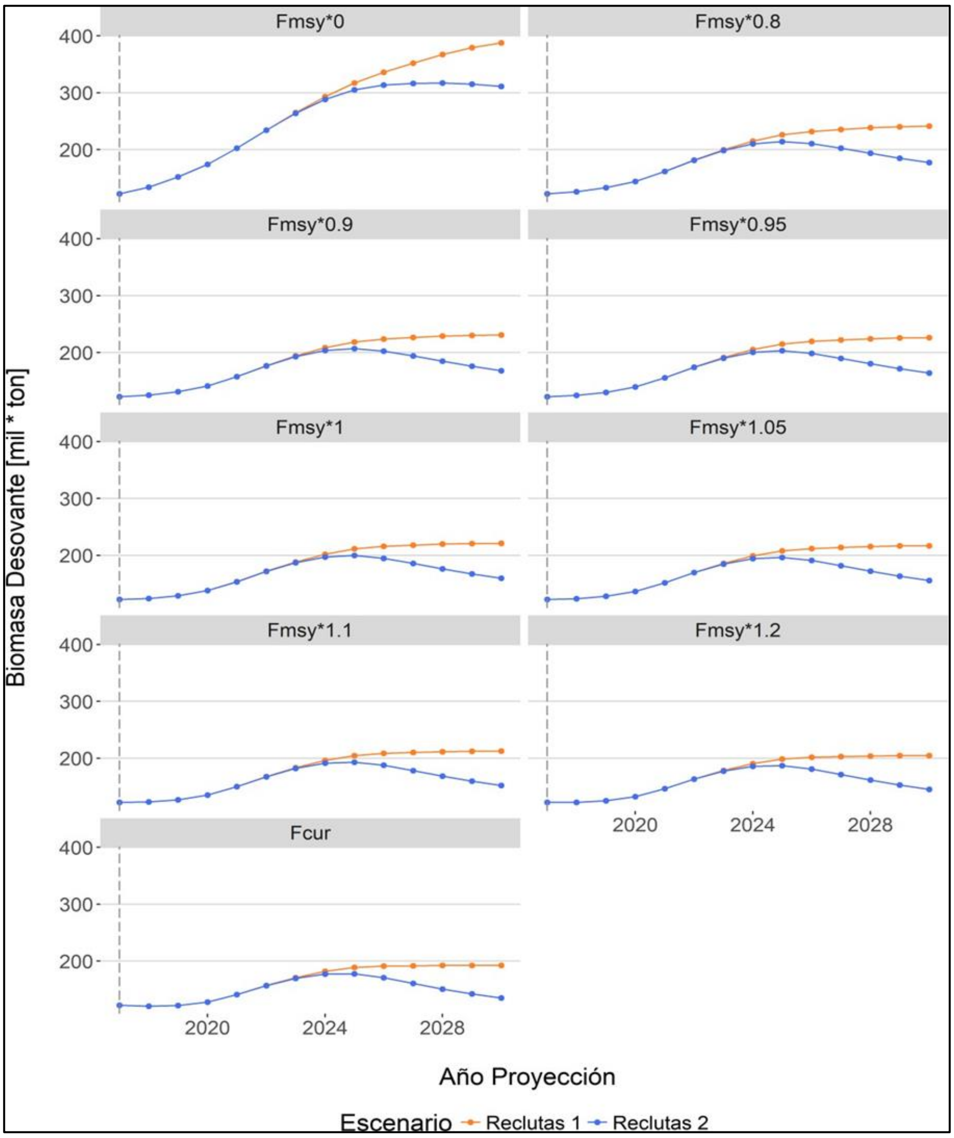



**Figure 24.** Proyections of SSB under two recruitment scenarios bajo dos escenarios de reclutamiento proyectado. Recruit1: average recruitment 2010-2016 (high) and Recruit 2: average recruitment:2006-2012(low). $SSB_{MSY}$ = 0.4SSBo is dotted redline (Source: Quiroz, 2017)

**Table 11.** Probability that SSB projected to 12 and 24 years will be below the target reference point [$B_{MSY}$ (40%SSBo)] or below the last SSB estimate for year 2016 with differents weighted values of $F_{MSY}$ under a rule of constant fishing mortality. Recruit1: average recruitment 2010-2016 (high) and Recruit 2: average recruitment:2006-2012(low). Source: (Quiroz., 2017)

| | | 12 years | | 24 years | |
|---|---|---|---|---|---|
| | Multiple FMSY | P(SSB/SSBo≤0.4) | P(SSBt≤SSB16) | P(SSB/SSBo≤0.4) | P(SSBt≤SSB16) |
| | 0 | 0 | 0 | 0 | 0 |
| | 0.8 | 0.031 | 0.002 | 0.024 | 0.001 |
| | 0.9 | 0.049 | 0.003 | 0.04 | 0.002 |
| Recruitment 1 | 0.95 | 0.06 | 0.003 | 0.05 | 0.003 |
| 2011-2016 | **1** | **0.072** | **0.004** | **0.061** | **0.003** |
| | 1.05 | 0.086 | 0.005 | 0.075 | 0.004 |
| | 1.1 | 0.103 | 0.007 | 0.09 | 0.005 |
| | 1.2 | 0.141 | 0.01 | 0.128 | 0.008 |
| | $F_{2016}$ | 0.221 | 0.019 | 0.21 | 0.017 |
| | 0 | 0 | 0 | 0 | 0 |
| | 0.8 | 0.139 | 0.002 | 0.783 | 0.059 |
| | 0.9 | 0.23 | 0.006 | 0.889 | 0.113 |
| Recruitment 2 | 0.95 | 0.285 | 0.008 | 0.924 | 0.149 |
| 2006-2012 | **1** | **0.346** | **0.012** | **0.95** | **0.192** |
| | 1.05 | 0.41 | 0.017 | 0.967 | 0.24 |
| | 1.1 | 0.023 | 0.476 | 0.023 | 0.98 |
| | 1.2 | 0.043 | 0.608 | 0.043 | 0.993 |
| | $F_{2016}$ | 0.1 | 0.794 | 0.1 | 0.999 |

**Initial Projections using Management Strategy Evaluation simulations**

As part of the technical consultations,associated with the implementation of the procedures for the management strategy evaluation for Austral hake, a set of MPs that incorporate different options for RCCs, BRPs and various production productivity levels.

The approach implemented in this objective is aimed at comparing different MPs under the premise that the information that feeds the MSE in each year's iteration comes from perfect information derived from an operating model (MO). The process of comparison of MPs is a multidimensional analysis due to the multiple options that derive from the combination of RCC, BRPs and productivity levels.

For example,on this preliminary model four levels of BRPs were defined ($SSB_{MSY}$ = {0.4, 0.3}, $SSB_{LIM}$ = {0.2}, $F_{MSY}$ = {45% SSBo}), as well as two alternative exploitation strategies based on screenshots and exploitation rates constants, three-level thresholds of capture and mortality fishing which are attached to the PBR, and finally, four levels of productivity (high and low fixed recruitment, recruitment related to random deviations under high and low thresholds). The combination of all these elements in different PMs involves an extensive process of simulation which requires highly demanding computational calculations . According to the evaluated MPs , Stochastic projections based on random recruitment simulations allow in a few years the goal of management defined as SSBMSY (40% of SSBo) (Figure 25).

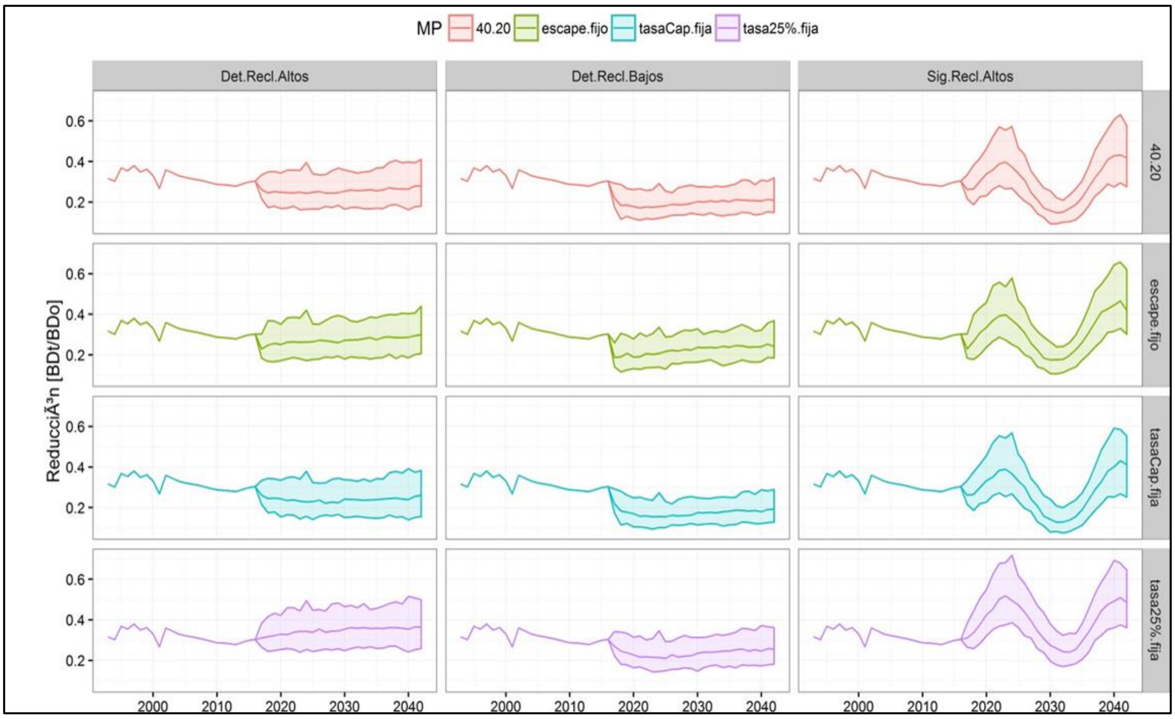



**Figure 25.** Percentage of SSB Projections percentages of SSB depletion under 12 management options that combine different levels of productivity and options of biological reference points. Source: Quiroz 2017

<u>Harvest Recommendations for year 2018</u>

*Analyses of alternatives for ABC (Acceptable Biological Catch) for 2018*

On the 4th session of the South Austral Demersal Resources Scientific Committee meeting held in November 16 2017, the SSC asked IFOP to update the available models in order to develop estimates of TAC for year 2018 (SUBPESCA., 2017). IFOP conducted 4 alternative scenarios and decided to use Model 0.9a which incorporates data till 2017 and reduce the weight in between the age class distribution documented from hydroacoustic services and the fishery. On December 26 2017, a technical report (informe tecnico IT 02-2017 CCT- RDZSA) was submitted to SUBPESCA with the purpose to establish the Global Total Allowable Catch for 2018.

The Chile Austral hake Scientific Technical Committee adopted a harvest strategy of a constant fishing mortality consistent of $F_{MSY}$*1 with risk level of 36% of surpassing the $F_{MSY}$ (SUBPESCA .,2017; SUBPESCA., 2018) after analyses conducted by IFOP were done to determine different levels of ABC based on different levels of $F_{MSY}$. Thus, the ABC for 2018 was 20,560 t.

However the value was reduced to 20,418 to take into account the discount of 0.7% of the 2016 Artisanal fishery discards estimates accounting to 142 tons. According to the Plan of Reduction of the Chile Austral hake and Pink Cusk eel Fisheries Discards, (SUBPESCA .,2018) All Austral hake discards coming from industrial fleets, have to be allocated to the Industrial Fishing Vessel owners Transfearable licenses quotas while the Austral hake discards from Artisanal fisheries will be discounted directly from the ABC.

Thus, the ABC for 2018 accounting for discards is estimated with this following equation:

ABCt = TCPp + D

Where:

- ABCt Acceptable Biological Catch derived from applied fishing mortality recommended by the harvest control rules.

- TPCPp Total Permissible Catch that is formally retained and officially accounted though fisheries administrative regulations (Annual Catch Quotas
- D the discard estimate applied on the TPC implemented for that year.

Therefore, for year 2018 the acceptable biological catch (ABC) recommended by the SSC was projected between 16.34 and 20.148 tons (**Error! Reference source not found.**Table 12). This range was thought reasonable given that in 2017 the status of *M. australis* was of overexploited $B<B_{MSY}$ and overfishing was occurring $F>F_{MSY.}$

**Table 12.** Acceptable Biological Catch (ABC) for different values of FMSY under a constant exploitation level. Different probabilities of current F exceeding FMSY were evaluated. Source: SUBPESCA, 2017.

| | **10%** | **20%** | **30%** | **36%** | **40%** | **50%** |
|---|---|---|---|---|---|---|
| $F_{msy}$*0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $F_{msy}$*0.8 | 13.63 | 15.08 | 16.12 | 16.66 | 17.01 | 17.84 |
| $F_{msy}$*0.9 | 15.25 | 16.86 | 18.02 | 18.62 | 19.01 | 19.93 |
| $F_{msy}$*0.95 | 16.05 | 17.74 | 18.96 | 19.59 | 20.00 | 20.97 |
| $F_{msy}$*1 | 16.84 | 18.61 | 19.89 | 20.56 | 20.98 | 22.00 |
| $F_{msy}$*1.05 | 17.63 | 19.48 | 20.82 | 21.51 | 21.96 | 23.02 |
| $F_{msy}$*1.1 | 18.42 | 20.35 | 21.74 | 22.47 | 22.93 | 24.04 |
| $F_{msy}$*1.2 | 19.98 | 22.06 | 23.56 | 24.35 | 24.85 | 26.05 |
| $F_{msy}$*1.367 | 22.54 | 24.87 | 26.56 | 27.44 | 28.00 | 29.34 |

## 3.4. Principle Two: Ecosystem Background

There has been a growing concern in the demersal fisheries in Chile of the need to reduce bycatch in their fishing operations(Bernal *et al.,* 2017;SUBPESCA., 2017). Since 2012, new regulations were implemented by SUBPESCA to ensure the management system can effectively reduce the bycatch of non-target species in the total species composition of the fleet catch. With the "N. 20.625 Ley del Descarte", fishery managers conducted studies to collect information that allowed to evaluate the magnitude of bycatch and the effectiveness of the management system to reduce it. Therefore, since 2013 when the article DSN 193 under the LGPA was approved, programs such as the scientific observer program were implemented with the objectives to obtain enough information to implement discard reduction measures in the fleet operations.

Bycatch information in the Austral hake fishery has been collected during 2015 and 2016 under the recently Southern Austral demersal fisheries discard program to allow fisheries managers to implement measures to reduce bycatch (Bernal *et al.,* 2017). The bycatch monitoring program is currently collecting data on the fishery operations on a year round and also it is collecting data on how the measures in place are working. Among some of the results from the Southern Austral demersal fisheries discard program included a description of the composition of non-target species bycatch in the Austral hake fishery. IFOP and SERNAPESCA collect data of the total composition of the catch and also biological samples are carried out of the target species and the main bycatch species. ETP and sensibles organisms are reported on specific logbook as a part of the new discard program. The data are analised to evaluate how efficiently some of the measures are performing in the reduction of bycatch.

Under non-target species that are not Endangered, Threatened or Protected Species (ETP, see section 3.4.4), the MSC considers two components: Primary and Secondary Species. Table 13 gives the definition of these two components bearing in mind that primary and secondary species can be either landed or discarded from now on with the regulations both will be reported in the logbook.

**Table 13.** Definition of Primary and Secondary Species according to MSC Guidance for the Fisheries Certification Requirements, 2014.

| Primary Species | Secondary Species |
|---|---|
| ▪ In scope species, e.g. fish and shellfish<br>▪ Managed with tools controlling exploitation<br>▪ Reference points are in place<br>▪ Analytical/empirical derived stock assessment in place | ▪ Fish and shellfish, and out of scope species (birds, reptiles, amphibians and mammals) that are not ETP species<br>▪ Not managed according to reference points<br>▪ No analytical/empirical derived stock assessment in place |

The assessment team is required to classify a species if it has management tools and measures implemented (i.e. biological reference points to control exploitation and maintain a stock above its limit reference points and fluctuate around its maximum sustainable yield - MSY levels, or target reference points) as a primary species, and if this is absent, then they should be classified as a secondary species. Depending on the percentage of catches, as well as their resilience o vulnerability to the fishery, these species are classified as main or minor. Information on potential resilience of individual species is obtained from FishBase(Froese and Pauly., 2018) which included specific information on a species; size, maturity, fecundity, growth rates, and trophic level. According to the MSC guidance (SA3.4.2.2a) for evaluating species resilience, a 2% threshold on the catch was applied for less resilient species and 5% for more resilient species.

A list of ETP species which are typical in Chilean waters, and the UoAs exploiting austral hake fisheries, were identified based on definitions in the MSC FCR SA3.1.5. More details are given in the ETP outcome section.

Bycatch data was collected by on board observers during the Southern Austral demersal fisheries discard program(Bernal *et al.,* 2017). The species found in all of the fleets are recorded in the Appendix 2. However, a specific table for each gear type has been made to better understanding of the total catch composition of each fleet evaluated in the report.

### 3.4.1. Primary species

Following the MSC FCR v2.0, primary species are species with management tools (i.e. biological reference points). Primary species are classified as main if their percentage of total weight is 5% or more of the total volume of the catch or minor if the percentage is less than 5%. Further, if the species is classified as 'Less resilient', and the catch of the species by the UoA comprises 2% or more by weight of the total catch, then it can be considered as main species in the UoA. Therefore, the species are detailed by gear type described in each UoAs. Further, the Assessment Team considered that species for which catches represent less than 0.1 % of total catch are considered as negligible and will not be further considered in the assessment.

#### 3.4.1.1 UoA 1: Bottom trawl and midwater trawl

In the UoA 1 two gear types were defined: bottom trawl and midwater trawl. The assessment team has reviewed the data by gear type and the list of species which are part of the total catch is detailed in Table 14 and Table 15.

**Table 14.** Bottom trawl primary species composition.

| Latin name | Common name | | Stock definition | Ref. points | AV total catch (t)* | % Total Catch | MSC classification |
|---|---|---|---|---|---|---|---|
| | Spanish | English | | | | | |
| *Micromesistius australis* | Merluza de tres aletas | Southern Blue whiting | Southeast Chilean Pacific[1] | yes | 2212.47 | 26 | Primary main |
| *Macruronus magellanicus* | Merluza de cola | Hoki | Southeast Chilean Pacific[2] | yes | 15119.59 | 39 | Primary main |
| *Genypterus blacodes* | Congrio dorado | Pink cusk-eel | Northern and Southern Chilean Pacific[3] | yes | 588.02 | 2 | Primary minor |
| *Brama australis* | Reineta | Southern rays bream | Southeast Chilean Pacific[4] | yes | 447.59 | 1 | Primary minor |
| *Zearaja chilensis* | Raya volantin | Yellownose skate | Northern and Southern Chilean Pacific | yes | 105.48 | 0.4 | Primary minor |

*Average of total catch by the bottom trawl fleet in 2015 and 2016. Source: IFOP

**Table 15.** Midwater trawl primary species composition.

| Latin name | Common name | | Stock definition | Ref. points | AV total catch (t)* | % Total Catch | MSC classification |
|---|---|---|---|---|---|---|---|
| | Spanish | English | | | | | |
| *Micromesistius australis* | Merluza de tres aletas | Southern Blue whiting | Southeast Chilean Pacific[1] | yes | 1610.97 | 21.2 | Primary main |
| *Macruronus magellanicus* | Merluza de cola | Hoki | Southeast Chilean Pacific[2] | yes | 15845.75 | 57.4 | Primary main |
| *Genypterus blacodes* | Congrio dorado | Pink cusk-eel | Northern and Southern Chilean Pacific[3] | yes | 311.38 | 1.1 | Primary minor |
| *Brama australis* | Reineta | Southern rays bream | Southeast Chilean Pacific[4] | yes | 85.46 | 0.3 | Primary minor |

*Average of total catch by the midwater trawl fleet in 2015 and 2016. Source: IFOP

#### 3.4.1.2 UoA 2: Longline

In the UoA 2, one gear type was defined: longline. The assessment team has reviewed the data available and a list of species which are part of the total catch are detailed in Table 16. Species for which catches represent les than 0.1 % of total catch are considered as negligible and will not be further considered in the assessment.

[1] Edwin Niklitschek *et al.*, 2009
[2] Stewart, I.J. & Hanselman, D.H., 2012.
[3] Wiff *et al.* 2007
[4] FIP N° 2013-21- Gobierno de Chile

**Table 16.** Longline primary species composition

| Latin name | Common name | | Stock definition* | Ref. points | Av Total Catch (t) | % Total Catch | MSC classification |
|---|---|---|---|---|---|---|---|
| | English | Spanish | | | | | |
| *Sardine pilchardus* | Common Sardine | Sardina de marruecos | FAO34 1.31 Zone C | yes | 252.00 | 14.67 | Primary main |
| *Genypterus blacodes* | Pink cusk eel | Congrio dorado | Northern and Southern Chilean Pacific[3] | yes | 218.36 | 12.72 | Primary main |
| *Brama australis* | Southern rays bream | Reineta | Southeast Chilean Pacific[4] | yes | 11.85 | 0.69 | Primary minor |
| *Dissostichus eleginoides* | Chilean seabass | Bacalao de profundidad | Southern Chilean Pacific[5] | yes | 5.86 | 0.34 | Primary minor |
| *Macruronus magellanicus* | Merluza de cola | Hoki | Southeast Chilean Pacific[2] | yes | 3.75 | 0.22 | Primary minor |

*Average of total catch by the longline fleet in 2015 and 2016. Source: IFOP

Basically, all the gear types have the same species composition of total catch and mostly the primary species are in the same proportion in all gear types. The main difference is the presence of Chilean seabass that is occurring only in UoA 2- longline and not in the UoA 1. Further, the bait (*S. pilchardus*) that has been considered primary main and it is used by the longline fleet but not by the trawl UoA.

### 3.4.1.3 Stock status of primary species defined in both UoAs

The data to evaluate the stock status of each species have been taken from the report [*Estado de Situacion de las principales pesquerias de Chile para año 2018*] published by SUBPESCA in March 2019 in which data from 2018 has been analysed.

- ***Micromesistius australis* (Merluza de tres aletas/Southern Blue whiting)**

The Scientific Technical Committee reported a spawning stock biomass (SSB) estimate around 117.14 tons that represents a reduction of the SSBo to 25% (Figure 26). The estimate is above the limit reference point which is $SSB_{20\%}$ with a probability of more than 80% of the SSB below the LRP. Fishing mortality was lower than the target reference point ($F_{45\%}$). Therefore overfishing was not occurring for this fishery. The spawner stock size structure in the last acoustic survey (2010 - 2018) has been characterized by young individuals of sizes between 44 and 46 cm.

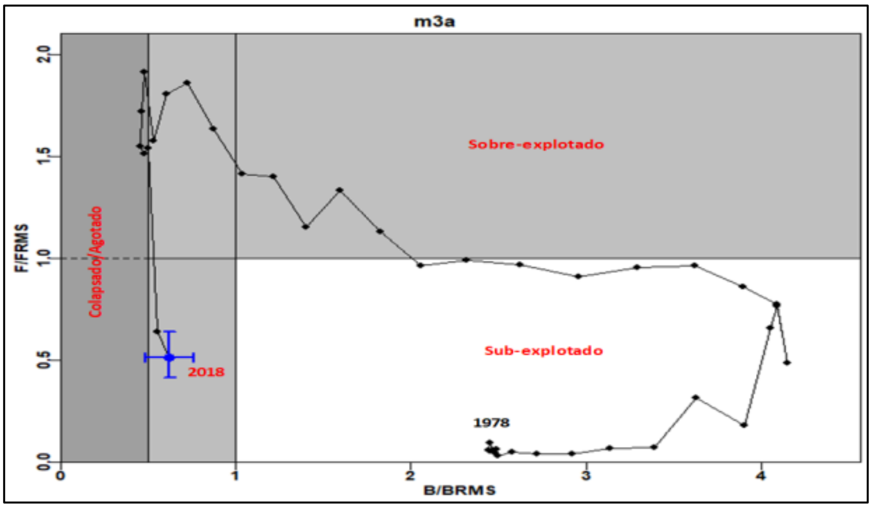



**Figure 26.** Stock status of Southern blue whiting in last report of 2018 [F/FRMS= F/FMSY; B/BRMS=BMSY]. Source: SUBPESCA, 2019.

[5] FIP 2006-41- Gobierno de Chile

The stock evaluated maintains the trends observed in recent years; reduced recruitment and the absence of size classes associated with the migratory reproductive individuals that has been supporting the fishery until 2010.

- ***Macruronus magellanicus*** **(Merluza de cola/Hoki)**

The stock assessment report showed a decreasing trend in spawning stock biomass (SSB) estimates with exploitation rates above target levels from 2006 to 2013 (SUBPESCA., 2019). Despite the current fishing mortality has been below the technically recommended level for the last two years, the $SSB_{2017}$ has decreased to 19 % with a probability of being below the limit reference point ($SSB_{20\%}$) of 98%. Furthermore, the age structure shows the predominance of juveniles and recruitment levels to be very low since 2000. Therefore There is a considerable risk of depletion for this species (Figure 27).

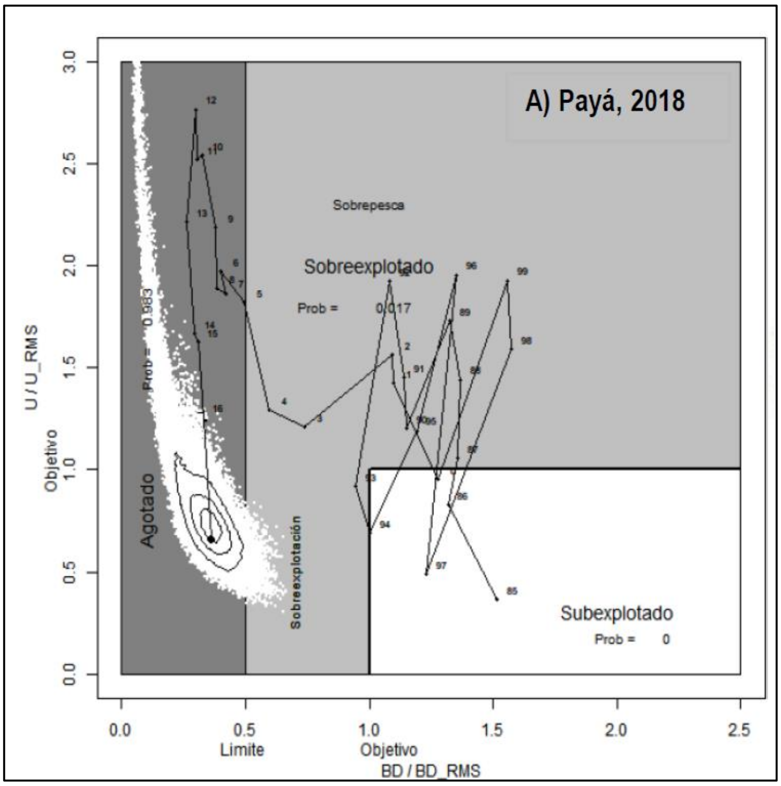



**Figure 27**. Stock status of hoki in 2018. Source: SUBPESCA, 2019.

- ***Genypterus blacodes*** **(Congrio dorado/Pink cusk-eel)- Southern and Northern stocks**

Northern and Southern stocks – There are two stocks of pink cusk eel in 2 separate regions within the study area where the fishery under evaluation operates. The last stock assessment update (SUBPESCA., 2019) has shown both stocks in route to recovery where the stocks are above the limit reference point and overfishing is not occurring. Figure 28 and Figure 29 show the reference points and the current situation of the stock status for the 2 stocks. Currently the stock is above the limit reference point $B_{2017}>0.5_{BMSY}$ and overfishing is not occurring $F_{2017}<F_{MSY}$.

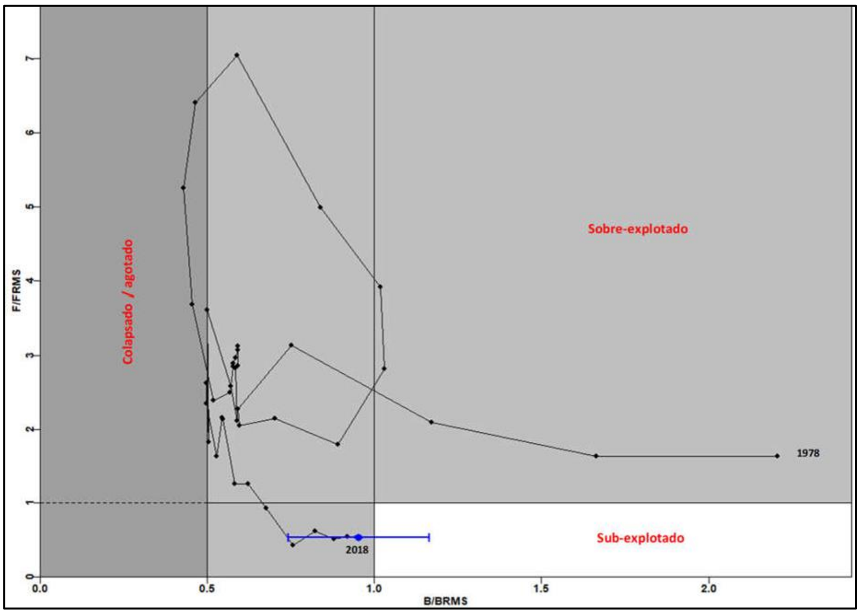



**Figure 28**. Stock status of pink cusk –eel in 2018 in the Northern area [F/FRMS= F/FMSY;B/BRMS=BMSY]. Source: SUBPESCA, 2019

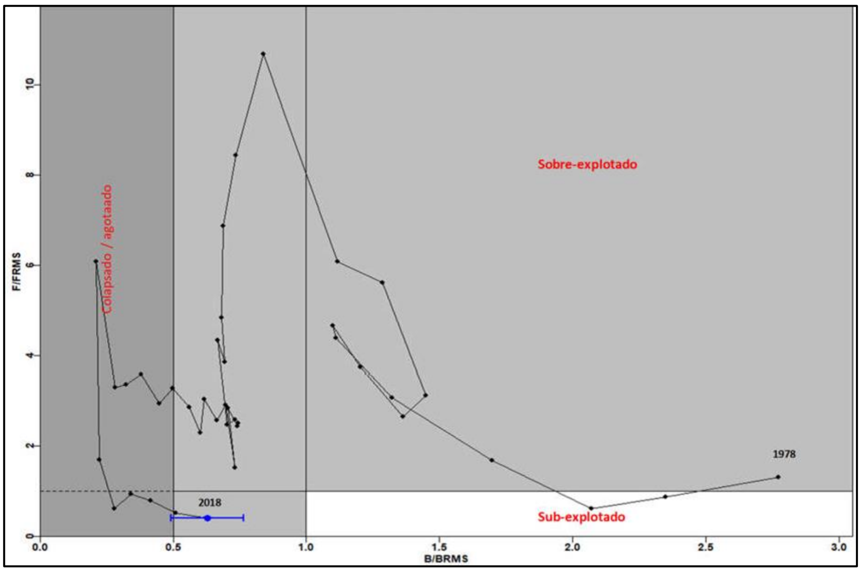



**Figure 29.** Stock status of pink cusk –eel in 2018 in the Southern area [F/FRMS= F/FMSY; B/BRMS=BMSY]. Source: SUBPESCA, 2019

- ***Brama australis* (Reineta/Southern rays bream)**

Historically, this fishery has been dominated by the artisanal fleet. More than 95% of total catch is coming from the artisanal fishing sector. However, since 2011, the industrial fishery has shown an emerging fishing intentionality in the Southern fishing grounds. Figure 30 shows the reference points and the current situation of the stock status. Currently the stock is above the limit reference point $B_{2016}$>0.5$B_{MSY}$ and overfishing is occurring $F_{2016}$>$F_{MSY}$.

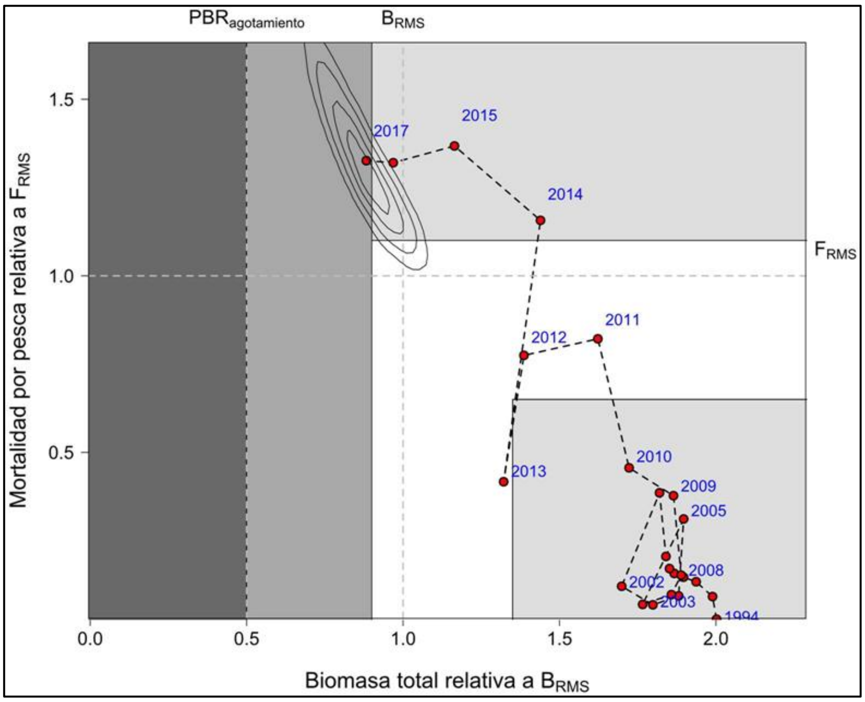



**Figure 30**. Stock status of Southern rays bream in 2017 [F/FRMS= F/FMSY; B/BRMS=BMSY]. Source: SUBPESCA, 2019.

- ***Dissostichus eleginoides*** **(Bacalao de profundidad/Chilean seabass)**

The Scientific Technical Committee agreed in classifying Chilean Seabass as species under tier 1b which list species that has data for conducting age/size structured models but don't have sufficient data to establish a parental stock / Recruit relationship which precludes calculations of MSY based on biological reference points. Therefore proxys of spawning potential ratios (SPR) were used to estimate stock status. The Scientific Technical Committee stated the stock status of Chilean seabass in the Patagonian area as overfished with a hard situation of overfishing (Figure 31) (Act 4 ° Session of the CCT-RDAP, October 25, 2017, pg. 4).

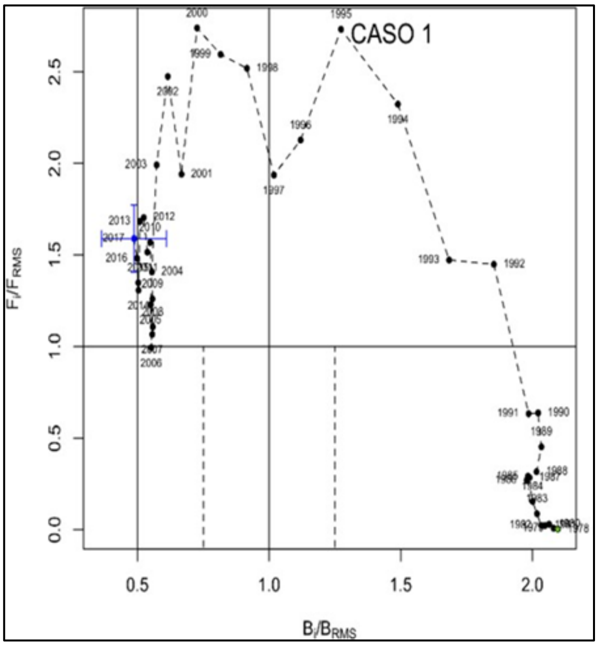



**Figure 31**. Stock status of Chilean seabass in 2018 [F/FRMS= F/FMSY; B/BRMS=BMSY]. Source: SUBPESCA, 2019.

- ***Zearaja chilensis* (Raya volantin/ Yellownose skate)**

*Zearaja chilensis* (Raya volantin or skate) is one of the skate species that is most reported in the bottom trawl scoring element. This species is reported as the synonym name of *Dipturus chilensis* (Common skate) that nowadays is not accepted (Worms, World Register of Marine Species). The vulnerability of large skates to overexploitation and subsequent populations depletion are well documented worldwide. In the case of *Z. chilensis*, it has been documented that the directed fishing pressure and the bycatch mortality from other commercial and artisanal fisheries activities have impacted this K-selected species. In Chile, overall biomass of *Z. chilensis* has decreased by 51% and spawning biomass approximately 20-40% ever since the fishery began in 1979. Research has shown that *Z. chilensis* makes up 85% of all skate catches.

Last stock assessment has shown that the stock is above limited reference point: $SSB_{2018=}$0.24 > 0.5.BMSY=[22.5%SSBo]=0.22 and overfishing is not occurring F2018<FMSY (Figure 32) (SUBPESCA., 2018c). Populations simulations under an scenario of 10 years predict there is a probability of 75% of achieving BMSY -45%SSBo. A low TAC has been set up in 2018, consisting of 70t in total.

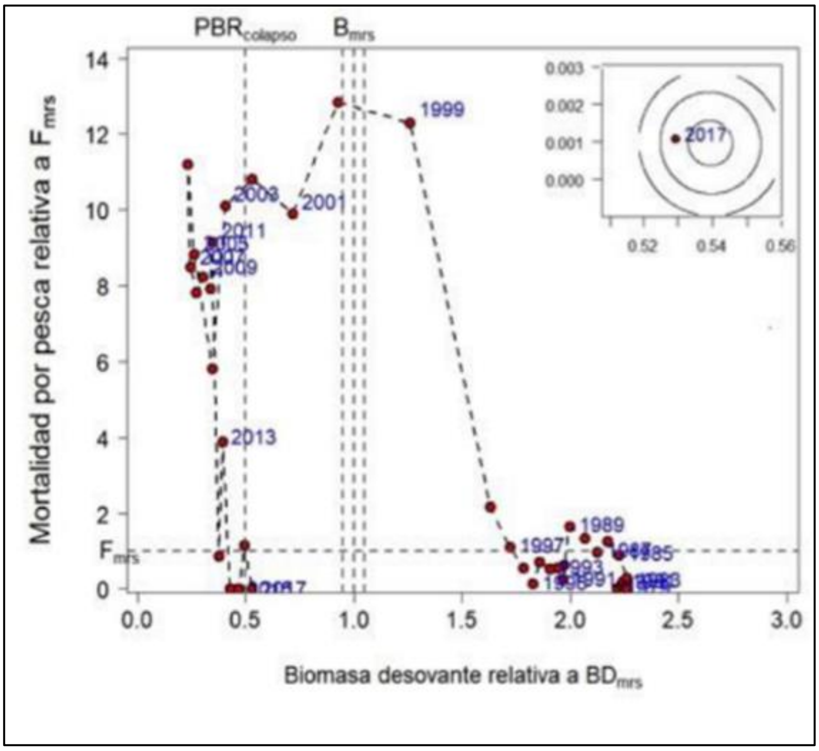



**Figure 32.** Stock Status of Yellownose skate for year 2018 [F/FRMS= F/FMSY;B/BRMS=BMSY]. Source: SUBPESCA, 2019

The UoA bottom trawl has negligible catches of skate's species accounting for a total of 0.4 % of the total volume of the catch. The midwater trawl component do not have skate species in its caught species composition. The UoA longline also has negligible catches with less than 0.1% of skate species composition in the total catch. Further, in the first semester of 2017, SERNAPESCA reported that overall, less than 1% of the TAC limit were caught.

- ***Sardina pilchardus* (Sardina de marruecos/Common sardine)**

Stock assessments have typically been performed by the FAO's working group on the assessment of small pelagic fish off Northwest Africa; but Morocco's INRH has also been publishing stock status reports in recent years (INRH 2016; INRH 2015;). The latest published reports by both the FAO and the INRH assess the stock's status using data through 2016 (INRH 2016b; FAO 2018).

The bait used in the Austral hake longline fishery comes from FAO 34-1.31 concretely from the south stock C. Stock status of the south zone stock (C) was evaluated using two surplus production methods (Biodyn and ASPIC). Both models suggest that the stock is above the limit ($0.5B_{MSY}$) and target reference points ($B_{MSY}$), however there are discrepancies on the situation of the fishery(INRH 2016b). The Biodyn model presents a state of overfishing ($F<F_{MSY}$) while the ASPIC model doesn't ($F>F_{MSY}$). Overall, the precautionary conclusion is that the stock is fully exploited, although the direct observations from the acoustic survey of biomass compared to catch, as well as size structure, suggest that it is likely to be less heavily exploited than the models describe. Further, studies done by FAO has shown the stock is not fully exploited (FAO 2016b). Nevertheless, it is recommended to monitor the status of this stock to detect abundance fluctuations as the abundance and recruitment can be influenced by environmental factors resulting in abrupt population fluctuations independent of fishing (FAO 2016b).

### 3.4.2. Secondary species

Following the MSC FCR v2.0, secondary species are species with no management tools. Secondary species classified as main if their percentage against the percentage of the total volume of the catch is 5% or more and minor if the percentage is less than 5%. Further, if the species is classified as 'Less resilient' and the catch of the species by the UoA comprises 2% or more by weight of the total catch, then it can be considered as main species in the UoA. The species are detailed by gear type described in each UoAs. Species for which catches represent less than 0.1 % of total catch are considered negligible and will not be further considered in the assessment

#### 3.4.2.1 UoA 1: Bottom trawl and midwater trawl

As it was done for primary species, the assessment team has reviewed the bottom trawl data by gear types and a list of species which are part of the total catch defined as secondary species, following MSC requirements, are detailed in Table 17.

**Table 17.** Bottom trawl secondary species composition.

| Latin name | Spanish common name | English common name | Ref. points | AV Total Catch (t)* | % Total Catch | MSC classification |
|---|---|---|---|---|---|---|
| *Seriolella punctate* | Cojinoba moteada | Silver warehou | no | 3150.26 | 8 | Secondary main |
| *Salilota australis* | Brótula | Tadpole codling | no | 988.79 | 3 | Secondary minor |
| *Seriolella caerulea* | Cojinoba del sur | White warehou | no | 833.14 | 2 | Secondary minor |
| *Mustelus mento* | Tollo negro | Speckled smooth-hound | no | 200.00 | 1 | Secondary minor |
| *Helicolenus lenerichi* | Chancharro | Rock cod | no | 431.69 | 1 | Secondary minor |
| *Paralabrax humeralis* | Cabrilla | Peruvian rock seabass | no | 250.71 | 1 | Secondary minor |
| *Dosidicus gigas* | Jibia | Humboldt squid | no | 149.22 | 0.4 | Secondary minor |
| *Lamna nasus* | Tiburon sardinero | Porbeagle | no | 209 | 0.5 | Secondary minor |
| *Isurus oxyrinchus* | Tiburon marrajo | Shortfin Mako | no | 100 | 0.3 | Secondary minor |
| *Squalus Acanthias* | Tollo de los cachos | Spiny dogfish | no | 92 | 0.2 | Secondary minor |
| *Schroederichthys chilensis* | Pintarroja del sur | Redspotted catshark | no | 80.67 | 0.2 | Secondary minor |
| *Bathyraja brachyourops* | Raya de los canales | Broadnose Skate | no | 80.75 | 0.2 | Secondary minor |

*Average of total catch by the bottom trawl fleet in 2015 and 2016. Source: IFOP

Table 18 shows the species classified as secondary main or minor for midwater trawl. Mostly, the total composition among UoA 1 is very similar however the assessment team has split the composition by gear type for a better understanding.

**Table 18.** Midwater trawl secondary species composition.

| Latin name | Spanish common name | English common name | Ref. points | AV total catch (t)* | % of Total Catch | MSC classification |
|---|---|---|---|---|---|---|
| *Seriolella punctate* | Cojinoba moteada | Silver warehou | no | 2479.83 | 9.0 | Secondary main |
| *Salilota australis* | Brótula | Tadpole codling | no | 612.55 | 2.2 | Secondary minor |
| *Seriolella caerulea* | Cojinoba del sur | White warehou | no | 219.60 | 0.8 | Secondary minor |
| *Helicolenus lenerichi* | Chancharro | Rockcods | no | 76.47 | 0.3 | Secondary minor |
| *Paralabrax humeralis* | Cabrilla | Peruvian rock seabass | no | 91.43 | 0.3 | Secondary minor |

*Average of total catch by the midwater tralw fleet in 2015 and 2016. Source: IFOP

### 3.4.2.2 UoA 2: Longline

In the UoA 2 longline, the assessment team has reviewed the data available and a list of species which are part of the total catch are detailed in the Table 19.

**Table 19.** Longline secondary species composition.

| Latin name | Spanish common name | English common name | Ref. points | AV Total catch (t)* | % Total Catch | MSC classification |
|---|---|---|---|---|---|---|
| *Macrourus carinatus* | Granadero de ojos grandes | Bigeye grenadier | no | 86.45 | 1.2 | Secondary minor |
| *Salilota australis* | Brótula | Tadpole codling | no | 77.78 | 1.1 | Secondary minor |
| *Helicolenus lengerichi* | Chancharro | Rockcods | no | 26.85 | 0.3 | Secondary minor |

*Average of total catch by the longline fleet in 2015 and 2016. Source: IFOP

### 3.4.2.3 Stock status of secundary species defined in both UoAs

The assessment team has evaluated the secondary species as a group rather than by scoring elements following interpretations given by MSC for the clause 7.10.7. The stock status of most of the non-target species classified as secondary is unknown. A comprehensive program to monitor and regulate all the catches from the demersal fisheries in Chile started in 2015. (Bernal *et al.,* 2017, Galvez *et al.,* 2017, Cespedes *et al.,* 2018). The measures recently established in the new Southern Austral demersal fisheries discard program will provide better information of the stock status of these species. This program will also contribute to the protection of sharks and rays as concrete measures are set up to conserve the populations of these species. A summary of measures in place is detailed in the section 3.4.3. The below list details the species scored as secondary minor as they presented more than 0.1% in the total catch composition in any of the UoAs:

- *Salilota australis* (Brótula/Tadpole codling)
- *Mustelus mento* (Tollo negro/Speckled smooth-hound)
- *Seriolella caerulea* (Cojinoba del sur/White warehou)
- *Helicolenus lenerichi* (Chancharro/Rockcods )
- *Paralabrax humeralis* (Cabrilla/Peruvian rock seabass)
- *Schroederichthys chilensis* (Pintarroja del sur/Redspotted catshark)
- *Bathyraja brachyourops* (Raya de los canales/Broadnose Skate)
- *Macrourus carinatus* (Granadero de ojos grandes/Bigeye grenadier)
- *Dosidicus gigas (*Jibia/Humboldt squid*)*
- *Lamna nasus* (Tiburon sardinero/Porbeagle)
- *Isurus oxyrinchus* (Tiburon marrajo/Shortfin Mako)
- *Squalus Acanthias* (Tollo de los cachos/Spiny dogfish)

Ever since PRDCI (Programa de Reduccion de la Captura Incidental) was implemented in 2015, on board observers have been collecting data and all catches have been recorded in logbooks. Fishery managers also are monitoring industrial fishery vessels operations by video camera systems. This information is allowing successfully implementation of measures for the conservation of these species and also to reduce the bycatch in the fleets. Bernal *et al.,* (2017) show the coverage of trips observed have substantially increased over the years. Furthermore, data quality have improved considerably in terms regarding the reporting and documentation of possible incidents and identification of the composition of the catch.

Of all species listed in the UoA 1 above, one species was defined as main secondary species: *Seriolella punctata* (Cojinoba moteada/Silver warehou). No information is available for the stock status evaluation for this species. However, a research program is being implemented recently to know more about the biological-fishery parameters of this species and other of the same genus, as well as the characteristic operations associated with their extraction in the Southern Austral demersal fishery (41 °28.6'S at 57 ° S). Given the above, the assessment team announced the use of the risk based framework (RBF) to evaluate the stock status. More details about the scoring of the species are given in the Appendix 1.2.

### 3.4.3. Primary and secondary species management in both UoAs

The main law that regulates the fisheries in Chile is called "Ley General de Pesca y Acuicultura, número 21033". The Fisheries law has been modified over the years and its last revision was in 2013 (SUBPESCA., 2016). The FAO organization has done a review of these regulations and some of their recommendations have been taking into account in recent modifications (Paya *et al.,* 2014; Paya., 2014a). Fishery management in Chile differs on the degree of species exploitation and the tools applied for the species. Licenses to fish are currently limited: "fully exploited fisheries" have been closed to new licenses for over twenty years. In response to overexploitation in some species, an individual, operationally transferable quota system was implemented in 2001 for the most important industrial fisheries. Quotas are allocated based on a percentage of the annual TAC, and are eventually granted for a ten-year period. Quotas are transferable in two ways: companies are allowed to merge fishing operations during particular years, and vessels can be retired so that the quota can then be sold. Fishing mortality targets are set for each stock independently based on the long term goal to achieve MSY. Therefore, for stocks which are overfished (and may also be subject to overfishing) the target fishing mortality is set at a level which will have a reasonable probability (>50%) of ensuring rebuilding of the stock within the timeline set within the relevant rebuilding program. There are a suite of management measures in order to achieve fishing mortality targets such as size limits, non-targeted species catch limits on directed fisheries, seasonal closures, mesh size limits and marine protected areas. These measures are also apply for the species which do not have management strategies.

Furthermore, in 2015, a new discard program was implemented in the Southern Austral demersal fisheries and discards data have been collected annually ever since (Bernal *et al.,* 2017). The first report of the monitoring program of discards in the Southern Austral demersal fisheries (Plan de reduccion del descarte y la pesca incidental) was published in 2017 (Bernal *et al.,* 2017). Based on the results of the study, a discard reduction plan for the Chile Austral hake/Pink Cusk eel fishery has been developed and implemented for fishing year 2018 (SUBPESCA., 2018). The objectives of the plan consist of introducing measures to control and reduce the impact of bycatch on nontarget economically and not economically important species(i.e. species that do not have management tools) as well as to reduce mortality and gear interactions on ETP species (Bernal *et al.,* 2017; SUBPESCA., 2018).

Fisheries independent data are reported as annual abundance estimates of all managed species provided by IFOP groundfish survey cruises supplemented by hydro acoustics surveys on spawning aggregation areas for some species (Lillo *et al.,* 2017). Important biological data (length frequencies, age/growth, reproduction, food habits etc.) are derived from material collected during the IFOP survey cruises (Cespedes *et al.,* 2018;Galvez *et al.,* 2017). Fishery dependent data in the fishery are collected by on-board observers, and coverage is nearly 100% of all Industrial trawl and longline trips (Cespedes *et al.,* 2018;Galvez *et al.,* 2017;IFOP., 2016). Further, observers have also been recently trained to collect more data of secondary species, ETP and sensible organisms that used to be discarded without being reported (Bernal *et al.,* 2017).

The primary responsibility for the collection of commercial fishery dependent information belongs to SERNAPESCA fisheries data services division. SUBPESCA and SERNAPESCA have also the responsibility for establishing quality standards for fisheries dependent data collections which are managed by IFOP(Galvez *et al.,* 2017). SERNAPESCA acquires data through mandatory reporting programs to provide timely and accurate landings and effort data on the regulated demersal fisheries in the South Austral region for in season management and analysis.

IFOP tasks also include dockside collection of catch data, biological samples from commercial fishing trips, and producing finished data products to support fisheries management and scientific analyses (IFOP., 2016, Galvez *et al.,* 2017;Cespedes *et al.,* 2018).

There are two different logbooks that have to be submitted by the fleet as a mandatory requirement. The logbooks sent to SERNAPESCA are focused on enforcement and compliance of the management regulations. The logbooks sent to IFOP contain more biological data that are collected with the purpose to analyse and provide advice for management strategies among other research objectives.

In the new Southern Austral commercial demersal fishery discards reduction plan, there are specific measures defined for each type of species which were carefully considered(some of these measures were already in place for some species) (SUBPESCA., 2018). However, there have been new adjustments on some already established measures in order to to keep the species out of depletion or to avoid irreversible harm.

- **New measures to manage primary species with reference points**

**M1.** According to the LGPA (Paragraph 1 Bis), discards of non-target species are not authorized for fleets targeting Austral hake or pink cusk-eel, for species managed with quota or subject to regulation (ban, prohibition of gear types, etc). All catches must be landed and imputed to the respective quotas or LTP. Notwithstanding, the application of article 7° B of the LGPA allows exceptions to the prohibition of discarding this category of species and authorizes discarding under the circumstances established by this Reduction Plan.

**M2.** Consequently, starting in 2018, it will be possible to discard some non-target species caught by the fleet subject to quota and /or regulation, if all the conditions established by article 7 ° B of the LGPA are met and if catches to discard are unusable due to mechanical damage, depredation, for not reaching commercial size, for documented reasons of safety at sea, for mechanical failure of the ship and /or for exceeding the capacities of storage or processing capacity of vessels. However, all catches of these species (either damaged or discarded catches) will be charged to the LTP. Deductions will have been made for the discarding of the fleets in setting of the Annual Catch Limits.

**M3.** Non-target species with annual global catch quota (LTPs) or subject to regulatory measures, to be discarded in accordance with the conditions indicated in M2, must be separated from other species discarded, quantified and returned to the sea under the current protocols (during the discard research program) and subsequently, under protocols compatible with the detection and quantification capacity of the video cameras devices, approved by Subpesca, in accordance with the DS N ° 76 of 2015. Same terms according to SERNAPESCA.

**M4.** It will be the obligation of the fishing vessel owners to report for each tow in the logbook, the total catch and the discarding of species of non-target species with annual global capture quota or subject to regulation, by estimating the weight of the specimens captured and discarded by species, in accordance with the current and estimation methodologies used by the discard research program, in accordance with Resolution for regulation of the estimate, established by the National Fisheries and Aquaculture Service (DS N ° 129/2013, Regulation for the delivery of information) which deals with the actual methodologies to estimate discards and the reality of the fishing operations for each fleet. Likewise, SERNAPESCA must consider differences between the captain catch estimations and landing declarations to establish a margin of tolerance limit between catch estimates.

**M5.** The exceptions to the prohibition of discarding indicated above are applicable only in the context of the measures established in this Discard Reduction Plan. Any other discarding of species of non-target species managed with annual catch limit, quota or subject to regulation, carried out in contravention of the conditions established in this Plan, shall constitute a prohibited discards and shall be subject to the sanctions established in the LGPA (Article 40 C. 111 A, 111 B and 113).

**M6.** Review the regulations that establish the list of authorized species for reduction (fishmeal or oil fish DS316 of 1985 and Art. 4 ° D of the LGPA), in the sense of incorporating, for a defined period (of at least three years) and in restricted quantities, non-target species caught by the fleet, managed with TACs, quota or subject to regulation (except for chondrichthyan), allowing the production of fishmeal as an immediate measure of reduction of the discards caused by the uselessness of these species. The authorized percentages will be in relation with the results of the research program and adjusted in time according to the results of the monitoring of this plan. The catches used to make fishmeal will be deducted from the fishing vessel owner LTPs.

**M7.** Use of net sensors and/or escape windows in the fishing operations to avoid catches greater than the hold capacities or processing of the vessels (applies only to trawlers).

**M8.** Mandatory use of flow scales (in factory vessels) or other technological devices that allow to weigh and accurately record the non-target species caught and discarded in accordance with this plan, for purposes of making exact imputations to the respective LTPs and controlling total removals by fishing. Flow scales must be graduated (tared) once a day according to a standard weight. SERNAPESCA will enforce the measure.

**M9.**Cuttlefish**.** Allow the discarding of cuttlefish in all fleets subject to the present Plan, during the execution of the research program in accordance with article 7 ° A of the LGPA. Evaluate the feasibility of on-board processing and incorporation of cuttlefish into a Decree authorizing species for reduction (D.S.316 of 1985 and Art. 4 ° D of the LGPA). Once the research program for the discarding of cuttlefish has been completed, the respective reduction plan must consider the operative reality of the fleets of the PDA and authorize their discarding due to the damage caused by the cuttlefish in the target catches.

**M10.** Hoki. Prohibited its discarding except for conditions indicated in M2. Apply operational modifications that improve selectivity and avoid capturing higher percentage of hoki when the target species is Austral hake or pink cusk-eel.

**M11.** Southern rays bream. To review the maximum percentage of landing of Southern rays bream as non-target species in trawling fishing operations, established by D.S. 411 of 2000. While the measures are revised, discarding of surpluses is authorized (measure does not apply to industrial longline).

**M12.** Pink cusk-eel caught as non-target species in vessels targeting Austral hake. Discarding will be forbidden and catches must be imputed to the LTP.

**M13.** Austral hake caught as non-target species when vessels are targeting other main species in the demersal fisheries are not allowed to be discarded and catches must be imputed to the LTP.

**M14.** Southern Blue whiting. Discarding is not allowed except for conditions indicated in M2. Apply operational modifications that improve selectivity and avoid higher percentage of catches when the fishing targeting austral hake.

**M15.** Rays. Review authorized percentage non target species during the biological closure of these species (D. Ex. No. 216 of 2017) for the industrial fishery of austral hake with trawl and longline. Evaluate change of percentage in weight to number of ray-sized individuals per fishing trip. Return of the surplus of these species of ray by above percentages or numbers authorized during the closure, under protocols that facilitate the survival of the specimens (Application Article 7C LGPA).

**M16.**Reviewing and implementing Res. Ex. N 3200 of 2013 (list and proportions of species associated with the art), DS 411 of 2000 (% of non-target species caught) or other regulations, as appropriate, in terms of technical consistency with the measures of the present plan and according to the results of the discard research program and the monitoring program of this plan.

**M17.** Evaluate the design and characteristics of the closures of target species in the demersal fisheries in the area, south of the parallel 41 ° 28, 6 'LS and modify, if applicable, the elements of discarding considering one or more of the following aspects: a) temporal and spatial characteristics of species subject to closures, b) incorporation of species not currently included, c) identification of critical areas, and d) tolerance percentages during closures. Note that selectivity studies will be carried out during the monitoring of this plan.

- **<u>New measures to manage secondary species with no reference points</u>**

**M1.** According to LGPA (Paragraph 1 Bis), is not allowed to discard non target species that do not have TAC or specific regulation. However, the application of article 7 ° B of the LGPA allows exceptions to the prohibition of discarding this category of species under the circumstances established by this Reduction Plan.

**M2.** From 2018, it will be possible to discard non target species that do not have a TAC and/or regulatory measures, if all the conditions established by article 7 are met.

**M3.** Non target species with no annual catch limits and/or regulatory measures, to be discarded in accordance with the conditions indicated in M2, must be separated from other species discarded, quantified and returned to the sea under the current protocols (during the program of discarding research) and subsequently, under protocols compatible with the detection and quantification capacity of video cameras devices, approved by the National Fisheries and Aquaculture Service, in accordance with the DS No. 76 of 2015.

**M4.** It will be the obligation of the captain to report for each operation the logbook with all the information regarding catches of target and non-target species and which one was or not discarded with the estimated weight. (DS N ° 129/2013).

**M5.** Review the regulations that establish the list of authorized species for reduction (fishmeal or oil fish DS316 of 1985 and Art. 4 ° D of the LGPA), in the sense of incorporating, for a defined period (of at least three years) and in restricted quantities, non-target species with no TACs or subject to regulation (except for chondrichthyan), allowing the production of fishmeal as an immediate measure of reduction of the discards caused by the uselessness of these species.

**M6.** Use of net sensors and/or escape windows in fishing operations to avoid higher percentage of non-target species.

**M7.** Mandatory use of scales as set up for species with TAC or regulations in place.

**M8.** Mandatory release of Chondrichthyan (rays and sharks) specimens under manipulation protocols that facilitate their survival, in accordance with article 7 ° C of the LGPA.

Some measures are applied for both all types of non-target species and further for ETPs or sensible specimens.

### 3.4.4. Primary and secondary species information

Fisheries in Chile have been well monitored with many improvements over the years since the general fisheries law was revised in 2013 (Galvez *et al.,* 2017, Cespedes *et al.,* 2018). The obligation of reporting all the catch, for which was implemented in 2018, provides a better understanding of the fisheries in the South Austral region. A more comprehensive information on species caught in different fleets help managers in the conservation of target and non-target species in the fisheries. For a large number of species, information collected includes direct monitoring of abundance/biomass, age/size structure, trophodynamics,recruitment among other biological characteristics within all the Chilean regions (Paya .,2014a;Paya *et al*., 2014). Species stock abundance/biomass trends information is calculated using data (age-length-weight-sex) collected from commercial catch, inspection/observation and IFOP reports as well as a number of fishing and ecosystems surveys that are carried out to provide with data the scientist committees in charge of setting up biological limits(Quiroz., 2017).

IFOP acquires data through mandatory reporting programs to provide timely and accurate landings and effort data on the Southern Austral demersal fisheries for in-season management and analysis(Galvez *et al*., 2017; Cespedes *et al.,* 2018) Tasks include dockside collection of catch data, biological samples from commercial fishing trips, and producing finished data products to support fisheries management and scientific analyses (Galvez *et al*., 2017, Cespedes *et al.,* 2018)

The on board observer program has high coverage levels in the industrial trawl and longline fisheries. Furthermore, a new state of the art monitoring program using a video cameras system to control and monitoring the catches and operational activities have been considered recently by managers for its implementation. These new measures will be able to improve the data of non-target species and vulnerable species and also will reveal some species/gear interactions that had been unreported in last years. The mandatory requirement of using cameras on board will be implemented to industrial fisheries vessels during 2018. Artisanal fisheries will have an extra period of time to implement the measures, (3 years). Devices must be activated at the time of leaving the harbour when the fishing trip is starting and deactivated at the end of the trip when landing. These devises should be approved and certified by SERNAPESCA.

Vessels that have not implemented the video cameras monitoring system or captains that are manipulating the information will face a fine of 20 to 300 monthly tax units, and the captain or skipper will be sanctioned with 3 to 30 monthly tax units. These measures are focused on achieving the actions set up in the current Chilean discard law which considers recommendations of the Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization of the United Nations (FAO) as well as suggestions from different international fishing forums.

### 3.4.5. UoA 2 Longline- Evaluation of Utilization of Bait as Primary Species and Secondary Species

In the industrial longline fishery UoA2, the bait (*S.pilchardus*) is used to attract the fish. The Assessment Team requested to the client evidence of bait purchase to confirm the estimated bait used and the country of origin. The client provided the Assessment Team with invoices and customs office documents. With the information facilitated, the Assessment team estimated the tons of bait used and that was in accordance with the table 16. Therefore, there is no uncertainty that the bait used by the fleet under evaluation is from FAO 34, Morroco, Stock zone C.

MSC FCR v2.0 requirements state that bait must be evaluated as Primary Species and/or Secondary Species following the same rules as used for the non-target species caught. Thus, the bait evaluated for this assessment is the European Pilchard- Common Sardine (*S. pilchardus*) as mentioned above, which comes from Morroco

(FAO 34 Stock C). Estimates of bait utilization for the fishery is 214 t for year 2015 and 290 for year 2016 (Sarah Hopf, CEPES-Table 20).

**Table 20.** Estimated bait usage by the industrial Austral hake longline fleet from 2014 to 2015. Source: CEPES.

| Year | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| **Number of hooks** | 1,651,082 | 3,503,840 | 4,743,626 | 1,295,952 |
| **Number of trips** | 128 | 306 | 285 | 114 |
| **Estimated bait used (t)** | 101 | 214 | 290 | 79 |

Note: Stock status of the species is detailed in the section of primary species above (3.4.1.2 Primary species UoA Longline).

### 3.4.6. Endangered Threatened and Protected Species

The trawl and longline gears may affect many protected species of birds, cetaceans, sea turtles, pinnipeds, and fish. Of primary concern, is the potential for the fishery to interact (e.g., bycatch) with these species. To understand the potential risk of interactions, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interactions with particular fishing gear types. It has been documented elsewhere that marine mammals, birds and turtles are some of the species that are known to interact in trawl and longline fisheries.

According to the fisheries legislation, there are 70 protected species, according to the decrees N ° 225 of 1995, amended by Decree N ° 135 of 2005 and no. 434 of 2007, all the Ministerio de Economia. The species are protected by a total ban for a period of 30 years, from November 11, 1995 and until November 10, 2025 **Error! Reference source not found.**.

Note that interactions marked in the table means that it could be observed by the on-board observers or the crew.

**Table 21.** Protected Species in Chile listed by Ministry of Economy. Source: Ministry of Economy of Chile.

| Protected Species<br>Decree No. 225 of 1995, amended by Decree No. 135 of 2005<br>Both from the Ministry of Economy | | | |
|---|---|---|---|
| **Common Name** | **Scientific Name** | **Interactions UoA 1?*** | **Interactions UoA 2?*** |
| Blue whale | *Balaenoptera musculus* | ✓ | ✓ |
| Fin whale | *Balaenoptera physalus* | ✓ | ✓ |
| Baleen whale | *Balaenoptera borealis* | | |
| Bryde's whale | *Balaenoptera edeni* | | |
| Minke whale | *Balaenoptera* | ✓ | ✓ |
| Antarctic minke whale | *Balaenoptera bonaerensis* | | |
| Humpback whale | *Megaprera novaeangliae* | ✓ | ✓ |
| Southern white whale | *Eubalaena australis* | | |
| Pygmy right whale | *Caperea marginata* | | |
| Sperm whale | *Physeter macrocephalus* | ✓ | ✓ |
| Dwarf sperm whale | *Kogia sima* | | |
| Pygmy sperm whale | *Kogia breviceps* | | |
| Hector beaked whale | *Mesoplodon hectori* | | |
| Gray's beaked whale | *Mesoplodon grayi* | | |
| Layard's beaked whale | *Mesoplodon layardii* | | |
| Blaiville's beaked whale | *Mesoplodon densirostris* | | |

| | | | |
|---|---|---|---|
| Spade-toothed whale | *Mesoplodon traversii* | | |
| Peruvian beaked whale | *Mesoplodon peruvianus* | | |
| Cuvier's beaked whale | *Ziphius cavirostris* | | |
| Southern bottle nose | *Hyperoodon planifrons* | | |
| Shepherd's beaked whale | *Tasmacetus shepherd* | | |
| Short-finned pilot shale | *Globicephala* | | |
| Arnoux's beaked whale | *Berardius arnuxii* | | |
| Spinner dolphin | *Stenella longirostris* | | |
| Striped dolphin | *Stenella coeruleoalba* | | |
| Pantripical spotted | *Stenella attenuata* | | |
| Long-beaked common | *Delphinus capensis* | ✓ | ✓ |
| Rough-toothed dolphin | *Steno bredanensis* | | |
| Commerson's dolphin | *Cephalorhynchus* | | |
| Black dolphin | *Cephalorhynchus eutropia* | | |
| Short-beaked common | *Delphinus delphis* | | |
| Long-finned pilot whale | *Globicephala melas* | ✓ | ✓ |
| Risso's dolphin | *Gramphus griseus* | ✓ | ✓ |
| Dusky dolphin | *Lagenorhynchus obscurus* | | |
| Paele's dolphin | *Lagenorhynchus australis* | | |
| Hourglass dolphin | *Lagenorhynchus cruciger* | | |
| Southern right whale | *Lissodelphis peronii* | ✓ | ✓ |
| Killer whale | *Orcinus orca* | ✓ | ✓ |
| Pygmy killer whale | *Ferasa attenuata* | | |
| Antarctic killer whale | *Orcinus glacialis* | | ✓ |
| False killer whale | *Pseudorca crassidens* | | |
| Common bottlenose | *Tursiops truncatus* | ✓ | ✓ |
| Spectacled porpoise | *Australophocoena* | | |
| Burmeister's porpoise | *Phocoena spinipinnis* | | |
| Southern elephant seal | *Mirounga leonina* | | |
| Crabeater seal | *Lobodon carcinophagus* | | |
| Leopard seal | *Hydrurga leptonyx* | | |
| Weddell seal | *Leptonychotes weddellii* | | |
| Ross seal | *Ommatophoca rossii* | | |
| Juan Fernández fur seal | *Arctocephalus philippii* | | |
| South American fur seal | *Arctocephalus australis* | ✓ | |
| Antarctic fur seal | *Arctocephalus gazella* | | |
| Subantarctic fur seal | *Arctocephalus tropicalis* | | |
| Marine otter | *Lontra felina* | | |
| Southern river otter | *Lontra provocax* | | |
| King penguin | *Aptenodytes patagonicuis* | | |
| Emperor penguin | *Aptenodytes forsteri* | | |
| Long-tailed Gentoo | *Pygoscelis papua* | | |
| Chinstrap penguin | *Pygoscelis antartica* | | |
| Adelie penguin | *Pygoscelis adeliae* | | |
| Southern rockhopper | *Eudyptes chrissocome* | | |
| Pingüino macaroni | *Eudyptes chrysolophus* | | |
| Magellanic penguin | *Sphenniscus magallanicus* | ✓ | ✓ |
| Humboldt penguin | *Spheniscus humboldti* | ✓ | ✓ |
| Little penguin | *Eudyptula minor* | | |
| Loggerhead sea turtle | *Caretta* | | |
| Galápagos green turtle | *Chelonia mydas agassizii* | | |
| Olive ridley sea turtle | *Lepidochelys olivacea* | | |

| | | | |
|---|---|---|---|
| Leatherback sea turtle | *Dermochelys coriacea* | ✓ | ✓ |
| Yellow-bellied sea snake | *Pelamis platurus* | | |

*Species marked mean that the fishery may potentially interact with the species.

In addition, Decree No. 179 of 2008 of Ministerio of Economia sets the permanent prohibition of capture resulting in death and the retention of animals of the species of cetaceans that they are indicated in the waters under national jurisdiction.

However the likely of interactions highlighted in the table 20, no detrimental interactions or mortality are known in the fishery under assessment, except for *Otaria flavescens* that is not listed in the table because is not considered protected by the regulation Decree No. 225 of 1995, amended by Decree No. 135 of 2005 from the Ministry of Economy, there is an specific regulation for this species to be considered protected in the EEZ Chilean waters (*Decreto exento N. 1892 de 2009 modificado a traves de los decretos N228 de 20110 y N115 de 2012 del Ministerio de Economia, Fomento y Turismo por el cual se establece una veda extractiva para el recurso lobo marino en todo el litoral de la Republica Chilena*). Therefore, the species is considered ETP in this assessment due to national agreements to protect and preserve the species located in Chilean waters. Species evaluated in the UoA 1 and UoA 2 under this section are detailed below.

<u>Marine mammals</u>
Marine mammals had no interactions reported by the fleet except for South American sea lion, *Otaria flavescens* in both UoAs. The species is not considered under IUCN as vulnerable but there is a national regulation to protect the species. There was a management plan for the species in 2010. However, in 2012, a temporaly closure with some exemption was established in Chilean waters (Decreto exento N. 1892 de 2009 modificado a traves de los decretos N228 de 20110 y N115 de 2012 del Ministerio de Economia, Fomento y Turismo por el cual se establece una veda extractiva para el recurso lobo marino en todo el litoral de la Republica Chilena).

It has been documented that sea lion populations have been decreasing mostly due to fishing activities. Therefore, there has been several recent efforts on the conservation of these species (Figure 33).

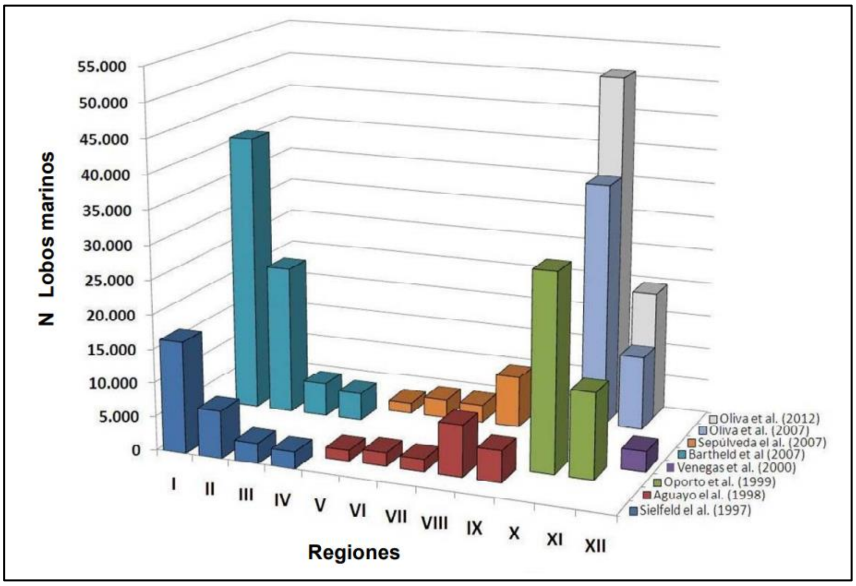



**Figure 33**. Total abundance of Southern sea lion in Chile according to the censuses taken between 1997 and 2012 by different authors. Source: Minecon.

The National regulation MINECON/SUBPESCA N 1892/09 has defined the sea lion as a protected species since 2009 establishing a moratorium. Ever since the moratorium was set up, the technical committee has been developing research projects, and doing reviews of the population abundance trends. These activities resulted in an extension of the moratorium over the last years. The last update of the regulation was in 2016 where the moratorium was extended for 5 years more, until 2021. In article 6 of the regulation it says that no catches are allowed except 60 specimens for indigenous communities because of socio-cultural aspects, 200 specimens for research purpose and some catches can be allowed due to safety reasons.

Furthermore, there are some international binding agreements to conserve the marine mammals in which Chile has been a member. First is the Convention on the Conservation of Migratory Species of Wild Animals in which Chile has been a member from 1983. The species is listed in the Appendix II where migratory species are conserved through international Agreements.

Additionally, in 1991, Chile started its membership of the Permanent Commission of the South Pacific (CPPS), which has promoted the Action Plan for the Conservation of Marine Mammals of the Southeast Pacific, approved in 1991, and whose primary objectives include the conservation of all species, subspecies, breeds and populations of marine mammals and their habitats. Also, during 2017, the Commission has carried out different workshops to ensure the members comply with US regulations. With the entry into force of the Marine Mammal Protection Act in August 2016, a moratorium of five years was opened for countries that export fishery products to adopt measures to reduce the levels of incidental mortality of marine mammals to the same levels required. The new legislation puts at risk the free commercialization of fish products to that market at the end of the established transition period, so the countries of the region should be prepared for this new challenge and for that reason strategies are being adapted to the new market regulation.

<u>Seabirds</u>
Information to assess the seabirds interactions in this fishery comes from different sources. Main information regarding mortality has been taken from IFOP reports of 2018 and 2019 (Bernal *et al.* 2018 & 2019).

Further, data from logbooks (self-reporting) that the vessels complete to share with SUBPESCA and IFOP have been also examined to obtain a better understanding of the interactions with seabirds, these logbook are called IOE and CIAMT and the information available takes from 2013 to 2017. In those logbooks quantitative and qualitative information is collected regarding ETP species.

The information collected primarily is the name of the species and the number of specimens, followed by the observations if the ETP species is alive or dead and in case is alive the captain has to report the following types of interactions described in the table below (Table 22).

**Table 22.** Type of interactions recorded on the logbook (IOE and CIAMT) reported by the vessels operating on Chile Austral Hake to IFOP and SUBPESCA.

| Code | Type of interaction |
|---|---|
| 1 | Impact with cables (birds trawling) |
| 2 | Impact with net (birds trawling) |
| 3 | Impact with boat (birds trawling) |
| 4 | Feeding on the net capture (birds trawling) |
| 5 | Feeding waste (birds trawling) |
| 6 | Feeding capture (mammals trawling) |
| 7 | Feeding waste (mammals trawling) |
| 8 | Impact with boat (longline birds) |
| 9 | Feeding on bait (longline birds) |

| | |
|---|---|
| 10 | Feeding of capture (longline birds) |
| 11 | Feeding waste (longline birds) |
| 12 | Feeding of capture (longline mammals) |
| 13 | Feeding waste (longline mammals) |

In these logbooks the main seabird species mostly reported in the Chile Austral fishery by industrial trawler fleet was the Black browed Albatross. Few interactions were reported of grey-headed albatross (11 interactions mostly accounted for death). Interactions with Salvin's albatross were not reported when the fishery target Chile Austral hake. all the other interactions with this species were reported when trawling vessels targeted Chilean hake (*M. gayi*), Southem blue whitting (*Micromesistius australis*) and Hoki (*Macruronus magellanicus*). The data from the fleet are very similar in species composition as the data reported by IFOP in Bernal et al. (2018, 2019).

Articles in peer reviewed scientific journals such as Robertson *et al.,* (2014, 2017); Adasme *et al.* (2017, 2019) have also reported information regarding the presence of Black browed Albatross as the main impacted seabirds by trawling fleet in the area.

Following the MSC guidelines FCR v2.0 GSA 3.6.3 to evaluate the seabirds impacts in the fishery the assessment team has taken information of higher level of verifiability and lower bias a such as: observer program, VMS location and independent researches further lower level of verifiability and higher bias information as standardised logbooks. Therefore, the adequacy of information to score seabirds in the assessment have been demonstrated by obtaining information from different sources and bias.

The observer program carried out by IFOP take into account the records of incidental catches corresponded to those specimens that arrived on board at the moment of the hauling of the fishing gear, into the net or codend, entangled in the net or in the cables always considering restrictions for safety reasons of observers and crew, therefore access to sectors of better observation (very close to the stern ) are in some cases restricted.

The specimens that interact with gears and can be affected or damaged without reaching cover, are not accounted for by the observer program but are reported in the standardised logbooks.
The general results observed for the ice-fishing fleet operating in the southern, suggest a moderate to low level of incidental capture of seabirds. The value recorded in the sets observed during 2017 amounted to 28 captured specimens (Table 23). On the other side, the factory trawler fleet showed a clear and important difference in the levels of incidental catches, with 2,002 specimens accounted for (Table 23). The increase of the absolute values of the bycatch could be related to the effort of observation of the Observer program. On the other hand, it is necessary to mention that, although during 2017 the total number of birds captured by this fleet was high, there was a considerable decrease with respect to 2016 (n = 4283). Figure 34 shows the comparative mortality from years 2016 and 2017 mentioned herein (Bernal et al. 2018 & 2019).

**Tabla 43**

Captura incidental de aves marinas (número vivas y número muertas) por grado de latitud para la zona sur austral.

| Latitud (grados | N° aves vivas | N° aves muertas | Total general |
|---|---|---|---|
| -40 | | 2 | 2 |
| -41 | | 1 | 1 |
| -42 | | 15 | 15 |
| -43 | | 5 | 5 |
| -44 | | 6 | 6 |
| -45 | 6 | 230 | 236 |
| -46 | 6 | 589 | 595 |
| -47 | 3 | 468 | 471 |
| -48 | | 372 | 372 |
| -49 | 1 | 273 | 274 |
| -50 | | 214 | 214 |
| -51 | | 238 | 238 |
| -52 | | 409 | 409 |
| -53 | | 205 | 205 |
| -54 | | 208 | 208 |
| -55 | | 468 | 468 |
| -56 | | 494 | 494 |
| -57 | | 185 | 185 |
| Total gene | 16 | 4382 | 4398 |

Fuente: elaborado mediante información de bitácoras IFOP (2016).

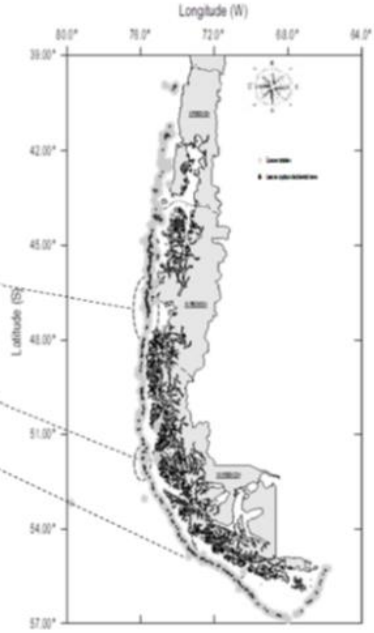



**Tabla 43**

Captura incidental de aves marinas (número vivas y número muertas) por grado de latitud para la zona sur austral en la flota arrastrera, 2017.

| Latitud Grados | Total Aves Capturadas Flota Arrastre |
|---|---|
| -41 | 11 |
| -42 | 1 |
| -43 | 2 |
| -44 | 1 |
| -45 | 115 |
| -46 | 29 |
| -47 | 341 |
| -48 | 109 |
| -49 | 19 |
| -50 | 13 |
| -51 | 51 |
| -52 | 239 |
| -53 | 287 |
| -54 | 94 |
| -55 | 200 |
| -56 | 377 |
| -57 | 113 |
| Total general | 2002 |

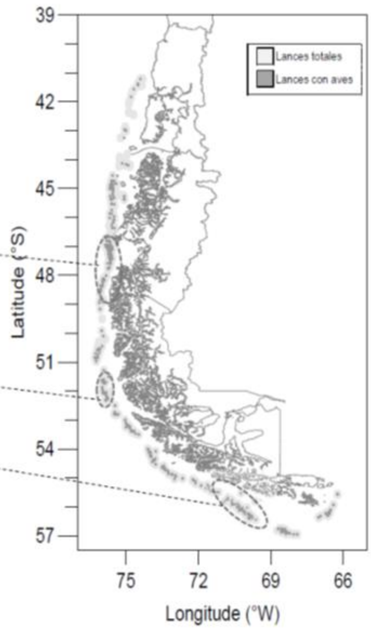



**Figure 34.** Coverage and distribution of total hauls and sets with presence of capture of seabirds

This decrease could be explained by fishing operations oriented towards mitigate and decrease the interactions with seabirds and ETPs species proposed in the management the discard plan for the Chile Austral hake fishery, making possible a management of fishing efforts, as well as, a decrease in discards and bycatch species (Bernal et al. 2019).

**Table 23.** Summary of negative interactions of seabirds observed in the industrial trawling fishery in 2017. Source: Bernal et al. 2019

| Estado | Flota | | Total |
|---|---|---|---|
| | Hielera | Fábrica | |
| Vivas | 0 | 26 (1,3%) | 26 (1,3%) |
| Muertas | 28 (100%) | 1948 (98,7%) | 1976 (98,7%) |
| Total | 28 | 1974 | 2002 |

Nota: En paréntesis se presentan los porcentajes asociados a cada condición de la captura.

In both type of trawling vessels the catches of seabirds were dominated by Black browed Albatross however the annual rate of caught were 1.195 seabirds/haul in 2017 versus 2.48 seabirds/ haul in 2016. Therefore, the results of these reports have shown a clear decreased of the interactions with seabird's populations.

**Error! Reference source not found.**Table 24 shows the seabirds listed in the last report of the discard program. All of those seabirds are considered ETPs by different international and national agreements (Chile and NZ arrangement to protect seabirds, Agreement on the Conservation of Albatrosses and Petrels ACAP/CMS, the Convention for Protection of Flora, Fauna and Scenic treasures of America, Bonn convention of migratory species and National Plan of Action, PAN-AM/Chile).

**Table 24**. List of seabirds species defined as ETP reported by the observer program and the discard program. Source: IFOP.

| **Common English name** | **Scientific name** | **Listed in international agreements*** | **IUCN classification**** |
|---|---|---|---|
| Black-browed albatross | *Thalassarche melanophris* | ACAP Annex I | LC |
| Southern giant-petrel | *Macronectes giganteus* | ACAP Annex I | LC |
| Hall's giant petrel | *Macronectes hallis* | ACAP Annex I | LC |
| Sooty shearwater | *Puffinus griseus* | ACAP Annex I | NT |
| White-capped albatross | *Thalassarche salvini* | ACAP Annex I | VU |
| Grey headed albatross | *Thalassarche chrysostomas* | ACAP Annex I | EN |

*Note that classsification of the species as ETPs has been done following MSC FCR v2.0 clause SA3.5.1 or SA3.1.5.2 or SA3.1.5.3 when applied.

**Legend: LC-least concern, NT-near threatened, VU-vulnerable, EN-endangered

As mentioned above, Black-browed albatross is known to consistently occur on the industrial fishing activities within the Chile South Austral region area mostly with the longline fleet. Black-browed albatross is a marine bird which has a circumpolar distribution ranging from subtropical to polar waters (ACAP 2009), breeding in the Falkland Islands (Islas Malvinas), Islas Diego Ramirez, Ildefonso, Diego de Almagro and Isla Evangelistas (Chile), South Georgia (Georgias del Sur), Crozet and Kerguelen Islands (French Southern Territories), Heard and McDonald Islands and Macquarie Island (Australia), and Campbell and Antipodes Islands, New Zealand (Croxall and Gales 1998). Two breeding sites are also found in southern Chile on islets in Tierra del Fuego and in the Mallaganes region (ACAP 2009). One colony was also recorded on Snares Island in 1986 (ACAP 2009). The total breeding population was estimated at c.700,000 pairs in 2010, c.72% at the Falkland Islands (Islas Malvinas), 19% in Chile and 8% at South Georgia.

Recent developments on mitigation efforts to minimise seabird bycatch by demersal longliners in Chile such as tori lines, vertical line systems, line weighting, and night setting has reduced the number of dead birds to almost zero. This has resulted in the increase and recovery of nesting colonies of black-browed and grey headed albatrosses (Moreno *et al.,* 2007; Robertson *et al.,* 2014). In the nine years between 2002 and 2011 the number of black-browed albatrosses at these sites increased by 52% and 18%, respectively, or 23% for both sites combined. Table 25 below shows the information from Robertson et al. 2017 where the estimated number of black browed albatrosses and grey headed albatrosses are shown in the main breeding areas from 2011 to 2014. As it can be observed in the data reported in the table, percentages have changed and the number of specimens have increased over the years showing a positive trend in the breeding areas (Table 25).

**Table 25.** Estimated number of black browed albatrosses (BBA) and grey-headed albatrosses (GHA) are shown in the main breeding areas from 2011 to 2014. Source: Robertson et al 2017

| Species | Location | Group/islet | Years | | | | | Change (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2002 | 2005 | 2011 | 2012 | 2014 | Total | Mean/year |
| BBA | Diego | Northern group | | | | | | | |
| | Ramirez | Islote Cabezas | 0 | | 0 | n.s. | 0 | | |
| | | Islote Penailillo | 0 | | 0 | n.s. | 0 | | |
| | | Islote Norte | 1316 | | 3826 | n.s. | 5001 | 30.0 | 9.3 |
| | | Islote Schlatter | 178 | | 204 | n.s. | 273 | 34.0 | 10.2 |
| | | Islote Martinez | 286 | | 227 | n.s. | 98 | −57.0 | −24.4 |
| | | Islote Mendoza | 143 | | 128 | n.s. | 383 | 199.0 | 44.0 |
| | | Total | 1923 | | 4385 | | 5755 | 31.0 | 9.5 |
| | | Southern group | | | | | | | |
| | | Isla Gonzalo | 6966 | | 9164 | n.s. | 11,133 | 21.0 | 6.7 |
| | | Total (see caption) | 8889 | | 13,549 | | 17,474 | 29.0 | 8.8 |
| | Ildefonso | Northern group | | | | | | | |
| | | Isla Norte | 10,920 | | 13,920 | 14,799 | 13,795 | −0.9 | −0.3 |
| | | Isla Cinclodes | 775 | | 871 | 1029 | 1014 | 16.0 | 5.2 |
| | | Isla Square | 488 | | 528 | 593 | 504 | −4.5 | −1.5 |
| | | Isla Spirit | 1383 | | 1447 | 1747 | 1571 | 8.5 | 2.8 |
| | | Isla Sur | 5222 | | 7053 | 7276 | 6822 | −3.5 | −1.1 |
| | | Total | 18,788 | | 23,819 | 25,444 | 23,706 | −0.5 | −0.1 |
| | | Southern group | | | | | | | |
| | | Isla Grande | 30,680 | | 34,358 | n.s. | 33,437 | −2.6 | −0.9 |
| | | Total birds | 49,468 | | 58,177 | | 57,143 | −2.0 | −0.6 |
| | | Total breeding pairs | | | | | 54,284 | | |
| | Evangelistas | Evangelistas | 0 | | | | 0 | | |
| | | Elcano | 3285 | | | | 3325 | | |
| | | Lobos | 1384 | | | | 1472 | | |
| | | Pan de Azucar | n.s. | | | | 22 | | |
| | | Total | | | | | 4818 | 3.5 | |
| | Leonard | | | 594 | | | 545 | −8.0 | |
| GHA | Diego | Northern group | | | | | | | |
| | Ramirez | Islote Cabeza | 0 | | 0 | n.s. | 0 | | |
| | | Islote Penailillo | 0 | | 0 | n.s. | 0 | | |
| | | Islote Norte | 463 | | 476 | n.s. | 765 | 60.7 | 17.1 |
| | | Islote Schlatter | 97 | | 76 | n.s. | 120 | 57.9 | 16.4 |
| | | Islote Martinez | 69 | | 49 | n.s. | 35 | −28.6 | −10.5 |
| | | Islote Mendoza | 174 | | 279 | n.s. | 285 | 2.2 | 0.7 |
| | | Total | 803 | | 870 | | 1205 | 38.5 | 11.5 |
| | | Southern group | | | | | | | |
| | | Isla Gonzalo | 4523 | | 4413 | n.s. | 5292 | 19.9 | 6.2 |
| | | Total (see caption) | | | 5293 | | 6497 | 22.7 | 7.1 |

Estimates for these two island groups are raw (uncorrected) counts. Estimates for 2002, 2011 and 2012 are from Robertson et al. (2014). Values for Ildefonso in 2014 include an estimate of the number of breeding pairs derived from the raw counts corrected downwards by 5 % following Robertson et al. 2008. The period of the current study is from 2011 to 2014. Change % is the difference in raw counts for the period 2011–2014. Mean change/year calculated following Robertson et al. (2014). Also included are estimates of the number of breeding pairs of black-browed albatrosses at Evangelistas and Leonard in 2014 in relation to estimates from previous surveys at these sites

*n.s.* Not surveyed

**Table 2** Estimated total number of black-browed albatrosses (BBA) and grey-headed albatrosses (GHA) at Diego Ramírez (selected islands only; see Fig. 1) and Ildefonso (whole archipelago) in the 2002, 2011, 2012 and 2014 breeding seasons

| Species | Location | Group/islet | Years | | | | | Change (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2002 | 2005 | 2011 | 2012 | 2014 | Total | Mean/year |
| BBA | Diego | Northern group | | | | | | | |
| | Ramirez | Islote Cabezas | 0 | | 0 | n.s. | 0 | | |
| | | Islote Penaillillo | 0 | | 0 | n.s. | 0 | | |
| | | Islote Norte | 1316 | | 3826 | n.s. | 5001 | 30.0 | 9.3 |
| | | Islote Schlatter | 178 | | 204 | n.s. | 273 | 34.0 | 10.2 |
| | | Islote Martinez | 286 | | 227 | n.s. | 98 | −57.0 | −24.4 |
| | | Islote Mendoza | 143 | | 128 | n.s. | 383 | 199.0 | 44.0 |
| | | Total | 1923 | | 4385 | | 5755 | 31.0 | 9.5 |
| | | Southern group | | | | | | | |
| | | Isla Gonzalo | 6966 | | 9164 | n.s. | 11,133 | 21.0 | 6.7 |
| | | Total (see caption) | 8889 | | 13,549 | | 17,474 | 29.0 | 8.8 |
| | Ildefonso | Northern group | | | | | | | |
| | | Isla Norte | 10,920 | | 13,920 | 14,799 | 13,795 | −0.9 | −0.3 |
| | | Isla Cinclodes | 775 | | 871 | 1029 | 1014 | 16.0 | 5.2 |
| | | Isla Square | 488 | | 528 | 593 | 504 | −4.5 | −1.5 |
| | | Isla Spirit | 1383 | | 1447 | 1747 | 1571 | 8.5 | 2.8 |
| | | Isla Sur | 5222 | | 7053 | 7276 | 6822 | −3.5 | −1.1 |
| | | Total | 18,788 | | 23,819 | 25,444 | 23,706 | −0.5 | −0.1 |
| | | Southern group | | | | | | | |
| | | Isla Grande | 30,680 | | 34,358 | n.s. | 33,437 | −2.6 | −0.9 |
| | | Total birds | 49,468 | | 58,177 | | 57,143 | −2.0 | −0.6 |
| | | Total breeding pairs | | | | | 54,284 | | |
| | Evangelistas | Evangelistas | 0 | | | | 0 | | |
| | | Elcano | 3285 | | | | 3325 | | |
| | | Lobos | 1384 | | | | 1472 | | |
| | | Pan de Azucar | n.s. | | | | 22 | | |
| | | Total | | | | | 4818 | 3.5 | |
| | Leonard | | | 594 | | | 545 | −8.0 | |
| GHA | Diego | Northern group | | | | | | | |
| | Ramirez | Islote Cabeza | 0 | | 0 | n.s. | 0 | | |
| | | Islote Penaillillo | 0 | | 0 | n.s. | 0 | | |
| | | Islote Norte | 463 | | 476 | n.s. | 765 | 60.7 | 17.1 |
| | | Islote Schlatter | 97 | | 76 | n.s. | 120 | 57.9 | 16.4 |
| | | Islote Martinez | 69 | | 49 | n.s. | 35 | −28.6 | −10.5 |
| | | Islote Mendoza | 174 | | 279 | n.s. | 285 | 2.2 | 0.7 |
| | | Total | 803 | | 870 | | 1205 | 38.5 | 11.5 |
| | | Southern group | | | | | | | |
| | | Isla Gonzalo | 4523 | | 4413 | n.s. | 5292 | 19.9 | 6.2 |
| | | Total (see caption) | | | 5293 | | 6497 | 22.7 | 7.1 |

Estimates for these two island groups are raw (uncorrected) counts. Estimates for 2002, 2011 and 2012 are from Robertson et al. (2014). Values for Ildefonso in 2014 include an estimate of the number of breeding pairs derived from the raw counts corrected downwards by 5 % following Robertson et al. 2008. The period of the current study is from 2011 to 2014. Change % is the difference in raw counts for the period 2011–2014. Mean change/year calculated following Robertson et al. (2014). Also included are estimates of the number of breeding pairs of black-browed albatrosses at Evangelistas and Leonard in 2014 in relation to estimates from previous surveys at these sites

*n.s.* Not surveyed

For year 2017, the Southern Austral demersal fisheries discard program report has shown that the quality of the data have improved resulting in documenting a higher number of interactions (Bernal *et al.,* 2017; Cespedes *et al*., 2018; Galvez *et al.,* 2017). The rate of individuals/hours trawled was 0.1 while on the industrial longline fishery, no individuals were caught and the percentage of interactions decreased to at least 2 % in both UoA.

### 3.4.7. ETP management

Chile is a member country of several agreements for the conservation of ETP species such as the Agreement on the Conservation of Albatrosses and Petrels with the aim "to achieve and maintain a favourable conservation status for albatrosses and petrels, Western and Central Pacific Fisheries Commission to preserve the Pacific resources, CODEFF birdlife international has projects in the industrial fishery, Convención de las Naciones Unidas por los Derechos del Mar (CONVEMAR) and different international agreements with countries around the world to preserve the marine life as "Chile - United States Memorandum of Understanding on

Cooperation for the Conservation and Management of Terrestrial and Marine Protected Areas" under which the sea lion is also protected.

In 2005, a National Plan of Action to reduce seabird bycatch in longline fisheries was implemented which included mitigation measures and good practices per fishery. Mitigation measures correspond to the use of bird-scaring lines or tori lines and line weighting. Good fishing practices, on the other hand, correspond to night setting, waste management and management of hooks.

Furthermore, in 2013 with the revised fisheries law (LGPA), new measures were introduced to mitigate the impact of longline activities on bird populations. These measures are as follows:

- Use deterrents or Bird scarying lines to deter birds from approaching very close to the fishing gear
- Increase the sinking rate on the fishing line gear to avoid the birds getting entangled.
- Conduct longline fishing operations at night.
- To eliminate waste on the opposite side of the fishing vessel where the fishing lines are pulled back from the water in order to avoid seabird entanglement.

In the industrial fleet using trawling gear, measures to reduce seabird interactions have been implemented since 2015. The measures on already in place since their implementation in 2015 are as follows:

- Use of tori lines
- Use of acoustic stimulus to deter seabirds from the surroundings of the fishing gear.
- Control of waste and discards
- Different fishing operations when there is a high abundance area close to the ground where the vessels are fishing
- Use of birds bafflers
- Use of laser devices
- Observer and crew training to apply survival protocols and code of conduct

Some of these measures had been evaluated in the IFOP technical reports of 2018 and 2019 (Cespedes et al 2018, Bernal et al 2019).

All of those measures are included on the Discard and Incidental Catch Reduction Plan for Chile Austral hake that was adopted on December 2017.

Finally, at the time of the publication of this report the Industrial trawl fleets that are represented by FIPES reported the following measures that are in currently in use to reduce seabird's mortality (Table 26).

**Table 26.** Measures implemented by Industrial Trawl fishery vessels represented by FIPES in 2019 to reduce seabird's mortality in following the current legislation. Source: FIPES*

| Measures to reduce seabirds mortality. Please mark the measures already in place in the fishery | | | | | |
|---|---|---|---|---|---|
| **Companies/Fleet** | **EMDEPES** | **FRIOSUR** | **DERIS** | | **Comments** |
| | | | **Trawler** | **Longline** | |
| *Tori lines* | Yes* | Yes | Yes | No | *From July 2019 use of tori lines |
| *Laser* | Yes | No | Yes | Yes | |
| *Other measures? Please specify* | No | No | No | No | |
| **Use of NET SONDA** | **Yes** | **Yes** | **No** | **No** | |
| **Mitigation measures for NETSONDA** | | | | | |
| Tori lines | No | Yes | Yes | No | |
| Laser | Yes | No | Yes | Yes | |
| mark the cable | most often | No | Not netsonde | | |
| decrease the tension of the cable | Yes | Yes | Not netsonde | | |
| netsonder without cable | No | Yes | Yes | No | |
| Deploy bird scaring lines while fishing to deter birds away from warp cables | No | No | Yes | No | |
| Deploy bird scaring lines specifically positioned to deter birds away from net monitoring cables while fish | Yes | Yes | Yes | Yes | |
| Video cameras | Yes | Yes | Yes | Yes | |
| Other measures? Please detail | No | No | No | Fishing operations done before sunrise | |
| | | | | | |
| **Mortality due to entanglements** | | | | | |
| Clean the nets before shooting | Yes | Yes | Yes | Longline | |
| Minimise the time the net is on the water surface during hauling through proper maintenance of winche | most often | No | Yes | Longline | |
| **Measures detailed in ACAP 2014** | | | | | |
| **Tie up the nets** | most often | most often | Yes | Longline | |
| **Clean the nets before shooting** | Yes | Yes | Yes | Longline | |
| **Net ballasts placed on or near the flake.** net ballasts placed on or near the flake to increase the elevation angle of the net during the turning operations, and also reducing the time it is on the surface of the water | No | No | No | | |
| **Reduction mechanism in nets.** For fisheries where multiple nets are pulled side by side (Pierre et al 2013). This mechanism acts by restricting the opening of the net in the tack when catches are observed. | No | No | No | | |
| Elaborate fishmeal with waste | Yes | No | Yes | No | |
| Batch dumping (store and control the release of waste during fishing operations) | Yes | Yes | Yes | Yes | |
| Storage of fish debris and offal, either for processing or controlled release | Yes | Yes | Yes | Yes | |
| espantadores de cable de arrastre (dispoYestivos con lastres sujetos a cada cable con broches o ganchos que se deslizan libremente hacia arriba y hacia abajo y se mantienen alineados a cada cable) | No | Yes | No | Longline | |
| Drag cable scarers (devices with ballasts attached to each cable with snaps or hooks that slide freely up a | most often | Yes | Yes | Yes | |
| Boom of the trawl cable. It is used with scarecrow tapes that extend to the water in front of the stern to keep the drag cables away from birds that feed on viscera | No | No | No | No | |
| Block or mechanism located on the stern of the boat to bring the third cable to the water and thus reduce its extension | No | No | Not netsonde | | |
| Towed compensation device i.e Tamini Table. This device is attached to the final tip of the LEP and has a floating top board with three vertical keels at 45 °, which have ballast for stability. When the boat moves forward, the keels move the device out of the tow cables, and thus prevent the LEP from becoming entangled with those cables. | No | Yes similar to Tamini Tabla | No | No | |
| Neta protector, use of floating net panels tied to the meshes with a light | No | No | No | No | |
| Mesh size reduced from 200 to 140 mm | No | Yes | Yes | Yes | |

*Note that the measures already in place will be reviewed and modified to follow the recent publication of the resolution RES. EX. N° 2941: Establish management measures to reduce incidental catches of seabirds in the trawl fisheries that are indicated, Valparaiso, 28 august 2019.

Additionally, in the report Bernal *et al.* (2018), it is mentioned that some of the measures implemented for longline in the National Action Plan, are being reviewed for their formal implementation for trawling vessels. Nevertheless, some of those measures are already defined in the Management Plan (Comite de Manejo de la Merluza Austral) of the fishery and in the National Discard Plan for Austral hake.

At the stage of the release of the PCR (Public Certification Report) the Assessment Team have been aware that a new regulation has been launched in August 28$^{th}$, 2019 (RES. EX. N° 2941) where new measures have been established to reduce seabird's mortality in the trawl fishery under assessment and will be implemented in the fleet before the end of the year. These measures will be closely monitored by the Assessment Team in the next surveillance audit.

Consequently, following Chile new regulations, measures will be evaluated every year to evaluate the effectiveness of the management plan. Some of the measures have already been applied in the longline fishery and reports by IFOP as well as peer review articles such as Robertson et al. (2014) and (2017) have shown the effectiveness of the measures in reducing the mortality of seabirds by promoting increasing abundance of some seabird populations in Chile.

Céspedes *et al.,* (2018) also compared mortality of seabirds from trawl activities in the Austral hake fishery from 2016 to 2017 and showed that laser devices reduced the interactions with seabirds by 53%. Therefore, evidence is mounting that laser mitigation device that currently used in fishing operations in the southern zone austral by the industrial longline and trawl fleets, has shown to be effective in bird deterrence.

However. although direct information from the vessels using this device has shown positive results (EMDEPES, Pers. Comm.) further investigation are needed. (Céspedes et al., 2018). Although some few studies show a certain effectiveness at the moment of dissuade seabirds in fishing operations[6] (Melvin et al 2016), concerns are raised about the damage that a laser could cause in seabirds. Furthermore, it seems the that effectiveness of laser methods depend on species that interact with the device and the specific conditions of the environment where the fleet operates (night vs day).

Because of this, laser devices are not recommended on the list of best practices recommendations to reduce seabird bycatch in trawls from the Agreement for the Conservation of Albatross and Petrels (ACAP) Mitigation group. Chile, being as a signatory country of ACAP is currently adopting recommendations and implementing new regulations and mandatory measures concerning seabird bycatch reduction.

Currently, the new discards and incidental catch reduction program has set up 9 new measures to reduce the mortality and interactions with ETPs. Most of those new measures have been implemented between 2015 and 2018 and others are very close to be implemented. For example, the implementation of the video cameras is still on going. Actually, all fishing vessels from client companies that are represented by FIPES have already installed video cameras while others fishing vessels are currently installing these devices. By law, it will be mandatory for all fishing vessels to have electronic monitoring systems by January 1st, 2020.

All the measures below are expected to reduce the mortality and interactions of ETPs in Chilean industrial fisheries and also they are included in the reduction and mitigation plan of bycatch and its resolution of December 29th, 2017 where it's stated in the article 4 that there is a legally enforced system and all the vessels targeting Chile Austral hake or golden seabass shall to comply with the measures defined and their timeline for implementation (Subsecretaría de Pesca. Resolución del 29 de diciembre de 2017. Aprobación del Plan general y reducción del descarte y captura incidental de la merluza del sur y congrio dorado).

The procedures are listed below:

**M1.** According to the provisions of the General Fisheries and Aquaculture Law (LGPA), the return of incidental fishing to the sea (Art. 7 ° C), under handling protocols approved by the National Fisheries and Aquaculture Service, will be mandatory and it must be compatible with the video camera system (DS N ° 76 of 2015).

**M2.** The industrial fishery must inform by each fishing haul incidental captures in the cases that occur, identifying the species or groups of species involved, as well as, the geographical position, date, time and haul in which the events occur in the terms established by the DS N ° 129 of 2013 (Regulation for the delivery of information of article 63 of the LGPA).

**M3.** It must comply with the protocols of identification, safe protocols, registration and release to the sea of the incidental catch that allow or guarantee the survival of the released specimens.

**M4.** Develop an action plan that complies with article 4, letters c), d) and e), regarding the mitigation and protection of incidental fishing.

**M5.** Approve the regulations, procedures and information gathering with the requirements of countries and / or consumer markets of the products of this fishery, as well as the standards of certification aspired by the fishery. E.g. USA marine mammals free products.

[6] https://wsg.washington.edu/wordpress/wp-content/uploads/SBWG7_Inf_12-Laser-trials-N-Pacific-MELVIN-et-al_E_s_f.pdf

**M6.** With respect to the mortality of seabirds due to cable collision (cove, netsonder, etc.), the use of streamer lines, tori lines and/or laser deterrent systems will be mandatory throughout the fishing operation. Additionally, in the case of vessels that use cable netsonder, the cable must be marked or painted, the operating voltage must be reduced and/or the use of wireless netsonder must be evaluated. Implement lines for the separation of net's buoys and marking or elimination of in the corresponding cases.

**M7.** Full compliance should be given to Res. Ex. 2110 of 2014, which established management measures to reduce incidental catches of seabirds in longline fisheries.

**M8.** Do not dispense waste and/or discard during draft or drift and crush discards according to MARPOL requirements Annex V (≤ 12 miles from the coast). The provisions of Annex V MARPOL must be fully complied with.

**M9.** Regarding incidental mortality of marine mammals: evaluate the implementation of grilles (flexible mesh) in hatch of entrance of the wells to avoid that specimens enter when emptying the flakes, cleaning the net before setting. Promote research programs that allow the evaluation of population size and feasibility of population and /or birth control measures if applicable.

### 3.4.8. ETP information

Chile has several sources of information clearly defined by regulations to monitor and manage ETPs species such as: vessel monitoring systems (VMS); onboard observer programs, specific standardised logbook for ETPs (IOE and CIAMT logbooks), fishermen's self-reporting, and research program carried out by IFOP and in collaboration with ENGO as Albatross force or Oceana.

Since 2000, Chile has a Vessel Monitoring System (VMS) for fishing vessels. This system is controlled by the National Fisheries and Aquaculture Service (SERNAPESCA) and the Chilean Navy. It allows real time monitoring of the entire industrial fishing fleet. In 2015, small-scale vessels larger than 15 m in length were also monitored by satellite in conformity with provisions set out in the current LGPA. Between 107 and 156 vessels are monitored with the VMS at a national level on a daily basis. The annual monitoring of fisheries is conducted by the Fisheries Research Institute (IFOP) under a consultancy contract with the Ministry of Economy, Development and Tourism. This consultancy includes monitoring of biological aspects of the main target species and direct or indirect stock abundance or populations assessments (Galvez et al., 2017, Céspedes et al., 2018). It also includes monitoring of extraction activities carried out by fishing fleets or in-shore fishermen as well as data collection of oceanographic conditions and economic aspects of the fisheries.

Since 2004, Chile has provided statistics of seabird bycatch to the ACAP Data Portal. The provision of information has been progressive, and according to the capabilities of collection of the scientific observers programs, fisheries monitoring projects, and projects of estimation of bycatch and discard. Furthermore, other sources of information such as observations of the NGO ATF-Chile and academic research centres have contributed the understanding of seabird bycatch in Chilean demersal fisheries.

It is important to say, that the fishing industry has been cooperating with researchers and fisheries managers on efforts addressed to mitigate bycatch by facilitating the presence of scientists on-board of their fleets (ATF-Chile, 2012, ATF- Chile MPSs research program Awarded 2018).

Since 2012, a group of experts and scientists committed to the conservation of seabirds are working on a regular basis. This group is organized and funded by SUBPESCA. It is aimed at updating the knowledge, guiding research, and recommending seabird conservation measures.

Further, the new Southern Austral demersal fisheries discards reduction program has as a part of its objectives to monitor and control seabird's gear interactions, and to reduce mortality and gear interactions of sharks, rays and marine mammals. The first report posted in December 2017 (Bernal et al., 2017) has shown a reduction of interactions of at least 2 % in seabirds and new protocols to release alive other species have been set up. Bernal et al., (2017) reported that on board observers have been collecting data with high coverage levels and fishing vessel crews have been adequately trained on catch and release techniques to successfully achieve a high percentage of alive released species.

Information on estimation of bycatch for ETP and non-target species, has been collected ever since from 2013. Bernal et al., (2017) reported increasing coverage of industrial fleet fishing trips by the observers program as it is shown in the Table 27 and Table 28. For example, in the last three years the coverage of fishing trips have doubled since 2014. Furthermore, data also suggests that the percentage of coverage of the industrial trawl fleet fishing trips by the observer program has been increasing from 19.1% to 95.4% in 2016. Therefore, the observer program has continuity in time and more accuracy data are obtained due to improvements in the methodologies to collect the data and better training of onboard observers and the crew of the fleets resulting in better quality of the data. More information will be collected in the new South Austral Demersal fishery discards program given that there are plans to monitor the fishery on an annual basis.

**Table 27.** Percentage of coverage of fishing trips by the observer program in the Industrial trawl fleet. Source: Bernal et al. 2017.

| Flota hielera | | | | | | |
|---|---|---|---|---|---|---|
| Año | Viajes totales con OC | Viajes CIAMT | % Viajes Obs. | Lances totales viajes CIAMT | Lances obs. CIAMT | % lances obs. |
| 2013 | 68 | 13 | **19,1** | 188 | 18 | **9,6** |
| 2014 | 73 | 31 | **42,5** | 423 | 137 | **32,4** |
| 2015 | 58 | 41 | **70,7** | 652 | 508 | **77,9** |
| 2016 | 108 | 103 | **95,4** | 1697 | 1102 | **64,9** |
| Flota fábrica | | | | | | |
| Año | Viajes totales con OC | Viajes CIAMT | % Viajes Obs. | Lances totales viajes. CIAMT | Lances obs. CIAMT | % lances obs. |
| 2013 | 18 | 5 | **27,8** | 547 | 95 | **17,4** |
| 2014 | 13 | 12 | **92,3** | 1355 | 310 | **22,9** |
| 2015 | 22 | 21 | **95,5** | 2084 | 1161 | **55,7** |
| 2016 | 21 | 20 | **95,2** | 2351 | 1583 | **67,3** |

**Table 28.** Percentage of coverage of fishing trips by the observer program in the Industrial longline fleet. Source: Bernal et al. 2017.

| Merluza del sur | | | | |
|---|---|---|---|---|
| **Año** | **Viajes totales con OC** | **Viajes CIAMT** | **Lances totales con OC** | **Lances obs. CIAMT** |
| 2014 | 2 | 1 (50%) | 118 | 26 (22,0%) |
| 2015 | 4 | 3 (75%) | 236 | 83 (35,12%) |
| 2016 | 7 | 4 (57,1%) | 285 | 182 (63,9%) |
| Total | 13 | 8 (61,5%) | 639 | 291 (40,8%) |

Additionally, to the coverage showed in the tables below, the on board observes have been training to ensure the taxonomy identification is improving over the years. In the last report published by IFOP it could be stated better understanding of the identification of the seabirds affected. Table 29 shows the species and number of seabirds observed in the different trawling fisheries during 2017.

**Table 29.** Species and number of specimens observed during the trawling operation carries out in 2017 by the fleet. Source: IFOP

| Especie | Flota | | Total |
|---|---|---|---|
| | Hielera | Fábrica | |
| Albatros Buller | | 2 (0,001) | 2 |
| Albatros de cabeza gris | 4 (0,004) | 70 (0,047) | 74 |
| Albatros de ceja negra | 17 (0,017) | 1763 (1,195) | 1780 |
| Albatros de frente blanca | 1 (0,001) | | 1 |
| Albatros de Salvin | 2 (0,002) | | 2 |
| Albatros errante | | 17 (0,012) | 17 |
| Albatros real | | 4 (0,003) | 4 |
| Fardela negra | 2 (0,002) | 2 (0,001) | 4 |
| Fardela negra grande | 1 (0,001) | 28 (0,019) | 29 |
| Petrel gigante antartico | | 15 (0,010) | 15 |
| Petrel gigante subantartico | 1 (0,001) | | 1 |
| Petrel moteado | | 73 (0,049) | 73 |
| Total | 28 | 1974 | 2002 |

Nota: En paréntesis se presentan las tasas de captura (aves/lance).

In addition, data from IFOP observer program have been used by Adasme et al. (2019) to define the cryptic mortality of the fishery in the seabirds. The results showed that incidental seabird mortality appears to be occurring mainly by the collisions with net monitoring systems (net-sonde cable), the duration of fishing hauls, the year period, and the fishing zones, these last 2 factors are related to the breeding period and areas of albatross colonies. Similar results support these findings on previous IFOP technical reports from Bernal *et al* (2018) and Céspedes *et al.* (2018). To get the cryptic mortality four models are used and a total number of 4,797 fishing hauls are taken into consideration. A mortality rate of 0.84 bird is obtained and the probability was estimated to be 0.14 (based on 683 hauls with observations of seabird killed in 4,797 fishing hauls). Considering the 11,833 fishing hauls analysed in this article, a simple extrapolation was made (11,833 hauls*0.84 birds/haul) to provide an estimation around 9,900 seabirds bycatched and killed for whole study period. The most determinant factors in the explanation for both probability and count of dead bird were the period of the year and the use of the net-sonde cable, factors already considered by Bernal *et al.,(*2018) in IFOP technical reports used to manage the fishery. The article states that the best solution to mitigate seabird bycatch and fishing discards seems to be not clear, therefore balanced recommendations should be proposed to minimize effects of trawling on marine ecosystems. A permanent and dedicated observation programme on non-target species and on bycatch of seabirds and mammals is a fundamental issue. Therefore, however IFOP reports do not consider cryptic mortality and the results are expressed in absolute data, most of the conclusions taken cryptic mortality are in the line with IFOP technical reports and the recommendations sates in Adasme *et al.* 2019 to reduce impact on seabirds are considered in the discard plan of Chile Austral Hake.

Therefore, the fishery under assessment is in compliance with the requirements to meet SG 80. As it is stated in the FCR v2.0 GSA 3.6.3 at SG 80 information adequacy required the estimation of the impact of the UoA on the outcome of the species as it is set up in the 2.3.1. Some quantitative information is required as showed in the table GSA5 of FCR v2.0 if the fishery has at least one source of information from the higher level of verifiability and lower bias or two or more of higher bias but the species under assessment are not below limits, therefore the fishery could meet SG 80.

The fishery under assessment has different sources of quantitative information as detailed in this section and summarized below:

- **From higher level of verifiability and lower bias:** Observers program with a high coverage; Electronic monitoring system (VMS) and research program are available.
- **From lower level of verifiability and higher bias:** standardized logbooks (IEO and CIAMT), self-reporting data.

### 3.4.9. Habitats outcome

Legislative and Policy Framework LGPA provides the legislative framework for an integrated ecosystem-approach to management in Chilean oceans, particularly in areas considered ecologically or biologically significant. The LGPA also commits Chile domestically to the development of a national network of MPAs within an integrated management planning context. SUBPESCA has many tools for protecting habitats and ecological areas, and adheres to policies and practices of good risk management and application of the precautionary approach. Identifying Ecologically and Biologically Significant Areas is not a general strategy for protecting all habitats and marine communities that have some ecological significance. Rather, it is a tool for calling attention to an area that has particularly high ecological or biological significance, to facilitate provision of a greater-than usual degree of risk aversion in management of fisheries activities in areas of especially high ecological and biological significance. Ecologically and Biologically Significant Areas are geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics. In this regard, it is important that results of EBSA identification are communicated clearly and concisely, and that EBSAs are defined in such as to support their use in policy and management decision-making. Among some of those EBSAs within the UoAs that had required special attention are deep coral reefs and seamounts.

Further, in Chile there are different conservation strategies to protect habitats depending on the type of fisheries, the management system and differences in marine fauna habitat utilization. This will be explained in the habitat management section.

In this report the assessment team has evaluated main or minor habitats in each UoAs. The assessment team categorized the bottom surface of the fishing grounds as main habitat for bottom trawl following the MSC requirements. Midwater trawl and longline were categorized as minor habitats . Please see the next section below.

#### 3.4.9.1 Main habitats:

Following the clause of FCR v2.0 SA 3.13.3, main habitats are defined by MSC as commonly encountered habitats during fishing operations. There is no fisheries in Chile that have interactions with VMEs due to these areas are well located and closed to fisheries activities under regulations.
117 seamounts have been regulated in 2017. Regarding commonly encountered habitats, the assessment team has used the footprint information reported on the recent publication of Amoroso *et al.,* (2018) to define the characteristics of these habitats.

Two main habitats have been defined:

1. Sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.
2. Muddy-sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat

As mentioned, the recently published study on impact of trawl fisheries worldwide (Amoroso *et al.,* 2018) showed that the main habitats that are most frequently encountered on the trawled activities areas in Chile regions (X-XII) are composed by muddy sand or sand bottoms (Figure 35). Amoroso *et al.,* (2018) calculated that the percentage of area trawled in South Austral Chile (Regions X-XII) is about 0.5% which is one of the lowest in comparison with other areas worldwide.

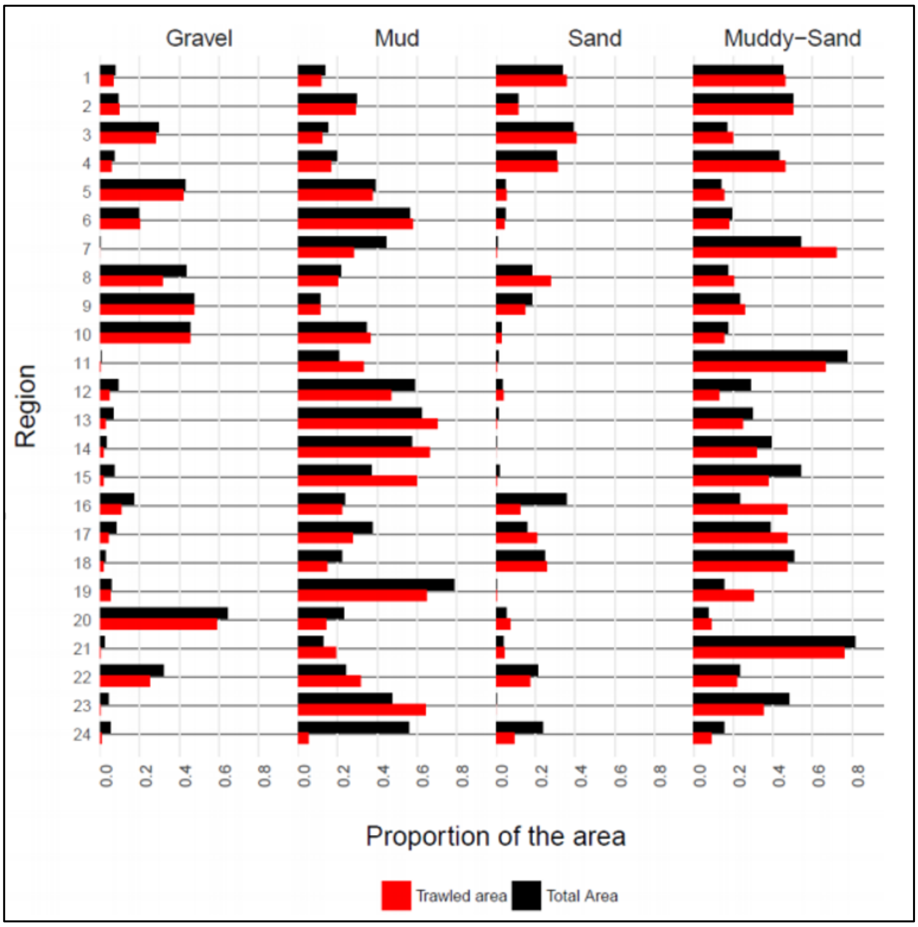



**Figure 35.** Relationship between the trawled area and total area sediment types and region (depths 0-1000 m). Note that Chile's (X-XII) region code is 24. Source: Amoroso *et al.* (2018).

Efforts to reduce the impacts of bottom trawl on bottom surfaces in Chile have resulted in the freeze of the trawl footprint impact. Oceana and the Chile government have been working in recent years to close new areas to trawling activities or industrial activities. As a result, ever since 2017, trawl activities can be done only on the same areas that have been fished for the last 15 years. The habitats where the industrial trawl fishery occurs consist of muddy- sand areas with no key biota elements and normally flat surfaces. Figure 36 shows the trawled areas in Chile and the kms impacted. The coverture of this result is 85%.

Further, the footprint is monitored by SUBPESCA and maps are available of each haul. The use of VMS has improved the information regarding where the fishing activities take place. Figure 37 shows the footprint in 2016 reported by the industrial vessels (UoA 1 and UoA 2). Over the years, the footprint has been very similar because the location of tradable fishing areas are well known.

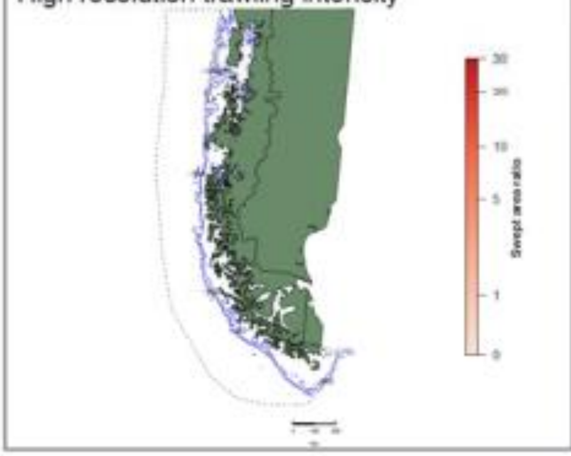
Because of the recent study by Amoroso *et al.,* (2018) and the new information from SUBPESCA, a more comprehensive information has been gathered on main habitats frequently encountered by trawls and for that reason the assessment team decided not to use the RBF as it was proposed in the announcement of the fishery certification.

South Chile
Numeric code 24

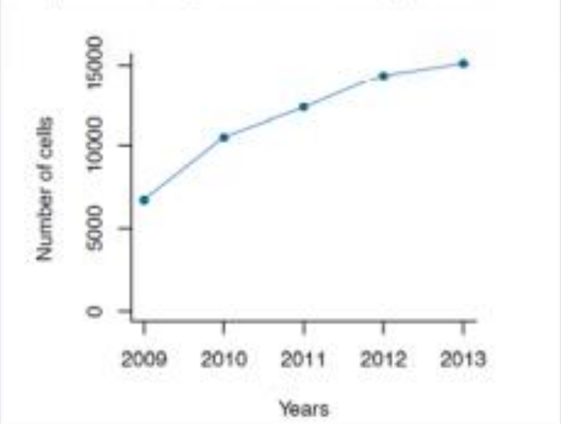
| | |
|---|---|
| **Region** | Americas |
| **Area 0-200 m (Km²)** | 148969 |
| **Area 200-1000 m (Km²)** | 39941 |
| | |

| | |
|---|---|
| **Years** | 2009-2013 |
| **Percentage of coverage** | 85% |
| **Contributing countries** | Chile |
| **Data type** | Logbook data. Coverage expressed in effort. |

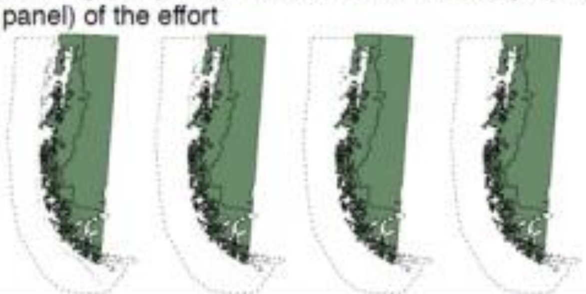
High resolution trawling intensity



Temporal changes in the area impacted



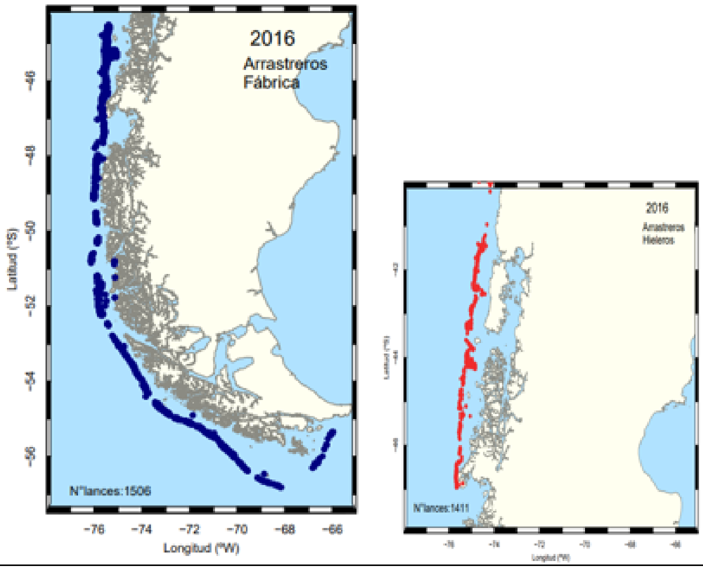

The total footprint of trawling (left panel) and the most intensively trawled areas including 80%, 50% and 30% (right panel) of the effort



Changes in trawl footprints as a function of grid resolution with grids of 1 Km (left panel), 5 Km, 10 Km and 20 Km (right panel)

**Figure 36.** Distribution and analyses of trawling activity data for South Chile (region code=24). The panels beneath the area and methods summary table shows the swept area ratio, by cell, for the entire regional grid (left), and the accumulation of the number of cells where trawling activity was recorded through time (right). The central panel of figures shows the concentration of bottom trawling by shading grid cells based on the rank contribution of activity in these cells to total activity. Source: Amoroso *et* al. (2018).

**Footprint industrial trawl (UoA1)**




**Footprint Longline (UoA 2)**

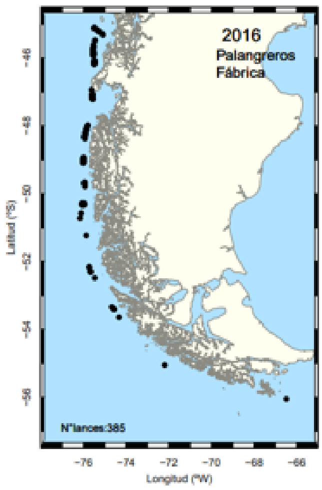



**Figure 37.** Distribution of trawling and longline activity data for South Chile. Footprint for both UoA in the study area. Source: Assessment team composition with maps from SUBPESCA.

In the midwater trawl, the contact with the bottom surface is very rare, and hardly ever the gear impacts the bottom because normally the fishing operations are in the water column and if any interaction happens is due to operation failures. Therefore, the water column is the main habitat for midwater trawl and also for longline UoA. Studies on impact of longline in habitats have been documented and effects of longline activities with habitats are known. This gear has little contact with the bottom surface and normally mayor impacts in habitats can occur depending on the hook size and how often longline gear is lost.

The maps show that the areas where different fishing gear operations take place are basically the same overall fishing grounds. However, there could be be some slight differences in the location. For that reason main habitats and minor habitats are defined with the same composition.

### 3.4.9.2 Minor habitats

Following the MSC criteria the assessment team has defined two minor habitats exclusively for bottom trawl. These are the bottom surfaces less trawled as shown in Figure 37. The benthic habitats classified as minor habitats using the criteria of MSC 2.0 SA3.13.2(ie habitat type, geomorphology and biota) are as follows:

Two main bottom surface are impacted by bottom trawl gear types classified as minor habitats:

1. Mud simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.
2. Gravel simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.

Following the recent publication by Amoroso *et al.,* (2018) the trawled surface bottoms classified as main habitats accounted for less than 0.1% of trawling activities. Therefore, these habitats are considered minor habitats. Minor habitats for longline and midwater trawl consist of the main habitats in the fishing grounds as all the activities take place in the same fishing grounds.

Figure 38 shows that most of the seafloor in Chile are not trawled. The figure also provide good information on fishing areas distribution and its overlap with the industrial fishery footprint allowing for a very detailed identification of main and minor habitats.

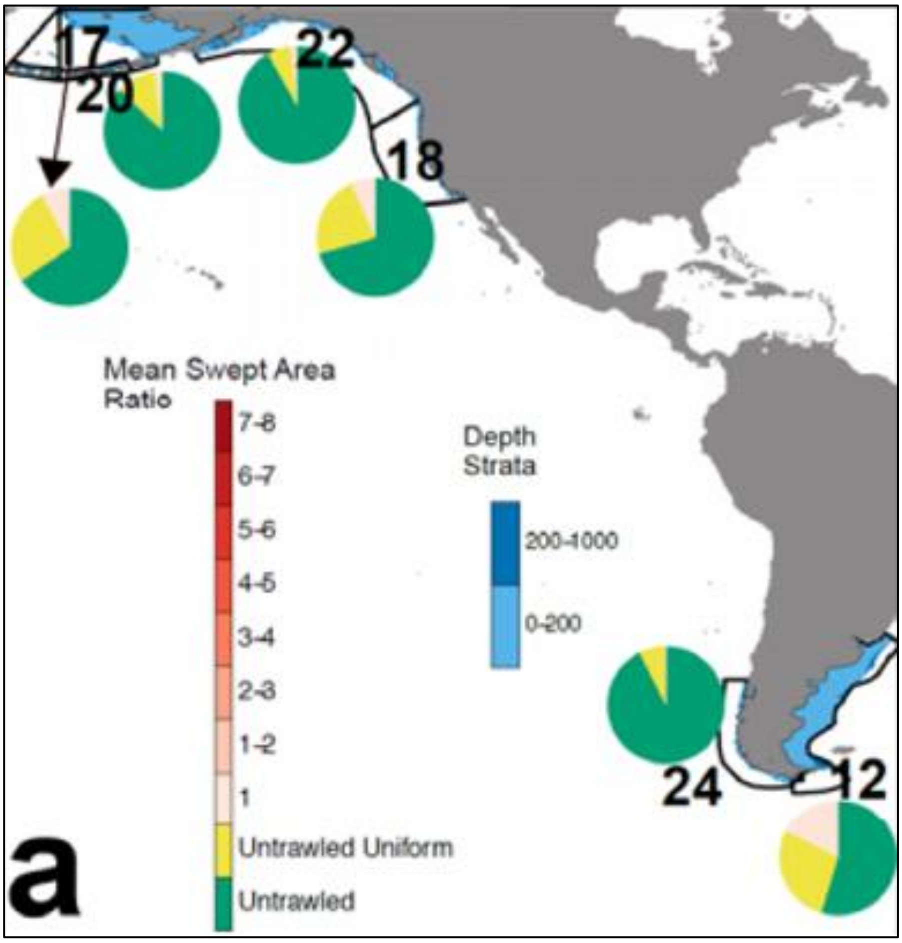



**Figure 38.** Portion of Chile region trawled versus untrawled. The green area in the diagram indicate the percentage of surface untrawled.

#### 3.4.9.3 Vulnerable Marine Ecosystems

Vulnerable Marine Ecosystems are not affected by the fishing activities in Chile. In fact, Chile has a robust management strategy to protect these ecosystems. Deep Sea Corals and seamounts are typically found at depths greater than 50 meters on the continental shelf and slopes, in offshore canyons, and near seamounts (Stone., 2006; Heifetz *et al.,* 2009). Many of these deep sea coral species form complex three dimensional structures that provide important habitat for many species of fish and invertebrates, enhancing local biodiversity. Because these corals are fragile and slow-growing, they are particularly vulnerable to disturbance from certain types of fishing gear. While the extent of deep sea coral habitat degradation has not been quantified in most areas, bottom tending fishing gear has been known to cause significant disturbance in many locations, and is considered to be the major threat to deep sea corals in areas where such fishing occurs (Stone., 2006; Heifetz *et al.,* 2009). Effects of commercial fishing gear on deep-sea corals has been documented (Stone., 2006, Heifetz *et al.,* 2009)

In Chile, information on these ecosystems is beginning to be gathered (Yanez *et al.,* 2009, Niklitschek *et al.,* 2010) resulting in a total of 118 seamounts distributed in the Chilean EEZ that have been identified and characterized. These studies have contributed on the community ecology and distribution of seamounts. Recent amendments to the Chilean Law of Fisheries and Aquaculture were implemented for the conservation of these ecosystems. New measures have been made for protecting vulnerable and sensitive habitats (e.g. implementing protection for all 117 seamounts) within its Exclusive Economic Zone from bottom trawling. These amendments were implemented in 2013 (Hernández Salas., 2015). The General Fisheries and Aquaculture Law, amended by Law No. 20,657, incorporates the protection of vulnerable marine ecosystems in the jurisdictional waters of the nation, including the seamounts, establishing in Article 5, third paragraph, that in the case of seamounts, bottom fishing will not be allowed, unless there is a scientific investigation carried out in accordance with the protocol and regulation referred to in Article 6 B, which demonstrates that the fishing activity does not generate adverse effects on the VMEs present in the area. Therefore, commercial fishing activities are not allowed in the areas. Thus, the UoAs defined herein have no interactions with seamounts and/or sensible ecosystems in Chile. Further, Chile has one of the most restrictive management systems in regards with the protection of the seamounts.

### 3.4.10. Habitats management

In Chile, there are three main ways to protect habitats:

- Marine protected areas which can be classified as marine parks, marine sanctuaries, marine reserves and National monuments;
- Vulnerable Marine ecosystems and;
- Bentonic Resources Management and Exploitation Areas (AMERB, “Áreas de Manejo y Explotación de Recursos Bentónicos”).

These areas are declared for the conservation and sustainable management of marine biodiversity, for which administrative and regulatory measures are established for access to fishing activities and others to prevent negative impacts on this biodiversity and the ecosystem. These measures are in accordance with the General corresponding Administration Plan and the general framework established in the General Fisheries and Aquaculture Law. Therefore, SUBPESCA establish the management system and the enforcement is part of SERNAPESCA responsabilities.

Marine parks are specific and delimited marine areas destined to preserve ecological units of interest for science and to protect areas that ensure the maintenance and diversity of hydrobiological species, as well as those associated with their habitat. No type of activity can be carried out in marine parks , except those that are authorized for purposes of observation, research or study.

The marine reserves correspond to protected areas of the hydrobiological resources in order to protect breeding areas, fishing grounds and areas of repopulation by management. Extractive activities can only be carried out for transitory periods, after a well-founded resolution of the under secretariat of Fisheries and Aquaculture.

Through the AMERB regime, exclusive use or exploitation rights are granted over the benthic resources (benthic invertebrates and algae), present in previously delimited geographic sectors. This regime can be developed exclusively by organizations of artisanal fishermen, legally constituted, prior approval of a management plan based on the sustainability of resources in the sector.

According to the General Law of Fisheries and Aquaculture (LGPA), this access regime can be established in the reserve area for artisanal fishing (ARPA) and in terrestrial waters (rivers and lakes) of the national territory. Therefore, this areas among others applied for artisanal fisheries or activities. However, the assessment team want to show that there are different control and management systems depends on the area and how is defined.

There has been considerable improvement on the studies of habitat and ecosystem functions and linkages since the last update of the fishing law in 2013. However, a recent article by Petit *et al.,* (2018) has shown that although conservation areas in Chile have been well defined with specific measures and actions, the efficiency of this management system needs to be evaluated.

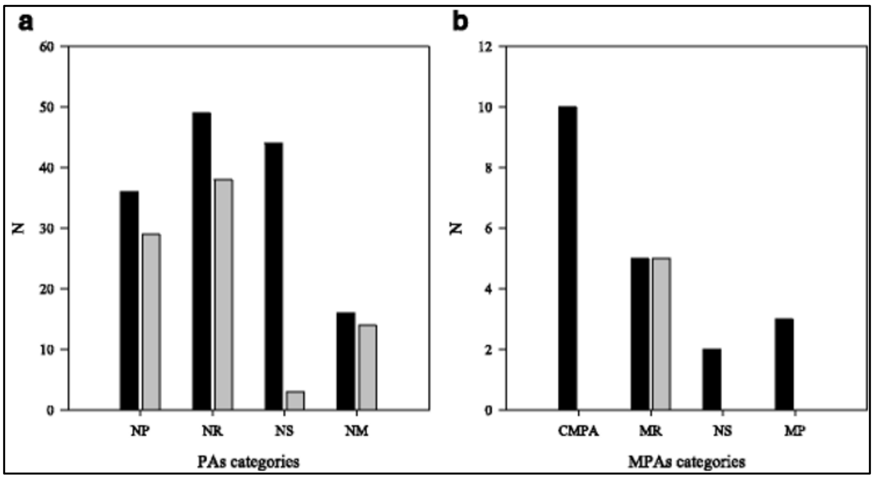



**Figure 39.** Protected areas (a) and Marine Protected Areas (b) divided by category of protection (NO: National Park, NR: National Reserve: NM: National Monument: NS: Nature Sanctuary: MR: Marine Reserve: CMPA: Coastal Marine Protected Area: MP: Marine park without (black bars) and with (grey bars) well defined management plan. Categories are shown from left to right in an increasing order of restriction. Source: Petit *et al*., 2018.

There are 20 currently declared MPAs representing more than 463,000 km$^2$ (13.6% of the Chilean EEZ) and include the following protection categories: Coastal Marine Protected Areas (CMPAs, N = 10), Marine Parks (MPs, N = 8), Marine Reserves (MRs, N = 5), and Nature Sanctuaries (NSs, N = 2). All Marine Reserves ("La Rinconada", "Isla Chañaral", "Isla Choros-Damas", "Pullinque" and "Putemún"), which correspond to 78.11 km$^2$, have management plans, but they only represent 0.1% of the total MPA surface area. Thus, 99.9% of the MPA surface area, corresponding to CMPAs, MPs, and NSs, don't have a well-defined management plan. According to Petit *et al*., (2018) and their analysis of the current situation in all the Chilean regions, 12.41% of the PAs in Chile have an effective management plan in place, but not all of them are effective managed. Therefore, only a 10.91% of the total are under protection in Chile is being effectively managed (Figure 39). Therefore more effort is still needed to ensure the protection of all the habitats in the Chilean regions.

### 3.4.11. Habitats information

There are some considerable efforts to obtain information on habitat in the Southern Austral region of Chile. For example, Global Positioning System information collected by VMS system is used to obtain information on fishing vessel position and the distribution of the fishery footprint of all fleets. Furthermore, there is a recent mandatory requirement for all industrial fishing vessels regarding the use of video cameras on board. This new technology will allow the collection of information about discards and record the presence of any vulnerable organism. Further, there is a research program carried out by the Ministry of the Environment to classify habitats on the areas where information is collected.

However, the current situation with the habitats information in Chile is that there is not enough information to develop conservation programs based on habitat requirements or linkages for marine resources in those regions. More effort should be done to compile all the information available.

### 3.4.12. Ecosystem outcome and management strategies

The fishing area of regions X-XII is characterized by the main oceanographic and zoogeographic patterns that characterize the South Austral region: a narrow continental shelf (<30 nautical miles), a strongly seasonal upwelling period (September to March) and high levels of primary productivity. The X-XII region also represents an independent management unit, comprising the main fishing ground for the Chilean industrial fleets, accounting for approximately 75% of total landings in Chile.

The Industrial fisheries on fish and crustacean species started in the decade of 1940s, when demersal trawlers targeted Chilean hake (*Merluccius gayi*). However, landings of this fleet were significant only from the mid 1950’s onwards. By the early 1960´s, mainly in the regions X-XIII, an industrial pelagic fishery developed, targeting small pelagic fish, mainly Araucanian herring (*Strangomera bentincki*) and anchovy (I).

At the same time, an industrial fleet operated on medium-sized pelagic fish, namely horse mackerel (I), landings of which were globally significant only from 1975 onwards; d) Significantly altered period (2000s-present): total landings in central Chile reached a peak in mid 1990s with a historical maximum landing of over 4.5 million tons in 1997, after which, total landings have consistently decreased. This is explained by serial stock declines in important fisheries such as horse mackerel (1998), red squat lobster and yellow squat lobster (1999) and Chilean hake (early 2000s). Since the early 1990s, all these fisheries have been managed by means of total allowable catches (TACs) set by the National Fisheries Council, following the technical advice of the Undersecretary of Fisheries. TACs are calculated following detailed analyses of the state of each fishery resource, based on fishery-independent (annual survey data) and fishery-dependent global or structured (by age or size) models. Other management measures include minimum legal size and reproductive (seasonal) bans (Neira *et.al.,* 2014).

Studies from indiseas website and by Neira *et al.,* (2016) have shown that because of the increasing fishing effort over the years, Chilean ecosystems are shifting from mature to immature ecosystems in which the trophic level index is getting lower. As a consequence, there has been an gradual increase on the abundance of small pelagic fish and rapidly becoming one of the most abundant and dominant species in the ecosystems (Figure 40).

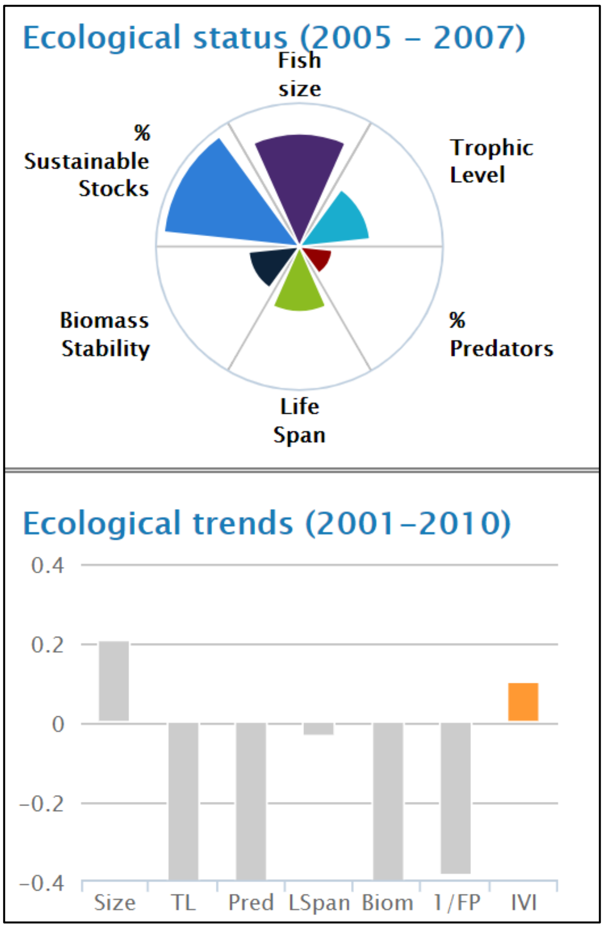



**Figure 40.** Ecological trends for Chilean ecosystems from 2001 to 2010. Source: Indicators for the seas. http://www.indiseas.org/.

Several studies state that the Chilean ecosystems are becoming immature because of the trend of increasing abundance of more small pelagic fish than high trophic predators (Figure 41 and Figure 42).

Commercial fishery data shows there have been changes in the total species composition on the landings over the years to small fish and these changes are reflected in the trends of other indicators. For example, significant declines occurred in total biomass and mean trophic level of landings from 1980 to 2005. Analysis of time series data from 1996 to 2005 shows significant increase in fish size, while a significant decline in TL .

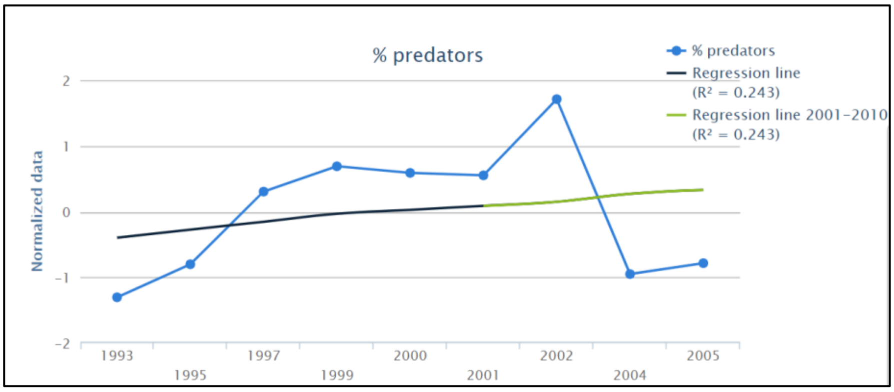



**Figure 41.** Percentage of predators in Chilean regions from 90's to 2005. Source: Indicators for the seas. http://www.indiseas.org/.

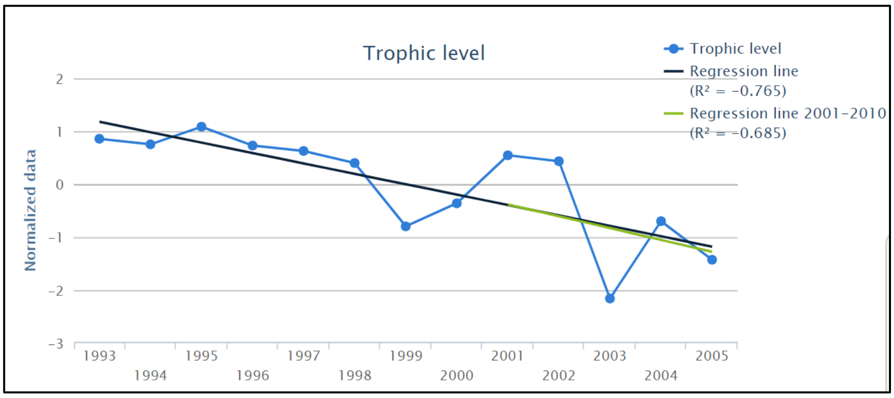



**Figure 42.** Trophic level of the Chilean ecosystems over the years. Source: Indicators for the seas. http://www.indiseas.org/.

These trends are the results of a wide spatial distribution of the industrial fleets through Chilean regions. The fragmentation and isolation of the landings and the organizational structure of the small-scale fleet have contributed in the difficulties of using traditional fisheries management measures for marine conservation because they are not effective enough. (Jurado *et al.,* 2016). Although Chile has not incorporated explicitly the ecosystem approach in the fisheries management, the concept has been introduced in a practical form through specific research projects, and regulations for the conservation of the stocks and the protection of the biodiversity (SUBPESCA., 2018). In this sense and despite that the principal focus of interest of the fishing research in Chile has been toward a simple single species framework, in the last 12 years an important amount of information has been produced that allowed a substantial improvement in the knowledge of ecological linkages between the species of interest and also the ecosystem approach in establishing the quotas every year is taken importance in recent years(Bernal *et al.,* 2017; Galvez *et al.,* 2017;Cespedes *et al.,* 2018) . IFOP, the fishery agency in charge of conducting and developing stock assessment models, is currently evaluating approaches regarding ecosystems needs in the models used to set up the reference points and/or limits.

Standing as sources of information for this purpose are the scientific observers programs, programs of monitoring fisheries operations and the programs of surveys to assess the main fish stocks (Bernal *et al.,* 2017; Galvez *et al.,* 2017; Cespedes *et al.,* 2018). In addition, other studies have been developed to obtain information and to describe the trophodynamics interactions between species, emphasizing for example age specific predator/prey relations by the Chile Austral hake (*Merluccius australis*) on the hoki (*Macroronus magellanicus*), which allowed to formulate a multispecific stock assessment models for the Chile Austral hake (Jurado *et al.,* 2016).

Overall, the new LGPA provides an ecosystem-based and precautionary approach to fisheries management in Chile but more effort is needed to recover all the commercial stocks. For example, SUBPESCA Ecosystem Science Framework was developed to provide an effective and comprehensive framework for identifying, monitoring, and interpreting trends important to ecosystem sustainability and integrating knowledge about the effects of human activities on ecosystem components. The Framework comprises two main elements: (1) conservation and sustainable use policies, and (2) planning and monitoring tools. The Conservation and Sustainable Use policies incorporate precautionary and ecosystem approaches into fisheries management decisions. Further IFOP is already using the ecosystem approach in the models to set up the quotas. Uncertainties regarding ecosystem needs/food webs/predator prey are taken into account on the model and also on projections for species with rebuilding plans. Some of these stocks such as Pink cusk eel, Southern Blue Whiting have improved presenting a notable recovery of their status. However, more years are needed to ensure that the strategies (i.e. ecosystem-based management) are working properly.

#### 3.4.12.1 Marine Protected Areas in the region

Marine Protected Areas (MPAs) are also defined in Chile within the context of integrated oceans management providing a mechanism for taking into account stakeholder input as well as broader ecological, social, cultural and economic considerations. It also provides an opportunity to reinforce conservation measures with complementary management regimes implemented in surrounding areas, including linkages with broader ecosystem objectives, as well as land-based initiatives such as habitat protection and enhancement, pollution control, land use controls and the establishment of coastal terrestrial parks. This approach of nesting MPAs within broader planning initiatives helps maintain the integrity and long-term viability of the MPA and maximize the conservation effectiveness of all MPA planning processes.

There are currently 19 MPAs in Chile under the above mentioned policy instruments among other protection figures. Six MPAs are present in the southern region (Figure 43). Among some of the most relevant MPAs include:

Pullinque (Region X) Declared in 2003, the Pullinque Marine Reserve is located in Region X. The marine reserve includes portions of sandy beach, water column, seabed and rocky islets located in the Gulf of Quetalmahue. The 7.4 km2 reserve is currently managed by SERNAPESCA with the goal to "preserve stocks of the Chilean oyster (*Tiostrea chilensis*) and protect, maintain and recover the affected area as a genetic reserve, natural bank and seeding ground for this species." An agreement is place between SERNAPESCA and the Chinquihue Foundation to implement a management plan; however, it is currently not operational.

Putemún (Region X) Putemún was also declared marine reserve in 2003 to protect a marine benthic resource. Managed by SERNAPESCA, the marine reserve's general goal is to "preserve stocks of the giant mussel (*Choromytilus chorus*) and protect, maintain and recover the affected area as a genetic reserve, natural bank and seeding ground for this species." Under an agreement between SERNAPESCA and IFOP, the latter is responsible for the research and management of the marine reserve.

Estero de Quitralco (Region XI) The 176 km2 sanctuary includes the waters, islands, and beaches surrounding an estuary in Region XI. The area is geologically significant due to volcanic activity and includes a number of hot springs. It is a tourist attraction and known for its coastal bird and seabird activity.

Francisco Coloane & Isla Carlos III (Region XII) in 2003, The Francisco Coloane multiple--use MPA was the first created under the GEF project "Conserving Globally Significant Biodiversity along the Chilean Coast". The largest in continental Chile, the Marine and Coastal Protected Area of Multiple Use spans 670 km2.

Isla Carlos III is a Marine Park (15 km2) that serves as the no take component of the MPA. Government agencies that are currently involved in the MPA management include the Navy, SERNAPESCA, MMA, and Ministerio Bien Nacionales; however, active on the ground management is weak and minimal because of a lack of capacity and resources in the region. Fishing occurs in and around the MPA. Tourism, based out of Punta Arenas, is established. There are currently less than ten ecotourism operators, with only two that have well developed, active programs.

In 2015 Chile created the largest Marine Reserve in the Americas around the Desventuradas Islands. The newly protected area is now a no fishing zone roughly the size of Italy, or 297,518 square kilometers.

The Nazca-Desventuradas Marine Park encloses the islands San Ambrosio and the San Felix islands, which are together known as the Islas de los Desventurados.

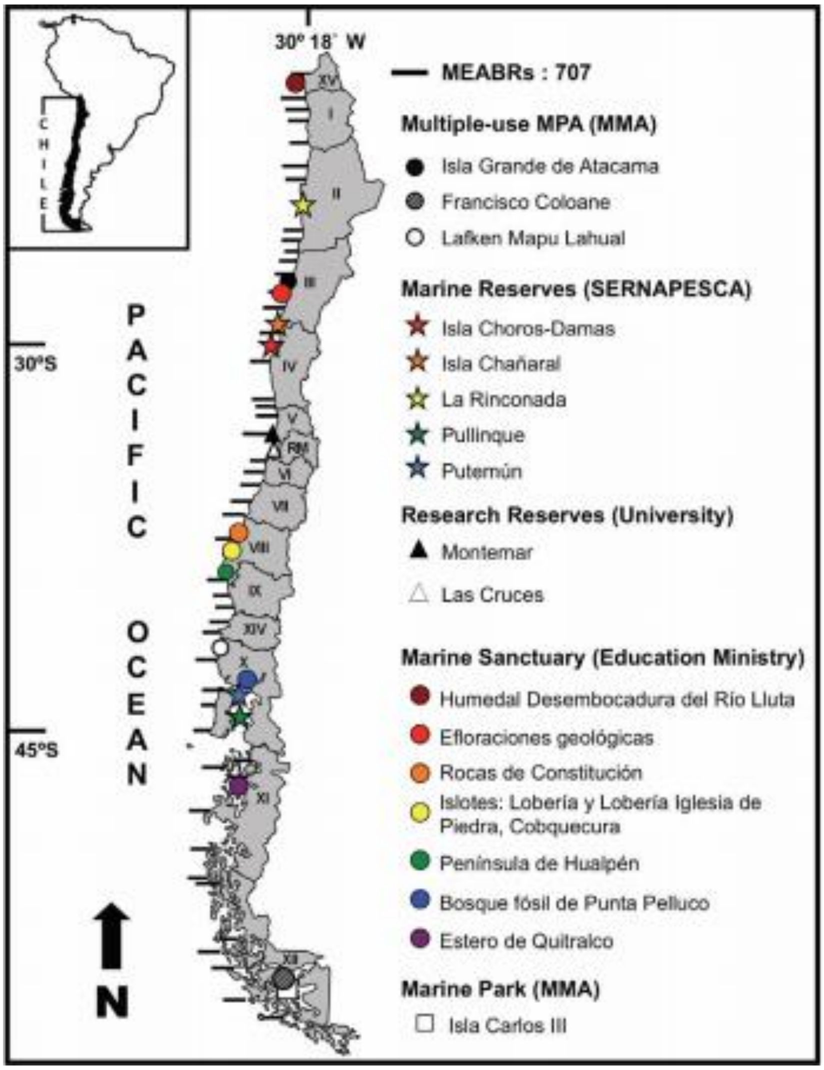


**Figure 43.** Marine protected areas in Chile and other figure of protection established in the LGPA. Source SERNAPESCA.

### 3.4.13. Ecosystem information

Information of Southern Austral Continental Shelves bioregion is data rich in many regards, but there are some gaps in some aspect relative to the area considered (e.g. temporally and spatially uneven survey coverage occurs across the area). Dealing with information and data originating from multiple sources and various collection methods present challenges in many ways (e.g. very large areas, seasonality, wide range of depths, etc.). It should be noted that the ecosystem approach to the analysis of important fishery resources in Chile is recent and has been aimed largely at the use of trophodynamic models that attempt to describe the abundance changes observed in some economically important resources (ie Austral hake, Hoki, Pink cusk eel, Southern Blue Whiting) (Jurado *et al*., 2016). Information collection programs on the Chilean fishery industry began to grow in importance over 40 years ago (Galvez *et al.,* 2017; Cespedes *et al.,* 2018). It has been accompanied by a more comprehensive collection of information, which is subjected to increasingly demanding standards in terms of the quality of the information (i.e. Optimum No. Samples, sampling survey design CVs in estimates etc.).

The Scientist Observer Program (Programa de observadores científicos) and the Southern Austral demersal fisheries discards program which initiated in 2015, are providing more data to include in the stock assessment models contributing in the advice and regulations. Therefore, it is expected to have a better understanding of the function of all key elements of the ecosystems in the coming years.

## 3.5. Principle Three: Management System Background

The industrial fishery of Chile Austral hake (*Merluccius australis*) consists of two units from the management point of view but belonging both to the same unit stock, which are distributed in the following areas (Figure 44).

**Northern Fishery Unit**: area between latitudes 41° 28.6 ' S and 47° S, from the East limit established by Article No. 47 of the Fishery Act (i.e., outside of the baselines established by Decree No. 416 of 1977 of the Ministry of Foreign Affairs), to the West limit corresponding to the imaginary line drawn at a distance of 200 nautical miles from the coast. Commonly called "Northern outer area".

**Southern Fishery Unit**: area between latitudes 47° S and 57° S, from the East limit set by Article No. 47 of the Fishery Act (i.e., outside of the baselines established by Decree No. 416 of 1977 of the Ministry of Foreign Affairs), to the West limit corresponding to the imaginary line drawn at a distance of 200 nautical miles from the coast. Commonly called "Southern outer area".

Both fishery units are declared as Fully Exploited, first by the transitional Article No. 4 of law 19.080 of September 1991 and then through Decree No. 354 of 1993 of the Ministry of Economy, Development and Reconstruction, hereinafter Ministry of Economy, and with closed access to the increase in fishing effort since 1989, through Decree No. 291 of 1989 of the Ministry of Economy, and then through successive decrees established annually between 1991 and 2013, and subsequently closed by law, according to Article No. 24 of the Fisheries Act.

Within the same stock unit, there is an artisanal fishery with fishing areas in the interior of the following regions: Los Lagos (Region X), Aysén of the General Carlos Ibáñez del Campo (Region XI), and Magallanes and Antartica Chilena (Region XII). The judicial category of Chile Austral hake corresponds to "Sole Jurisdiction".

Figure 44 shows Chile Austral hake industrial fishery geographic distribution.

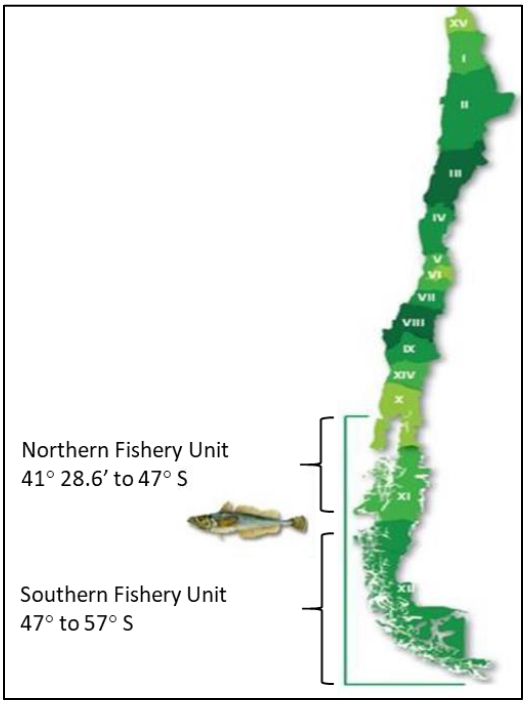



**Figure 44.** Map showing the geographic distribution of Chile Austral hake. **Source**: Status of the main Chilean fisheries, 2015. SUBPESCA.

### 3.5.1. Legal and/or customary framework

Overall fisheries in Chile are regulated under the new General Law for Fishery and Aquaculture (LGPA Ley General de Pesca y Aquicultura), which provides the regulatory framework for sustainable management of hydrobiological resources and their environment in Chile. More recently, the law was under revision to change one of the parts regarding the licenses and the permits to fish in Chilean waters. In 2013 an amendment of the Draft Fisheries Act LGPA was adopted and implemented.

The LGPA modifies the old law in terms of sustainability of aquatic resources, access to industrial and artisanal fishery activities, and regulations for research, management and enforcement. The most significant previous amendment to the LGPA was in 2001 with the establishment of an ITQ system of Maximum Catch Limits by ship-owner, the artisanal extraction regime, management and exploitation areas for benthic resources, a vessel monitoring system and mandatory dockside monitoring of all landings and the discard regulations introduced in 2012.

Nowadays, the management system is directly linked to the LGPA, and basically, SUBPESCA (management system) and SERNAPESCA (enforcement and compliance) are the bodies in charge to apply the different articles of the law. The LGPA in place is the number 21.033 where the last updates were approved by the Minister. More details on the workings of this Act are given in the sections below.

### 3.5.2. Particulars of the recognised groups with interests in the UoA.

Stakeholders involved in the management processes of Chile Austral hake fishery at different life stages are as follows: Ministry of Economy, Development and Tourism, Undersecretary of Fishery, National Fishery Service, Institute of Fishery Development, Fishery Research, Management Committee of Chile Austral Hake, Scientific Technical Committee of South Austral Demersal Zone Resources, National Fishery Council, Zonal Fishery Council of Regions X, XI, and XII. Their composition, roles and responsibilities are as follows:

- **Ministry of Economy** (Ministerio de Economía): According to the Decree 2.442 of 1978, among other matters, it sets basic policies to direct and coordinate the activities of the State in relation to the fishery sector. Its action is to promote the development of the fishing sector, the protection, conservation, and comprehensive utilization of resources and the aquatic environment. The Ministry establishes the rules of law, as well as management regulations, according to reports from the Undersecretary of Fishery.

- **Undersecretary of Fishery** (Subsecretaría de Pesca): Regulatory agency under the Ministry of Economy, which designs and implements policies and management regulations aimed at conservation and sustainability of hydrobiological resources, in coordination with the decision makers of the sector through instances of participation established by law. The adoption of administrative and management regulations should be supported by technical reports and comply, as appropriate, with the demands of consultations, approvals or communications established by law for each of them (Decree 2.442 of 1978 and General Law of Fishery and Aquaculture = Ley General de Pesca y Acuicultura LGPA)). The organizational structure of the Undersecretary of Fishery, is as follows (Figure 45):

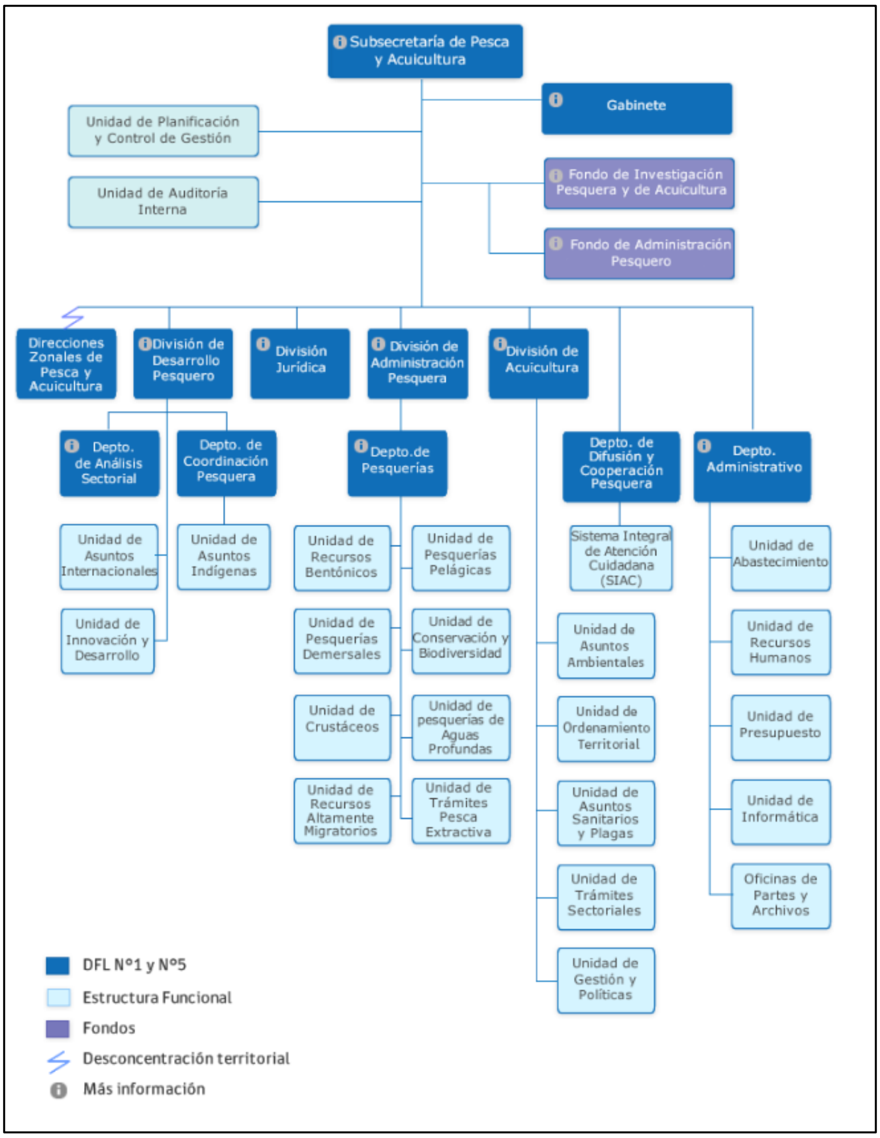



**Figure 45.** Chart showing the organizational structure of the Undersecretary of Fishery. Source: Website of the Undersecretary of Fishery.

- **National Fishery Service** (Servicio Nacional de Pesca): Agency under the Ministry of Economy, monitors fishing activities while ensuring compliance with the legal and regulatory rules established. In addition, manages the Fishery Records (Registros Pesqueros), which is crucial for the harvesting activities; collecting and processing landings information, and capture and processing of hydrobiological resources (Decree No. 2.442 of 1978 and General Law of Fishery and Aquaculture).

- **Institute of Fishery Development** (Instituto de Fomento Pesquero, IFOP): Agency specializing in scientific research in the field of fishery and aquaculture, collaborates and is the permanent advisor to the Undersecretary of Fishery in decision-making regarding the sustainable use of fish stocks and the conservation of the marine environment, according to the Fishery Act. Responsible of developing research continuity defined in the research program developed by the Undersecretary of Fishery every year, and responsible the data base management generated by research activities and the monitoring of the fisheries (Article No. 156 LGPA).

Research databases are owned by the State and are of public access. Statistical quality standards, form and content of the data obtained from the research programs should be established in conjunction with the Scientific Technical Committee.

- **Management Committee of Chile Austral Hake** (Comite de Manejo de Merluza del Sur): Organization of advisory character, one of its main functions is the elaboration of a Management Plan proposal for the fishery, its implementation, evaluation and adaptation, if applicable. The Committee is composed of representatives of artisanal fishery, industry, processing plants, the National Fishery Service, and Undersecretary of Fishery, who chairs it. The management committees were created in the last modification to the fishery law of 2013. The Management Committee of Chile Austral hake was formed on August 25, 2014 and its members are identified in the Undersecretary of Fishery webpage.

  The Management Plan proposal should be reviewed by the Scientific Technical Committee, after which the Management Committee modifies the proposal, if applicable. The Undersecretary of Fishery must approve the Management Plan by resolution and its provisions are mandatory for all agents.

- **Scientific Technical Committee of South Austral Demersal Zone Resources** (Comité Científico Técnico de Recursos Demersales Zona Sur Austral, CCT): advisory body and/or consultation group for the Undersecretary of Fishery on scientific matters relevant to the management of closed access fisheries, as well as environmental issues and conservation where the Undersecretary considers pertinent. The Scientific Technical Committee was created by the Fishery Act in 2013. The members of the Committee are listed in the Undersecretary of Fishery webpage.

  In general terms, the Scientific Technical Committee, should have from 3 to 5 members. To become a member, applicants must prove to have a professional degree and experience in marine sciences related to the management and conservation of fishery resources. Members are appointed prior public tender, last four years in its functions, and are subject to causes of conflict of interest. Two representatives from the Institute of Fishery Development (IFOP) and the Undersecretary of Fishery are also members. Two members with grounds for disability can participate, but they have no right to vote.

  Grounds for conflict of interest are:
  - having the status of dependent public official or independent advisor of the Ministry of Economy or from the dependent public dealings,
  - be dependent worker or an independent advisor of the Institute of Fishery Development or fishing companies, associations of artisanal and industrial fishing, or processing plant or its parent, subsidiaries or affiliates.

  The Scientific Technical Committee, according to the Fishery Act, hereinafter LGPA, (Article No. 153 of the LGPA) should determine: (i) Status of the fishery, (ii) biological reference points, and (iii) the range within which the authority may establish the catch quota. In addition, can be consulted by the under-Ministry of fishing in other areas such as: design of management and conservation, and formulation of the plans of management regulations.

  The Scientific Technical Committee of the Chile Austral hake was founded in December 2013.

- **National Fishery Council** (Consejo Nacional de Pesca): auxiliary agency of the State's administration in advisory and operative character, as appropriate, it aims to contribute to effective participation of agents of the fishery sector on the national level in matters related to the activity of fishing.

The Council consist of 28 representatives, 3 representing the public sector, 5 representing the business sector (industrial), 7 representatives from the labor sector, 5 representatives of the artisanal sector, 7 representatives from the processing and shipping plants, 7 members nominated by the President and approved by the Senate. Members of the National Fishery Council can be found in the Undersecretary of Fishery webpage.

Besides the subjects in which the law establishes the participation of the Council, according to Article No. 149 of the LGPA, the Undersecretary of Fishery should consult with the Council with respect to the following matters: (i) National Fisheries Development Plan; (ii) International Fisheries Policy; (iii) modifications of the General Law of Fisheries and Aquaculture; (iv) development of artisanal fisheries, and (v) National Plan for Fishery Research.

The Council can also refer to other sectoral matters that it considers relevant, being able to request the necessary technical background of public or private sector organizations, through its President. Counselors can also present to the sectoral authorities, the facts which, in his opinion, affect fishing activities, hydrobiological resources and their environment, and require initiatives to the Undersecretary in any matter within its power, requirement that the Undersecretary can deny.

The National Fishery Council is in operation since 1993.

- **Zonal Fishery Councils** (Consejos Zonales de Pesca): they are auxiliary agencies of the State administration of consultative or operative character, as appropriate. They are intended to help decentralize the management regulations adopted by the authority and make effective the participation of fishing agents at the zonal level, on matters related to fishing activities.

  At the national level there are 8 Zonal Fishery Councils composed of 18 members each: 5 representing the public sector, regional or zonal, 2 representatives of universities related to marine sciences, 4 representatives of the industrial associations, 3 representing fleet and processing plants workers, 3 representatives of the artisanal sector, and 1 representative of non-profits that have as objective the protection of the environment, preservation of natural resources, or research of natural resources. Members of the Zonal Fishery Councils can be found in the Undersecretary of Fishery webpage.

  The Zonal Fishery Councils should express their opinion before the consultations, as well as produce technical reports on various matters related to the management of fishery resources.

- **Other stakeholders:** Holders of transferable fishing licenses (licencias transables de pesca=LTP) for pink cusk eel, Southern blue whiting, and hoki, when capturing these resources, they also catch Chile Austral hake as bycatch. The current fishing regulation establishes that holders of transferable fishing licenses of these resources, must have a quota for Chile Austral hake, in order to have where to impute the catches made on said resource as a bycatch.

  Artisanal fishermen are registered in the Artisanal Fishing Registry (Registro Pesquero Artesanal) in the Chile Austral hake fishery, since they share the exploitation of the stock, but not the fishing areas.

### 3.5.3. Details of consultations leading to the formulation of the management plan.

The Management Plan of the Chile Austral hake fishery is established according to the Technical Report of the Undersecretary of Fishery of October 2016, and made official by the Resolution No. 3.069 of October 2016 of the Undersecretary of Fishery. The Management Plan of the Chile Austral hake fishery was prepared according to the existing regulation, and submitted to the Undersecretary of Fishery by the Management Committee of the fishery, which prior to its official recognition was subjected to Scientific Technical Committee for consult.

**a. Arrangements for on-going consultations with interest groups.**
The current fishing regulation requires that once the Management Plan has been established, all the conservation measures taken must be contained in the Plan. The Management Plan should considered the evaluation period, which may not exceed five years. (Article No. 8 of the LGPA).

Still, depending on the type of regulation that should be established, compliance with the requirements of participation and consultation of the different agencies involved in the decision-making process established by law, as stated in the letter f), should be done. Thus, for example, for the determination of the annual global catch quota, this must be set within the range proposed by the corresponding Scientific Technical Committee.

**b. Details of other non-MSC fishery users or activities, which could affect the UoA, and arrangements for liaison and co-ordination.**
In the case of the Chile Austral hake industrial fishery happening in the outer sea area south of 41° 28.6' S., there are no other non-fisheries activities that may affect this fishery since there are no farming activities developed on the outside sea area.

In the case of the artisanal Chile Austral hake fishery, which takes place in inland waters in Regions X, XI and XII, this activity has to share the area with the development of farming activities, both fish (especially salmon), and mollusks (mostly mussels). Farming activities can only be done in areas previously designated by decree by the Ministry of National Defense (Ministro de Defensa Nacional) as appropriate for the exercise of aquaculture, prior technical report of the Undersecretary of Fishery, which consults all the agencies responsible for alternative uses of water and citizenship in general. In addition, the law establishes that appropriate areas could not be established for aquaculture in those areas that qualify as fishing grounds.

Another activity with which artisanal activities in inland waters should be shared with are the marine coastal areas previously established.

### 3.5.4. Details of the decision-making process or processes, including the recognised participants.
In the decision-making process, the fisheries authority must set queries or requirements of technical report or previous communications to the agencies involved in the management. Participation of different stakeholders on the establishment of prohibitions or management regulations are as follow:

- For the establishment of the conservation or management regulations, referred to in Article No. 3 of the LGPA, (establish closed areas, prohibition of temporary or permanent capture of species protected by international agreements, establish catch quotas, determination marine parks and marine reserves, setting percentages of landing as bycatch), in addition to the technical report of the Undersecretary of Fishery, regulations made by the Scientific Technical Committee must be communicated previously, also some of them should be reported to the National Fishery Council, i.e. the quota set aside for research. The corresponding Scientific Technical Committee should propose the range within which the global catch quota should be established.

- To set conservation or management regulations referred to in Article No. 4 of the LGPA (set minimum sizes of harvest, set dimensions and characteristics of the fishing gear types, require the use of devices to minimize the capture of bycatch, require the use of devices to release bycatch), the Undersecretary of Fishery can set them after consultation with the corresponding Zonal Fishery Council and prior notice to the appropriate Scientific Technical Committee.

- To establish conservation and management regulations referred to in Article No. 6A of the LGPA, (regulation of Vulnerable Marine Ecosystems) the Minister may establish them after seen the

Undersecretary of Fishery technical report and after communicating with the appropriate Zonal Fishery Council.

- Resources whose fisheries qualify as demersal fishing, which could affect vulnerable marine ecosystems, according to Article No. 6B of the LGPA, is determined according to the decision made by corresponding Scientific Technical Committee.

- The Undersecretary can also confer with the Scientific Technical Committee of South Austral Demersal Zone Resources regarding the creation of conservation and management regulations and the preparation of management plans. The Scientific Technical Committee should consider in their reports the information provided by Institute of Fishery Development (IFOP) as well as from other sources.

The establishment of the Management Plan, according to Article No. 8 of the LGPA, is established per request of the management committee of the fishery, after consulting the appropriate scientific technical committee.

The necessary research program for the regulation of fishing, should be prepared annually by the Undersecretary of Fishery, which will require research proposals from the National Fishery Council, Zonal Fishery Councils, Scientific Technical Committees, and the Institute of Fishery Development (Article No. 91 of the LGPA), as well as the management plans.

### 3.5.5. Objectives for the fishery (referring to any or all of the following if relevant):

- Resource
- Environmental
- Biodiversity and ecological
- Technological
- Social
- Economic

The general objective of the law that regulates fisheries activities is the conservation and sustainable use of hydrobiological resources through the application of a precautionary and exosystemic approach, protecting marine ecosystems. It must, at least, assess the effectiveness of the regulations taken every five years.

To achieve these goals, the agencies should always consider the following (Article No. 1C of the LGPA):

- Establish long-term goals for the conservation and management of fisheries and protection of their ecosystems.
- Periodic assessment of the effectiveness of the regulations.
- Apply the precautionary approach, and be cautious when scientific information is uncertain, not reliable or incomplete. The lack of scientific information, reliability, or completeness should not be use as a reason for postponing or not adopting conservation and management regulations.
- Apply the ecosystem approach to the conservation and management of fishery resources and the protection of its ecosystems, considering the interrelationship of the dominant species in a given area.
- Manage fisheries resources in a transparent, responsible, and inclusive way.
- Collect, verify, report, and share in a systematic, timely, correct and public way the data on hydrobiological resources and its ecosystems.
- Consider the impact of fishing on associated or dependent species and the preservation of the aquatic environment.
- Prevent or eliminate overfishing and going over the fishing capacity.
- Oversee the effective implementation of conservation and management regulations.
- Minimize discarding, both of the target species and the bycatch of non-target species.

To achieve their goals, the fisheries management agencies have the power to establish the following management regulations:

- Seasonal and spatial closure: biological (spawning and recruitment protection), and bycatch allowances.
- Prohibition of temporary or permanent capture of species protected by International Convention.
- Annual quotas of catch by species in a given area.
- Designation of marine parks and marine reserves in conjunction with the Ministry of the Environment.
- Percentages of species landed as bycatch.
- Set size or minimum weights of harvest by species in a given area and its margins of tolerance.
- Set dimensions and characteristics of the fishing gear types.
- Establishment of use and size of devices or tools in ships to minimize or avoid the capture of bycatch, so the fishing will be more selective.
- Establishment of the use of devices and tools in vessels to release bycatch according to the different fishing gear types.
- Establishment of good fishing practices to avoid, minimize, or mitigate bycatch of mammals, birds, and aquatic reptiles.
- Extraordinary seasonal and spatial closures in an area or particular fishery, in the event of oceanographic phenomena which cause damage to one or more species.

The specific objectives for the Chile Austral hake management are specified in its Management Plan contained in the report of the Management Committee made official through resolution No. 3.069 of 2016 of the Subsecretary of Fishery.

The purpose of the management plan is to contribute to the "conservation and sustainable use of Chile Austral hake resource, for greater social and economic value over time". To achieve this purpose, goals are established in three areas: biological/ecological, economic, and social. The main objectives are as follows:

<u>Biological/ecological goals:</u>

- Bring spawn biomass to 40% of the virgin value.
- Define the best strategy that would allow to obtain the highest level of annual harvest from the stock.
- Protect the reproductive process.
- Protect juveniles to preserve the resource productivity.
- Reduce and mitigate the discard of target species, their bycatch, and the capture of bycatch.
- Propose a proper management of the harvest of cuttlefish and others that affect the availability of Chile Austral hake.

For each of the biological/ecological objectives, the Management Plan has its corresponding indicator, reference point, management/actions regulations, and rules for decision control.

<u>Economic objectives:</u>

- Increase the net income of the participants of the fishery.
- Maximize the total value of the fishery.

For each of the economic objectives, the Management Plan presents, its indicator, reference point, actions and regulations.

<u>Social objetives:</u>

- Promote improvements on working conditions on the artisanal fishing fleet based on current regional conditions.
- Improve knowledge of fishery regulations.

For each of the social objectives, the Management Plan has its indicator, point of reference, actions and products.

In addition, the Management Plan includes harvesting strategies, evaluation criteria of the fulfilment of the objectives and strategies, contingency strategies, and research and monitoring requirement.

### 3.5.6. Particulars of arrangements and responsibilities for monitoring, control and surveillance, and enforcement.

The National Fishery Service, the Chile Navy, and the Chile Carabineros (these last two in their pertinent territorial area) are responsible to enforce the regulations established in the Fishing Act (Article 122 of the LGPA). The fishing regulation establishes the requirement of various devices for a proper monitoring, control, and surveillance of harvesting activities, processing, and marketing, for compliance with agreed standards of conservation and management.

Monitoring devices currently required are the following:

- **Satellite Positioner:** required on all industrial fishing vessels since August of 2000, independent of the system with which they are operating. Harvesting activities should be done while maintaining the positioning system automatic in the sea, starting from the moment of the departure until it docks at port. (Law 19.521 amended by the LGPA).

  The positioning system signal comes on automatically and simultaneously to two institutions, the General Directorate of the Maritime Territory (agency within the Chile Navy), and the National Fishery Service. Both institutions have the obligation to ensure compliance with the requirement and are empowered to make the relevant complaints to breaches detected.

  This requirement is applicable to all industrials vessels equal or greater than 15 m, independent of their fishery harvesting activities, and applicable to the artisanal fleet in the case of the Chile Austral hake fishery vessels equal to or greater than 15 meters.

- **Landing Certification:** since 2001, the law establishes the requirement for all industrial buildings, independent of the system of administration with which they are operating, to certify catches at the time of landing. The certification must be done by an auditing agency accredited by the National Fishery Service (Law 19.713). This requirement was included as a permanent rule in the legal amendments of 2013 to the LGPA, by Law 20.657.

  This requirement is also applicable to artisanal fleet vessels of a length equal to or greater than 12 meters.

- **Scientific Observer:** since 2001 the law establishes the obligation to accept onboard scientific observers designated by the Undersecretary to all vessels, industrial or artisanal (Law 19.713). This requirement was included as a permanent rule in legal modification to the LGPA by Law 20.657 in February 2013.

  By the end of the month, Undersecretary of Fishery establishes which vessels should accept a scientific observer on board during the following month. The designated vessels are not authorized to set sail without the presence of the observer on board.

- **Cameras for the recording images on board the ships:** since the end of 2012, the law establishes that all industrial vessels should install and maintain in operation a device for the recording of images that allows to detect and record all discarding actions that may occur on board. (Law 20.625 amending the LGPA).

This requirement is applicable to the artisanal fleet only to the vessels in a length equal to or greater than 15 meters.

This requirement has not been implemented yet by the agency, which is working to determine the technical requirements of the recording devices (i.e. cameras) to be required, as well as the location and number of devices by type of fishery and size of the boat. According to the information provided by the Sernapesca, it is estimated that the system will be operational in April 2019.

- Using enabled ports: since 2015, vessels can only unload their catches in points or unloading ports approved by the National Fishery Service (Article No. 63 of the LGPA) determined in the Resolution 04 of 2015, of the service National Fishery Service.

- Electronic logs of catches by fishing lance: all industrial vessels should inform the National Fishery Service of all catches from each resource after each haul. In the future, the National Fishery Service must set the margin of difference to be accepted between reported catches and certified landings. All the differences that are above the set range will be liable to the holder's authorized share (Law 20.657). This same information, could be required from the artisanal fleet.

- **Traceability:** according to the Decree No. 129 of 2013 of the Ministry of Economy, the National Fishery Service was empowered to provide computer systems to ensure appropriate reports of industrial or artisanal ship-owners, and to facilitate monitoring of catches in the processes of transformation and marketing.
  Consistent with the above, Resolution No. 2.523 of 2017 of the National Fishery Service, established the mandatory use of an online traceability system for the delivery of information of all the agents involved in the chain custody of fishery resources, and established its gradual implementation.

  According to the Resolution, the requirement is applicable to:
  - Transferable fishing licenses and special fishing permits holders, from the tenth day after the Resolution was published, this is from June 21, 2016.
  - Transshipment vessels owners for transportation from January 1, 2018.
  - Artisanal shipowners required to certify their landings from August 1, 2017.
  - Artisan ship-owners not required to certify their landings of Chile Austral hake, starting from January 1, 2018.
  - Oowners of processing / transformation plants and the people that perform Chile Austral hake marketing, starting from January 1, 2018.

- **Legal origin certification:** the Resolution No. 3510 of 2018 of the National Fishery Service, established the electronic procedure of certification of legal origin for the agents participating in the traceability system.

### 3.5.7. Date of next review and audit of the management plan.

According to the LGPA (Article No. 8) the period for assessing management plans should not exceed 5 years. However according to Point 7 of Chile Austral hake management plan, the management ccommittee shall perform an annual review with respect to the compliance associated with each of the objectives in order to make adjustments / changes to the management plan.

[Note: Some of the above may be of a generic nature and hence be dealt with in the general rules of fishing (e.g. a national fishery legislation), in which case these can be referred to in the plan, without repeating all the details. However, specific points or detail may be required for specific fisheries.]

2. The report shall indicate which combination of jurisdictional categories apply to the management system of the UoA, including consideration of formal, informal and/or traditional management systems when assessing performance of UoAs under Principle 3, including:

- Single jurisdiction
- Single jurisdiction with indigenous component
- Shared stocks
- Straddling stocks
- Stocks of highly migratory species (HMS)
- Stocks of discrete high seas non-HMS

According to the assessment of the area of distribution of Chile Austral hake, its jurisdiction qualifies as unique.

# 4. Evaluation Procedure

## 4.1. Harmonised Fishery Assessment

MSC CR v2.0 Guidance states that, "*The aim of harmonization is to avoid the perversity that two essentially similar fisheries receiving materially different scores (materially in the number, and text, of conditions, or in the overall outcome, whether a pass or a fail). Fisheries that are identical should receive identical scores*." MSC have also confirmed that harmonization of similar fisheries using different versions of the default assessment tree, i.e. v1.3 and v2.0, should still take place where they are materially unchanged (MSC Interpretations webpage).

Therefore, in this instance, it is concluded that harmonisation is required for those fisheries that:

1. Target the same Principle 1 stock and have been assessed using v2.0, i.e. the same version used for the Chile Austral hake industrial trawl and longline fishery; and,
2. Operate under the same overarching governance and policy framework (PIs prefixed with 3.1.1-3.13).
3. Have 2 UoAs that are identical in scope even if the UoCs are different (i.e. different client).

**Rationale for harmonization decisions**

Currently there are 6 other fisheries within FAO area 87 that are either currently certified or in assessment. These are detailed in Table 30.

Of these the Chilean fisheries may require some harmonisation around elements of Principles 2 and 3. Harmonization should be considered between the Chile Austral hake industrial trawl and longline fishery and the other Chilean Certified fisheries with respect to performance indicators PI-3.11-3.14 from Principle 3.

Table 30 lists the MSC certified or in-assessment fisheries that overlap with the Chile Austral hake Industrial. The fisheries that are coloured are those that meet points 1 and 2 above and need to be harmonised. Table 31 shows the scoring of the overlapping fisheries in 3.11-3.13 PIs.

**Table 30**. MSC certified and in-assessment fisheries that overlap with the Chile Austral hake Industrial Trawl and Longline Fishery.

| MSC Fishery | MSC Link | MSC CR version | | Comment |
|---|---|---|---|---|
| | | 1.3 | 2.0 | |
| Chilean jack mackerel Purse Seine fishery | https://fisheries.msc.org/en/fisheries/chile-purse-seine-jack-mackerel-jurel/@@view | | ✓ | Harmonisation required for PIs pre-fixed with 3.1. Harmonisation with P2 with Chilean jack mackerel fisheries is required as both fisheries impacts same population of ETP species; even if scores are different as explained below |
| Chile Nylon shrimp and squat lobsters Modified trawl fishery | https://fisheries.msc.org/en/fisheries/chile-squat-lobsters-and-nylon-shrimp-modified-trawl/@@view | ✓ | | Harmonisation required for PIs pre-fixed with 3.1 |
| Chile squat lobsters demersal trawl Camanchaca Fishery | https://fisheries.msc.org/en/fisheries/chile-squat-lobsters-demersal-trawl-camanchaca-fishery/@@assessments | | ✓ | Harmonisation required for PIs pre-fixed with 3.1 |
| Chilean mussel fishery and suspended culture Toralla S.A and Cultivos Toralla S.A | https://fisheries.msc.org/en/fisheries/chilean-mussel-fishery-and-suspended-culture-toralla-s.a- | ✓ | ✓ | Certified In 2014 under MSC 1.3. In assessment under MSC 2.0 assessment.<br>No scores yet |

| MSC Fishery | MSC Link | MSC CR version | | Comment |
|---|---|---|---|---|
| | | 1.3 | 2.0 | |
| | and-cultivos-toralla-s.a/@@assessments | | | |
| Chile Purse Seine jack mackerel jurel | https://fisheries.msc.org/en/fisheries/chile-purse-seine-jack-mackerel-jurel/@@assessments | | ✓ | In Assessment –Final Report posted on 7th March, 2019. |

**Table 31.** Certified and in assessment Overlapping fisheries with the same Principle 3 governance and policy framework PIs3.1.1-3.1.3. Orange highlighted cells indicate where there was a difference in score of 15 or more.

| MSC Fishery | 3.1.1 | 3.1.2 | 3.1.3 |
|---|---|---|---|
| Chile Austral hake Industrial Trawl and Longline fishery | 100 | 85 | 100 |
| Chilean jack mackerel Purse Seine fishery | 90 | 90 | 90 |
| Chile Nylon shrimp and squat lobsters Modified trawl fishery | 95 | 85 | 100 |
| Chile squat lobsters demersal trawl Camanchaca Fishery | 100 | 85 | 100 |
| Chilean mussel fishery and suspended culture Toralla S.A and Cultivos Toralla S.A | 90 | 85 | 90 |
| Chile Purse Seine jack mackerel jurel | 95 | 95 | 100 |

The audit team can confirm that the Chile Austral hake industrial trawl and longline fishery is harmonised with each of the overlapping certified / in-assessment fisheries, see Table 30. MSC certified and in-assessment fisheries that overlap with the Chile Austral hake Industrial Trawl and Longline Fishery.

**Chile Austral hake and Chile Purse Seine jack mackerel jurel**

The purse seine jack mackerel fishery has two conditions on P2 in the PIs 2.2.2 (e) and 2.3.2 (e) related with unwanted catches of secondary species and unwanted mortality of ETPs. However, the Chile Austral hake does not have the same conditions because rationales of jack mackerel are in relation with the purse seine fishery management system in areas where Chile Austral hake fishery does not take place or fishing grounds are not located for the fishery. Additionally, the Jack mackerel assessment team does not reach SG 80 in SI e due to the particular measures in the purse seine fishery to minimise unwanted catches of secondary species and that does not apply to Austral hake fishery.

Further, the condition on ETP is set up in jack mackerel linked to pink footed shearwater that does not have relevant interactions with Chile Austral hake. For seabirds ETPs species SAIG have included the impacts of this fishery in their rationale same as for sea lions and the scoring are in the line within the two fisheries.

However, the fisheries have impacts in some common species and those have been taken into account, there is no need to harmonise regarding the conditions raised in Jack Mackerel.

## 4.2. Previous assessments

The fishery has not previously been assessed against MSC Principles and Criteria.

## 4.3. Assessment Methodologies

The MSC Principle and Criteria for Sustainable Fishing Standard sets out the requirements for a certified fishery. The Certification Methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Performance Indicators against which the performances of the fishery can be measured according to pre-specified guideposts. A fishery is assessed against three Principles. The default assessment tree developed by the MSC includes 28 Performance Indicators. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock belongs to; and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations.

**PRINCIPLE 1: Sustainable fish stock**
A fishery must be conducted in a manner that does not lead to overfishing or depletion of the exploited populations, and for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

**PRINCIPLE 2: Minimizing environment impact**
Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

**PRINCIPLE 3: Effective management**
The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principle 1 and 2, appropriate to the size and scale of the fishery.

Regarding the Operational Criteria that affects direct and indirectly the three principles, the fishing operations shall:

- Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimize mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.
- Implement appropriate fishing methods designed to minimize adverse impacts on habitat, especially in critical and sensitive zones such as spawning and nursery areas.
- Not use destructive fishing practices such as fishing with poisons or explosives.
- Minimize operational waste such as lost fishing gear, oil spills, on-board spoilage of catch, etc.
- Be conducted in compliance with the fishery management system and all legal and administrative requirements.
- Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

#### 4.3.1.1 MSC Scheme Documents

This assessment followed the current version of MSC procedures implemented by SAI Global's accredited MSC Procedures (QP) using the MSC scheme documents outlined in

Table 32.

**Table 32.** MSC scheme documents used during assessment activities.

| MSC Scheme Document | Version | Issue Date | Implementation |
|---|---|---|---|
| MSC Fisheries Certification Requirements | 2.0 | 1st October 2014 | Standard and Process |
| General Certification Requirements | 2.1 | 20th February 2015 | Process |
| General Certification Requirements | 2.2 | 1st March 2018 | Process |
| General Certification Requirements | 2.3 | 31st August 2018 | Process |
| Full Assessment Reporting Template | 2.0 | 8th October 2014 | Process |

#### 4.3.1.2 Applicability of the Default Assessment Tree

There are no characteristics of the fishery that would necessitate any revisions to the default assessment tree. This assessment of the Chile Austral hake industrial trawl and longline fishery uses the default assessment tree (FCR v2.0) without adjustments.

## 4.4. Evaluation Processes and Techniques

### 4.4.1. Site Visits

Initial consultation meetings were held in November 2017 (Table 33). The objectives of the consultation meetings were to gather information and further discussion on fishery performance and the fishery management organizational roles in the management of Chile Austral hake. Due to the large number of entities involved in the management of Chile Austral hake, the consultation meetings were not designed to be inclusive of all organizations and representatives of the Chile Austral hake fisheries; however, the consultation plan was designed to strategically capture enough information to ensure understanding and confidence with respect to full assessment scoring. In addition, all identified stakeholders were contacted directly and invited to participate in the Assessment process.

The on-site consultation also served other important functions. These included:

- Responding to questions and comments raised by participants in the fishery at this initial stage in the assessment.
- The client group provided information, documents, and a list of stakeholders as required by SAI Global. This served to allow the Assessment Team to collect general information on the fisheries, identify information gaps and identify key stakeholders for the information gathering exercise.
- Following the collation of general information on the fishery, several meetings with key stakeholders who expressed an interest to meet were scheduled by the team to fill in information gaps and to explore and discuss areas of concern.

However, during the initial site visit the assessment team found some issues relating to the assessment approach and gear definition regarding the current units of assessment identified at the announcement of the fishery.

Specifically, the gear types, originally identified as otter trawl gear and longline were in actual fact more accurately described as:

- Bottom trawl
- Mid-water trawl

- Longline

The client informed the team the Industrial trawl fleet commonly switch from bottom trawl to midwater trawl when towing on a normal fishing trip. Therefore, the catch is not separated by midwater/bottom trawl.

SAI Global decided to denominate Bottom trawl and midwater trawl as scoring elements that will be evaluated separately but their scoring will be combined into one unit of assessment: Trawl.

An extension of the unit of assessment Trawl was requested to be able to modify the UoA by adding mid-water trawl within UoA 1= Trawl.

After reviewing the data and information collected on the initial audit, the assessment team decided to conduct another fact-finding site visit which was announced August 20, 2018 (Table 33).

**Table 33.** Consultation Meetings during the On-Site Surveillance Assessment of the Chile Austral Hake Industrial Trawl and Longline for the initial site visit from 11/27 - 11/30 2017.

| Meeting 1 | | |
|---|---|---|
| **Location** | SERNAPESCA, Victoria 2832, Valparaíso | |
| **Venue** | SERNAPESCA | |
| **Date** | 11/27/2017 | |
| **Time** | 1:30-3:00 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist |
| Cynthia Fernandez | On behalf of SAI Global | Assessor & P2 specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Fernando Naranjo | SERNAPESCA | Chief Division Fisheries Monitoring and Compliance |
| Daniel Molina | SERNAPESCA | Subdirector Fisheries |
| Guillermo Moreno | SERNAPESCA | Fisheries agent |
| Sergio Cansado | ASI | ASI auditor |
| **Meeting 2** | | |
| **Location** | SUBPESCA, Bellavista 168, Valparaíso | |
| **Venue** | SUBPESCA | |
| **Date** | 11/27/2017 | |
| **Time** | 3:30-5:00 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist |
| Cynthia Fernandez | On behalf of SAI Global | Assessor & P2 specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Luis Cocas | SUBPESCA | Lead biologist Fisheries Discard Program |
| Maria Angela Barbieri | SUBPESCA | Chief Fisheries Administration |
| Jorge Farias | SUBPESCA | Chief Austral hake management |
| Lorenzo Flores | SUBPESCA | Fisheries Agent |
| Sergio Cansado | ASI | ASI auditor |
| **Meeting 3** | | |
| **Location** | CEPES, Pérez Valenzuela 1276, Providencia Santiago | |
| **Venue** | CEPES | |
| **Date** | 11/30/2017 | |
| **Time** | 3:30-5:30 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |

| | | |
|---|---|---|
| Ivan Mateo | SAIGlobal | Lead Assessor & P1 specialist |
| Cynthia Fernandez | On behalf of SAI Global | Assessor & P2 specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Hector Torruella | EMDEPES | Manager Operations |
| Andres Galvez | EMDEPES | Manager Sales |
| Oscar Barra | FRIOSUR | Manager Operations |
| Benjamin Azua | DERIS | Manager Operations |
| Sarah Hopf | CEPES | Fisheries consultant (FIPES) |
| Valeria Carvajal | FIPES | General Manager |
| Alejandro Zuleta | CEPES | Fisheries consultant (FIPES) |
| Andres Franco | CEPES | Fisheries consultant (FIPES) |
| Sergio Cansado | ASI | ASI auditor |
| **Meeting 4** | | |
| **Location** | IFOP, Location Blanco Encalada 839- Valparaíso | |
| **Venue** | IFOP headquarters | |
| **Date** | 11/28/2017 | |
| **Time** | 9:00 - 12:00 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist |
| Cynthia Fernandez | On behalf of SAI Global | Assessor & P2 specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Juan Carlos Quiroz | IFOP | Chile Austral hake Stock assessment Lead Biologist |
| Sergio Lillo | IFOP | Chief of Division Direct Evaluations |
| Patricio Galvez | IFOP | Senior Researcher |
| Renato Cespedes | IFOP | Senior Researcher |
| Claudio Bernal | IFOP | Senior Researcher |
| Liu Chong | IFOP | Researcher |
| Sergio Cansado | ASI | ASI auditor |

**2nd site visit by the SAI Global team**

**Table 34.** Consultation Meetings during the On Site Surveillance Assessment of the Chile Austral Hake Industrial Trawl and Longline for the initial site visit from 09/24-09/26/ 2018.

| **Meeting 5** | | |
|---|---|---|
| **Location** | IFOP, Location Blanco Encalada 839- Valparaíso | |
| **Venue** | IFOP headquarters | |
| **Date** | 9/24/2018 | |
| **Time** | 9:00 - 12:00 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist and traceability |
| Virginia Polonio | SAI Global | Assessor & P2 and RBF specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Mauricio Galvez | IFOP | Chief Division Fisheries Research |
| Juan Carlos Quiroz | IFOP | Chile Austral hake Stock assessment Lead Biologist |
| Sergio Lillo | IFOP | Chief of Division Direct Evaluations |
| Patricio Galvez | IFOP | Senior Researcher |
| Renato Cespedes | IFOP | Senior Researcher |
| Claudio Bernal | IFOP | Senior Researcher |
| Maria Cristina Perez | IFOP | Researcher |
| Ignacio Paya | IFOP | Chief of Division Resources Evaluations |
| Liu Chong | IFOP | Researcher |

| | | |
|---|---|---|
| Antonio Hervas | ASI | ASI auditor |
| **Meeting 6** | | |
| **Location** | SERNAPESCA, Victoria 2832, Valparaíso | |
| **Venue** | SERNAPESCA | |
| **Date** | 9/24/2018 | |
| **Time** | 3:30-5:30 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist and traceability |
| Virginia Polonio | SAI Global | Assessor & P2 and RBF specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Fernando Naranjo | SERNAPESCA | Chief Division Fisheries Monitoring and Compliance |
| Daniel Molina | SERNAPESCA | Subdirector Fisheries |
| Guillermo Moreno | SERNAPESCA | Fisheries agent |
| Manuel Gonzales | SERNAPESCA | Fisheries agent |
| Antonio Hervas | ASI | ASI auditor |
| **Meeting 7** | | |
| **Location** | SUBPESCA, Bellavista 168, Valparaíso | |
| **Venue** | SUBPESCA | |
| **Date** | 9/25/2018 | |
| **Time** | 9:30-12:30 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist |
| Virginia Polonio | SAI Global | Assessor & P2 and RBF specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Luis Cocas | SUBPESCA | Lead biologist Fisheries Discard Program |
| Mauro Urbina | SUBPESCA | Chief Fisheries Administration |
| Jorge Farias | SUBPESCA | Chief Austral hake management |
| Javier Rivera | SUBPESCA | Chief Division Fisheries |
| Lorenzo Flores | SUBPESCA | Fisheries Agent |
| Antonio Hervas | ASI | ASI auditor |
| **Meeting 8** | | |
| **Location** | CEPES, Pérez Valenzuela 1276, Providencia Santiago | |
| **Venue** | CEPES | |
| **Date** | 9/25/2018 | |
| **Time** | 3:30-5:30 PM | |
| **Purpose** | Status of conditions updates on fisheries management activities and performance. | |
| **Representative** | **Organisation** | **Position** |
| Ivan Mateo | SAI Global | Lead Assessor & P1 specialist and traceability |
| Virginia Polonio | SAI Global | Assessor & P2 and RBF specialist |
| Edith Saa | On behalf of SAI Global | Assessor& P3 specialist |
| Hector Torruella | EMDEPES | Manager Operations |
| Andres galvez | EMDEPES | Manager Sales |
| Oscar Barra | FRIOSUR | Manager Operations |
| Benjamin Azua | DERIS | Manager Operations |
| Sarah Hopf | CEPES | Fisheries consultant (FIPES) |
| Alejandro Zuleta | CEPES | Fisheries consultant (FIPES) |
| Andres Franco | CEPES | Fisheries consultant (FIPES) |
| Antonio Hervas | ASI | ASI auditor |

### 4.4.2. Consultations

In order to become aware of the concerns of relevant stakeholders, SAI Global followed the Consultation requirements laid out in the MSC FCR v2.0. In addition to posting information on the MSC website and MSC email announcements, stakeholders were made aware of the assessment process, and of opportunities for them to contribute/comment, via direct emails. Where additional stakeholders were identified these were added to the list of registered stakeholders. Instances where the progress of the assessment was communicated to stakeholders, including through public announcements, are outlined in (Table 35).

**Table 35.** Stakeholder consultation process.

| Date | Purpose | Media |
|---|---|---|
| 10/25/2017 | Fishery announcement including:<br>▪ Confirmation of Assessment Team<br>▪ Confirmation of Assessment Tree<br>▪ Additional Site Visit scheduled<br>▪ Client sharing agreement | Notification on MSC website.<br>Direct email. |
| 08/20/2018 | Fishery announcement including:<br>▪ Confirmation of Assessment Team<br>▪ Confirmation of Assessment Tree<br>▪ Additional Site Visit scheduled<br>▪ Revised Client sharing agreement<br>Change fishery name assessment team additional site visit and timeline<br><br>Indicative timeline<br>Assessment Team CVs | Notification on MSC website.<br>Direct email. |
| 12/7/2018 | Notification of Revised Timeline<br>Revised Indicative timeline | Notification on MSC website.<br>Direct email. |

### 4.4.3. Evaluation Techniques

After the site visit the Assessment Team compiled and analysed all relevant information before proceeding to score the UoA against the Performance Indicator Scoring Guideposts (PISGs) in Default Assessment Tree. In scoring the UoA the Assessment Team, using the methodology set out in requirements 7.10 CR (v2.0), discussed the evidence together, weighed up the balance of evidence and used their expert judgement to agree a final score. While individual team members led on the scoring of a principle (P1, P2 or P3 Assessor), their conclusions were discussed in detail and agreed upon by the Assessment Team as a whole; therefore, the score for each PISG reflects the group consensus for that PI.

Note: the outcomes of stakeholder engagement and their supporting rationale are documented in the Evaluation Results section, while the specific content of stakeholder written, or verbal submissions or information generated in meetings or workshops are provided in Appendix 3 of this report.

#### 4.4.3.1 Rationale for choosing the media for public announcements

Public announcements relating to the fishery were posted on the MSC website as this was felt to be the most appropriate media for such announcements. In addition, all identified stakeholders were contacted directly via email informing them of the substance of any announcements and advising where the announcements themselves could be accessed. All identified stakeholders were also furnished with copies of consultation announcements including the “MSC Template for Stakeholder Input into Fishery Assessments” no longer than 4 days after the start of each consultation period.

#### 4.4.3.2 The scoring process

In the MSC Assessment Process there are 4 distinct elements that contribute to a fishery's score and ultimately determine whether or not a fishery is eligible for Certification, in descending order these are:

- Principles
  - Performance Indicators (PIs)
    - Performance Indicator Scoring Guideposts (PISGs)/Scoring Guideposts (PISGs)
      - Scoring Issues (SIs)

In order to be eligible for certification a fishery must achieve an overall weighted average score of 80 for each of the three Principles and scores of at least 60 for each and every PI.

**Scoring Performance Indicators (PIs)**

At the PI level, the performance of the fishery is assessed as a 'score' taking into account whether or not each Scoring Guidepost (SG60, SG80, and SG100) was met for each Scoring Issue.

In order for the fishery to eligible for certification, each PI must score 60 or more. If any PI scores 60 or more but less than 80 a Condition is raised for that PI. Any Conditions must be addressed by an agreed upon Client Action Plan (CAP). Any PI that scores 80 or more is awarded an unconditional pass.

PIs are normally scored to the nearest five units (60, 65, 70, etc.).

**Performance Indicator Scoring Guideposts (PISGs)/Scoring Guideposts (PISGs)**

Scoring Guideposts identify the level of performance necessary to achieve 60, 80 (a pass score), and 100 scores for each Scoring Issue under each Performance Indicator; note some PIs only have a single Scoring Issue.

PISGs are the benchmark level for a fisheries performance.

**Scoring Issues**

Scoring Issues are different parts of a PI covering related but different topics. Each PI has one or more SIs against which the fishery is assessed at the SG60, 80 and 100 levels; note there may not be a SI at every SG level.

If a Performance Indicator has multiple SIs some of which a particular Scoring Guidepost and some of which do not then an intermediate score may be awarded (e.g. 75, 85, and 90).

**Scoring Principles**

Once each individual PI has been scored, the weighted score for each PI under each Principle is summed together in order to calculate the Principle level score for that Principle. Scoring at the Principle level is pass/fail and in order for the fishery to be eligible for certification, a fishery is required to achieve a score of 80 or more as the weighted average score of all PIs within that Principle. If any Principle scores less than 80 the fishery fails.

Principle level scores are reported to the nearest 0.1 units.

**Scoring methodology**

The scoring methodology is fully explained in the MSC Fisheries Assessment Methodology. It can be summarized as follows:

- Scoring is a qualitative process, involving discussion between team members and arrival at a joint agreed score. Scores should be normally assigned in divisions of 5 points

- The only narrative guidance that is available is at 60, 80 and 100 SGs. Intermediate scores must therefore reflect;
    - A failure to meet all the scoring issues specified in a SG.
- The following system should then be used to determine the overall score for the PI from the scores of the different scoring issues. This system combines a primary approach based on the combination of scores achieved by the individual scoring issues (the a) to I) list below):
    a) Score = 60: all issues meet SG60, and only SG60. Any scoring issues within a PI which fails to reach SG60, represents a failure against the MSC standard and no score shall be assigned.
    b) 65: all issues meet SG60; a few achieve higher performance, at or exceeding SG80, but most do not meet SG80.
    c) 70: all issues meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to ensure they get there.
    d) 75: all issues meet SG60; most achieve higher performance, at or exceeding SG80; only a few fail to achieve SG80 and require intervention action.
    e) 80: all issues meet SG80.
    f) 85: all issues meet SG80; a few achieve higher performance, but most do not meet SG100.
    g)  90: all issues meet SG80; some achieve higher performance at SG100, but some do not.
    h) 95: all issues meet SG80; most achieve higher performance, at SG100; only a few fail to achieve SG100.
    i) 100: all issues meet SG100

#### 4.4.3.3 Scoring elements considered in each outcome PI in Principles 1 and 2

Table 36 below describes the set of scoring elements (e.g. species or habitats) that have been considered in each outcome PI in Principles 1 and 2. The table also describes under which component each scoring element was assessed and whether any scoring elements were data-deficient.

**Table 36**. Scoring elements**.**

| UoA | Component | Scoring elements | Main/Not main? | Data-deficient? |
|---|---|---|---|---|
| **UoA 1 & 2** | **P1 (PI 1.1.1)** | *Merluccius australis* | Target species | No |
| **UoA 1 Bottom trawl** | **Primary species (PI 2.1.1)** | *Micromesistius australis* | Main | No |
| | | *Macruronus magellanicus* | Main | No |
| | | *Genypterus blacodes* | Not main | No |
| | | *Brama australis* | Not main | No |
| | | *Dosidicus gigas* | Not main | No |
| | | *Zearaja chilensis* | Not main | No |
| | **Secondary species (PI 2.2.1)** | *Mustelus mento* | Not main | No |
| | | *Seriolella caerulea* | Not main | No |
| | | *Helicolenus lenerichi* | Not main | No |
| | | *Paralabrax humeralis* | Not main | No |
| | | *Salilota australis* | Not main | No |
| | | *Schroederichthys chilensis* | Not main | No |
| | | *Bathyraja brachyourops* | Not main | No |
| | | *Seriolella punctate* | Main | Yes |
| | | *Lamna nasus* | Not main | No |
| | | *Isurus oxyrinchus* | Not main | No |
| | | *Squalus Acanthias* | Not main | No |
| **UoA 1 Midwater trawl** | **Primary species (PI 2.1.1)** | *Macruronus magellanicus* | Main | No |
| | | *Genypterus blacodes* | Not main | No |
| | | *Brama australis* | Not main | No |
| | | *Micromesistius australis* | Main | No |
| | **Secondary species (PI 2.2.1)** | *Salilota australis* | Not main | No |
| | | *Seriolella caerulea* | Not main | No |

| UoA | Component | Scoring elements | Main/Not main? | Data-deficient? |
|---|---|---|---|---|
| | | *Paralabrax humeralis* | Not main | No |
| | | *Seriolella punctata* | Main | Yes |
| | | *Helicolenus lenerichi* | Not main | No |
| **UoA 2 Longline** | **Primary species (PI 2.1.1)** | *Macruronus magellanicus* | Not main | No |
| | | *Genypterus blacodes* | Main | No |
| | | *Brama australis* | Not main | No |
| | | *Dissostichus eleginoides* | Not main | No |
| | | *Sardina pilchardus* | Bait/Main | No |
| | **Secondary species (PI 2.2.1)** | *Salilota australis* | Not main | No |
| | | *Helicolenus lenerichi* | Not main | No |
| | | *Macrourus carinatus* | Not main | No |
| **UoAs 1 & 2 Bottom and Midwater trawls** | **Habitats (PI 2.4.1)** | Sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat. | Main | No |
| | | Muddy-sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat. | Main | No |
| | | Mud simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat. | Not main | No |
| | | Gravel simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat. | Not main | No |
| **UoAs 1 & 2 Bottom and Midwater trawls** | **Ecosystem (PI 2.5.1)** | FAO area 87 South Pacific Ocean Chilean regions from parallel 41° 28.6' S and the extreme south of the country. | -.- | No |

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

The criteria set in (Table 37) of MSC FCR 7.7.6 are used by assessment teams to make a decision on whether a fishery may or may not be data-deficient with respect to one or more PI. For this assessment the use of RBF was announced on October 25th, 2017 and a subsequent follow up was also announced on August 20th 2018. The assessment team announced the use of RBF for 2.2.1 and 2.4.1 PIs.

**Table 37.** Criteria for triggering the use of the RBF was used for both PIs.

| Performance Indicator | Criteria | Consid-eration | Notes |
|---|---|---|---|
| 1.1.1 Stock status | Stock status reference points are available, derived either from analytical stock assessment or using empirical approaches | Yes | Use default PISGs within Annex SA for this PI |
| | | No | Use Annex PF (RBF) for this PI |
| 2.1.1 Primary species outcome & 2.2.1 Secondary species outcome | Stock status reference points are available, derived either from analytical stock assessment or using empirical approaches | Yes | Use default PISGs within Annex SA for this PI |
| | | No | Use Annex PF (RBF) for this PI |
| 2.3.1 ETP species outcome (where there are no national requirements for protection and rebuilding) | Can the impact of the fishery in assessment on ETP species be analytically determined? | Yes | Use default PISGs within Annex SA for this PI |
| | | No | Use Annex PF (RBF) for this PI |
| 2.4.1 Habitats outcome | Are both of the following applicable:<br>1 Information on habitats encountered is available<br>2 Information of impact of fishery on habitats encountered is available | Yes | Use default PISGs within Annex SA for this PI |
| | | No | Use Annex PF (RBF) for this PI |
| 2.5.1 Ecosystem outcome | Is information available to support an analysis of the impact of the fishery on the ecosystem? | Yes | Use default PISGs within Annex SA for this PI |
| | | No | Use Annex PF (RBF) for this PI |

For 2.2.1 the RBF-PSA has been used for the secondary main species, *Cojinoba moteada*. Stock assessment, reference points, derived either from analytical stock assessment or using empirical approaches are not available for *C.moteada*. The information of this species is scarce. However a project is calling for tenders no information at the time of the surveillance audit was available. Therefore the PSA was used.

For 2.4.1 the Assessment team considered that no information on habitats encountered was available and also no information of the impacts on these possible habitats.

However, after the site visit and with the information gathered the assessment team triggered table 3 again for 2.4.1 because new information was published and it was considered that could have a major change in the overall outcome of 2.4.1. After consideration the Assessment team has concluded that RBF is not needed for 2.4.1 as new information is available and already published. The announcement for not using the RBF for 2.4.1 was posted on MSC website on December 5th, 2018. Consequently, the assessment team has used the RBF for 2.2.1 in the UoA 1 – bottom trawl and midwater trawl components.

After the announcement of the certification using RBF the assessment team sent before the site visit a document with the main points for RBF to all the stakeholder list.

Meetings with key stakeholders were carried out during the site visit and when a face to face meeting were not possible, conference calls were realised to gather as much information as possible.

After the site visit and with all the new information the assessment team shared a preliminary results to be consulted by all stakeholders.

Several follow-up files were conducted to agree in the scoring given after the site visit.

Few comments were received by the assessment team however all of them have been considered to score the PSA.

A summary of the main aspects discussed during the meetings and the follow up it attached as an Appendix 1.2.

# 5. Traceability

## 5.1. Eligibility Date

In accordance with FCR 7.6.1 the CAB shall nominate a date from which product from a certified fishery is eligible to be sold as MSC certified or bear the MSC ecolabel (the eligibility date) which may be either the date of the certification of the fishery; or the publication date of the first Public Comment Draft Report.

The target eligibility date for this fishery is the the publication date of the first Public Comment Draft Report. This means that any Chile Austral hake caught by the industrial fleet under assessment following that date will be eligible to enter the chain of custody as product under- assessment product and then as a MSC product once the source fishery is certified.

Barring any unforeseen delays, the expected date of publication of the Public Comment Draft Report is April 19, 2019. The eligibility date will be the date of the publication of the Public Comment Draft Report. Following FCR 7.8.3.2 an indicative assessment timeline has been uploaded to the MSC website.

Traceability and segregation systems in the fishery will be implemented by this date as they are already in place for other Certification Schemes. There is no risk of loss in the traceability, segregation and identification systems and these systems can differentiate product from before or after the eligibility date.

## 5.2. Traceability within the Fishery

Traceability of product from the sea to the consumer is important so as to ensure that the MSC standard is maintained. There are several aspects to traceability that the MSC require to be evaluated: Traceability within the fishery; at-sea processing; at the point of landing; and subsequently the eligibility of product to enter the chain of custody. These requirements are assessed here.

Traceability has been examined as part of this assessment. The results reflect the fact that there are systems in place that are adequate to ensure fish is caught in a legal manner and is accurately recorded. Risk factors for traceability within the Chile Austral hake Industrial trawl and longline fishery are identified in (Table 38).

The entire catch (Chile Austral hake and accompanying species) is placed in storage containers and are delivered to a classification sector where experienced crew members separate them by species. The target species is the first to be processed. Other retained species, are classified and stored in a special containers waiting to be processed.

When processing certified fish, the production line operates exclusively for Chile Austral hake this species because the filleting machine requires specific calibration for. Failing if other species is introduced. When producing HG/HGT, Chile Austral hake discrimination from other species depends exclusively on eye-recognition by staff members and supervisors. Fillets boneless skin-on or not are placed in plates in freezers. Only one species products are placed in each cabinet freezer.

The crew registers products according to form of preparation and by species in internal records that allow traceability. Once frozen, products are packaged with traceability information included (company data, vessel name, quantities - gross and net weights –type of product, production and expiry date).

Industrial fishing vessels authorized to fish Chile Austral hake in external waters are governed by the dispositions in the General Fisheries and Aquaculture Law. In order for an industrial fishing vessel to operate, it is compulsory to have a global positioning system with the capacity to transmit the fishing vessel's location. In addition to that, an electronic logbook containing catch data for each tow/haul must be provided at the time of landing and needs to be certified by an authorized official of SERNAPESCA (Resol. Ext. No. 114-2015). Industrial Fishing vessels must land at Sernapesca-authorized ports or points.

As well as complying with the current regulations when the vessel puts in, the captains should provide the company with:

1. The fish control record (crate quantity per tow/haul, tow/haul time, location in the hold).
2. A copy of the trawler/Longline logbook data.
3. The hold temperature control record.

The landing process is 100% monitored at all time by SERNAPESCA agents. A SERNAPESCA inspector weighs and recounts boxes to verify catches previously declared by captain through the following information:

- Total fish caught by species in the trip, including main fishing operation areas.
- Total daily catch per species and area position.
- Species and quantities per fishing hauls.
- Fish products processed including form and quantities.

Information detailed above is checked in the unloading declaration and SERNAPESCA staff ensures Chile Austral hake weighing complies with the regulations. The unloading declaration is a mandatory record needed to transport the load from the harbor to the processing plant. The legal origin must be certified to undertake the transfer, with the appropriately certified unloading declaration.

All products are re-counted and weighted by inspectors. As the product is frozen, Chile Austral hake can be transported directly to customers or processing plants with a WAYBILL. Products are transported by subcontracted/owner company in sealed containers. All products sold provided are registered with the proper information including species, type of product, total weight, number of boxes and the receiving company. All information provided must be completed by each vessel and company.

The unloading process can be undertaken directly in the processing plant or into Lorries for transfer to processing plants. In addition, the processing plants must provide daily storage data to SERNAPESCA, identifying the tonnage of resources received and their origin (Ministry of Economy, Development, and Tourism Supreme Decree No. 129 of 2013). In case processing on board, the risk to mix certified and non-certified fish is reduced because Chile Austral hake fishery is managed throughout allocation quota and the companies must control Chile Austral hake production to comply with SUBPESCA recommendation according to the proportion of TAC assigned.

Fishes can be traced from their origin using the mentioned documents and traceability is maintained as it is implemented by SERNAPESCA system. This process is deemed robust enough to allow tracing fish products back to the area and day of catch, through a series of required documents by SERNAPESCA and records provided by the company.

Only Chile Austral hake caught on operations by industrial fishing vessels from the client groups using bottom and mid-water trawl net and longline can be MSC certified according to UoA defined. Also, only companies linked to the Client Group can sell Chile Austral hake as MSC.
Tracking and tracing certified Chile Austral hake will be guaranteed via the following system:
Logbooks and Vessel Monitoring System (VMS) will allow the tracing of catch back to the location and date of landing;

- Outgoing documentation (waybills, Unloading declaration, Certification of legal origin) states species and origin.

SERNAPESCA has recently implemented a traceability system which integrates all declarations made at the different stages: vessel (logbook), landing (landing declaration), reception at the processing plant (reception declaration), processing and storage (production declaration), to sales and transportation (destination declaration).

The traceability system will ensure a very detailed control over allocated quotas and ensure traceability. It will also facilitate the administrative procedures for the fishing and processing companies since all paperwork will be done on-line (e.g. the legal origin accreditation needed for exporting will be requested and authorized on-line, while at this moment all declarations to be taken to the Sernapesca offices for their inspection). This system is applicable to all Chilean fisheries.

**Table 38. 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/s to be used within the fishery** | Low risk. Chile Austral hake fishing activities in waters under Chilean jurisdiction is only authorized through the use of trawls (Demersal and Midwater trawl), longline and gillnets. In offshore waters, between the X and XII regions, only fishing vessels with gear considered in the UoCs (trawl and longline) can operate and they are actively monitored by Electronic Monitoring System (EMS). Finally, the remote location and unique environmental conditions of the fishing location makes very difficult to fish with other encircling net gear such as gillnets. |
| **Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)** | Low risk. Chile Austral hake catch quotas are assigned for its extraction within the area considered in the UoCs. Vessels participating in this fishery are permanently monitored regarding their geographical position through (EMS) by Sernapesca and the maritime authority. On the other hand, there are no incentives to fish Chile Austral hake in other areas, as the area covering the UoCs corresponds to that in which the aggregations of Chile Austral hake most commonly occurs which justify and allow industrial fishing operations. |
| **Potential for vessels outside of the UoC or client group fishing the same stock** | Low risk. Only registered industrial fishing vessels that belong to companies with transferable fishing licenses/permits are authorized to catch Chile Austral hake. Four of the five fishing companies (Pesquera Sur Austral S.A., Pesquera Grimar S.A., Deris S.A. and Empresa de Desarrollo Pesquero de Chile S.A.) who participate in the Austral hake industrial fishery are represented by FIPES. Thus, the client group members possess more than 90% of all transferable fishing licenses/permits/quotas. Finally, the total catch as well as the landings are differentiated, quantified and certified by each industrial fishing company on which later is discounted from the transferable fishing licensing quotas from each individual industrial fishing company. |
| **Risks of mixing between under-assessment-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)** | The risk of other sources for product substitution is low. Illegal fishing in offshore waters is not a factor identified in the Chile Austral hake fishery, in as much as the fleet that operates is very small, it is clearly identified and very well monitored, as well as the landings that came from the industrial fleet operations. The authorized quotas that are outside of the UoCs are very small when compared to the overall target quote within the area of the UoCs (Approximately 0.01%) and is defined to justify a potential catch of Chile Austral hake as a non-target species catch from other fishing activities targeting other species.<br><br>The landing process is 100% monitored at all time by SERNAPESCA agents. A SERNAPESCA inspector verify catches previously declared by captain through the following information:<br>• Total fish caught by species in the trip, including main fishing operation areas.<br>• Total daily catch per species and area position.<br>• Species and quantities per fishing hauls.<br>• Fish products processed including form and quantities. |

| | |
|---|---|
| | Information detailed above is checked in the unloading declaration and SERNAPESCA staff ensures Chile Austral hake weighing complies with the regulations. As the product is frozen, Chile Austral hake can be transported directly to customers or processing plants with a WAYBILL. Products are transported by subcontracted/owner company in sealed containers. All products sold provided are registered with the proper information including species, type of product, total weight, number of boxes and the receiving company. All information provided must be completed by each vessel and company.<br><br>The unloading process can be undertaken directly in the processing plant or into Lorries for transfer to processing plants. In addition, the processing plants must provide daily storage data to SERNAPESCA, identifying the tonnage of resources received and their origin (Ministry of Economy, Development, and Tourism Supreme Decree No. 129 of 2013). |
| **Risks of mixing under-assessment certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)** | The risk of mixing among under-assessment, certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody is low. On board, Chile Austral hake catch by vessels belonging to the companies within the UoCs is recorded by each haul and subsequently reported in fishing logbooks. Once in port, landings are reported by fishing vessel and tide.<br><br>Servicio Nacional de Pesca (SERNAPESCA) has implemented a system of electronic certification and monitoring of landings called "traceability". Those who have tradable fisheries licenses [Licencias Transables de Pesca (LTP)], must enter landings of all species captured on this database which in turn is monitored by SERNAPESCA, which officially certifies the landings. Henceforth, all transfers of these raw materials or sales from the processing plants are discounted from the stock or entry into the system by each ship-owned. |
| **Risks of mixing between under-assessment, certified and non-certified catch during transhipment** | Negative: Transhipment does not occur for this fishery. |
| **Any other risks of substitution between fish from the UoC (under-assessment,certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required** | The risks of substitution between fish from the UoC (under-assessment, certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required are very low.<br><br>There are systems are in place to ensure that Chile Austral hake and related products can be differentiated among under-assessment, certified and non-certified products<br>• Tracking and electronic/satellite monitoring of fleet operation.<br>• Reporting of fisheries operations on board by means of fishing logbooks which are delivered to Sernapesca. Reporting is by each haul and tide.<br>• Inspection in port of landings by fishing vessel, tides and company.<br>• Traceability system as a mechanism of follow-up landings and its use. |

**Ports of landing:**

All ports in Chile that are authorized for landings of hydrobiological resources as well as the port of Ushuaia in Tierra de Fuego, Argentina are eligible points of landing for fishing vessels of Chile Austral hake industrial trawl and longline to enter into further Chains of Custody. For a list of ports in Chile please see Table 39. List of ports in Chile that are authorized to land hydrobiological resources as of 12/18 2018. Source: (SERNAPESCA, 2018).

**Table 39.** List of ports in Chile that are authorized to land hydrobiological resources as of 12/18 2018. Source: (SERNAPESCA, 2018)

**REGIÓN DE ARICA Y PARINACOTA**

**COMUNA ARICA:**
- Caleta Arica
- Caleta Quianes
- Puerto de Arica

**COMUNA CAMARONES:**
- Camarones

**REGIÓN DE TARAPACÁ**

**COMUNA IQUIQUE:**
- Bahía El Colorado (Bahía CORPESCA)
- Cáñamo
- Caramucho
- Cavancha
- Chanavaya
- Chanavayita
- Chipana
- Guardiamarina Riquelme
- Los Verdes
- Playa Blanca
- Puerto Iquique
- Río Seco
- San Marcos

**COMUNA HUARA:**
- Pisagua

**REGIÓN DE ANTOFAGASTA**

**COMUNA TOCOPILLA:**
- Caleta Huachán
- Caleta Urcu
- Caleta Paquica
- Muelle Tocopilla
- Punta Atala
- Caleta Indígena
- Caleta Buena
- Caleta Cobija
- El Fierro
- Punta Arenas
- Punta Atala

**COMUNA MEJILLONES:**
- Muelle Mejillones
- Caleta Hornitos
- Bahía CORPESCA
- Caleta Michilla
- Caleta Gualaguala

**COMUNA ANTOFAGASTA:**
- Muelle Antofagasta
- Caleta Coloso
- Isla Santa María
- Caleta La Chimba
- Puerto Antofagasta
- Caleta Constitución
- Caleta Abtao (Juan López)
- Caleta Blanco Encalada
- El Cobre
- Caleta Bolfin
- Caleta Botija

**COMUNA TALTAL:**
- Muelle Taltal
- Caleta Cifuncho
- Caleta Paposo
- La colorada
- Punta Plata
- Huanillo

**REGIÓN DE ATACAMA**

**COMUNA CALDERA:**
- Bahía Salada
- Barranquilla
- Cabeza de vaca
- Caldera
- Cueva Pérez
- El Cisne
- El morro
- Las lisas
- Lozas amarillas
- Maldonado
- Obispito
- Pajonales
- Peña blanca
- Playa Blanca
- Puerto Viejo
- Ramada
- Zenteno

**COMUNA CHAÑARAL:**
- Chañaral
- El refugio
- Flamenco
- Los Médanos
- Los toyos
- Pan de Azúcar
- Portofino
- Torres del Inca

**COMUNA COPIAPÓ:**
- Bahía salada
- Caleta La sal
- Chasco
- La gaviota
- Los Burros
- Pajonales
- Totoral

**COMUNA FREIRINA:**
- Agua de la zorra
- Bahía Sarco
- Bascuñán
- Caleta Carrizalillo o Maman
- Caleta La peña
- Chañaral de Aceituno
- Ensueño
- La Chépica
- Los Bronces
- Los Burros Sur
- Los lachos

**COMUNA HUASCO:**
- Caleta Angosta
- Carrizal Bajo
- Corrales norte
- Huasco
- Los Pozos
- Punta Lobos

**REGIÓN DE COQUIMBO**

**COMUNA CANELA:**
- Huentelauquén
- Maitencillo
- Puerto Manso
- Puerto Oscuro

**COMUNA COQUIMBO:**
- Coquimbo
- Guanaqueros
- Guayacán
- Muelle 1, Coquimbo II
- Muelle Orizon Coquimbo
- Muelle Orizon Tongoy
- Peñuelas
- Playa Chica de la Herradura
- Puerto Aldea (Hornilla)
- Tongoy
- Totoralillo Centro
- Muelle Asoc. Industriales Pesqueros
- Terminal Puerto Coquimbo

**COMUNA LA HIGUERA:**
- Chungungo
- El Apolillado
- Hornos
- Los Choros
- Punta Choros A – San Agustín
- Punta Choros B – Los Corrales
- Totoralillo Norte

**COMUNA LA SERENA:**
- San Pedro

**COMUNA LOS VILOS:**
- Cascabeles
- Chigualoco
- La Cachina
- Las Conchas
- Ñague
- Pichidangui
- San Pedro Los Vilos
- Totoralillo Sur

**COMUNA OVALLE:**
- El Sauce
- La cebada
- Limarí
- Punta Talca
- San Lorenzo
- Sierra
- Talcaruca
- Talquilla
- Totoral

**REGIÓN DE VALPARAÍSO**

**COMUNA ALGARROBO:**
- Algarrobo

**COMUNA CASABLANCA:**
- Quintay

**COMUNA CONCÓN:**
- Higuerillas
- San Pedro-Concón

**COMUNA EL QUISCO:**
- El Quisco

**COMUNA ISLA DE PASCUA:**
- Hanga Piko
- Hanga Roa
- Hotu Iti
- Laperouse (Hanga Hoonu)
- Vaihu

**COMUNA JUAN FERNÁNDEZ:**
- Alejandro Selkirk
- Bahía Cumberland

**COMUNA LA LIGUA:**
- Ligua
- Los Molles
- Pichicuy

**COMUNA PUCHUNCAVI:**
- Horcón
- Maitencillo
- Ventana

**COMUNA QUINTERO:**
- El Embarcadero
- El Manzano
- Loncura
- Papagayo
- Muelle Asimar
- Muelle Pesquera Quintero

**COMUNA SAN ANTONIO:**
- Desembocadura río Maipo
- Molito
- Muelle Camanchaca
- Puertecito
- San Pedro - Pacheco Altamirano
- Cartagena

**COMUNA VALPARAÍSO:**
- El Membrillo
- Laguna Verde
- Portales

**COMUNA VIÑA DEL MAR:**
- Montemar

**COMUNA PAPUDO:**
- Papudo

**COMUNA ZAPALLAR:**
- Zapallar

**REGIÓN DEL LIBERTADOR GENERAL BERNARDO O'HIGGINS**

**COMUNA NAVIDAD:**
- Boca de Rapel
- Chorrillos
- La Vega de la boca
- Matanzas
- Puertecillo

**COMUNA PICHILEMU:**
- Pichilemu
- Cáhuil

**COMUNA PAREDONES:**
- Bucalemu

**COMUNA LITUECHE:**
- Topocalma

**REGIÓN DEL MAULE**

**COMUNA VICHUQUÉN:**
- Boyeruca
- Llico

**COMUNA LICANTÉN:**
- Duao
- La Pesca
- Pichibudi

**COMUNA CUREPTO:**
- La Trinchera

**COMUNA CONSTITUCIÓN:**
- Río Maule
- Maguillines
- Los Pellines
- El Parrón

**Table 39** (Continued)

**COMUNA CHANCO:**

- Loanco

**COMUNA PELLUHUE:**

- Curanipe
- Pelluhue
- Cardonal

**REGIÓN DEL BÍOBÍO**

**COMUNA ARAUCO:**

- Arauco
- Laraquete
- Llico
- Los Piures
- Punta Lavapie
- Rumena
- Muelle artesanal de Tubul
- Yana

**COMUNA COBQUECURA:**

- Cobquecura (Rinconada de Taucú)

**COMUNA COELEMU:**

- Purema

**COMUNA CORONEL:**

- Caleta Lo Rojas
- Maule
- Puerto Norte I. Santa María
- Puerto Sur I. Santa María

**COMUNA HUALPÉN**

- Lenga
- Peroné
- Chome

**COMUNA LEBU:**

- Isla Mocha
- Islote del Trabajo - Isla Mocha
- Villarica – Lebu (Ranquil)
- La Hacienda - Isla Mocha
- Puerto Pesquero Artesanal de Lebu
- Millongue
- Morguilla
- Sector Mina Costa, Lebu

**COMUNA LOTA:**

- Caleta Lota Bajo
- El Blanco
- Pueblo Hundido
- El Morro de Lota

**COMUNA PENCO:**

- Cerro Verde
- Lirquén
- Penco/Playa negra

**COMUNA SAN PEDRO DE LA PAZ:**

- Boca Sur

**COMUNA TALCAHUANO:**

- El Morro de Talcahuano
- El Soldado
- Infiernillo
- Puerto Talcahuano
- San Vicente, puerto artesanal
- Talcahuano, sector La Poza
- Tumbes, muelle artesanal

**COMUNA TIRÚA:**

- Quidico
- Tirúa

**COMUNA TOMÉ:**

- Caleta Tomé
- Cocholgue Caleta chica
- Dichato, sector Villarrica
- Los Bagres
- Muelle artesanal de Coliumo
- Quichiuto
- Tomé, muelle pesquero artesa

**REGIÓN DE LA ARAUCANÍA**

**COMUNA CARAHUE:**

- Nehuentué

**COMUNA SAAVEDRA:**

- Boca Budi
- Nahuelhuapi
- Romopulli
- Puerto Domínguez
- Puerto Saavedra - El Huilque

**COMUNA TOLTÉN:**

- La Barra - Toltén
- Queule
- Los Pinos

**REGIÓN DE LOS RÍOS**

**COMUNA CORRAL:**

- Amargos
- Chaihuín
- Corral Bajo
- Huape
- Huiro
- La Aguada
- San Carlos
- Muelle Pesquera Blumar S.A.

**COMUNA LA UNIÓN:**

- Lamehuapi

**COMUNA MARIQUINA:**

- ChanChan
- Maiquillahue
- Mehuín
- Missisipi

**COMUNA VALDIVIA:**

- Bonifacio
- El Piojo
- Isla del Rey
- La Misión
- Los Molinos
- Mancera
- Muelle Etchepare (Valdivia)
- Muelle Avenida España N° 513
- Muelle Calypso
- Muelle Cartagena
- Muelle La Isla
- Muelle Las muñecas
- Muelle Mora & Mora
- Muelle Pesquera Camanchaca
- Muelle Santa Isabel
- Muelle Shivar
- Niebla
- San Ignacio
- Valdivia

**REGIÓN DE LOS LAGOS**

**COMUNA ANCUD:**

- Ancud
- Caulín
- Chacao
- Chaumán
- Chepu
- Coñimo
- Duatao
- El Dique
- Faro Corona
- Fatima
- Guabún
- Hueihue
- Huelden
- Huicha
- Lamecura
- Linao
- Los Chonos
- Manao
- Mar Brava
- Nal
- Piñihuil
- Pudeto
- Pulelo
- Punta Chilén
- Quetalmahue
- Quilo
- Yuste

**COMUNA CALBUCO:**

- Aguantao
- Alfaro
- Caleta Martin
- Chauquear
- Chayahue
- Cholgue
- Chope
- Colaco
- El Rosario
- Isla Chidhuapi
- Isla Guar
- Isla Huapi-Abtao
- Isla Puluqui
- Isla Tabón
- Machil
- Pargua
- Pollollo
- Poza Llaicha
- Puerto Calbuco
- Puerto San José
- San Agustín
- San Antonio Calbuco
- San Rafael
- San Ramón
- Isla Queullin

**COMUNA CASTRO:**

- Castro
- Chelin
- Quehui
- Rilan

**COMUNA CHAITÉN:**

- Auchemo
- Ayacara
- Buill
- Caleta Poyo
- Chaitén
- Chuit
- Chulin
- Chumeldén
- Huequi
- Loyola
- Nallahue
- Palena
- Pumalín
- Talcán

**COMUNA CHONCHI:**

- Chonchi
- Cucao
- Teupa

**COMUNA COCHAMÓ:**

- Cochamó
- Sotomó

**COMUNA CURACO DE VELE**

- Curaco de Vélez

**COMUNA DALCAHUE:**

- Dalcahue
- Tenaum

**COMUNA FRESIA:**

- Punta Capitanes

**COMUNA HUALAIHUE:**

- Aulen
- Caicura
- Chauchil
- Cheñue
- Cholgo
- Contao
- Cubero
- El Manzano
- Hualaihue Estero
- La Poza
- Llanchid
- Lleguimán
- Los Toros
- Mañihueico
- Pichanco
- Pichicolo
- Puelche
- Puerto Bonito
- Puerto Hualaihué
- Quetén
- Quiaca
- Rio Negro - Hornopirén
- Rolecha
- Tentelhué

**COMUNA LOS MUERMOS:**

- Estaquillas
- Huahuar

**COMUNA MAULLÍN:**

- Amortajado
- Astillero
- Carelmapu
- Cariquilda
- Chanhue
- La Pasada
- Lepihue
- Lolcura
- Maullín
- Muelle Toledo
- Quenuir
- San Pedro Nolasco

**COMUNA PUERTO MONTT:**

- Anahuac
- Angelmó
- Bahía Huelmo
- Bahía Ilque
- Caleta Gutiérrez
- Chaicas
- Chamiza
- Chinquihue
- Coihuín
- El Morro
- Isla Maillén
- La Arena
- Lenca
- Metri
- Panitao Bajo
- Pichipelluco
- Piedra Azul
- Tenglo
- Yerbas buenas

**COMUNA PUERTO VARAS:**

- Rollizo

**COMUNA PUQUELDÓN:**

- Puqueldón

**COMUNA PURRANQUE:**

- Manquemapu
- San Pedro

**COMUNA QUEILÉN:**

- Alqui
- Mapue
- Queilen
- San José de Tranqui

**Table 39** (Continued).

**COMUNA CISNES:**

- Caleta Puerto Gala
- Puerto Raúl Marín Balmaceda
- Puerto Cisnes
- Puerto Gaviota
- Puerto Puyuhuapi

**COMUNA GUAITECAS:**

- Puerto Melinka
- Repollal alto
- Repollal bajo

**COMUNA TORTEL:**

- Muelle Tortel
- Muelle aeropuerto
- Puerto Yungay

**REGIÓN DE MAGALLANES Y LA ANTÁRTICA CHILENA**

**COMUNA CABO DE HORNOS:**

- Terminal pesquero puerto Williams

**COMUNA PORVENIR:**

- Bahía Chilota
- Santa María
- Fortuna
- Dalmacia
- Terminal pesquero Porvenir

**COMUNA PUERTO NATALES:**

- Puerto Natales
- Puerto Edén
- Muelle EPA
- Terminal pesquero Puerto Natales
- Muelle de puerto Edén

**COMUNA PUNTA ARENAS:**

- Bahía Mansa (Punta Arenas)
- Los Pinos
- Muelle artesanal Barranco Amarillo
- Punta Arenas (Muelle ASMAR)
- Muelle Arturo Prat
- Muelle Mardones
- Punta Carrera
- Agua fresca

**COMUNA RIO VERDE:**

- Rio Canelo
- Muelle cruce canal Fitz Roy

The fleet of Factory Industrial trawl and longline is based in Punta Arenas . The fleet of non-factory industrial vessels is based in Puerto Chacabuco over at FRIOSUR, one of the client group members. These are the closest ports for these fleets to land their catch and processed products to their respective companies.

**Point of intended change of ownership of product**: For Chile Austral hake landed at any of the ports listed in Chile list of ports in Chile that are authorized to land hydrobiological resources (Table 39), as well as in the port of Ushuaia in Tierra de Fuego, Argentina, products will be sold directly to clients in boxes, which are intended to change of ownership under that situation, or to be conducted to a processing plant of the same company for a re-processing process. The change of ownership will occur upon purchase of the seafood. If Chile Austral hake is sold directly to clients, its transportation shall be completed by an approved sub-contractor employed by the Chile Austral hake industrial trawl and longline client members and this shall be covered within the scope of the fishery certificate.

**Point from which Chain of Custody is required:** Separate Chain of Custody Certification will be required from on board the fishing vessels belonging to the Chile austral hake industrial client companies including factory and non-factory trawl and factory longline fishing vessels. (When Chile Austral hake hauls are carried out and deposited in the container or from the first point of sale (Chile Austral hake products change ownership). So, all processing plants require to carry out Chain of Custody's certification, including processing on board carried out by UoA's vessels.

***Industrial Trawl Fishing Vessels [Non-Factory,Factory)***

Chain of Custody Certification will be required at the point of landing for non-factory trawl fishing vessels belonging to the Chile Austral hake industrial client companies. Thus, all processing plants are required to carry out Chain of Custody's certification.

Chain of Custody Certification will be required from on board for factory trawl fishing vessels belonging to the Chile Austral hake industrial client companies where processing on board is carried out by UoA's vessels.

***Industrial Longline Fishing Vessels [Non-Factory,Factory)***

Chain of Custody Certification will be required from on board for factory longline fishing vessels belonging to the Chile Austral hake industrial client companies where processing on board is carried out by UoA's vessels. There are no Industrial non-factory longline fishing vessels.

**Conclusion for product eligibility to be sold as under-assessment product and then as MSC product once the source fishery is certified**

As it is in traceability description, there are catch hauls in a same fishing trip on industrial trawl fishery vessels belonging to the client members companies addressed to other target species not subject of this certification (*i.e.* Hoki, Pink Cusk eel and Southern blue whiting, where Chile Austral hake is classified as accompanied fauna, representing < 2% of total weight catch of each fishing haul and in some cases, being absent). So, when trawler fishing vessels owned by client companies addressed fishing operations to other target species, Chile Austral hake caught as accompanying fauna will be sold as under-assessment fish and then as MSC fish subsequently once the source fishery is certified. However, in the case of industrial longline where there are two directed fisheries targeting exclusively for Chile Austral hake and Chilean Seabass, any catch of Chile Austral hake as non-target on the Chilean Seabass fishery by client companies won't be certified.

In other words, all Chile Austral hake caught by client companies fishing vessels (i.e. eligible vessels) using eligible gears (e.g. Industrial Trawl, Industrial Longline) within the UoA area are eligible for certification.

Catch location in MSC certified areas is verifiable through VMS data. Traceability documentation allows tracing of the products back to the area, day and method of capture. Waybill, 'Parte de Pesca Final', 'Parte Diario de

Posición y Captura', 'Parte de Pesca Lance por Lance", "Parte de Producción a Bordo", 'Acta de Descarga' and 'Certificado de Control de Carga' provide clear identification of product into further chains of custody. The conclusion of the team is that only Chile Austral hake caught by vessels linked to the client group can be sold as under-assessment and then as MSC subsequently once the source fishery is certified. Vessels outside of UoC described in Table 1 cannot use the certificate, if they enter a sharing agreement they can be included in the UoC

## 5.3. Eligibility of IPI stock(s) to Enter Further Chains of Custody

There are no IPI stocks included in the assessment process.

# 6. Evaluation Results

## 6.1. Principle Level Scores

**Table 40.** Final principle scores for all UoAs

| Unit of Assessment (UoA) | Principle | Score | Pass/Fail |
|---|---|---|---|
| **UoA 1 – Trawl** | Principle 1 – Target Species | 84.2 | Pass |
| | Principle 2 – Ecosystem | 82.7 | Pass |
| | Principle 3 – Management System | 90.0 | Pass |
| **UoA 2 – Longline** | Principle 1 – Target Species | 84.2 | Pass |
| | Principle 2 – Ecosystem | 83.3 | Pass |
| | Principle 3 – Management System | 90.0 | Pass |

All two Units of Assessments (UoAs) achieved the minimum required score of 80 or above on each of the three MSC Principles independently and did not score less than 60 against any Performance Indicator (Table 40). However, while the assessment Team found all two UoAs to be in overall compliance with MSC Standard, it also found the performance of 2 Performance Indicators (1.1.1, 2.1.1) to be below the established compliance mark for each of the UoAs (UoA 1 – Trawl, and UoA 2 – Longline) (Table 41).

Therefore, a total of 2 Conditions were raised for the purpose of improving the performance of the relevant Performance Indicators to at least the 80 level. These Conditions are presented in detail below (
Table 42).

## 6.2. Summary of PI Level Scores

Presents the Performance Indicator (PI) scores for each PI across all two Units of Assessment (UoAs). Where a PI has scored <80 (i.e. where a Condition has been raised) this is highlighted in amber.

**Table 41.** Performance Indicator (PI) scores for each of the two Units of Assessment (UoA); Trawl, Longline.

| Principle | Component | PI | Performance Indicator (PI) | UoA 1 Trawl | UoA 2 Longline |
|---|---|---|---|---|---|
| One | Outcome | 1.1.1 | Stock status | 70 | 70 |
| | | 1.1.2 | Stock Rebuilding | 80 | 80 |
| | Management | 1.2.1 | Harvest strategy | 95 | 95 |
| | | 1.2.2 | Harvest control rules & tools | 80 | 80 |
| | | 1.2.3 | Information & monitoring | 80 | 80 |
| | | 1.2.4 | Assessment of stock status | 100 | 100 |
| Two | Primary species | 2.1.1 | Outcome | 75 | 80 |
| | | 2.1.2 | Management | 85 | 85 |
| | | 2.1.3 | Information | 85 | 85 |
| | Secondary species | 2.2.1 | Outcome | 80 | 80 |
| | | 2.2.2 | Management | 90 | 90 |
| | | 2.2.3 | Information | 80 | 80 |
| | ETP species | 2.3.1 | Outcome | 85 | 85 |
| | | 2.3.2 | Management | 80 | 85 |
| | | 2.3.3 | Information | 80 | 80 |
| | Habitat | 2.4.1 | Outcome | 95 | 95 |
| | | 2.4.2 | Management | 80 | 80 |
| | | 2.4.3 | Information | 80 | 80 |
| | Ecosystem | 2.5.1 | Outcome | 80 | 80 |
| | | 2.5.2 | Management | 80 | 80 |
| | | 2.5.3 | Information | 85 | 85 |
| Three | Governance and policy | 3.1.1 | Legal & customary framework | 100 | 100 |
| | | 3.1.2 | Consultation, roles & responsibilities | 85 | 85 |
| | | 3.1.3 | Long term objectives | 100 | 100 |

| Principle | Component | PI | Performance Indicator (PI) | UoA 1 | UoA 2 |
|---|---|---|---|---|---|
| | | | | Trawl | Longline |
| | Fishery specific management system | 3.2.1 | Fishery specific objectives | 80 | 80 |
| | | 3.2.2 | Decision making processes | 95 | 95 |
| | | 3.2.3 | Compliance & enforcement | 85 | 85 |
| | | 3.2.4 | Monitoring and Management performance evaluation | 80 | 80 |

## 6.3. Summary of Conditions

**Table 42. Summary of Conditions**

| Condition number | Condition | Performance Indicator | Related to previously raised condition? (Y/N/NA) |
|---|---|---|---|
| **1 (Both UoAs)** | By the 4th surveillance audit after reassessment, the Assessment Team shall be provided with evidence that the stock (i.e. Chile Austral hake) is at or fluctuating around a level consistent with MSY in the Industrial Trawl and Longline Fishery (UoA1 &2). | **1.1.1** | **N** |
| **2 (UoA Trawl)** | By the 4$^{th}$ surveillance, the assessment team shall be provided with evidence that Main primary species (i.e. Hoki) in the Industrial Trawl Fishery (UoA1) are highly likely to be above the PRI.<br><br>OR<br><br>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. | **2.1.1** | **N** |

## 6.4. Recommendations

During the consultation period for the accepted Notice of Objection (See Appendix 6), the client group (FIPES) advised SAI Global that a new regulation related to the implementation of seabird mitigation measures had come into effect in Chile.

Technically, according to MSC FCR v2.0, Assessment Teams can only consider information that was available in final form on the date of publication of the Public Comment Draft Report (PCDR); as the implementation of this new regulation post-dates the publication of the PCDR, the Team was not able to formally consider this new regulation in the scoring of this fishery.

While, the Team was precluded from formally considering the information in this assessment, SAI Global would like to make it clear that we are aware of these recent developments mandating the implementation of additional migration measures. The implementation of these measures will be specifically examined at subsequent surveillance audits and should the fishery fail to comply with any new regulations then a condition in the area of compliance under P3 may be appropriate. In order to facilitate follow up at future surveillance audits the Team have added the following recommendation.

**Recommendation 1 (applicable to PI 2.3.2 for UoA 1 Industrial Trawls)**

The Assessment Team recommends that measures recognised as “best practice” in mitigating the fishery’s impacts on seabirds (e.g. as recommended by ACAP) be implemented as soon as is practicable; furthermore, the Team recommends that studies be undertaken to examine the effectiveness of any new measures.

At the first surveillance audit post-certification and subsequent surveillance audits, the Assessment team will closely review:

a) The implementation of the measures included in the recent resolution, and;

b) Any new evidence related to the effectiveness of these measures.

## 6.5. Determination, Formal Conclusion and Agreement

Following a meeting on 06th June 2019, SAI Global's internal Certification Committee, having considered this report and the Assessment Team's recommendation, determined that;

- **Chile Austral hake (*Merluccius australis*) industrial trawl and longline**

Should be awarded MSC certification.

SAI Global's internal Certification Committee, being SAI Global's official decision-makers in this regard, have determined that the above fishery is to be certified to the Marine Stewardship Council (MSC) Fisheries Certification Requirements (FCR) Version 2.0. The client can therefore claim the fishery to be a "Well Managed and Sustainable Fishery", in accordance with MSC's Principles and Criteria for Sustainable Fishing.

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# 8. MSC Interpretations

The MSC requires that the use in an assessment report of an interpretation from the interpretation log must be properly referenced in a separate Appendix of the report with the date, title and web link of the interpretation being provided.

| | |
|---|---|
| **Relevant Interpretation 1** | |
| **Title:** | Scoring SG100 if not all SG80 met? (FCR v2.0 - 7.10.5.3) |
| **Date:** | 29th August 2018 |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218 |
| **Question:** | FCR 7.10.5.3 states: "If all of the SG80 scoring issues are met, the PI must achieve at least an 80 score, and the team shall assess each of the scoring issues at the SG100 level." The inference from this is that if not all the SG80 scoring issues are met, the SIs shall not be assessed at SG100 However, there are a number of reasons the SG100 should be scored: 1. In Table 4 (FCR p.37), for example at the 70 level, it states: "All elements meet SG60; some achieve higher performance, at or exceeding SG80, but some do not meet SG80 and require intervention action to make sure they get there." The inference being there that you do score all the way through (how else would you know that some elements exceed SG80?). 2. The consequence of not scoring the SG100s is that, when it comes to the condition on that PI being met at some point in future, you'd have to go and score any SIs with an SG100 level in order to work out what the PI was now being scored at overall (i.e., you'd have to fill in all the 'not scored' sections in case they were meeting a higher performance elsewhere). 3. We're only on the Client Draft level, and if though client review or peer review or stakeholder review it was determined that, in fact, no condition was required, we'd have to go back and score the SIs at 100 before finalising the report 4. In terms of scoring elements, there is a faint risk (for example in PI 1.2.1) that where an SI is only scored at 100, not scoring it could result in a fishery failing for not averaging 80 for the Principle, when scoring it could have brought it to an average of 80 or above…. 5. Even if, while a PI is scored at <80 the SG100s aren't actually contributing to the score, it just seems odd not to bother giving credit where credit is due – I presume any fishery would want to see (and want others to see) where they are doing well. Can the MSC please clarify the intent with regard to scoring the SG100 level? |
| **Answer:** | The MSC do not require the SG100s to be assessed (or rationales provided) when all of the scoring issues within the SG80 level are not met, as per FCR 7.10.5.3, except in cases where obtaining a combined scoring element PI score require it (7.10.7). However, if the assessment team judge that it would be useful to assess the SG100s they may do so. |
| **Relevant Interpretation 2** | |
| **Title:** | P2 species outcome PIs - scoring when no main or no minor (or both) (FCR v2.0 - Annex SA PI 2.1.1, 2.2.1)<br>P2 species outcome PIs - scoring when no main or no minor (or both) (FCR v2.0 - Annex SA PI 2.1.1, 2.2.1) |
| **Date:** | 30th August 2018* |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344 |
| **Question:** | When using the scoring element approach for 2.1.1 and 2.2.1 (version 2.0), what scores would you achieve in the following scenario: Scenario 1: no main species, minor species meet Sib SG100. Here I think we can agree the score is 100 Scenario 2: no main species, minor species do not meet Sib SG100. Here it's confusing because the score is different whether you consider that SIa is 'not applicable' or scores 100. So the score here is either 80 or 90. So in essence my question is, in the absence of main species, do you score SIa as not applicable or SG100 met? The same would need to be true for Sib (in the absence of minor species). I'm hoping it's not applicable as that would make a lot more sense from a practical scoring perspective, particularly if you're dealing with multiple scoring elements (it makes no sense for example to score a main species against Sib). On the other hand, if a fishery has no primary or secondary species, you would want to score both SI's as 100 being met |
| **Answer:** | Basically you only score the main species in the 'main' (SIa) scoring issue and the minor in the 'minor' (Sib) for 2.1.1 and 2.2.1.<br><br>So in your scenario 1, if the fishery has no main species, scoring issue (a) is not applicable, and scoring issue (b) is scored at the 100 level. If it meets it for all species, then score is 100. |

| | |
|---|---|
| | In scenario 2, if the fishery has no main species, scoring issue (a) is still not applicable. In scoring issue (b) each species will score either 80 or 100 depending on whether the SG100 is met or not (noting previous interpretation on grouping these, see hyperlink).<br><br>Clause SA3.2.1 applies when there are no species within a component at all ('If a team determines that a UoA has no impact on a particular component, it shall receive a score of 100 under the Outcome PI'). If no main or minor primary species, for example, then the automatic 2.1.1 score is 100.<br><br>Hyperlink<br>- Minor species and scoring element approach at SG100 |
| **Relevant Interpretation 3** | |
| **Title:** | Pelagic habitats and gear (FCR v2.0 - Annex GSA 1.13.2, Table GSA 7, Box GSA 8) |
| **Date:** | 29 th August 2018 |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/pelagic-habitats-and-gear-Box-GSA7-1527262009346 |
| **Question:** | Where do the requirements and guidance address pelagic habitats and/or impacts of pelagic gear? |
| **Answer:** | The consideration and assessment of pelagic habitat/gear are noted in the following places: Box GSA7 on ghost fishing, GSA3.13.2 on habitat characteristics, and Table GSA8 for an example of a pelagic UoA's management strategy. In a pelagic gear situation, it is expected that the commonly encountered habitat would be the water column, and the minor habitat(s) would be anything the gear may accidentally contact when gear loss/malfunction occurs. |
| **Relevant Interpretation 4** | |
| **Title:** | "Commonly encountered" habitat (FCR v2.0 - Annex SA PI 2.4.1, GSA 3.13.3.1) |
| **Date:** | 29th August 2018 |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/Commonly-encountered-habitat-GSA3-13-3-1-1527586958002 |
| **Question:** | Is a "commonly encountered" habitat specific to the habitat preferred by the target species? |
| **Answer:** | It is likely that the "commonly encountered" habitat(s) is the one(s) preferred by the target species; however, there may be exceptions. |
| **Relevant Interpretation 5** | |
| **Title:** | Minor species and scoring element approach at SG100 (FCR v2.0 - 7.10.7, Annex SA PI 1.1.1, 2.2.1) |
| **Date:** | 30th August 2018 |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233 |
| **Question:** | Should each P2 "minor" species be assessed as a separate scoring element? We have been considering main retained species as separate scoring elements, while generally regarding the minor species as just a single element. We feel that this is the most correct approach, particularly when you take the weightings of the various scoring elements into consideration (i.e. minor species should not have the same weighting as main species). For very large, mixed species fisheries it also saves a lot of time. Is this approach also correct? It would be great if you could provide us with a bit more guidance on this issue. |
| **Answer:** | The MSC recognise that there are time and cost implications of scoring each individual element separately, particularly in cases where there are large numbers of species to assess. After some discussion we have determined that teams should list which main or minor species are assessed in each component to make clear what is being scored as main vs minor. All minor species automatically achieve at least SG80. Then it would be up to the team whether they decide to score these species at SG100 as individuals (some meet SG100, others do not) or to use an 'all or none' approach to scoring. So if all minors meet 100 then it is achieved. If any do not, it stays at SG80. The team then need to record and assess the scores for minor species but they can 'group' how they report these scores.<br><br>Examples of how this might be presented are given below. The numbered minors could be provided in a table in the background section.<br><br>Example 1: 'all or none' approach to minors at SG100, so in this case not all meet 100 so all get 80:<br>Main species x: 60<br>Main species y: 60<br>Main species z: 80 |

| | |
|---|---|
| | Minors no. 4-20: 80<br>Overall score: 75 (all meet 60, most achieve 80 or higher, only a few fail to achieve 80). Note: The fact that all minors are 'scored' even if they aren't looked at in detail at SG100 means there is a pull to make the score higher, but it wouldn't be able to meet 80 since one or more main species requires a condition.<br><br>Example 2: using the 'individual' approach:<br>Main species x: 60<br>Main species y: 60<br>Main species z: 80<br>Minors no. 4-6: 100<br>Minors no. 7-20: 80<br>Overall: 75 (all meet 60, most achieve 80 or higher, only a few fail to achieve 80) (note above also applies here).<br><br>This will be considered in more detail in the next review of the requirements. |
| **Relevant Interpretation 6** | |
| **Title:** | Indirect vs unobserved mortalities in ETP (FCR v2.0 - Annex SA PI 2.3.1, SA 3.1.8, GSA 3.1.8, 3.16) |
| **Date:** | 26/05/2016 |
| **Weblink:** | https://mscportal.force.com/interpret/s/article/Indirect-vs-unobserved-mortalities-in-ETP-PI-2-3-1-PI-2-3-1-1527262008559 |
| **Question:** | In V1.3 there was not the new language now found in V2.0 in the general introduction to Principle 2, where on p. 402 it states that " ETP species are assessed for both direct and indirect impacts….direct impacts in this context include the actual capture of a species by fishing and other types of direct mortality, such as following discarding or interactions with the fishing gear. Indirect impacts include situations where the removal of the target species reduces its availability as prey for a predator species, and a range of ecosystem level changes as described in section GSA3.16."<br><br>With this in mind, do direct effects include unobserved mortalities if they are not actually associated in an immediate temporal sense with fishing events (e.g. discards that die immediately after fishing)? Or should these be considered indirect effects (i.e. meaningfully delayed mortality, or decreased reproductive output or decreased competitive advantage that occurs well after the fishing event has passed – regardless, something with a fitness impact and population-level effects)? If indirect effects are food web interactions etc, these are already scored in the Ecosystem PI |
| **Answer:** | First, it should be noted that indirect effects are only considered in scoring issue (c). Unobserved mortalities are not what is meant by indirect effects (these cover depletion of species used as prey by other species, biological interactions, etc), so unobserved mortalities should be considered along with the other direct impacts in SIs (a) or (b). With regards to unobserved mortalities, in CR v 1.3, the following clause exists to clarify that unobserved mortalities should be taken into account when assessing P2 species: "ACB3.1.2; The consideration of the impact of the fishery on all components in P2 shall include unobserved, in addition to observed fishing mortality and impacts."<br><br>The guidance to this, GCB3.1.2.1, clarifies examples of unobserved mortality such as ghost fishing, stress from being released alive etc. In FCR v2.0, the same intent can be found in SA 3.1.8 and GSA 3.1.8.<br><br>So teams have always needed to take into account unobserved, directly caused mortality when assessing the outcome for all P2 species. In addition, 'indirect effects', which as explained above are different to unobserved, direct effects, also need to be scored for ETP species only. This has not changed from v 1.3 to 2.0.<br><br>This does and has always, unfortunately meant that an element of double scoring exists for indirect effects in PIs 2.3.1 and 2.5.1. However, the rationale does not need to be repeated, but the fact that indirect effects for ETP species have been taken into account in PI 2.3.1 should be made clear in 2.5.1. The Ecosystem PI will be reviewed further in the next version of the CR and these double scoring elements will be considered then. |

# 9. Appendices

## 9.1. Appendix 1 Scoring and Rationales

### 9.1.1. Appendix 1.1 Performance Indicator Scores and Rationale – Evaluation Tables

#### 9.1.1.1 Principle 1 – Sustainable Target Fish Stocks – Evaluation Tables

**PI 1.1.1 – Stock Status**

<table>
<tr><td colspan="2">PI 1.1.1</td><td colspan="3">The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Stock status relative to recruitment impairment</td></tr>
<tr><td>Guidepost</td><td>It is likely that the stock is above the point where recruitment would be impaired (PRI).</td><td>It is highly likely that the stock is above the PRI.</td><td>There is a high degree of certainty that the stock is above the PRI.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>Not scored</td></tr>
<tr><td>Justification</td><td colspan="3">It is highly likely that the stock is above the PRI.<br><br>For this stock PRI, or the point at which recruitment is expected to be impaired, corresponds to the limit reference point $SSB_{lim}$ which is based on maintaining spawning stock biomass (SSB) above 20% of the expected SSB in the absence of fishing ($SSB_0$). Estimated $SSB_0$ for this fishery is based on the estimated unexploited or virgin biomass at the outset of the fishery in 1977.<br><br>Based on the latest stock assessment for this stock:<br>- $SSB_0$ = 449,585 mt<br>- PRI = 0.2*$SSB_0$ = 89,917 mt<br>- $SSB_{2018}$ = 144,000 mt<br>- $SSB_{2018}/SSB_{lim}$= 1.60<br><br>The latest estimate for spawning stock biomass $SSB_{2018}/B_{lim}$= 1.6. Furthermore, the likelihood of $SSB_{2018}$ being >$B_{lim}$ is well in excess of 80% (see Figure 22). Therefore, it is highly likely that the stock is above the PRI; SG60 and SG80 are met.<br><br>According to FCR 7.10.5.3, if SG80 is not met for all SIs then no SI can be scored at SG100; therefore, as SG80 for SIb was not met, SG100 was not scored.</td></tr>
<tr><td rowspan="4">b</td><td colspan="4">Stock status in relation to achievement of MSY</td></tr>
<tr><td>Guidepost</td><td></td><td>The stock is at or fluctuating around a level consistent with MSY.</td><td>There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years.</td></tr>
<tr><td>Met?</td><td></td><td>N</td><td>Not scored</td></tr>
<tr><td>Justification</td><td colspan="3">There stock is not at or fluctuating around a level consistent with MSY.<br><br>For this stock the level consistent with MSY corresponds to the target reference point $SSB_{target}$ which is based on maintaining spawning stock biomass (SSB) above 40% of the expected SSB in the absence of fishing ($SSB_0$). Estimated $SSB_0$ for this fishery is based on the estimated unexploited or virgin biomass at the outset of the fishery in 1977.<br><br>Based on the latest stock assessment for this stock:<br>- $SSB_0$ = 449,585 mt<br>- Level consistent with MSY ($SSB_{target}$) = 0.4*$SSB_0$ = 179,834 mt<br>- $SSB_{2018}$ = 144,000 mt<br>- $SSB_{2018}/SSB_{target}$ = 0.8</td></tr>
</table>

| **PI 1.1.1** | **The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing** | | |
|---|---|---|---|
| | The latest estimate of SSB is below the biomass target reference point 40%$SSB_0$. Furthermore, the stock has not been above $SSB_{target}$ since the 1990's or consistently so since it first fell below that level in 1991 (see Figure 22); **SG80 is not met.**<br><br>According to FCR 7.10.5.3, if SG80 is not met for all SIs then no SI can be scored at SG100; therefore, as SG80 was not met, **SG100 was not scored**. | | |
| **References** | SUBPESCA 2016 Plan de Manejo para la pesqueria Merluza del Sur desde el paralello 41'22.86 al 57'00 LS 47 pg.<br>SUBPESCA,2017 Informe Tecnico 02/2017 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>SUBPESCA, 2018 Informe Tecnico 01/2018 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>IFOP, 2018b. MINUTA TÉCNICA: ESTATUS Y CBA. Convenio de Desempeño 2018. Estatus y posibilidades de explotación biológicamente sustentables de los principals recursos pesqueros nacionales al año 2019: Merluza del sur, 2019. SUBSECRETARÍA DE ECONOMÍA Y EMT / Noviembre 2018. | | |
| **Stock Status relative to Reference Points** | | | |
| | **Type of reference point** | **Value of reference point** | **Current stock status relative to reference point** |
| **Reference point used in scoring stock relative to PRI (SIa)** | PRI = $SSB_{lim}$ = 20%$SSB_0$<br><br>where $SSB_0$ is based on the virgin biomass at the outset of the fishery in 1977. | $SSB_{lim}$ = 89,917mt | $SSB_{2018}$= 144,000 mt<br><br>$SSB_{2018}/SSB_{lim}$<br>= 144,000 mt/89,917 mt<br>= 1.6 |
| **Reference point used in scoring stock relative to MSY (SIb)** | $SSB_{MSY}$ = 40%$SSB_0$<br><br>where $SSB_0$ is based on the virgin biomass at the outset of the fishery in 1977.<br><br>$F_{MSY}$ = $F_{45\%}$<br><br>*F* that decreases per recruit SSB to 45% of the unfished per recruit SSB. | $SSB_{MSY}$ = 179,834 mt.<br>$F_{MSY}$= 0.24 | $SSB_{2018}$= 144,000 mt<br><br>$SSB_{2018}/SSB_{target}$<br>= 144000 mt/179,834 mt<br>= 0.8<br><br>$F_{2018}$ = 0.23<br>$F_{2018}/F_{MSY}$ = 0.23/0.24 = 0.96 |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | | | **70** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | | **70** |
| **CONDITION NUMBER (if relevant):** | | | **1**<br>**(for both UoAs)** |

## PI 1.1.2 – Stock rebuilding

<table>
<tr><td colspan="2">PI 1.1.2</td><td colspan="3">Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Rebuilding timeframes</td></tr>
<tr><td>Guidepost</td><td>A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.</td><td></td><td>The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.</td></tr>
<tr><td>Met?</td><td>Y</td><td></td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.<br><br>The MSC defines Generation Time (GT) as the average age of a reproductive individual in a stock. For a stock where 0.1 ≥ M ≥ 2 (which is the case for Austral hake) this may be approximated based on the following equation:<br><br>$$GT = \frac{1}{M} + A_{m50}$$<br><br>Where: $A_{m50}$ (age at 50% maturity) = 9 – 11.2 (range of GT values calculated based on this range)<br>M (Natural mortality) = 0.21(according to Quiroz (2017)).<br><br>Therefore, for Austral hake:<br><br><u>Male:</u><br>$$GT = \frac{1}{0.21} + 9 \text{ to } \frac{1}{0.21} + 10 = 13.76 \text{ to } 14.76 \text{ and } 2GT = 27.32 \text{ to } 29.52$$<br><br><u>Female:</u><br>$$GT = \frac{1}{0.21} + 10 \text{ to } \frac{1}{0.21} + 11.2 = 13.76 \text{ to } 15.96 \text{ and } 2GT = 27.32 \text{ to } 31.92$$<br><br>So, in the context of the above, and based on the range of values available, two generation times for Austral hake is likely to be between 27.32 years and 31.92 years.<br><br>A fishery management plan was adopted recently in October 2016. In this plan, A rebuilding strategy for M. australis have been developed with a harvest strategy and control rule as well as with a rebuilding timeframe of no more of 16 years with continued monitoring. Therefore, a rebuilding timeframe is specified for the stock that is less than 2 generation time, even where the most precautionary estimate for 2GT = 27.32 is used; SG60 is met.<br><br>The rebuilding timeframe specified for the stock (i.e. 16 years) exceeds one generation time for the stock based on all estimates of generation time (i.e. 13.76 years to 15.96 years); SG100 is not met.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 1.1.2</td><td colspan="3">Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe</td></tr>
<tr><td>b</td><td colspan="4">Rebuilding evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.</td><td>There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.</td><td>There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.<br><br>There is a fishery management plan in place, supported by an operational framework with considerable stakeholder participation, scientific research, stock monitoring, comprehensive assessments and peer reviews.<br><br>There is a high level of scientific research and monitoring associated with Austral hake, including regular stock assessments. Much of the scientific research and monitoring is carried out by IFOP which provide SUBPESCA and the Austral hake scientific and management committee scientific advice, including stock assessments, to guide the management of the fishery. Stock assessments account for all sources of fishing mortality. There is therefore a wealth of both fishery dependent and fishery independent data available to SUBPESCA in order to ensure the fishery is managed effectively. Status of the stock and the fishery is based on results from a catch-at-age model that uses fishery catch statistics and sampling for size and age composition of the catch. The model is calibrated to trends in abundance from state agencies. This monitoring is carried out annually. Given the above monitoring is in place that is expected to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe. SG60 is met.<br><br>A constant F strategy is utilized for this stock between framework assessments. Within the constraint of F not to exceed $F_{MSY}$, the decision on the appropriate level for F is to be determined in the framework assessment year considering the acceptable level of risk for the stock in relation to the results of the long-term simulations. Fishing mortality (F) have been considerably reduced in recent years (2014-2018). The current $F_{MSY}$ is 0.24 (IFOP, 2018b) . The current fishing mortality for 2018 is 0.23. Thus $F_{2018}$ is below $F_{MSY}$ (For reference, please see Figure 19). Finally projections of SSB under different management scenarios and recrutiement episodes were explored on the SCA model and on the MSE. all stochastic projections showed that SSB reach target MSY before 1 generations time (13-16yrs) even in low periods of recruitment.<br><br>Therefore, there is evidence that the current strategy is likely helping in rebuilding Chile hake stocks, based on the information on the lower exploitation rates in recent years. SG80 are met.<br><br>However given that the strategy is relatively new and the model needs some refinement to correct for some uncertainties, it remains to be determined whether this strategy will be sufficient to increase and maintain SSB above to the target level over the short term. Given the above, it cannot be said that there is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe; SG100 is not met.</td></tr>
</table>

| PI 1.1.2 | Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe | |
|---|---|---|
| **References** | SUBPESCA 2016 Plan de Manejo para la pesqueria Merluza del Sur desde el paralello 41’22.86 al 57’00 LS 47 pg.<br>SUBPESCA, 2017 Informe Tecnico 02/2017 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>SUBPESCA, 2018 Informe Tecnico 01/2018 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA.<br>IFOP, 2018b. MINUTA TÉCNICA: ESTATUS Y CBA. Convenio de Desempeño 2018. Estatus y posibilidades de explotación biológicamente sustentables de los principals recursos pesqueros nacionales al año 2019: Merluza del sur, 2019. SUBSECRETARÍA DE ECONOMÍA Y EMT / Noviembre 2018. | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | **80** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

## PI 1.2.1 – Harvest strategy

<table>
<tr><th colspan="2">PI 1.2.1</th><th colspan="3">There is a robust and precautionary harvest strategy in place</th></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Harvest strategy design</td></tr>
<tr><td>Guidepost</td><td>The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.</td><td>The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.</td><td>The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td>Justification</td><td colspan="3">The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.<br><br>The Chile Austral hake industrial fishery is managed by the SUBPESCA and SERNAPESCA through the 2013 amended Fisheries Law in conjunction with annual TAC decisions.<br><br>There is an Austral hake management plan in place is supported by an operational framework with considerable stakeholder participation, scientific research, stock monitoring, comprehensive assessments and peer reviews. According to the management plan the general harvest strategy is to keep removals of hake at levels below $F_{MSY}$.<br><br>Biological reference points have been defined for this stock including target reference points for stock biomass ($B_{MSY}$) and fishing mortality ($F_{MSY}$) and a biomass limit reference point ($B_{lim}$).<br><br>The harvest strategy for this fishery involves a Harvest Control Rule (HCR) based on the ratio of Spawning Biomass at time (t) ($SSB_t$) to virgin biomass ($SSB_0$) whereby:<br><br>- If $[(SSB_t/SSB_{B0})*100] \geq 20\%$, apply a constant fishing mortality of $F = F_{MSY}$<br>- If $[(SSB_t/SSB_{B0})*100]$ $10\% \geq \leq 20\%$, apply a constant fishing mortality of $F = 0.8F_{MSY}$<br>- If $[(SSB_t/SSB_{B0})*100] < 10\%$, apply a constant fishing mortality of $F = 0.5F_{MSY}$<br><br>An average level of risk is applied to the fishery according to Law 20. Since 2013 this has consisted of maintaining F at a level corresponding to a 36% chance that F will not exceed $F_{MSY}$. Consistent with the population dynamics of the resource and in accordance with the corresponding strategy the maximum recovery time specified for this stock is 16 years.<br><br>Given that it is based on varying fishing mortality according to the ratio of current biomass ($SSB_t$) to virgin biomass, the harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80 (i.e. maintain the stock at a point where it is highly likely to be above the PRI and at or fluctuating around a level consistent with MSY); SG60, SG80 and SG100 are met.</td></tr>
<tr><td rowspan="4">b</td><td colspan="4">Harvest strategy evaluation</td></tr>
<tr><td>Guidepost</td><td>The harvest strategy is likely to work based on prior experience or plausible argument.</td><td>The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</td><td>The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.</td></tr>
</table>

<table>
<tr><th colspan="2">PI 1.2.1</th><th colspan="3">There is a robust and precautionary harvest strategy in place</th></tr>
<tr><td></td><td></td><td colspan="3">According to the Austral hake fishery management plan the general harvest strategy objectives is to keep the removals of Austral hake at levels below FMSY. With this approach the final goal is optimize catch levels in a way that the SSB may reach the target SSB reference point A constant F strategy is utilized for this stock between framework assessments. Within the constraint of F not to exceed $F_{MSY}$, the decision on the appropriate level for F is to be determined in the framework assessment year considering the acceptable level of risk for the stock in relation to the results of the long-term simulations.<br><br>Fishing mortality (F) have been considerably reduced in recent years (2014-2017) . The current $F_{MSY}$ is 0.24 (IFOP, 2018b) . The current fishing mortality for year 2018 is $F_{-2018}$ = 0.23.<br>Thus, $F_{2018}$ is below $F_{MSY}$ (For reference, please see Figure 19). Therefore, while the harvest strategy may not have been fully tested, evidence exists that it is achieving its objectives based on the information on the lower exploitation rates in recent years. SG60 and SG80 are met.<br><br>However, given that the strategy is relatively new and the model needs some refinement to correct for some uncertainties, it remains to be determined whether this strategy will be sufficient to increase and maintain SSB above to the target level over the short term. Therefore it cannot be said that the performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels; SG100 is not met</td></tr>
<tr><td>c</td><td colspan="4">Harvest strategy monitoring</td></tr>
<tr><td></td><td>Guidepost</td><td>Monitoring is in place that is expected to determine whether the harvest strategy is working.</td><td></td><td></td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td></td><td></td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Monitoring is in place that is expected to determine whether the harvest strategy is working.<br><br>Monitoring is in place which ensures that fishing vessels are in compliance with the various elements of the harvest strategy. Industrial fishery fleets are required to have VMS which records location and timing of fishing activity. All Industrial fishery vessels are required to have an automatic location and communication (ALC) device to transmit the vessel's position.<br><br>Compliance with individual vessel quotas is monitored at the point of landing through the SERNAPESCA Traceability system. Vessels must hail-in before landing and may land only at designated ports.<br><br>At-sea observers are deployed to record fishing activity and address conservation issues as required such as misreporting of catch, undersize catch, or high levels of incidental catch. Use of logbooks to record details of fishing activity and catch is mandatory. Surveillance at sea and aerial surveillance is carried out by IFOP AND SERNAPESCA, and monitoring of catch and fishing gear at sea and at dockside is conducted randomly.<br><br>In addition to the MCS activities to ensure compliance with the harvest strategy, the stocks are monitored through a series of fishery dependent and fishery–independent indicators. These are updated and reviewed as part of the annual stock assessment process to provide information on stock status and hence on the performance of the harvest strategy. Monitoring is in place that is expected to determine whether the harvest strategy is working; SG60 is met.</td></tr>
<tr><td>d</td><td colspan="4">Harvest strategy review</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td></td><td>The harvest strategy is periodically reviewed and improved as necessary.</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>Y</td></tr>
</table>

| PI 1.2.1 | | There is a robust and precautionary harvest strategy in place |
|---|---|---|
| | Justification | The harvest strategy is periodically reviewed and improved as necessary.<br><br>The harvest strategy is evaluated on an annual basis and improved as necessary through framework adjustments to management measures and amendments. The current Chile Austral hake fishery management plan is a "living" document that is continuously amended as needed. The Chile Austral hake fishery management plan includes a performance review section which outlines the measures that are used in achieving fisheries management goals. The harvest strategy is evaluated on an annual basis through a stock assessment review process which involves stakeholder representatives (ie IFOP staff, fisheries scientists, NGOS), and through consultations with industrial fisheries groups in formal advisory committee meetings. This process evaluates stock status in relation to the harvest strategy and considers/recommends appropriate adjustments in TACs for the upcoming season<br><br>As mentioned earlier, stock status is evaluated annually and scientific advice is provided for catch options in relation to the Fref harvest rate. The Scientific Technical and Advisory Committee consultative process leads to a consensus recommendation for TAC. The TAC decision is communicated via a Harvesting Plan notification that provides fleet sector allocations as well as other management measures. Periodic performance review of management measures is a requirement of the fishery management plan<br><br>The team is providing a list of recommendations for actions sent by the South Austral Demersal fisheries Scientific Technical Committee (STC) to the Austral hake management board that are specifically directed to revision/modification to the harvest strategy[7].<br><br>2013: SST adopted BRPs recommended by IFOP consisting of<br>• LRP =20%SSBo<br>• TRP=50%SSBo<br>• FMSY as overfishing limit<br><br>2014: SST made modifications of fisheries harvest control rule management strategy.<br>• Based on the 2014 BRP workshop (Paya et al.,2014), the SST recommended to use F45% as proxy of FMSY; 40%SSBo as proxy of BMSY and and Blim as 0.5BMSY<br>• It was agreed by SST to increase the upper limit of ABCs<br><br>2015: Based on the results of the international BRP workshop (Paya et al., 2014), It was agreed that Austral hake would be placed as a species under tier 1b. Species under tier 1b are the ones that don't have a stock recruitment relationship. Thus the SST aproved to use different proxys that can substitute MSY based BRPs.<br>• FMSY=F45%SSBR<br>• SSBMSY=40%*SSB0<br>• SSBlim=20%*SSB0<br>• It was agreed that the annual catch quotas should be estimated with a fishing mortality that not exceeds FMSY mortality allowable<br>• The SST agreed to use a fishing mortality with a probability of 50% of not exceeding FMSY.<br>• The SST agreed to include on the harvest strategy :<br>  o a fishing mortality rate that can allow the species to achieve MSY(ie F ramp, Fconstant, catch constant,etc ))<br>  o rebuilding time<br>  o include uncertainty and probability of reach conservation goals (ie B> BSMY)<br><br>2016:<br>• Due to the performance of the fishery, SST modified the ABCs and recommended a precautionary approach of changing the risk of exceeding FMSY from 50% to 10%. |

[7] http://www.subpesca.cl/portal/616/w3-propertyvalue-51145.html#collapse03

  

<table>
<tr><th colspan="2">PI 1.2.1</th><th colspan="3">There is a robust and precautionary harvest strategy in place</th></tr>
<tr><td></td><td></td><td colspan="3">

- A fishery management plan was adopted in 2016 and implemented in 2017.

2017:
- A plan for the reduction of bycatch and discards was approved in 2017. The plan was based on a study on the bycatch and discards conducted during 2015 and 2016 made by scientific observers (Bernal *et al.,* 2017).
- SST approved to incorporate estimates of discards from the South Austral demersal fishery into the stock assessments and some protocols were evaluated.
- As a SST recommendation Stock assessments were improved by inclusion of CPUE data that has been standardized by fleet (This was not done in previous assessments).
- Due to the performance of the fishery, SST modified the ABCs and recommended a risk of exceeding FMSY from 10% to 36% on the fishery management plan.

2018: A marine strategy evaluation (MSE) of the Austral hake fishery was conducted in 2018 and found that with the current situation (ie fishing mortality, abundance, SSB), the fishery cannot achieve the goals of the Austral hake management plan that has been in place in 2016.
- the SST recommended that all BRPs need to be reevaluated and estimated again.
- The SST also recommended that the steepness (h) parameter need to be reevaluated again.
- Due to the uncertainty on the estimates, it was agreed by the SST to hold back the calculations of ABC and TACS for 2019 until new stock assessment updates have been conducted with new scenarios and more recent data . It is expected that the stock assessment will be done in May 2019 .
- The SST made recommendations the risk level of the fishery rates exceeding FMSY currently established in the revised Austral hake management plan update (42% ) has to be modified to 50%. Thus, the estimates of fishing harvest rates, ABCs and TACS will need to be recalculated using a probability of risk of the fishery exceeding FMSY modified from 42% to 50%

Finally , It can be shown from the summary of the SST meeting acts that the harvest strategy has been periodically reviewed regarding several different topics and improved as necessary, therefore SG 100d is met.

Therefore,it can be said the harvest strategy is periodically reviewed and improved as necessary and **SG100 is met**.
</td></tr>
<tr><td>e</td><td colspan="4">Shark finning</td></tr>
<tr><td></td><td>Guidepost</td><td>It is likely that shark finning is not taking place.</td><td>It is highly likely that shark finning is not taking place.</td><td>There is a high degree of certainty that shark finning is not taking place.</td></tr>
<tr><td></td><td>Met?</td><td>Not relevant)</td><td>Not relevant</td><td>Not relevant</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">The target species (Austral hake) is not a species of shark; SIe is not relevant.</td></tr>
<tr><td>f</td><td colspan="4">Review of alternative measures</td></tr>
<tr><td></td><td>Guidepost</td><td>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.</td><td>There is a regular 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.</td><td>There is a biennial 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.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is a biennial 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.</td></tr>
</table>

| PI 1.2.1 | There is a robust and precautionary harvest strategy in place |
|---|---|
| | According to discard reduction plan for Chile Austral hake and Pink Cusk eel (SUBPESCA., 2018) which was implemented in 2018 there is an annual review of impact of unwanted catch on the status of target and non-target species. Bernal *et al*., (2017) proposed different alternative options to reduce unwanted catch on target, non-target species as well as metrics to evaluate effectiveness of the management measures to reduce unwanted catches. These proposed evaluations of the management measures to mitigate bycatch impact are set to be conducted every year.<br><br>Stock status is usually assessed every year and scientific advice provided for catch options and alternatives to unwanted catch. The Advisory Committee consultative process leads to a consensus recommendation on TACs and other conservation and management measures such as gear modification, seasonal closures, and size restrictions. Among some of the measurements to reduce UoA-related mortality of unwanted catch of the target stock is that there is a quota of allowance of unwanted catch for the demersal groundfish in the Industrial fishery.<br><br>IFOP, SUBPESCA are generally communicated to committee stakeholders via emails. Annual reviews of management measures is a requirement of the fishery management plan; **SG60, SG80 and SG100 are met.** |
| **References** | SUBPESCA 2016 Plan de Manejo para la pesqueria Merluza del Sur desde el paralello 41’22.86 al 57’00 LS 47 pg<br>SUBPESCA,2017 Informe Tecnico 02/2017 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>SUBPESCA 2018. Informe Técnico (R. Pesq.) N° 244-2017 Plan de Reducción del Descarte para las pesquerías de la merluza del sur y el congrio dorado y su fauna acompañante dentro de los paralelos 41°28’.6 y 57° LC.<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesquerfas Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Galvez P, L. Chong, R. Cespedes, J. Sateler, L. Adasme, R. San Juan, E. Garces, C. Toledo y J. Gonzalez. 2017. Proyecto Seguimiento de las pesquerias demersales y de aguas profundas, 2017: Seccion pesquerias demersales. Documento Tecnico de Avance. Convenio de desempeno IFOP/SUBDECON 2017. 121pp.<br>IFOP, 2018b. MINUTA TÉCNICA: ESTATUS Y CBA. Convenio de Desempeño 2018. Estatus y posibilidades de explotación biológicamente sustentables de los principals recursos pesqueros nacionales al año 2019: Merluza del sur, 2019. SUBSECRETARÍA DE ECONOMÍA Y EMT / Noviembre 2018. |

| | |
|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | **95** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **95** |
| **CONDITION NUMBER (if relevant):** | **NA** |

### PI 1.2.2 – Harvest control rules and tools

<table>
<tr><td colspan="2">PI 1.2.2</td><td colspan="3">There are well defined and effective harvest control rules (HCRs) in place</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">HCRs design and application</td></tr>
<tr><td>Guidepost</td><td>Generally understood HCRs are in place or available that are expected to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached.</td><td>Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY, <s>or for key LTL species a level consistent with ecosystem needs</s>.</td><td>The HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">Well defined HCRs are in place that ensure that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock fluctuating around a target level consistent with (or above) MSY.<br><br>A fishery management plan was adopted recently in October 2016. In this plan, A rebuilding strategy for M. australis have been developed with a harvest strategy and control rule as well as with a rebuilding timeframe of no more of 16 years with continued monitoring. According to the management plan the general harvest strategy is to keep removals of hake at levels below FMSY. With this approach the final goal is optimize catch levels in a way that the SSB may reach the target SSB reference point A constant F strategy is utilized for this stock between framework assessments. Within the constraint of F not to exceed FMSY, the decision on the appropriate level for F is to be determined in the framework assessment year considering the acceptable level of risk for the stock in relation to the results of the long-term simulations<br><br>Biological reference points have been defined for this stock including target reference points for stock biomass (BMSY) and fishing mortality (FMSY) and a biomass limit reference point (Blim).<br><br>The harvest strategy for this fishery involves a Harvest Control Rule (HCR) based on the ratio of Spawning Biomass at time (t) (SSBt) to virgin biomass (SSB0) whereby:<br>- If [(SSBt/$SSB_{B0}$)*100] ≥ 20%, apply a constant fishing mortality of F = $F_{MSY}$<br>- If [(SSBt/SSBB0)*100] 10% ≥ ≤20%, apply a constant fishing mortality of F = 0.8$F_{MSY}$<br>- If [(SSBt/SSBB0)*100] <10%, apply a constant fishing mortality of F = 0.5$F_{MSY}$<br><br>An average level of risk is applied to the fishery according to Law 20. Since 2013 this has consisted of maintaining F at a level corresponding to a 36% chance that F will not exceed FMSY. Consistent with the population dynamics of the resource and in accordance with the corresponding strategy the maximum recovery time specified for this stock is 16 years.<br><br>The HCRs in place are well defined and ensure that fishing mortality is reduced as PRI is approached. Furthermore, the HCRs are designed in such a way (i.e. F no to exceed $F_{MSY}$) that they are expected to, once the stock has rebuilt, keep the stock fluctuating around a target level consistent with (or above) MSY; Projections of SSB under different management scenarios and recruitment episodes were explored on the SCA model and on the MSE stochastic projections showed that SSB reach target BMSY before 2 generations times even in low periods of recruitment. Furthermore, there is evidence indicating that the harvest control rules effective in achieving the exploitation levels required under the HCRs. Fishing mortality (F) has been significantly reduced in recent years resulting in that the current fishing mortality F2018 to be below the target level $F_{MSY}$[F2018=0.23 < $F_{MSY}$=0.24] (IFOP., 2018b). SG60 and SG80 are met.</td></tr>
</table>

| PI 1.2.2 | | There are well defined and effective harvest control rules (HCRs) in place | | |
|---|---|---|---|---|
| | | However, the HCRs have only recently been implemented and recent data shows that current SSB is not fluctuating at or above the target reference point. Thus, it cannot be said that this time the HCRs are expected to keep the stock fluctuating at or above a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock; **SG100 is not met**. | | |
| **b** | HCRs robustness to uncertainty | | | |
| | **Guidepost** | | The HCRs are likely to be robust to the main uncertainties. | The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are robust to the main uncertainties. |
| | **Met?** | | Y | N |
| | **Justification** | The HCRs are likely to be robust to the main uncertainties.<br><br>There have been efforts to account for the uncertainties on the SCA model results on which the harvest control rules are based. Implications of uncertainty about the biology of Austral hake either by using different assumptions of natural mortality or different selectivity patterns as well as stock-recruit relationships in the harvest strategy simulations have been explored.<br><br>Other relevant information as retrospective analyses, projections of SSB under different management scenarios and recruitment episodes explored on the SCA model and on the MSE was looked up. Model outputs showed weak retrospective patterns in SSB and F. There was some considerable degree of restrospective patterns in recruitment. However all stochastic projections from the SCA model and the MSE showed that SSB reach target MSY before 1 generations time (13-16 yrs) even in low periods of recruitment. Therefore, the HCRs are likely to be robust to the main uncertainties; **SG80 is met.**<br><br>However, the authors of the model confirmed with the team that there have not been simulations to look at the impact of all uncertainties on the harvest control rules. Juan Carlos Quiroz, principal researcher of the Austral hake stock assessment, confirmed that the harvest rule in the closed loop simulations did not include a ramp down as it approached the Limit Reference Point. Quiroz noted that at the next assessment, IFOP can incorporate that harvest rule in the simulation model through the MSE model. Given the information above, it cannot be said that the HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties; **SG100 is not met.** | | |
| **c** | **HCRs evaluation** | | | |
| | **Guidepost** | There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation. | **Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs. | **Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs. |
| | **Met?** | Y | Y | N |
| | **Justification** | Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.<br><br>Fishing mortality (F) has been significantly reduced in recent years resulting in that the current fishing mortality F2018 to be below the target level FMSY[$F_{2018}$=0.23 < $F_{MSY}$=0.24] (IFOP., 2018b). Thus, there is evidence indicating that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs; **SG60 and SG80 are met.** | | |

| PI 1.2.2 | There are well defined and effective harvest control rules (HCRs) in place | |
|---|---|---|
| | However, there is still work pending on investigating uncertainty on harvest control rules; therefore it cannot be said that there is evidence which clearly shows that the tools in use are effective in achieving the exploitation levels required under the harvest control rules; **SG100 is not met**. | |
| **References** | SUBPESCA 2016 Plan de Manejo para la pesqueria Merluza del Sur desde el paralello 41’22.86 al 57’00 LS 47 pg.<br>SUBPESCA, 2017 Informe Tecnico 02/2017 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>SUBPESCA, 2018 Informe Tecnico 01/2018 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>IFOP, 2018b. MINUTA TÉCNICA: ESTATUS Y CBA. Convenio de Desempeño 2018. Estatus y posibilidades de explotación biológicamente sustentables de los principals recursos pesqueros nacionales al año 2019: Merluza del sur, 2019. SUBSECRETARÍA DE ECONOMÍA Y EMT / Noviembre 2018. | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | **80** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

## PI 1.2.3 – Information and monitoring

<table>
<tr><td>PI 1.2.3</td><td colspan="4">Relevant information is collected to support the harvest strategy</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td>a</td><td colspan="4">Range of information</td></tr>
<tr><td></td><td>Guidepost</td><td>Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.</td><td>Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.</td><td>A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy.<br><br>Research studies have provided considerable knowledge of all aspects of Austral hake life history, population biology, ecology and stock structure throughout the X-XII.<br><br>Stock productivity and abundance are monitored by way of an annual RV survey which provides ongoing, fishery-independent indices of abundance and biomass at age as well detailed information on size, age and maturity composition.<br><br>Detailed information on the number and type of vessels in the fishery is collected through the licensing system. The temporal and spatial pattern of the fishery, gear usage, etc. are well known. Catch monitoring within the commercial groundfish fishery has many components. All vessels are required to hail-out to SERNAPESCA prior to departing on a fishing trip and are also required to hail-in from sea prior to returning to port. Both hails are captured by a third-party, independent dockside monitoring company who records information on the vessel as well as the catch on board. A variety of information must also be reported to SERNAPESCA in fishery monitoring documents completed by the captain for each trip. All of the majority of the commercial Industrial groundfish fleet is required to carry an approved Vessel Monitoring System (VMS) on board when on a fishing trip. The VMS unit transmits positional information to a communication service provider who, in turn, makes the information available to Sernapesca. Furthermore, the X- XII bio regions, has been the focus of extensive ecosystem research for many years. Therefore, sufficient relevant information related to stock structure, stock productivity, fleet composition and other data is available to support the harvest strategy; SG60 and SG80 are met.<br><br>Observer coverage for the industrial fleets within the fishery little varies and is considered to be high in some instances. This results in imprecise estimates of bycatch and discards. The majority of Austral hake landings are monitored at the point of offloading by independent, third-party dockside monitors. The monitors verify the weight and the species of fish offloaded. IFOP staff undertakes dockside sampling to characterize the age and size composition of the landings.<br><br>There are still gaps of knowledge in the biology of the species, (i.e. early life history, recruitment dynamics, natural mortality, growth) as well as the impact of environmental correlates to the species distribution. There is also some notable estimates of uncertainty on bycatch estimates. Given the above , it cannot be said that a comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available; SG100 is not met.</td></tr>
</table>

| PI 1.2.3 | | Relevant information is collected to support the harvest strategy | | |
|---|---|---|---|---|
| **b** | Monitoring | | | |
| | **Guidepost** | 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 **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule. | **All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty. |
| | **Met?** | Y | Y | N |
| | **Justification** | Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.<br><br>An annual RV survey provides ongoing, fishery-independent indices of abundance and biomass at age as well as detailed information on size, age and maturity composition of the catch.<br><br>Austral hake is harvested by industrial and artisanal fishing vessels as part of a mixed, multi-species fishery that includes other groundfish such as Hoki, Blue Southern Whiting , Pink Cusk eel, Southern Pomfret among other species making it difficult to define a directed fishing trip. Consequently, catch is reported for all groundfish trips from industrial and artisanal fishing vessels for mobile and fixed gear. The majority of Austral hake landings from industrial and artisanal are monitored at the dockside point of offloading by dockside monitors. The independent, third-party monitors verify the weight and the species of fish offloaded. IFOP Science undertakes dockside sampling to characterize the age and size composition of the landings. Furthermore, the high level of observer coverage of the industrial fleets and areas within the Austral hake fishery provides verification of actual catches with landings. Therefore, stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule; **SG60 and SG80 are met.**<br><br>However, while possible sources of uncertainty in data from the fishery are known, it cannot be said that all information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty; **SG100 is not met.** | | |
| **c** | Comprehensiveness of information | | | |
| | **Guidepost** | | There is good information on all other fishery removals from the stock. | |
| | **Met?** | | Y | |
| | **Justification** | There is good information on all other fishery removals from the stock.<br><br>Austral hake is harvested by industrial and artisanal fishermen as part of a mixed, multi-species fishery that includes other groundfish such as Hoki, Blue Southern Whiting, and Pink Cusk eel. Consequently, catch is reported for all groundfish trips for mobile and fixed gear from the Industrial and Artisanal sectors. The majority of Austral hake landings from industrial and artisanal sectors are monitored at the dockside point of offloading by independent, third-party dockside monitors and complemented in logbooks. These monitors verify the weight and the species of fish offloaded, thereby quantifying total removals for each species by all fisheries. More recently, a monitoring study of discards in the Southern Austral demersal groundfish fishery was initiated in | | |

| PI 1.2.3 | Relevant information is collected to support the harvest strategy |
|---|---|
| | 2015 (Bernal *et., al* 2017, Bernal *et., al* 2018) with the purpose to provide estimates of discards on many different groundfish fisheries. The 2015-2016 data on Industrial discards and Artisanal discrads and subreport information from Bernal *et al.,* (2017) was used by IFOP to calculate TACs by taking into consideration the impact of discards and subreporting. Therefore, there is good information on all other fishery removals from the stock. **SG80c** is met. |
| **References** | SUBPESCA 2016 Plan de Manejo para la pesqueria Merluza del Sur desde el paralello 41'22.86 al 57'00 LS 47 pg.<br>SUBPESCA, 2017 Informe Tecnico 02/2017 del Comite Cientifico Tecnico de Recursos Demersales Zona Sur Austral (CCT-RDZSA).<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. Informe Final. Convenio de desempeno 2016 Programa de Investigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesquerfas Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Galvez P, L. Chong, R. Cespedes, J. Sateler, L. Adasme, R. San Juan, E. Garces, C. Toledo y J. Gonzalez. 2017. Proyecto Seguimiento de las pesquerias demersales y de aguas profundas, 2017: Seccion pesquerias demersales. Documento Tecnico de Avance. Convenio de desempeno IFOP/SUBDECON 2017. 121pp. |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **80** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 1.2.4 – Assessment of stock status

| PI 1.2.4 | | There is an adequate assessment of the stock status | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Appropriateness of assessment to stock under consideration | | | |
| | **Guidepost** | | The assessment is appropriate for the stock and for the harvest control rule. | The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA. |
| | **Met?** | | Y | Y |
| | **Justification** | The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.<br><br>A new assessment framework was adopted in 2017 (Quiroz *et al*. 2017). This framework used a statistical catch-at-age (SCA) model to assess the stock status and a Management Strategy model to evaluate the impact of a suite of harvest strategies on the biomass/population trends and landings.<br><br>The framework uses a statistical catch-at-age (SCA) model that estimates historical biomass, fishing mortality, recruitment and biological reference points, and is used to condition, or parameterize, the operating model. The assessment model (SCA) and the Austral hake MSE currently depict similar dynamics of hake growth, mortality, and at-sea discarding of under-sized fish in the Industrial and Artisanal fisheries. Therefore, the assessment takes into account the major features relevant to the biology of the species and the nature of the UoA; **SG80 and SG100 are met.** | | |
| b | Assessment approach | | | |
| | **Guidepost** | The assessment estimates stock status relative to generic reference points appropriate to the species category. | The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated. | |
| | **Met?** | Y | Y | |
| | **Justification** | The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.<br><br>The assessment provides an estimate of stock status in relation to reference points established for the Austral hake; the latest such estimates are:<br>- $SSB_{2017}/SSB_{lim}$ = 144,000 mt/89,917 mt = = 1.60<br>- $SSB_{2018}/SSB_{target}$ = 144,000 mt/179,834 mt = 0.800<br>- $F_{2018}/F_{MSY}$ = 0.23/0.24 = 0.96<br><br>The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated; **SG60 and SG80 are met.** | | |
| c | Uncertainty in the assessment | | | |
| | **Guidepost** | The assessment **identifies major sources** of uncertainty. | The assessment takes uncertainty into account. | The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way. |
| | **Met?** | Y | Y | Y |
| | **Justification** | The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way. | | |

| PI 1.2.4 | | There is an adequate assessment of the stock status | | |
|---|---|---|---|---|
| | | The Austral hake model is meant to provide a practical, yet realistic representation of Austral hake stock dynamics, fishery harvesting process, and monitoring data so that non-linear stock dynamics, time lags, and data uncertainties can be taken into account in annual TAC advice. Assessment outputs are based on a Bayesian framework. Further the model does incorporate the majority of uncertainties for some of the important parameters such as growth, mortality and selectivity. Some of the uncertainties on the model are explored in sensitivity analyses of estimates from the assessment model due to uncertainty in abundance indices, catch length composition, and biological data. There are also diagnostics and retrospective patterns analysis to test the robustness of the model based on distinct alternative of runs. The assessment model provides kove plots to visualize the level of uncertainty on the reference points.<br><br>The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way; **SG60, SG80 and SG100 are met.** | | |
| **d** | Evaluation of assessment | | | |
| | **Guidepost** | | | The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. |
| | **Met?** | | | Y |
| | **Justification** | The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.<br><br>The assessment model was developed from a series of workshops initiated by IFOP in 2013 (Paya *et al*., 2014). Those workshops intended to define and/or establish the technical standards and available methods for estimating the maximum sustainable yield (MSY) by species and the biological reference points (BRP) associated with it. At the workshop, Chilean scientists and seven international scientists developed a tier system to categorize stocks according to what type of assessment could be performed and what type of reference points could be estimated (FMSY and BMSY or proxies), set out a number of methods by which reference points could be computed, and recommended methods of computing reference points for each of 24 stocks.<br><br>For Chile Austral hake, there is an extensive amount of information available to conduct an assessment of the stock. There are CPUE indices for each major fleet, and an acoustic survey extending over 20 years. In addition, over 30 years of age composition information is available for each major fleet. It was found that the most appropriate model to be applied on the fishery was a standard age-structured assessment model in which a Beverton-Holt stock recruit relationship is used to model the central tendency in recruitment. A fixed value of 0.6 is used for steepness in the stock recruit relationship. This approach was recommended because there was no patterns of residuals on the parent stock recruitment relationship. Thus this stock assessment model was approved to be used on the workshops (Paya *et al*., 2014).<br><br>One of the concern of the workshop is the uncertainty in the estimates of stock status. Among some of the alternative approaches to evaluate uncertainty on biological reference points discussed on the workshops were the use of maximum likelihood methods (i.e. Inversion of hessian matrix,) and Bayesian methods (Markov Chain Methods). At the end of the workshops, the group recommended Bayesian methods as a more robust approach to maximum likelihood. There have been sensibility analyses on recruitment projections exploring alternative scenarios such density dependence influences and stock recruitment relationship | | |

  

<table>
<tr><td colspan="2">PI 1.2.4</td><td colspan="3">There is an adequate assessment of the stock status</td></tr>
<tr><td></td><td></td><td colspan="3">Other approaches that were investigated to evaluate the model was the magnitude of retrospective patterns in output values such as SSB or F. Diagnostic plots showed weak retrospective patterns. It is noteworthy to add that the IFOP and SUBPESCA science peer review process provides opportunity for scientific peer review of data inputs, model structure, reference points, interim procedure, harvest strategies and objectives for the fishery. (Quiroz, 2017)<br>Based on the above, it can be said that the assessment has been tested and shown to be robust. It can also be said that alternative hypotheses and assessment approaches have been rigorously explored. It meets 100d.<br><br>IFOP and SUBPESCA science peer review process provides opportunity for scientific peer review of data inputs, model structure, reference points, interim procedure, harvest strategies and objectives for the fishery. (Quiroz, 2017). SG100 is met.</td></tr>
<tr><td>e</td><td colspan="4">Peer review of assessment</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>The assessment of stock status is subject to peer review.</td><td>The assessment has been internally and externally peer reviewed.</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td>Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">The assessment has been internally and externally peer reviewed.<br><br>The assessment of stock status for M. australis is completed by IFOP scientists who specialize in demersal fish assessments. These assessments are peer reviewed internally by other IFOP scientists as well as externally by scientists from other research and management institutions. Evidence of external reviews comes from peer reviews reports by Ianelli (2011) and Garcia et al (2017). SG80 and SG100 are met.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Ianelli, J. 2011. Reporte sobre la evaluación del stock de la merluza del sur (Merluccius australis), págs. 68-108. En: Informe Final. Proyecto N° 2011-4728-35. Programa de revisión experta a la asesoría científica de las principales pesquerías nacionales, año 2011. Merluza común y merluza del sur. Universidad de Concepción, 276 p.<br>García, D., J. Jurado-Molina, S. Sánchez, H. Arancibia, R. Alarcón y M. Barros. 2017. Informe de Taller. Proyecto CUI 2016-33-DAP-18. Revisión de pares evaluaciones de stock merluza del sur y merluza común. Universidad de Concepción, 137 p. + Anexos.<br>Quiroz J C. 2014. Informe Final. Convenio II. Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros. Proyecto 2.8: Investigación y posibilidades de explotación biológicamente sustentables en merluza del sur, año 2014. Merluza del sur año 2014. Abril 2014. 73 pp+Anexos.<br>Quiroz J.C. 2014. Investigación del estatus y posibilidades de explotación biológicamente sustentables en merluza del sur, año 2014. Informe Consolidado. Subsecretaría de Economía y Empresas de menor tamaño - IFOP. 73 pp + anexos.<br>Quiroz J.C 2015 Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales al año 2016:Merluza del sur, 2016.<br>Quiroz J.C 2016 Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales al año 2017:Merluza del sur, 2017<br>Quiroz J.C 2017 Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales al año 2018:Merluza del sur, 2018.<br>IFOP, 2018b. MINUTA TÉCNICA: ESTATUS Y CBA. Convenio de Desempeño 2018. Estatus y posibilidades de explotación biológicamente sustentables de los principals recursos pesqueros nacionales al año 2019: Merluza del sur, 2019. SUBSECRETARÍA DE ECONOMÍA Y EMT / Noviembre 2018.</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):</td><td>100</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):</td><td>100</td></tr>
<tr><td colspan="4">CONDITION NUMBER (if relevant):</td><td>NA</td></tr>
</table>

### 9.1.1.2 Principle 2 – Environmental Impact of Fishing – Evaluation Tables

**PI 2.1.1 – UoA 1 Industrial trawl-bottom and midwater trawl: Primary species outcome**

<table>
<tr><td colspan="2">PI 2.1.1</td><td colspan="3">The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Main primary species stock status</td></tr>
<tr><td>Guidepost</td><td>Main primary species are likely to be above the PRI<br><br>OR<br><br>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.</td><td>Main primary species are highly likely to be above the PRI<br><br>OR<br><br>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.</td><td>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</td></tr>
<tr><td>Met?</td><td>Scoring element 1 Southern blue whiting – Y<br>Scoring element 2 Hoki – Y</td><td>Scoring element 1 Southern blue whiting – Y<br>Scoring element 2 Hoki – N</td><td>N for both scoring elements</td></tr>
<tr><td>Justification</td><td colspan="3">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.<br><br><u>Scoring element 1- bottom trawl</u><br>Among all the species caught as non-target species in the component bottom trawl, two species were defined as primary main species: Southern blue whiting and hoki (blue grenadier).<br><br><u>Scoring element 2- midwater trawl</u><br>Of the total of ten species defined as non-target species in this component of the UoAs the same species as in bottom trawl component were identified as primary main: Southern blue whiting and hoki (blue grenadier).<br><br>The stock status of the species for both components is defined below:<br><br>Hoki [(Macruronus magellanicus) - merluza de cola] - Spawning stock biomass (SSB) estimates show a decreasing trend, with exploitation rates above target levels from 2006 to 2013. SSB has decreased to 19 % of its Virgin Stock $SSB_o$ in recent years with a high risk of being depleted in a short time. The stock is overexploited and in risk of depletion, age structure shows predominance of juveniles and recruitment levels are very low since 2000. Therefore, hoki stock is below the PRI, but the UoC has measures in place that are expected to ensure that the UoC (bottom trawl and midwater trawl) does not hinder recovery and rebuilding and SG60 is met. Although a Management Committee for Hoki was created for the development of a management plan (SUBPESCA, 2016), in line with the new Fisheries Law requirements the trends in the recovery regime has not shown expected changes in the SSB, therefore there is no evidence of recovery or a demonstrably effective strategy in place and SG80 is not met.<br><br>Southern blue whiting [(Micromesistius australis), merluza de tres aletas] – Spawning Stock biomass (SSB) is decreasing over the years. The Scientific Committee points out a spawning biomass of around 84 thousand tons, which represents a virgin stock reduction of 21% of the Virgin Biomass (Bo). However fishing mortality has been lower than the target value (F45%) recently. Thus, the stock is currently above the LRP and overfishing is not occurring. The probability to be in collapse is around 20 % therefore, the assessment team has concluded that</td></tr>
</table>

<table>
<tr><th colspan="2">PI 2.1.1</th><th colspan="3">The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.</th></tr>
<tr><td></td><td></td><td colspan="3">southern blue whiting is above the PRI therefore SG 80 is met however the trends show that the recruitment is decreasing in recent years and the stock is not fluctuation around a level consistent with MSY therefore SG 100 is not met.</td></tr>
<tr><td>b</td><td colspan="4">Minor primary species stock status</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td></td><td>Minor primary species are highly likely to be above the PRI<br><br>OR<br><br>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>Scoring elements bottom and midwater trawls:<br><br>Pink cusk eel (both stocks)- Y<br>Southern rays bream- N<br>Yellownose skate (for Bottom trawl) - Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species<br><br><u>Scoring element- bottom trawl</u><br>Among all the species caught as non-target species in the component bottom trawl, two species were defined as primary minor species: Pink cusk eel and Southern rays bream with percentage between 2 and 1, respectively.<br><br>Pink cusk-eel [(Genypterus blacodes) - Congrio dorado] - Northern and Southern stocks – There are two stocks of Pink cusk eel in 2 separate regions within the study area where the fishery under evaluation operates. The last report published by SUBPESCA has shown both stocks as above the limit reference point. However, it is important to say the data used to define the status can be underestimating abundance and size structure as there are large uncertainties in the CV of the biomass estimates due to the landings do not match with the discards program data therefore the stocks are not highly likely above the limits, however, the last stock assessment update (SUBPESCA 2017 )has shown both stocks in route to recovery where the stocks are above the limit reference point and overfishing is not occurring. In conclusion, for both Northern and Southern stocks, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species and SG 100 is met.<br><br>Southern rays bream [(Brama australis)-Reineta] –Total catches of this species used to be from the artisanal fishery but since 2012 the catches from industrial fisheries have increased and the overall total catch have increased in the last two years. There is no clear management plan for this species and the technical committee to manage the stock status has not been formed. However, in the 2017 stock assessment report the stock has been defined as overfished and overfishing is occurring because fishing mortality has increased in recent years. Therefore, there is no evidence that the UoA does not hinder the recovery and rebuilding of minor primary species and SG 100 is not met.<br><br>Yellownose skate [(Zearaja chilensis/Raya volantin)] – The fishery of skate in Chile is regulated by reference points, total catches and is monitored by SERNAPESCA. The technical committee</td></tr>
</table>

| 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.** |
|---|---|
| | evaluates every year the stock status of the species and makes a recommendation to set up a limit. In 2018, the limit was established at 70t. It has been documented that 99% of catches originate from artisanal vessels with high percentage of the catches occurring in inside waters. Catches from industrial fisheries are negligible being the percentage of catch of bottom trawl 0.4% of the total catch composition, therefore there is evidence that the UoA does not hinder the recovery and rebuilding and **SG 100 is met.**<br><br>Scoring element- midwater trawl<br>Among all the species caught as non-target species in the component midwater trawl, two species were defined as primary minor: Pink cusk-eel and Southern rays bream with a percentage of 1% and 0.3% respectively.<br><br>The stock status of both species is detailed above and therefore as mentioned for Northern and Southern stocks of Pink cusk eel there is evidence that the UoA does not hinder the recovery and rebuilding and **SG 100 is met.**<br><br>Southern rays bream has shown an increasing trend in fishing mortality and there is no evidence that that the UoA does not hinder the recovery and rebuilding and **SG 100 is not met.** |
| **References** | Estado de situación de las principales pesquerías chilenas, año 2017. Departamento de Pesquerías División de Administración Pesquera Subsecretaría de Pesca y Acuicultura. Marzo 2018.<br>Informe técnico del Comité Científico Técnico (CCT) de los Recursos Demersales de la Zona Sur Austral (CCT-RDZSA). Dic 2017.<br>MSC interpretations: https://mscportal.force.com/interpret/s/article/Scoring-SG100-if-not-all-SG80-met-7-10-5-3-1527262010218 |

| | |
|---|---|
| **Bottom trawl** | |
| **Scoring element 1 (Hoki)** | **60** |
| **Scoring element 2 (Southern blue withing)** | **80** |
| **Scoring element 3 (Pink cusk-eel- both stocks)** | **100** |
| **Scoring element 4 (Southern rays bream)** | **80** |
| **Scoring element 5 (Yellownose skate)** | **100** |
| **Midwater trawl** | |
| **Scoring element 1 (Hoki)** | **60** |
| **Scoring element 2 (Southern blue whiting)** | **80** |
| **Scoring element 3 (Pink cusk-eel)** | **100** |
| **Scoring element 4 (Southern rays bream)** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE:** | **75** |
| **CONDITION NUMBER (UoA 1 - trawl):** | **2** |

## PI 2.1.1 – UoA 2 Longline: Primary species outcome

<table>
<tr><td colspan="2">PI 2.1.1</td><td colspan="3">The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Main primary species stock status</td></tr>
<tr><td>Guidepost</td><td>Main primary species are likely to be above the PRI<br><br>OR<br><br>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.</td><td>Main primary species are highly likely to be above the PRI<br><br>OR<br><br>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.</td><td>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</td></tr>
<tr><td>Met?</td><td>Scoring element 1-Pink cusk-eel-Y<br>Scoring element 2-Common sardine-Y</td><td>Scoring element 1-Pink cusk-eel-Y<br>Scoring element 2-Common sardine- bait - Y</td><td>Scoring element 1-Pink cusk-eel- N<br>Scoring element 2-Common sardine- N</td></tr>
<tr><td>Justification</td><td colspan="3">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.<br><br>Two species were defined as primary main in the longline fishery. One of them is represented in the total composition of the species caught: Pink cusk-eel (12.72%). Further, the other species is common sardine representing around 14% of the total catch composition of the UoC and is used as bait by longline vessels.<br><br>The stock status of pink cusk – eel Northern and Southern stocks – There are two stocks of pink cusk eel in 2 separate regions within the study area where the fishery under evaluation operates. The last stock assessment update (SUBPESCA., 2017) has shown both stocks in route to recovery where the stocks are above the limit reference point and overfishing is not occurring. Figure 22 and Figure 23 show the reference points and the current situation of the stock status for the 2 stocks along with 95% confidence intervals. Currently, the stock is above the limit reference point $SSB_{2017}>0.5B_{MSY}$ with a probability to be above the LRP for more than 80% and overfishing is not occurring $F_{2017}<F_{MSY}$. Thus, Pink cusk eel stocks are highly likely to be above the PRI showing evidence of recovery. Therefore, SG80 is met. However, the SSBs for these Pink cusk eel populations have not fluctuated around the MSY level, therefore SG100 is not met.<br><br>Common sardine [(Sardina pilchardus), Sardina de Marruecos- Stock C]- The Southern zone stock (C) was evaluated using two Surplus production models (Biodyn and ASPIC). Both, Biodyn and ASPIC models suggest that the stock is not overfished (i.e. Biomass current Year >0.5BMSY). Given that the biomass has been above BMSY since 2000 resulting with a high probability 95% that the SSB is above the LRP. Thus, it can be said is likely that the stock status is above the LRP and SG 80 is met. However, as some uncertainties have been shown among the models(e.g magnitude of fishing mortality), there is not a high degree of certainty that the fishery is fluctuating around MSY and therefore SG 100 is not met.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.1.1</td><td colspan="3">The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.</td></tr>
<tr><td rowspan="3">b</td><td colspan="4">Minor primary species stock status</td></tr>
<tr><td>Guidepost</td><td></td><td></td><td>Minor primary species are highly likely to be above the PRI<br><br>OR<br><br>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species</td></tr>
<tr><td>Met?</td><td></td><td></td><td>Scoring element 3- Hoki - N<br>Scoring element 4- Southern rays bream – N<br>Scoring element 5- Patagonian toothfish – N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">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.<br><br>Three minor primary species were found in the catch species composition of the longline fleet:. Southern rays bream accounted for 0.69 % of the total volume of the catch followed by Chilean seabass/Patagonian toothfish (0.34%) and Hoki accounting for 0.22%.<br><br>Hoki [(Macruronus magellanicus), Merluza de cola] - as defined for trawls the stock status of the species is not in good shape, SSB is decreasing over the years. The last report has shown the estimated SSB in 2016 has decreased to 19 % from its Virgin Biomass. F is above limits but the possibility to be below limits in the up-coming years is high. However, in the last 5 years there has been a slight trend to recovery. The stock status is overfished but overfishing is not occurring. Therefore, there is no evidence of recovery or a demonstrably effective strategy in place and SG 100 is not met.<br><br>Southern rays bream [(Brama australis), Reineta]- as mentioned for the other UoA-trawl, in the last report from 2017 the stock has been defined as overfished and overfishing is occurring due to the fishing effort that has been increasing in recent years. Furthermore, the current situation of the stock status is that there is no specific management plan for this species and there is no technical committee to manage the stock. Therefore, there is no evidence that the UoA does not hinder the recovery and rebuilding of minor primary species and SG 100 is not met.<br><br>Patagonian toothfish/Chilean seabass [(Dissostichus eleginoides), bacalao de profundidad] - The committee in charge to evaluate demersal fisheries in the area has considered that the Chilean seabass has enough data to run models on which reference limits can be estimated. However, in the North area, the fisheries data from artisanal fleets is scarce and there are not enough local studies to establish reference points. Consequently ,proxys have to be used to define the stock status. In the 2017 stock status report, the stock of Chilean seabass was classified as collapsed (ie. below their LRP) and in a state of overfishing with high fishing mortality levels. Therefore, there is no evidence that the UoA does not hinder the recovery and rebuilding of minor primary species and SG 100 is not met.</td></tr>
</table>

| 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. |
|---|---|
| References | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP. |

| | |
|---|---|
| **Scoring element 1 (Pink cusk-eel)** | **80** |
| **Scoring element 2 (Common sardine)** | **80** |
| **Scoring element 3 (Hoki)** | **80** |
| **Scoring element 4 (Southern rays bream)** | **80** |
| **Scoring element 5 (Patagonian toothfish)** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE:** | **80** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.1.2 – Primary species management strategy- All UoAs (Trawls and longline)

<table>
<tr><td colspan="2">PI 2.1.2</td><td colspan="3">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.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Management strategy in place</td></tr>
<tr><td>Guidepost</td><td>There are measures 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 above the point where recruitment would be impaired.</td><td>There is a partial strategy 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.</td><td>There is a strategy in place for the UoA for managing main and minor primary species.</td></tr>
<tr><td>Met?</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td><td>N (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is a partial strategy in place for both UoA, trawl and longline, 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.<br><br>The recently amended 2013 Chile fisheries law specifies the management measures for groundfish species off the Southern Austral region. Under the recently revised law, a system of Annual Catch Limits (ACLs) and Accountability Measures (AMs) is designed to ensure catches remain below desired targets for each stock in the management complex. AMs are management controls to prevent ACLs from being exceeded and to correct or mitigate overages of the ACL if they occur. These new ACLs are based on biological reference points approved by a scientific committee. The AC are also measures in place such as: closed areas, minimum sizes (60 cm), biological closures, mesh sizes (13cm and Hook N.6) among others. Therefore, there are measures in place to manage primary species and SG 60 is met for both UoAs.<br><br>In 2014, the “Programa de investigación del Descarte y la Captura incidental en pesquerías demersales” (PRDCI) was signed by the government and implemented by IFOP. This program is part of the new modifications of the general law aimed to control and monitor the bycatch.<br><br>From 2015 to 2017, there have been on board observer programs in all fleets involved in the demersal fisheries in Chile to collect information to be evaluated under the PRDCI.<br><br>From 2018, different measures have been in development in order to establish a discard reduction plan aimed for several target species in the regions between 41 to 57 LS in order to build a strategy to reduce the bycatch of non-target species and incidental catches. The main goals proposed are to improve the selectivity of the fishing activities and comply with the sustainable agreements made in the law, currently under review (Ley General de Pesca y Acuicultura).<br><br>These projects are carried out by SUBPESCA in cooperation with the scientific organism IFOP, and are aimed at: Austral hake, Southern blue whiting, Hoki and pink cusk-eel and further frequent non-target species in the demersal fisheries with trawl and longline.<br><br>These measures are being implemented gradually and no results can be observed yet. Among some of the measures already in place are for example, net cameras, on-board electronic monitoring of the catches, VMS and logbooks.<br><br>There will be some measures exclusively for primary and secondary main species defined in this report and also for a species of skate due to its condition of ETP species. The team will evaluate the species in the section 2.3.1 below.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.1.2</td><td colspan="3">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.</td></tr>
<tr><td></td><td></td><td colspan="3">All the measures are applicable for all the UoAs defined in the certification with one exception, the vessel which process on board to land the final product will have measures to improve the weight system to ensure the material balance is in accordance with the data reported in the logbook.<br><br>Therefore, there is a partial strategy in place for the all UoAs (trawl and longline) under evaluation and SG 80 is met for both UoAs. However, SG 100 is not met due because some of the measures have been implemented in 2018 and their implementation will be evaluated in oncoming surveillance audits.<br><br><u>Bait Fishery- Moroccan sardine fishery stock zone C</u><br>The percent of catch in industrial longline (UoA/UoC2) represents less than 0.04% of the total sardine fishery following the designation of main species in GSA 3.4.2 for bait, Therefore, the UoA is expected to maintain and not hinder rebuilding of the main primary species Sardine at levels which are highly likely to be above the point where recruitment would be impaired, and SG 80 is met.<br><br>The key management document for this fishery is the décret 2-07-230 of November 2008 that has been modified and updated several times in recent years. The measures in place consist of a partial strategy to ensure that the stock is in a good shape and above limits. The TAC in 2017 was 1,000,000 tons for all the pelagic species. Other measures consist of the closure of areas aimed to protect identified spawning grounds and the implementation of the use of VMS to document directly the performance of the fishery for management purposes.<br><br>Therefore, the used of bait in longline does not hinder any recovery plan for the fishery and SG 80 is met for both UoAs.<br><br>Further, following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td>b</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).</td><td>There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.</td><td>Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.</td></tr>
<tr><td></td><td>Met?</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td><td>N (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved.<br><br>There is evidence that these types of measures have worked successfully in other regions (i.e., Atlantic Canada and US Northeast groundfish fisheries). There is documentation that partial strategies have been implemented successfully and achieving its objectives for many non-target species that are part of fisheries in both UoAs. The first report of PRDCPI published on December 2017 has shown that in all UoAs (trawl and longline) the bycatch has decreased from 2015 to 2016.<br><br>More years of data collection will be needed to support if the strategies are working. Nevertheless, in the last two years there has been some evidence of some progress. For example,</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.1.2</td><td colspan="3">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.</td></tr>
<tr><td>C</td><td></td><td colspan="3">the coverture of on-board observer program has increasing satisfying at least, the 90% of the fishing activities in all fleets.<br><br>From the beginning until now, main bycatch species has decreased among 8% to 0.7 % of catches. In general, all fleets have reduced their catches in at least 2% of non- target species. Therefore, there is some objective basis for confidence that the measures/partial strategy will work as explained and SG 80 is met for both UoAs. However, SG 100 is not met due to some of the measures have been implemented in 2018 and their implementation will be evaluated in oncoming surveillance audits where the Assessment team will evaluate if the measures are working with a high degree of confidence.<br><br><u>Bait Fishery- Moroccan sardine fishery stock zone C</u><br>As mention above, the percentage of bait in the longline fishery is almost negligible. However, concerning the measures in the fishery, a FIP project has shown that there are no significant levels of retained species in the fishery. Furthermore, overall, bycatch is not significant in this fishery. However, same management measures and information collection are required for all of these bait species and the fishery. Therefore, the objectives are in place and are working, based on some information directly about the fishery and/or species involved and SG 80 is met.<br><br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td>C</td><td colspan="4">Management strategy implementation</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>There is some evidence that the measures/partial strategy is being implemented successfully.</td><td>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).</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y (for all scoring elements in all UoAs)</td><td>N (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some evidence that the measures/partial strategy is being implemented successfully.<br><br>The PRDCPI started in 2015, and during the last two years, IFOP has been collecting data. The first report was published on December 2017 (Bernal et al., 2017). Measures to reduce bycatch in all of the fleet have been adopted by SUBPESCA and most of them have been recently implemented in 2018. Given that these measures have been recently implemented, information on the efficiency of those measures in place and others will be evaluated as more results become available. Nevertheless, (Bernal et al., 2017) reported a decrease of 2% in the catches of the main non-target species. A new revised version of the general law summarizing new measures for the fishing activities in the study area will be released shortly. Therefore, there is some evidence that the measures/partial strategy is being implemented successfully and SG 80 is met for both UoAs. However, SG 100 is not met due to some of the measures have been implemented in 2018 and the Assessment team cannot evaluate the measures are implemented successfully. However, the team is still confident to conclude that they are achieving their objectives as more information will be evaluated in oncoming surveillance audits.<br><br><u>Bait Fishery- Moroccan sardine fishery</u><br>Stock assessments are carried out for the stocks that are considered main retained species. Even though some of the stocks are depleted in the North area, the fishery which provides the bait is managed by Moroccan government. The Moroccan fishery agency has measures and conservation efforts in place that had resulted in healthy sardine populations (i.e. B>BMSY) in their waters.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.1.2</td><td colspan="3">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.</td></tr>
<tr><td></td><td></td><td colspan="3">More restrictive measures are being considered under the FIP project, therefore, there is some evidence that the measures/partial strategy is being implemented successfully and SG 80 is met.<br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td>D</td><td colspan="4">Shark finning</td></tr>
<tr><td></td><td>Guidepost</td><td>It is likely that shark finning is not taking place.</td><td>It is highly likely that shark finning is not taking place.</td><td>There is a high degree of certainty that shark finning is not taking place.</td></tr>
<tr><td></td><td>Met?</td><td>Not relevant</td><td>Not relevant</td><td>Not relevant</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Note that this guidepost is applicable for bottom trawl and longline but not for midwater trawl where no sharks were found in the composition of the bycatch species. However, none of the sharks are considered primary species. Therefore, the species are not evaluated in the primary species section. Of the total species found in both gear types, all were considered secondary species and will be evaluated in that section (2.2.1).<br>In addition, the “article 5 bis” of the general law (LGPA n. 20.525) includes a modification in which is told that any finning activity is illegal and vessels practicing any illegal activity in relation with this article will be prosecute and enforcement regulations will be applied. Different types of fines are stipulated for any suspicious illegal activity regarding finning. Monitoring is carried out by the obligation to comply with the CIAMT logbook reported to IFOP and SERNAPESCA.<br><br><br><u>Bait Fishery- Moroccan sardine fishery stock zone C</u><br>The recent report presented by the FIP project has shown that the retained non-target species are minimal and there are no sharks in the catch composition of the fishery targeting the bait used in the industrial longline. Further, as defined in the Moroccan law, from 2012 to 2017, protected sharks cannot be captured in accordance with commitments and recommendations made by the International Commission for the Conservation of Atlantic Tunas and the General Fisheries Commission for the Mediterranean.<br><br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td>E</td><td colspan="4">Review of alternative measures</td></tr>
<tr><td></td><td>Guidepost</td><td>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.</td><td>There is a regular 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.</td><td>There is a biennial 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.</td></tr>
<tr><td></td><td>Met?</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is a regular 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.<br><br>In this context the term ‘unwanted catch’ refers to 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.<br><br>In the case of the Chile hake fishery, bycatch specimens that have no potential market and/or exceed the quota allowed could meet the definition of unwanted catch as fishers choose not to use them and exclude them using technical measures or commercial value.</td></tr>
</table>

| 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. |
|---|---|
| | Under the new updates of the general law (LGPA) measures have been implemented to reduce the catch of unwanted species of main primary species under the Code of good practices to reduce discarding of target species.<br><br>Among the measures set up in the code to reduce unwanted catches the main alternatives are listed below, and they are applied for all the fleets targeting Chile hake except the first one which only applies to trawler:<br><br>Only for trawler:<br>- Use of net sensors and / or escape windows in the gears to avoid overtaken catches that cannot be stored in the ship's hold.<br><br>For all the fleet targeting Chile hake (Trawl and longline):<br>- All the species, following the article 7 B, complying with normative could be discarded but the catch will be imputed in the ACL for each vessel (Licencia Transable de Pesca, LTP).<br>- Limited time to carry out a tow - According to the registered by cameras (DRI), VMS and the information in the Logs the captain must not repeat a haul if 5% or more weight is detected of southern hake, pink cusk eel, hoki (due to quality, size or lack of quota). At least not repeat within 12 hours a set (same direction, sense and depth) in that place that this condition is recorded. If in a lapse of 24 hours consecutively more than 5% of unusable copies, including juveniles, are captured consecutively, the area should be changed according to the "move on" protocol proposed by the working group of the Management Committee.<br>- When the situation above happens it shall be communicated to all the captain fishing in the area.<br>- The operational methodology will be improving following technical modifications to reduce damage in the catches that makes valueless the capture.<br>- Encourage and recognize the outstanding compliance with the good fishing practices of fishermen. Highlight individual compliance "scheme for responsible fishing"<br>- Keep working with on board observer to collect data useful for improvements in the fleet.<br>- Develop operational strategies that prevent gears from operating on the bottom and capture main species as can be pink cusk eel when there is limitation of the quota of this resource. Operate with pelagic nets when the quota of any demersal stocks is exhausted where it is known bottom gears can encounter those species.<br><br>Since 2014, IFOP have been investigating the impact of discards and discard mortality on the Chile Austral hake industrial fishery and the measures above have been taken in place as a part of a new strategy to manage the fishery.<br><br>There is a review of setting ACLs for multispecies stocks element of the existing periodic adjustment process. On the adjustment process requires the technical committee to prepare a report every year. Every year, the technical committee evaluates whether management measures need to be revised in order to meet mortality objectives. The technical committee will review available data, including information on catch (landings and discards), DAS and other measures of fishing effort, estimates and forecasts from recent assessments about stock status and fishing mortality rates, enforcement and compliance with measures, and any other relevant information, such as trawl survey indices or other data. The technical committee is required to submit suggested measures to SUBPESCA if revisions are necessary. SUBPESCA will then consider the adjustments. |

<table>
<tr><td colspan="2">PI 2.1.2</td><td>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.</td></tr>
<tr><td></td><td></td><td>Consequently, there is a regular review of the potential effectiveness and practicality of alternative measures to minimize as appropriate and SG 80 is met for all UoAs (trawl and longline). Further the new discard program set up that the measures will be reviewed annually to support the reduction of non-target species caught and to be in the line with the management measures established for primary species, thus SG 100 is met for both UoAs.<br><br><u>Bait Fishery- Moroccan sardine fishery stock zone C</u><br>Unwanted catches in the fishery are regulated with an allowed percentage of small pelagic species for discarding. This percentage of small pelagic species discarded is documented and must be reported. Further, there are some measures as closures areas and minimum sizes in place to minimise the unwanted catches and SG 80 is met for UoA 2.<br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td colspan="2">References</td><td>Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesquerfas Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>Modificación de LGPA número 20.525. LGPA - Aprovechamiento y beneficio de tiburones<br>FIP Project: Morocco sardine - pelagic trawl and seine / Maroc sardine - chalut pélagique et senne: Stage 5, Progress Rating A.<br>INRH. 2017, May 11. HCR et rejets dans le contexte des pêcheries pèlagiques au Maroc. Casablanca.https://fisheryprogress.org/system/files/action_proof_files/pr%C3%A9sentation%20rejets_HCR_0.pdf</td></tr>
</table>

| | |
|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.1.3 – Primary species information (All UoAs: Trawls and Longline)

<table>
<tr><td colspan="2">PI 2.1.3</td><td colspan="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</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">A</td><td colspan="4">Information adequacy for assessment of impact on main primary species</td></tr>
<tr><td>Guidepost</td><td>Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.<br><br>OR<br><br>If RBF is used to score PI 2.1.1 for the UoA:<br>Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.</td><td>Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status.<br><br>OR<br><br>If RBF is used to score PI 2.1.1 for the UoA:<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.</td><td>Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.</td></tr>
<tr><td>Met?</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td><td>N (for all scoring elements in all UoAs)</td></tr>
<tr><td>Justification</td><td colspan="3">Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status.<br><br>Targeted and Non- targeted species catch data in the fishery are collected by on-board fisheries observers, and coverage is >90 % for all trawl trips (IFOP 2017). The primary responsibility for the collection of fishery dependent information from commercial fishery operations is with IFOP. In addition, the IFOP has responsibility for establishing quality standards for fisheries dependent data collections that are managed by the SERNAPESCA Office, improving the quality of fishery dependent data, and the collection of biological information from commercial catches.<br><br>IFOP acquires data through mandatory reporting programs to provide timely and accurate landings and effort data on the Southern Austral demersal fisheries for in-season management and analysis. Tasks include dockside collection of catch data, biological samples from commercial fishing trips, and producing finished data products to support fisheries management and scientific analyses.<br><br>IFOP is the leading agency in charge of the PRDCPI. IFOP have been continuously collecting data since the program inception in 2015. Recently, the first report of discard program covering 2 years of data has been published (Bernal et al., 2017). This information will be collected subsequently on annual basis to ensure the measures in place are being applying and working properly. Therefore, from December 2017, when the first report was posted, some quantitative information is available and is adequate to assess the impact of all the UoAs on the main primary species with respect to status and therefore SG 80 is met for both UoAs.<br><br>Because the data are still being collected and more years of data will be needed to assess the impact SG 100 is not met for both UoAs.<br><br><u>Bait Fishery- Moroccan sardine fishery stock Zone C</u><br>Information regarding the bait used in the fishery was provided by the client. Bait purchases were used by CEPES to estimate the tons used during the years 2015 and 2016. Table 20 included in the background section shows the estimation in tons of bait used in the longline fishery. The information allows to understand the impact of the Chile Austral hake longline fishery in the bait</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.1.3</td><td colspan="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</td></tr>
<tr><td></td><td></td><td colspan="3">fishery(small pelagic fishery in Morocco). The percentage of bait used to follow the information of the invoices and customs office in Chile (forms for importation of fishery products), show that nearly nil amounts of bait are used in comparation with the total catch of the pelagic fishery in the area.<br><br>Further, regarding the sardine stock and the non-target species, information is available to evaluate the stock status of the main retained species in the sardine fishery (INHR 2017). Also, while the key sardine stocks are within Moroccan waters, the stocks of other small pelagic species (main retained species) are mainly shared. There is a regional cooperation for research and stock assessment, within the framework of FAO (CECAF), where data is shared to set up the management plan for these species, therefore some quantitative information is available and is adequate to assess the impact on the main primary species with respect to status and SG 80 is met.<br><br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100.</td></tr>
<tr><td>B</td><td colspan="4">Information adequacy for assessment of impact on minor primary species</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td></td><td>Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>Y (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.<br><br>The report of PRDCPI has shown quantitative data of all the non-target species collected by the fleet. Measures are being taken place for main and minor species, all species caught by fleets have been reported and the final purpose of the project is to reduce the catch of non-target species. Therefore, following the rationale above in the guidepost, a, some quantitative information is adequate to estimate the impact of all the UoAs on minor primary species with respect to status and SG 100 is met for both UoAs.</td></tr>
<tr><td>C</td><td colspan="4">Information adequacy for management strategy</td></tr>
<tr><td></td><td>Guidepost</td><td>Information is adequate to support measures to manage main primary species.</td><td>Information is adequate to support a partial strategy to manage main Primary species.</td><td>Information is adequate to support a strategy to manage all primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective.</td></tr>
<tr><td></td><td>Met?</td><td>Y (for all scoring elements in all UoAs)</td><td>Y (for all scoring elements in all UoAs)</td><td>N (for all scoring elements in all UoAs)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Information is adequate to support a partial strategy to manage main Primary species.<br><br>Since the Project PRDCPI started in 2015, information is being collected continuously . Bernal et al., (2017) shows that quantitative data have been analysed to set up different measures to reduce the bycatch of the demersal fisheries in Chile. As a direct result of the study, a partial strategy was implemented in 2018 and more measures will be implemented after the review of the general law (LGPA). Therefore, information is adequate to support a partial strategy to manage main Primary species. To meet SG 100 the team will need to review upcoming results of the project in place. Therefore, SG 80 is met for both UoAs. However, as some measures directly related to the main objectives of the bycatch plan have been recently implemented during 2018, the Assessment</td></tr>
</table>

| 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 | |
|---|---|---|
| | | team is still not confident to evaluate with a high degree of certainty if the strategy is achieving the objectives., **Therefore, SG 100 is not met.**<br><br>**<u>Bait Fishery- Moroccan sardine fishery stock Zone C</u>**<br>Information used to evaluate the bait utilization in the Chile Austral hake longline fishery was estimated using the invoices from two years. Table 16 in the background section shows the number of hooks and the weight of sardine used in each hook. This information allows to calculate estimates with the fishery dependent information. In addition, most of the stocks considered main retained species in the FIP project are shared. There is a Sub-Regional Fisheries Commission (Commission Sous-Régionale des Pêches, CSRP; that includes Mauritania and Senegal) that has conducted efforts to assess and manage the transboundary small pelagic stocks shared within the countries of the region, jointly with Morocco.<br><br>Further, there is a national small pelagic TAC in Morocco, as well as catch ceilings for foreign fleets operating under legal agreements in Morocco and Mauritania. Existing monitoring, control and surveillance (MCS) systems throughout the region have undergone improvements in the recent decade. Therefore, Information is adequate to support a **partial strategy** to manage **main** Primary species and **SG 80 is met**.<br><br>Following the clause GSA3.4.2 (FCR v2.0) the bait fishery has to be assessed at SG 60 and SG 80 levels, for that reason the assessment team has not evaluated the bait fishery at SG 100. |
| **References** | | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesquerfas Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>FIP Project: Morocco sardine - pelagic trawl and seine / Maroc sardine - chalut pélagique et senne: Stage 5, Progress Rating A.<br>INRH. 2017, May 11. HCR et rejets dans le contexte des pêcheries pèlagiques au Maroc. Casablanca.https://fisheryprogress.org/system/files/action_proof_files/pr%C3%A9sentation%20rejets_HCR_0.pdf |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawl):** | | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | **85** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

## PI 2.2.1 – UoA 1 Industrial trawl-bottom and midwater trawl: Secondary species outcome

<table>
<tr><td colspan="2">PI 2.2.1</td><td colspan="3">The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">A</td><td colspan="4">Main secondary species stock status</td></tr>
<tr><td>Guidepost</td><td>Main Secondary species are likely to be within biologically based limits.<br><br>OR<br><br>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</td><td>Main secondary species are highly likely to be above biologically based limits<br><br>OR<br><br>If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.<br>AND<br>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.</td><td>There is a high degree of certainty that main secondary species are within biologically based limits.</td></tr>
<tr><td>Met?</td><td>Bottom trawl Silver warehou – RBF result- Y<br>Midwater trawl Silver warehou RBF result- Y</td><td>Bottom trawl Silver warehou – RBF result - Y<br>Midwater trawl Silver warehou RBF result- Y</td><td>Bottom trawl Silver warehou – RBF result - N<br>Midwater trawl Silver warehou RBF result- N</td></tr>
<tr><td>Justification</td><td colspan="3">If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.<br><br><u>Scoring elements- bottom trawl and midwater trawl</u><br>Among all the species caught as non-target species in both components of the UoA, just one species was defined as secondary main species: Silver warehou, Seriolella punctate (Cojinoba moteada).<br><br>No information was available at the time of the full assessment audit and the RBF has been used to evaluate its status. After performing the RBF for these species in both scoring elements the risk was considered low in both elements achieving an unconditional pass in MSC scoring range. The main results can be consulted in the RBF section in the link below:<br><br>Appendix 1.2 Risk Based Framework (RBF) Outputs<br><br>Following the results of the RBF the fishery meets SG 80.</td></tr>
<tr><td rowspan="2">B</td><td colspan="4">Minor secondary species stock status</td></tr>
<tr><td>Guidepost</td><td></td><td></td><td>Minor secondary species are highly likely to be above biologically based limits.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.2.1</td><td colspan="3">The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.</td></tr>
<tr><td></td><td></td><td></td><td></td><td>OR<br><br>If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>N (bottom trawl)<br>N(midwater trawl)</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.<br><br>Minor secondary species have not been scored with RBF. Therefore, as per PF5.3.2.1states, the final score of the PI shall not be greater than 80. However, none of the secondary species meet SG 100 as there is no there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species.<br><br><u>Scoring element- Bottom trawl</u><br>The species defined as secondary minor in the bottom trawl component of the UoA trawl are listed below:<br>- Mustelus mento, Speckled smooth-hound–Tollo negro<br>- Seriolella caerulea, White warehou–Cojinoba del sur<br>- Helicolenus lenerichi, rockcods–Chancharro<br>- Paralabrax humeralis, Peruvian rock seabass– Cabrilla<br>- Schroederichthys chilensis, Redspotted catshark- Pintarroja del sur<br>- Salilota australis, Tadpole codling – Brótula<br>- Dosidicus gigas, Humboldt squid–Jibia<br>- Lamna nasus, Porbeagle – Tiburon sardinero<br>- Isurus oxyrinchus, Shortfin Mako – Tiburon marrajo<br>- Squalus Acanthias, Spiny dogfish– Tollo de los cachos<br><br>Most of the catches of secondary species are from Tadpole codling (3%) and White warehou (2%) the rest of species have percentage of less than 1% in the average catch of 2015 and 2016, therefore the catches in the total composition of the fleet are almost negligible.<br><br><u>Scoring element Midwater trawl</u><br>The species defined as secondary minor in the midwater trawl component of the UoA trawl are listed below:<br>- Seriolella caerulea, White warehou-Cojinoba del sur<br>- Helicolenus lenerichi, rockcods- Chancharro<br>- Paralabrax humeralis, Peruvian rock seabass- Cabrilla<br>- Salilota australis, Tadpole codling - Brótula<br><br>Similarly, like in the bottom trawl component, the species composition are found in low percentages. For example, the percentage ranges from 2.2 % for the most common species, Tadcole codling to 0.3 % the lowest one.<br><br>The composition of the catches of secondary minor species are very similar in both components and the rationale provided is for both components as the risk of hinder the stock status has been defined the same as the percentage are very similar among both gear types, with no high different in the % of caught of any of those common species. Therefore, the assessment team has evaluated the secondary species following interpretations given by MSC for the clause 7.10.7 at SG 100</td></tr>
</table>

| PI 2.2.1 | | The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit. |
|---|---|---|
| | | where MSC states that due to time and cost implications of scoring each individual element separately, particularly in cases where there are large numbers of species to assess and they are in minimal percentage the teams should list all minor species automatically achieve at least SG80 and if all minors meet 100 then it is achieved. Therefore, the minor species have been evaluated as a 'group' rather than by scoring elements.<br><br>The stock status of most of the non-target species classified as secondary is not well defined. Until 2015, there was not a comprehensive program to regulate and monitor all the catches from the demersal fisheries in Chile. Ever since PRDCI was implemented in 2015, on board observers have continuously been collecting data for all the species . This information on the fisheries monitoring and performance have been used in demersal fishery discards reduction programs. Therefore, there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species and **SG 80 is met** for all the species in both scoring elements. However, more data is necessary to evaluate what is the current stock status of all the species caught by the UoA, hence the assessment team is not confident to score SG 100 for all the species in both scoring elements. |
| **References** | | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP<br>MSC interpretation- https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233 |
| **OVERALL PERFORMANCE INDICATOR SCORE:** | | **80** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

**PI 2.2.1 – UoA 2 Longline: Secondary species outcome**

| PI 2.2.1 | | The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit. | | |
|---|---|---|---|---|
| **Scoring Issue** | | SG 60 | SG 80 | SG 100 |
| **A** | Main secondary species stock status | | | |
| | **Guidepost** | Main Secondary species are **likely** to be within biologically based limits.<br><br>OR<br><br>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding. | Main secondary species are **highly likely** to be above biologically based limits<br><br>OR<br><br>If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding.<br>AND<br>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. | There is a **high degree of certainty** that main secondary species are within biologically based limits. |
| | **Met?** | Not applicable | Not applicable | Not applicable |
| | **Justification** | Following the clause SA 3.4.2 of FCR v2.0, the catches of the secondary species are less than 5% of the total catch and therefore, are not considered main species (see list on background section-3.4.2). There are no main secondary species in the longline fisheries. All the species found with no reference points or management tools classified as secondary have been reported in percentages less than 5 %. For that reason all of them have been classified as secondary minor and this guidepost is not applicable for this UoA. The MSC interpretations on August 30th 2018 P2 species outcome PIs - scoring when no main or no minor (or both) (FCR v2.0 - Annex SA PI 2.1.1, 2.2.1)" states that if a fishery has no main species, scoring issue (a) is not applicable, and scoring issue (b) is scored at the 100 level. If it meets it for all species, then score is 100. | | |
| **B** | **Minor secondary species stock status** | | | |
| | **Guidepost** | | | Minor secondary species are highly likely to be above biologically based limits.<br><br>OR<br><br>If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species |
| | **Met?** | | | N |

<table>
<tr><td>PI 2.2.1</td><td colspan="2">The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit.</td></tr>
<tr><td></td><td>Justification</td><td>If below biologically based limits, there is either evidence of recovery or a demonstrably effective partial strategy in place such that the UoA does not hinder recovery and rebuilding.<br><br>The assessment team has evaluated the secondary species following interpretations given by MSC for the clause 7.10.7 at SG 100 [8] where MSC states that due to time and cost implications of scoring each individual element separately, particularly in cases where there are large numbers of species to assess and they are in minimal percentage the teams should list all minor species automatically achieve at least SG80 and if all minors meet 100 then it is achieved. Therefore, the minor species have been evaluated as a 'group' rather than by scoring elements. More details are given in the background section.<br><br>The species found are listed below:<br>- Helicolenus lenerichi, rockcods- Chancharro<br>- Salilota australis, Tadpole codling – Brótola<br>- Macrourus carinatus, Bigeye grenadier-Granadero de ojo grande<br><br>The stock status of most of the non-target species classified as secondary is not well defined. Until 2015, there was not a comprehensive program to regulate and monitor all the catches from the demersal fisheries in Chile. Ever since PRDCI was implemented in 2015, on board observers have continuously been collecting data for all the species . This information on the fisheries monitoring and performance have been used in demersal fishery discards reduction programs. However, more data is necessary to evaluate what is the stock status of all the species caught by the UoA, hence, the assessment team is not confident to score SG 100 and, there is no evidence that the UoA does not hinder the recovery and rebuilding of secondary species therefore SG 80 is met.</td></tr>
<tr><td colspan="2">References</td><td>Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>MSC interpretations: https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344</td></tr>
<tr><td colspan="2">OVERALL PERFORMANCE INDICATOR SCORE:</td><td>80</td></tr>
<tr><td colspan="2">CONDITION NUMBER (if relevant):</td><td>NA</td></tr>
</table>

[8] https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233

PI 2.2.2 – Secondary species management strategy- All UoA (Trawls and Longline)

<table>
<tr><td colspan="2">PI 2.2.2</td><td colspan="3">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.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">A</td><td colspan="4">Management strategy in place</td></tr>
<tr><td>Guidepost</td><td>There are measures 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.</td><td>There is a partial strategy 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.</td><td>There is a strategy in place for the UoA for managing main and minor secondary species.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is a partial strategy 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.<br><br>Since the PRDCI started as part of components of the amendment of the New Fishing Law (LGPA), there have been on board observers collecting data from target and non-target species. This information has been used to set up measures to reduce the catch of secondary species. Most of the measures has been put in place during 2018. Therefore SG 60 is met for both UoAs.<br><br>The result of the measures in place has been a partial strategy that will reduce the catch of non-target species. Among the actions those strictly aimed at maintaining the species within biological limits are listed below:<br><br>- All fleets have to follow the Handbook of Good practice launched after the first report of the Discard program (PRDCI)<br>- Non-target species with no TAC could be discarded but the vessel will need to report all catches. Non-target species shall comply with the article 7 BIs of the law to be discarded.<br>- Escape windows and other technical measures will be put in place to reduce the bycatch.<br>- All catch composition (all species)must be recorded in the logbook<br>- Balance will be used to estimate the total catch at landing and it will be double check with the logbook<br>- If more than defined % of some non-target species are caught, the captain has to report it and the move on protocol will be put in place. The % will be set up by the technical committee in the upcoming years meanwhile the discard program is being implemented<br>- Video camera desk monitoring will be used to ensure all the protocols are in use by the members of the crew and the discards are done following the procedures set up in the law.<br>- All chondrichthyans and vulnerable species must be released alive to the sea following the protocols established in the law.<br>- New species can be used by processors to get fishmeal if the catches reported are high, the regulation can include species for consume for a period of 3 years<br><br>Therefore, the assessment team is confident that a partial strategy is in place, however, more work is needed for evaluation because some of the measures are still being implemented and some of them will become effective after the site visit. Consequently, there is not enough data to evaluate if the measures were successfully implemented. Thus, these measures and actions will be monitored in the next surveillance audit. Hence, SG 100 is not met however, there is a partial strategy in place, if necessary, for all the UoAs that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be within biologically</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.2.2</td><td colspan="3">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.</td></tr>
<tr><td></td><td></td><td colspan="3">based limits or to ensure that all the UoAs does not hinder their recovery and SG 80 is met for both UoAs.</td></tr>
<tr><td>B</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).</td><td>There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.</td><td>Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.<br><br>The Monitoring Program of the Discard Reduction Plan (PMSPRD) of the basic or permanent research program shall establish and monitor (for scientific purposes only) indicators to evaluate the effectiveness of the measures in this Plan. Likewise, it must monitor the levels of incidental catch, the use of mitigation strategies or devices, compliance with good fishing practices, among others, under the reduction plan. Also, there will be electronic monitoring by the use of video cameras to ensure that the reported catches match with capture in each operation. Data from 2015 and 2016 reported in the first report of 2017 have shown a decrease in the catches of non-target species and measures have been tested to ensure they could be implemented in the fleets (Bernal et al., 2018). However, most of these strategies and measures have been implemented recently. Fishing mortality for many species is still high.<br><br>Therefore, there is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved and SG 80 is met for both UoAs.<br><br>However, as some of the measures defined in the strategy have been implemented in 2018, the assessment team is still not confident to conclude that testing supports high confidence that the partial strategy/strategy will work, and SG 100 is not met.</td></tr>
<tr><td>C</td><td colspan="4">Management strategy implementation</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>There is some evidence that the measures/partial strategy is being implemented successfully.</td><td>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).</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some evidence that the measures/partial strategy is being implemented successfully.<br><br>With data collected during 2015 and 2016 from the on-board observer program which had a coverage of more than 90 % of the fishing trips, Bernal et al., (2017) reported that the percentage of discards is decreasing in 2016. Furthermore, the total discard amount (considering all the species registered) was at least 2% less than the previous year (Bernal et al., 2017). Therefore, there is actual information of a notable reduction on the discards being documented recently.<br>When more data is available, the scientific technical committee will review which measures are not working and the actions to take to ensure the strategy is working. Therefore, there is some evidence that the measures/partial strategy is being implemented successfully and SG 80 is met for both UoAs.</td></tr>
</table>

| 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.** | | |
|---|---|---|---|---|
| | | For clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a), the team agreed to wait for more results of the Southern Austral demersal fisheries discard program as it is starting in this year and the results are still very preliminary, therefore **SG 100 is not met for both UoAs.** | | |
| D | Shark finning | | | |
| | **Guidepost** | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **There is a high degree of certainty that shark finning is not taking place**.<br><br>In both UoAs the composition of bycatch species has found four species of sharks, most of them in the bottom trawl fishery and in very low percentages against the total composition.<br><br>The four species of sharks identified are:<br>- Shortfin Mako,(*Isurus oxyrinchus*- secondary minor),<br>- Redspotted catshark, (*Schroederichthys chilensis*-secondary minor),<br>- Porbeagle, (*Lamna nasus*-secondary minor) and;<br>- Speckled smooth-hound, (*Mustelus mento*-secondary minor)<br><br>Basically, all the species listed above are identified in bottom trawl gear type, the other gear types have no representation of sharks in their total composition of catch.<br><br>However, sharks are listed in the bycatch composition, thus, finning practices are not allowed. All Chilean vessels have a ban of finning sharks. The vessels have a mandatory requirement to report any catch of sharks in a logbook designated as CIAMT and the specimens must to be returned alive to the sea if possible. New protocols have been implemented in recent years (from 2016 to 2018) to ensure successful release. Further, in the CIAMT database from 1997 to 2017, just one shortfin mako has been reported in the fisheries targeting Austral hake. The specimens were found dead and all the information regarding the trip has been documented in the logbooks.<br><br>Compliance in the fishing industry to reduce possible interactions is high. There are different measures to monitor gear interactions information. For example, on board observers report any interactions with sharks and the condition of the species at the time of the interactions. Further, there is a specific logbook to be completed and reported by the fleet to IFOP and SUBPESCA where any possible catch and/or interactions must be described (IOE -interacciones con otras especies).<br><br>Additionally, the “article 5 bis” of the general law (LGPA n. 20.525) includes a new amendment which states that any finning activity is illegal and vessels practicing any illegal activity in relation with this article will be prosecuted and enforcement regulations will be applied. Different types of fines are stipulated for any suspicious illegal activity regarding finning.<br><br>Therefore, there is a **high degree of certainty** that shark finning is not taking place and **SG 100 is met for both UoAs.** | | |
| E | Review of alternative measures to minimise mortality of unwanted catch | | | |

| 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. | | |
|---|---|---|---|---|
| | **Justification** | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species. | 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. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate. |
| | **Met?** | Y | Y | Y |
| | **Guidepost** | **There is a biennial review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.**<br><br>The new Southern Austral demersal fisheries discards reduction program have in place new measures to reduce unwanted catches and protocols to release alive most of the species that can get caught by the fleet. These new protocols and measures will be evaluated every year and new interpretations, training and actions will be put in place if the current measures set up in 2018 do not work effectively.<br><br>Therefore, 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 and **SG 80 is met for both UoAs**. Further, most of the measures implemented to reduces the catch of these species will be reviewed under the discard program annually, hence **SG 100 is met for both UoAs** | | |
| **References** | | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>Modificación de LGPA número 20.525. LGPA - Aprovechamiento y beneficio de tiburones. | | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | | | | **90** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | | | **90** |
| **CONDITION NUMBER (if relevant):** | | | | **NA** |

## PI 2.2.3 – Secondary species information (All UoAs: Trawls and longline)

| 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 **adequate to estimate** the impact of the UoA on the main secondary species with respect to status.<br><br>OR<br><br>**If RBF is used to score PI 2.2.1 for the UoA:**<br><br>Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species. | Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status.<br><br>OR<br><br>**If RBF is used to score PI 2.2.1 for the UoA:**<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species. | Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status. |
| | **Met?** | Y | Y | N |
| | **Justification** | **Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species**.<br><br>Information about the stock status is not well known. However, quantitative data about the species is collected in the discards program and also reported in the logbook.<br><br>Some biology information is available in Fishbase and the assessment team ran the RBF_PSA technique during the site visit with key stakeholders. Therefore, the quantitative information that was gathered was good enough to score the PSA. **SG 80 is met for both UoAs** .<br><br>However, due to the lack of information in the study area, and due to the Assessment Team has used some similar information from other fisheries (New Zealand fisheries) for biological aspects such as reproducibility, the Assessment Team cannot conclude with a high degree of certainty that the quantitative information available is adequate to assess the impact on the species and therefore, **SG 100 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. |
| | **Met?** | | | N |
| | **Justification** | Some quantitative information relating to the levels of catches of non-target in the fishery is available but there is no quantitative information relating to the stock status of most of minor Secondary species. Therefore, **SG100 is not met** in both UoAs. | | |
| **C** | Information adequacy for management strategy | | | |
| | **Guidepost** | Information is adequate to support **measures** to manage **main** secondary species. | Information is adequate to support a **partial strategy** to manage **main** secondary species. | Information is adequate to support a **strategy** to manage **all** secondary species and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**. |

  

| 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.** | | |
|---|---|---|---|---|
| | **Met?** | Y | Y | N |
| | **Justification** | **Information is adequate to support a partial strategy to manage main secondary species**.<br><br>Total catches of the species are recorded in the discard program and are still being collected. The new regulations state all the catches have to be reported even if they are discarded. The observer program is collecting data and is planned to continue. Therefore, information is adequate to support a **partial strategy** to manage **main** secondary species **and SG 80 is met for both UoAs.**<br><br>However, because the new discard program is still being implemented, it cannot be concluded that the strategy is achieving its objective with a high degree of certainty and **SG100 is not met (both UoAs)**. | | |
| **References** | | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP. | | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | | | | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | | | **80** |
| **CONDITION NUMBER (if relevant):** | | | | **NA** |

**PI 2.3.1 – UoA 1 Industrial trawl-bottom and midwater trawl: ETP species outcome**

| | | | | |
|---|---|---|---|---|
| **PI 2.3.1** | | **The UoA meets national and international requirements for the protection of ETP species**<br>**The UoA does not hinder recovery of ETP species** | | |
| **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 **likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population/stock are known and **highly likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits. |
| | **Met?** | Not relevant | Not relevant | Not relevant |
| | **Justification** | **Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits**.<br>The UoA 1- Trawl is not affecting any ETPs species with national or international limits established. This scoring issue only applies to species for which national and or international limits for protection or rebuilding are in place, either through national legislation or binding international agreements see FCR v2.0 at SA3.10.1, therefore this scoring guidepost is not relevant for the UoA 1. | | |
| **B** | Direct effects | | | |
| | **Guidepost** | Known direct effects of the UoA are likely to not **hinder recovery** of ETP species. | Known direct effects of the UoA are **highly likely** to not **hinder recovery** 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?** | SE Bottom trawl-Y for all SE<br>SE Midwater trawl-Y for all SE | SE Bottom trawl-Y for all SE<br>SE Midwater trawl-Y for all SE | **SE Bottom trawl-**<br>Y for Sealions<br>N for Seabirds<br>**SE Midwater trawl-**<br>Y for Sealions<br>N for Seabirds |
| | **Justification** | **Known direct effects of the UoA are highly likely to not hinder recovery of ETP species**.<br>There is a list of 70 protected species under Chile regulation DS N°225 de 1995, updated by DS 135 in 2005. There is also a ban of 25 years until 2025. Further, Chile as a country member of the CPPS, participates in the Action plan for conservation of marine mammals in which there are different agreements set up to preserve the marine mammals in the South Pacific. However, it has been reported that the fishery has minimal interactions with marine mammals (Cedepesca, 2010). The marine mammal species which normally has interactions with the two scoring elements of the UoA1 is the sealion, *Otaria flavescens.*<br>The species is not considered under IUCN as vulnerable but there is a national regulation to protect the species. The National regulation MINECON/SUBPESCA N° 1892/09 has defined the species as protected since the establishment of a moratorium for sea lion from 2009 to 2021.<br>Quantitative information for sea lion is reported in the logbook CIAMT, these information is sent to IFOP and SUBPESCA to monitor the interactions with the species.<br>From 2013 to 2017 the information collected by IFOP and SUBPESCA in the logbooks have shown more than 1096 interactions with sea lions. Most of the interactions have been defined as feeding activities on the catch and on the fishing discards. Few of them (less than 50) have been identified as being impacted with the gear type. Further, 25 specimens have been killed due to these interactions with the fleet in the last 5 years.<br>The IUCN has classified the South American sea lion as a species of least concern. It has been estimated that the population abundance in Chile consist of 197,000 individuals. It has been reported that mature and overall sea lion population abundance in South America have increased | | |

| PI 2.3.1 | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species |
|---|---|
| | resulting in a positive population growth trend. IUCN has stated the current stock status for this population is stable.<br>With the data presented herein, the fishery under assessment has a minimal effect on the population given that reported catches consist of being less than 0.12% and with the other MSC fisheries consist of less than 0.03% of the total populations have been caught by the fisheries. Therefore, there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species (marine mammal- Sealions) and **SG 60, 80 and 100 are met in both scoring elements, bottom and midwater trawl.**<br>The incidental capture of seabirds is studied in both components of the UoA trawl, impacts of trawling are higher than in the longline fishery but the species composition is very similar in both fisheries. Below the assessment team has identified seabird species interacting with the UoAs, although more than 90 % of the interactions in trawling when is targeting Chile Austral hake are happening with the same species, the black browed albatross. The other species that can be impacted are also listed below:<br>- Black-browed albatross *Thalassarche melanophris*<br>- Southern giant-petrel *Macronectes giganteus*<br>- Hall's giant petrel *Macronectes hallis*<br>- Sooty shearwater, *Puffinus griseus*<br>- White-capped albatross, *Thalassarche salvini*<br>- Grey headed albatross, *Thalassarche chrysostomas*<br><br>Since 2001, Chile is a member country of the Agreement on the Conservation of Albatrosses and Petrels with the aim "to achieve and maintain a favourable conservation status for albatrosses and petrels". An Action Plan to reduce the effects of fisheries on seabirds is in place since 2016. There has been more effort to control and manage the impact of the longline fishery. However, in recent years the coverage of the observer program to collect data in the trawls has been increased to 95 %. The information gathered has been more accurate and measures have been adopted in the new discard program plan to mitigate the impacts on sea birds, focusing on black browed albatross, which is the species most encountered by trawls.<br><br>The information collected in the IOE and CIAMT logbooks, reported to IFOP and SUBPESCA, have shown the type of interactions with protected seabirds in the direct austral hake fishery. From 1997 to 2007, approximately 800 observations were reported during trawling operations. In the logbooks the interactions are mostly defined as seabirds feeding around the fishing catch but with no detrimental effect on them. However, it is also stated that most of Black-browed albatross identified were reported as dead. Few interactions were reported of other seabird's species such as the Southern giant-petrel, Salvin's Albatross and Grey headed albatross when the fishery was targeting Chile Austral hake. These other species were more encountered in industrial fisheries targeting, hoki, southern blue whiting and common hake.<br><br>Data from IFOP observer program have been used by Adasme et al. (2019) to estimate cryptic mortality of the fishery in the seabirds. The results showed that incidental seabird mortality appears to be related to collisions with net monitoring systems (net-sonde cable), the duration of fishing hauls, the year period, and the fishing zones. These 2 last factors mentioned above, are related to the breeding period and nearby feeding/nesting areas of albatross colonies which coincides with the time and location of fishing operations. These observations have also been reported by Bernal et al (2019) and Céspedes et al. (2018). Using a simple extrapolation, Adames et al (2019) estimated a cumulative mortality of 9,900 seabirds for the whole study period (2013-2016). Using Generalized Lineal models (GLM), Adames et al., (2019) found that determinant factors that explained the total deviance for the response variables in model 1 and 2 (e.g. probability of dead birds count of dead birds) were the period of the year, followed by the use of the net-sonde cable, and zone, factors already mentioned by Cespedes et al (2018) and Bernal et al. (2019). Regarding fishing discards (Model 3), the analysis showed total catch per haul, the use |

| PI 2.3.1 | | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species |
|---|---|---|
| | | of net-sonde cable, the operating zone he operating zone and type of fleet were the most influential explanatory variables in the model. Finally, on the last 4th model, the most relevant factors on fishing performance (i.e. Catch rate of the target species per hour of trawling) were: fishing haul duration, followed by fleet type, use of a net-sonde system and fishing period (i.e. quarters).<br><br>Adames et al. (2019) states that there is no best simple solution to monitor adequately or mitigate seabird bycatch and fishing discards. This study highlights the need to develop more comprehensive monitoring programmes on non-target species and on bycatch of seabirds and mammals . For example, IFOP reports do not consider unobserved mortality on their studies and it is unknown the magnitude of this variable.<br>Adasme et al. (2019) study made recommendations to reduced seabird mortality during trawl fishing operations<br>▪ to reduce operations during the third quarter of the year south of 53ºS, when seabird colonies are preparing for breeding season.<br>▪ to minimize or exclude the use of net-sonde cable in trawling operations depending on seabird aggregation,<br>▪ to reduce fishing time, for example, below 4 h per haul, and carry out fishing hauls in the afternoon or at night.<br><br>Most of these recommendations have been included on the new mandatory measures regarding implementation of devices and practices to reduce seabird interactions during trawl operations released on August 28th, 2019 that have to be implemented into its totality 3 months after the date of the announcement.<br><br>Other studies based on population census techniques shows a positive outlook at the most common seabird populations encountered by the fishery. For example, the population abundance of Black browed albatross has increased showing a positive population growth rate . In the list of the species reported by the Minister of Environment (Ministerio de Medio Ambiente de Chile), the species is not considered vulnerable. The birds' census in the breeding areas have estimated the number of albatrosses in increase. Based on these estimates, Chile has the second largest population of black-browed albatross 123,000 annual reproductive pairs or 20% of the world's population, after Falklands Islands, where 66% of the species is reproduced (Robertson et al. 2017). Further, Birdlife international in its last report considered to classify the species in IUCN red list has stated that Black-browed albatrosses has a global population of mature individuals of 1,400,000 and in the last assessment it was considered as a species of least concern. This statement is attributed to (i) recent increasing population abundance trends, (ii) populations are not considered severely fragmented (iii) Abundance decline of mature individuals was found not to be happening (BirdLife International 2018. *Thalassarche melanophris*. The IUCN Red List of Threatened Species 2018).<br>Other species considered impacted by the fishery is the Grey headed albatross, however, these species presents few interactions with the fishery under assessment. Bernal et al (2019) reported frequency of occurrence was less than 3 % of the interactions with this species. CIAMT logbooks has shown few interactions when the target species is Chile hake and it's more encountered when the trawling is targeting hoki or blue whiting. In addition (Robertson et al 2017) showed that Chile has the second largest population of reproductive individuals with the 23% of the total population and they have been increased in most of the breeding areas in the last census (Robertson et al. 2014).<br>Therefore, with all the information presented herein, the assessment team can conclude that known direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species and **SG 80 is met for both scoring elements in the UoA 1.**<br>However, although quantitative information is available, the assessment team is not confident to meet SG 100 as the measures have been established recently and more data regarding cryptic |

| PI 2.3.1 | | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species | | |
|---|---|---|---|---|
| | | mortality and in general, uncertainties in the estimation of unobserved mortality are needed to have a high degree of confidence that the detrimental effects are negligible. Therefore, there isn't a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species (seabirds) and **SG 100 is not met for both scoring elements in the UoA 1** | | |
| | Indirect effects | | | |
| | **Guidepost** | | Indirect effects have been considered and are thought to be **highly likely** 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. |
| | **Met?** | | SE Bottom trawl-Y<br>SE Midwater trawl-Y | SE Bottom trawl-N<br>SE Midwater trawl-N |
| | **Justification** | **Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts.**<br>The effect on ETPs species is monitored and Chile is part of many binding agreement to protect ETPs species. Action plans to preserve sea birds, marine mammals and other vulnerable species are considered under the new regulations and updates have been done to incorporate the data collected in 2015 and 2016.<br>Following the FCR v2.0, indirect impacts on ETPs must consider unobserved mortality besides the potential effect of the fishery in key elements of the ecosystems that can have a negative effect on ETP populations. Consequently, the Assessment Team have identified a number of possible significant detrimental indirect effects of the Chile austral hake on ETP species including the potential disruption of predator-prey dynamics resulting (directly and/or indirectly) from the fishery mostly in seabirds' populations and the likelihood of gear being lost and allowed to potentially ghost fish.<br>Potential for adverse impacts on ETPs' prey availability<br>The main seabirds affected by trawls in the study area are the black-browed albatrosses. Numerous studies have shown that the main diet is composed by crustaceans, squid and small fish also carrion. They are scavenger seabirds which frequently feed on the catch of the fishing operations or the fishery discards (Cherel *et al*. 2002, Arata *et al*. 2003, Xavier *et al*. 2003, and Mariano Jelicich *et al*. 2014).<br>Further, marine mammals occurring in the area that can interact with the fishery present a diet based on small fishes and squid rather than large fish. Few chondrichthyes prefer feeding on large fishes other sharks or even small mammals.<br>Chile Austral hake has a trophic level of 4.5 being well apart of the preferred preys of the species described as ETPs or non-retained species in the fishery.<br>There is no evidence of any species being critically dependent on Chile austral hake. Therefore, the fishery is **highly likely** to not create unacceptable indirect impacts on ETPs.<br>Potential for gear loss and ghost fishing<br>Chile hake trawls are large expensive pieces of equipment that are attached at all times at vessels. The way in which the fishery operates means it is extremely unlikely that fishing gear would become lost and the cost of the gear makes it virtually impossible that, were such an event to occur, the gear would not be immediately retrieved.<br>To conclude, the assessment team can confirm that the lack of any evidence of ETPs' dependency on Chile Austral hake as a food source and the unlikelihood of ghost fishing of ETPs provide a high degree of confidence that indirect effects can be considered to be **highly likely** to not create unacceptable impacts, thus SG **80 is met for all scoring elements in the UoA 1**.<br><br>However, given that there is scarce information on local gear interactions on ecosystems components, impacts studies should be carried out with recent data. Thus, the Assessment Team cannot conclude that there is a high degree of confidence that there are no significant detrimental indirect effects of the fishery on ETP species and **SG 100 is not met for all scoring elements in the UoA 1.** | | |

| PI 2.3.1 | **The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species** |
|---|---|
| **References** | https://www.federalregister.gov/documents/2016/08/15/2016-19158/fish-and-fish-product-import-provisions-of-the-marine-mammal-protection-act<br>https://www.fisheries.noaa.gov/topic/international-affairs#international-cooperation<br>Informe Técnico IT N° 03/2016 "Asesoría Administración Pesquería de Raya volantín y Raya espinosa, Año 2017 acompañante entre los paralelos 4128,6' y 57 LS (December 2017) "<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. Informe Final. Convenio de desempeño 2016 Programa de investigación del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluación de los planes de reducción del descarte. Sección Pesqueras Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Bernal et al. 2019<br>Gálvez, M., Pérez C. & F. Espíndola. 2016. Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales, 2017: Raya volantin. Informe 1 de estatus. Octubre 2016. Instituto de Fomento Pesquero (IFOP). Convenio de desempeño 2016. Subsecretaria de Economía y EMT. 120pp más anexos.<br>https://www.cms.int/sites/default/files/basic_page_documents/cms_cop12_ap%C3%A9ndices_s.pdf<br>Comisión Permanente del Pacífico Sur (CPPS). Secretaría ejecutiva del Plan de Acción del Pacífico Sudeste. Plan de Acción para la Protección del Medio Marino y Áreas Costeras del Pacífico Sudeste. 2004<br>Ministerio de Economía, Diciembre de 2016. Prórroga de la veda extractiva para el recurso del Lobo marino común.<br>Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE). FIP 2006-30<br>https://www.acap.aq/en/acap-species<br>http://www.mma.gob.cl/clasificacionespecies/ficha11proceso/FichasPAC_11RCE/Thalassarche_chrysostoma_11RCE_01_PAC.pdf<br>http://www.mma.gob.cl/clasificacionespecies/ficha11proceso/FichasPAC_11RCE/Thalassarche_melanophris_11RCE_01_PAC.pdf<br>BirdLife International 2018. Thalassarche chrysostoma. The IUCN Red List of Threatened Species 2018: e.T22698398A132644834.<br>BirdLife International 2018. Thalassarche melanophris. The IUCN Red List of Threatened Species 2018: e.T22698375A132643647.<br>Adasme, L. M., Canales, C. M., and Adasme, N. A. Incidental seabird mortality and discarded catches from trawling off far southern Chile (39–57S). 2019 – ICES Journal of Marine Science, doi:10.1093/icesjms/fsz001. |

| | |
|---|---|
| **Bottom trawl** | |
| **Scoring element 1- Sea lions** | **100** |
| **Scoring element 2- Seabirds** | **80** |
| **Overall bottom trawl (1 meets 80; 1 meets 100 = 85)** | **85** |
| **Midwater trawl** | |
| **Scoring element 1- Sea lions** | **100** |
| **Scoring element 2- Seabirds** | **80** |
| **Overall midwater trawl (1 meets 80; 1 meets 100 = 85)** | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE (SE 1 & 2; Bottom and midwater trawl):** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.3.1 – UoA 2 Longline: ETP species outcome

| PI 2.3.1 | | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species | | |
|---|---|---|---|---|
| **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 **likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population/stock are known and **highly likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits. |
| | **Met?** | Not revelant | Not relevant | Not relevant |
| | **Justification** | The UoA 2- Longline is not affecting any ETPs species with national or international limits established. This scoring issue only applies to species for which national and or international limits for protection or rebuilding are in place, either through national legislation or binding international agreements see FCR v2.0 at SA3.10.1, therefore this scoring guidepost is not relevant for the UoA 2. | | |
| **B** | Direct effects | | | |
| | **Guidepost** | Known direct effects of the UoA are likely to not **hinder recovery** of ETP species. | Known direct effects of the UoA are **highly likely** to not **hinder recovery** 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?** | SE 1 Sea lions–Y<br>SE 2 Seabirds–Y | SE 1 Sea lions–Y<br>SE 2 Seabirds–Y | SE 1 Sea lions–Y<br>SE 2 Seabirds–N |
| | **Justification** | **Known direct effects of the UoA are highly likely to not hinder recovery of ETP species**.<br>There is a list of 70 protected species under Chile regulation DS N°225 de 1995, updated by DS 135 in 2005. There is also a ban for 25 years period until 2025. Further, Chile as a country member of the CPPS, participates in the Action plan for conservation of marine mammals in which there are different agreements set up to preserve the marine mammals in the South pacific. However, it has been reported that the fishery does not have interactions with marine mammals (Cedepesca, 2010). The marine mammal species that can be affected by the UoA- Longline is the South American sea lion, *Otaria flavescens*.<br><br>The data reported by IFOP from the observer program in 2018 has shown that in the longline fishery targeting Chile hake, 258 interactions with this species were reported between 2014 to 2017. Most of the interactions (198) were defined as "feeding on fishing catch" and the rest of were split into interactions with cables (8) and feeding on fishing discards (52). No specimens were killed by longline were reported during these years by the observer program.<br>Therefore, there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species and **SG 60, 80 and 100 is met.**<br><br>For the scoring elements group; seabirds, the incidental capture of these species is higher in this UoA 2 longline than in UoA 1 trawls. However, detrimental effects are low and measures are in place to reduce the mortality of the identified seabird species interacting with the UoA-longline. The species included in this group are listed below:<br><br>- Black-browed albatross *Thalassarche melanophrys*<br>- Southern giant-petrel *Macronectes giganteus*<br>- Hall's giant petrel *Macronectes hallis*<br>- Sooty shearwater, *Puffinus griseus*<br>- White-capped albatross, *Thalassarche salvini*<br>- Gray headed albatross, *Thalassarche chrysostomas* | | |

  

| PI 2.3.1 | | **The UoA meets national and international requirements for the protection of ETP species**<br>**The UoA does not hinder recovery of ETP species** | | |
|---|---|---|---|---|
| | | From 1997 to 2007 observers have reported interactions of Austral hake longline with seabirds. More than 200 cases have been reported and information regarding sightings of seabirds are available from IFOP and SERNAPESCA.<br><br>The composition of the seabirds in the longline is different than in the bottom trawl by being more representative the presence of petrels, sooty shearwater and black browed albatross with more than 2000 cases in the CIAMT logbook. Most of the sightings were defined as seabirds feeding on the catch or rests of the fishing operations. Therefore **SG 60 is met for this scoring element**.<br><br>Since 2001, Chile is a member country of the Agreement on the Conservation of Albatrosses and Petrels with the aim "to achieve and maintain a favourable conservation status for albatrosses and petrels". An Action Plan to reduce the effects of fisheries on seabirds is in place from 2016.<br><br>More effort has been made to control and manage the impact of the longline fishery. Tthe observer program to collect data in the industrial fishery including longline vessels has been increased to 95 % of coverage, the information gathered is more accurate and measures (most of them focus on the improvements of tori lines, weights on the lines to reduce the buoyancy and the speed of the operations) have been implemented in the new discards program to mitigate the impacts on seabirds, focusing on black browed albatross, the most encountered seabird in all fishing gears defined in the UoA 1 and 2.<br><br>Further, there is a program aimed at reducing seabirds mortality from 2002 where all the interactions are monitored, and quantitate data is available from this research project (PAN-AM/Chile).<br><br>Therefore, known direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species and **SG 80 is met for this escoring element**.<br><br>However, the Assessment Team is not confident in scoring SG 100 as some measures have been established recently (from 2015 to 2018) and more data is needed to have a high degree of confidence. Therefore, there is not a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species and **SG 100 is not met for this scoring element.** | | |
| **C** | Indirect effects | | | |
| | **Guidepost** | | Indirect effects have been considered and are thought to be **highly likely** 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. |
| | **Met?** | | Y | N |
| | **Justification** | **Indirect effects have been considered and are thought to be highly likely to not create unacceptable impacts**.<br>The effect on ETPs species are monitored and Chile is part of many binding agreements (see background section) to protect ETPs species. Action plans to preserve sea birds, marine mammals and other vulnerable species are considered under the new regulations and updates have been done to incorporate the data from the discard program collected in 2015 and 2016.<br><br>Following the FCR v2.0, indirect impacts on ETPs must consider unobserved mortality besides the potential effect of the fishery in key elements of the ecosystems that can have a negative effect on ETP populations. Consequently, as it was mentioned previously for trawls UoAs, the Assessment Team have identified a number of possible significant detrimental indirect effects of the Austral hake fishery on ETP species. This includes potential disruption to predator-prey | | |

| PI 2.3.1 | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species |
|---|---|
| | dynamics mostly in seabirds' populations and the likelihood of gear being lost and still potentially fishing.<br><br>Regarding the potential for adverse impacts on ETPs' prey availability, the assessment team concluded that for UoA 2-longline, the target species is the same as well as the fishery effects on the same proportions. Chile Austral hake has a trophic level of 4.5, being well apart of the preferred preys of the species described as ETPs or non-retained species in the fishery UoA longline. There is no evidence of any species being critically dependent on Chile austral hake. Therefore, the fishery is **highly likely** to not create unacceptable indirect impacts on ETPs.<br><br>Potential for gear loss and ghost fishing<br>Chile hake longline are large expensive pieces of equipment. The longline used for Chile austral hake is a mother line with more than 16,000 hooks with floaters and weights fishing devices that are attached to the equipment normally located at the stern of the vessels. The way in which the fishery operates means it is extremely unlikely that fishing gear would become lost and the cost of the gear makes it virtually impossible as it happens to the trawl's vessels also.<br><br>To conclude the Assessment Team can confirm that the lack of any evidence of ETPs' dependency on Chile Austral hake as a food source and unlikelihood of ghost fishing of ETPs reports a high degree of confidence that there are no indirect effects and the fishery is highly likely to not create unacceptable impacts therefore SG 80 is met.<br><br>However, as the Assessment Team cannot confirm with a high degree of confidence if any component of the gears could affect indirectly the ETPs populations, therefore **SG 100 is not met** |
| **References** | https://www.federalregister.gov/documents/2016/08/15/2016-19158/fish-and-fish-product-import-provisions-of-the-marine-mammal-protection-act<br>https://www.fisheries.noaa.gov/topic/international-affairs#international-cooperation<br>Informe Técnico IT N° 03/2016 "Asesoría Administración Pesquería de Raya volantín y Raya espinosa, Año 2017.<br>Gálvez, M., Pérez C. & F. Espíndola. 2016. Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales, 2017: Raya volantin. Informe 1 de estatus. Octubre 2016. Instituto de Fomento Pesquero (IFOP). Convenio de desempeño 2016. Subsecretaria de Economía y EMT. 120pp más anexos.<br>https://www.cms.int/sites/default/files/basic_page_documents/cms_cop12_ap%C3%A9ndices_s.pdf<br>Comisión Permanente del Pacífico Sur (CPPS). Secretaría ejecutiva del Plan de Acción del Pacífico Sudeste. Plan de Acción para la Protección del Medio Marino y Áreas Costeras del Pacífico Sudeste. 2004.<br>Ministerio de Economía, Diciembre de 2016. Prórroga de la veda extractiva para el recurso del Lobo marino común.<br>Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE). FIP 2006-30.<br>https://www.acap.aq/en/acap-species |

| | |
|---|---|
| **Scoring element 1 (Sea lions)** | **100** |
| **Scoring element 2 (Seabirds)** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE (UoA 2 longline: 1 meets 80; 1 meets 100)** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.3.2 – ETP species management strategy (UoA 1 Trawls)

<table>
<tr><td colspan="2">PI 2.3.2</td><td colspan="3">The UoA has in place precautionary management strategies designed to:<ul><li>meet national and international requirements;</li><li>ensure the UoA does not hinder recovery of ETP species.</li></ul>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">A</td><td colspan="4">Management strategy in place (national and international requirements)</td></tr>
<tr><td>Guidepost</td><td>There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.</td><td>There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.</td><td>There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.</td></tr>
<tr><td>Met?</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – N<br>SE midwater trawl – N</td></tr>
<tr><td>Justification</td><td colspan="3"> There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. The amended Chile fishing law requires agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The Plan to reduce and minimize the bycatch and incidental catches in the fishery implemented in 2017 has made a big progress in implementing measures to control and monitor if any UoA has a significant impact on ETP species and if the impacts has been decreased with the implementation of these actions. By the resolution of December 29$^{th}$, 2017 all the measures set up in the Discard plan have a legally enforcement system and they have to be included in the management of the fishery. SUBPESCA and SERNAPESCA, the government agencies authorized to implement many different requirements on the fishery, have developed many ETP species monitoring and evaluation programs. These include general management measures for both trawls, such as: area or time closures, mitigation measures for seabirds including the mandatory use of seabird saver system (i.e. laser) from 2018 and acoustic devices, management of discard and wastes following MARPOL protocols, use of tori lines and bafflers and window escapes for marine mammals; codes of conduct; monitoring programs; control mechanisms by gear modifications; training and dissemination program for crews; workshops to trainee fishermen to implement protocols among others. Research plans are organized in a practical, binding and synergistic way, with the purpose of achieving the general and specific objectives of preserving ETPs as stated in all of the binding agreements in which Chile is part. (Please see background section 3.4.7 for agreements and measures already established).<br>In the Austral hake fishery is also mandatory to carry out nightly fishing operations with minimal artificial light, just to guarantee the safety of the crew.<br>Additionally, new protocols to release alive ETPs species are being put in place and trainings have been carrying out to observers and crew.<br>Therefore, there is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and </td></tr>
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<table>
<tr><td colspan="2">PI 2.3.2</td><td colspan="3">The UoA has in place precautionary management strategies designed to:<ul><li>meet national and international requirements;</li><li>ensure the UoA does not hinder recovery of ETP species.</li></ul>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</td></tr>
<tr><td></td><td></td><td colspan="3">international requirements for the protection of ETP species and SG 80 is met for both scoring elements.<br><br>As some of the measures were implemented recently (from 2015-2018) the Assessment Team is not confident to score SG 100 on neither scoring elements.</td></tr>
<tr><td>B</td><td colspan="4">Management strategy in place (alternative)</td></tr>
<tr><td></td><td>Guidepost</td><td>There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.</td><td>There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.</td><td>There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species</td></tr>
<tr><td></td><td>Met?</td><td>Not scored</td><td>Not scored</td><td>Not scored</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Following the FCR v2.0 clause SA 3.11.2.2 the fishery is not score in SI (b).</td></tr>
<tr><td>C</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).</td><td>There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.</td><td>The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.</td></tr>
<tr><td></td><td>Met?</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – N<br>SE midwater trawl – N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.<br><br>ETP species interactions with the fishery are directly monitored at sea by observers and enforcement agents. The interactions are defined following the impact on the species; from sightings to mortality events by fishing activities. Most of the interactions reported are classified as individuals feeding on the fishing catch or discards. The interactions that have caused mortality on ETPs species must be reported in the logbooks. IFOP monitors every year if the strategies are working properly using these databases among others. Some of the measures have been implemented since 2015 when the Discard Plan for Chile Hake was approved. Annually, the records from the observer program and the logbooks are analysed by IFOP researchers who are involved in the scientist committees to give advises for the management plan of the fishery. The trends in the data regarding ETPs have shown that interactions have decreased over the years showing that the objectives set up in the discard plan are working properly (Céspedes et al. 2018, Bernal et al. 2019)<br><br>Consequently, quantitative analyses are available for all the species under the new discards program. Therefore SG 60 is met for both scoring elements.<br>Regarding marine mammals there is existing information that there is a very low number of interactions on all of fishing gears. Also, there are measures in place to control the interactions with mammals, sharks and rays and protocols to release them alive when they have been caught by fleets.</td></tr>
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<tr><td colspan="2">PI 2.3.2</td><td colspan="3">The UoA has in place precautionary management strategies designed to:<br>• meet national and international requirements;<br>• ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</td></tr>
<tr><td></td><td></td><td colspan="3">Regarding birds, (Bernal et al 2018; 2019) have shown a considerable reduction in the mortality of most encountered seabirds in the fishery. Although interactions with Black borrowed albatrosses are higher than with other ETPs species, in 2016 the reported observation were approximately n=4283 specimens. In 2017, even though, the number of observations was still high, it was reported as n=2002 specimens. Therefore, Bernal et al. 2019 has shown that the measures are working as the impacts on Black browed albatross have decreased to nearly 53% from 2016 to 2017.<br>In addition, population abundance of Black browed albatross have increased . In the list of the species reported by the Minister of Environment (Ministerio de Medio Ambiente de Chile), the species is not considered vulnerable. The birds’ census in the breeding areas have estimated the number of albatrosses in increase. Based on these estimates, Chile has the second largest population of black-browed albatross 123,000 annual reproductive pairs or 20% of the world's population, after Falklands Islands, where 66% of the species is reproduced (Robertson et al. 2007). Further, Birdlife international in its last report considered to classify the species in IUCN red list has stated that Black-browed albatrosses has a global population of mature individuals of 1,400,000 and in the last assessment it was considered as a species of least concern. This statement is attributed to (i) recent increasing population abundance trends, (ii) populations are not considered severely fragmented (iii) Abundance decline of mature individuals was found not to be happening (BirdLife International 2018. Thalassarche melanophris. The IUCN Red List of Threatened Species 2018).<br>Other species considered impacted by the fishery is the Grey headed albatross, however, these species presents few interactions with the fishery under assessment. Bernal et al (2019) reported less than 3 % of the interactions with trawl operations resulted in mortality were associated to this species. CIAMT logbooks has shown few interactions when the target species is Chile hake and it’s more encountered when the trawling is targeting hoki or blue whiting. In addition Robertson et al 2017 showed that Chile has the second largest population of reproductive individuals with the 23% of the total population and they have been increased in most of the breeding areas in the last census (Robertson et al. 2014).<br>Therefore, there is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved and SG 80 is met for both scoring elements.<br><br>However, as some of these measures/protocols have been implemented during last year, the assessment team cannot say that there is high confidence that the strategy will work and SG 100 is not met for both scoring elements.</td></tr>
<tr><td>D</td><td colspan="4">Management strategy implementation</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>There is some evidence that the measures/strategy is being implemented successfully.</td><td>There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).</td></tr>
<tr><td></td><td>Met?</td><td></td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – N<br>SE midwater trawl – N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some evidence that the measures/strategy is being implemented successfully.<br><br>The discard plan for Chile Austral hake fishery started in 2015 with the first measures implemented. During 2015 and 2016 most of the measures were implemented by all the vessels targeting Chile austral hake and golden seabass.</td></tr>
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<tr><td colspan="2">PI 2.3.2</td><td colspan="3">The UoA has in place precautionary management strategies designed to:<br>• meet national and international requirements;<br>• ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</td></tr>
<tr><td></td><td></td><td colspan="3">In terms of impact on seabirds the vessels included in the certificate have developed good practice such as: use of Mustard Seabird Saver, tori lines, bafflers and scaring lines for more than 4 years, but officially approved by resolution in December 2017. Among other measures, the management of the waste and fishing discards and the modification of the fishing operations to avoid high abundance areas and impacts on ETPs and bycatch have been in place since 2015.<br><br>First report with the analysis of these measures were published by IFOP in 2018, where all the data from 2015 and 2016 were presented. After that, in 2019 a second report were published with new data and revised information, in this latest report, it was shown that a decreased in the interactions between the results of 2016 and 2017.<br><br>Additionally, in the trawl UoA, the interactions reported with marine mammals have increased in number of observations reported due to the increased percentage of on board observers in the fleets. From 2014 to 2016 the percentage of observers has increased from 22% to 66%. Thus, the quality of the data is improving making possible a better sound monitoring of the measures included in the strategy. All of these efforts are allowing IFOP to evaluate how the strategies are being successfully implemented in all the fleet doing their recommendations in the management committees of the fishery. Therefore, there is some evidence that the measures/strategy is being implemented successfully and SG 80 is met for both scoring elements.<br><br>However, it is still soon to have a clear evidence of some of the measures implemented in the last year, for that reason and being precautionary, the assessment team can conclude that there is no clear evidence that the measures/strategy is being implemented successfully and SG 100 is not met for both scoring elements.</td></tr>
<tr><td>E</td><td colspan="4">Review of alternative measures to minimize mortality of ETP species</td></tr>
<tr><td></td><td>Guidepost</td><td>There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.</td><td>There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.</td><td>There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.</td></tr>
<tr><td></td><td>Met?</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – Y<br>SE midwater trawl – Y</td><td>SE bottom trawl – N<br>SE midwater trawl – N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.<br><br>As stated in the FCR v2.0 SA 3.5.3 alternative measures means alternative fishing gears/practice to reduce the mortality of unwanted species. Measures established for reducing the mortality of ETP species have been implemented over the years from 2015 up to 2018. Measures such as use of bafflers, different methodologies to fishing operation in areas where high abundance of seabirds or other ETPs are known, use of tori lines and other deterrent devices, control and manage of discards products and waste, washing the mesh between fishing operation, as well as other measures reported in the background have been in place in the fishery as alternatives measures since 2015. Some vessels included in the assessment, also have followed good practice code in regards waste treatments and discards and further, the elimination of the net cable from more than 5 years ago. Other measures have been proposed after the analysis of the first results with the data collected from 2015 and 2016 and they have been implemented over 2018 as the</td></tr>
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<table>
<tr><td>PI 2.3.2</td><td colspan="2">The UoA has in place precautionary management strategies designed to:<br>• meet national and international requirements;<br>• ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</td></tr>
<tr><td></td><td colspan="2">mandatory used of the laser for birds or the video cameras systems to control fishing operation and discards of unwanted catches. New protocols of releasing vulnerable species alive are documented in the regulations D.S. N° 76 from 2015 and article 7C LGPA has been implemented to ensure the release of sharks, rays and other vulnerable species.<br>Further, all the catches are reported in the logbooks. Studies of post-mortality and science monitoring of the successful implementation are also in place since the resolution of the Discard plan in December of 2017.<br>Therefore, most of the measures set up to minimise the mortality of ETPs including seabirds, marine mammals and other species of sharks and rays that can be considered ETPs were implemented at the time of the site visit in 2018. Regular review means under MSC FCR v2.0 standard, at least once every 5 years, the new discard program has set up 9 new measures to reduce the mortality and interactions with ETPs in its report of 2018 and all measures will be reviewed annually. Consequently, a review of the measures is scheduled to take place annually and there is already some evidence that they are being implemented successfully as it was shown in the first complete discard program report published with the data of 2015 and 2016 (Bernal et al., 2018). Furthermore, remedial action plans are considered in the new program if any of the measures are considered to not work successfully.<br><br>All those measures are focused on reducing and minimising the related mortality of ETP, therefore SG 60 and SG 80 are met for both scoring elements.<br><br>Data are collected annually and every year the technical committees analyse the data available to set up recommendations that result in limits established by SUBPESCA. Depending of the species stock status, measures are developed and follow up consultations are done every year. However, as they are measures implemented during 2018 and the use of the video cameras is still in implementation, the assessment team has followed the precautionary approach and SG 100 is not met for both scoring elements.</td></tr>
<tr><td>References</td><td colspan="2">Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Céspedes et al. 2017. Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesqueras Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>Comisión Permanente del Pacífico Sur (CPPS). Secretaría ejecutiva del Plan de Acción del Pacífico Sudeste. Plan de Acción para la Protección del Medio Marino y Áreas Costeras del Pacífico Sudeste. 2004.<br>Ministerio de Economía, Diciembre de 2016. Prórroga de la veda extractiva para el recurso del Lobo marino común.<br>Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE). FIP 2006-30.<br>https://www.acap.aq/en/acap-species</td></tr>
<tr><td colspan="2">Scoring element 1 Bottom trawl (4 meets 80)</td><td>80</td></tr>
<tr><td colspan="2">Scoring element 2 Midwater trawl (4 meets 80)</td><td>80</td></tr>
<tr><td colspan="2">OVERALL PERFORMANCE INDICATOR SCORE UoA 1:</td><td>80</td></tr>
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| | |
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| **PI 2.3.2** | **The UoA has in place precautionary management strategies designed to:**<br>• **meet national and international requirements;**<br>• **ensure the UoA does not hinder recovery of ETP species.**<br><br>**Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.** |
| **CONDITION NUMBER (if relevant):** | **NA** |

**PI 2.3.2 – ETP species management strategy (UoA 2 Longline)**

| | | | | |
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| **PI 2.3.2** | | **The UoA has in place precautionary management strategies designed to:**<br>• **meet national and international requirements;**<br>• **ensure the UoA does not hinder recovery of ETP species.**<br><br>**Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.** | | |
| **Scoring Issue** | | SG 60 | SG 80 | SG 100 |
| **A** | Management strategy in place (national and international requirements) | | | |
| | **Guidepost** | There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species. |
| | **Met?** | Not scored | Not scored | Not scored |
| | **Justification** | Following the FCR v2.0 clause SA 3.11.2.1 the fishery is not score in SI (a). | | |
| **B** | Management strategy in place (alternative) | | | |
| | **Guidepost** | There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species |
| | **Met?** | Y | Y | N |
| | **Justification** | **There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species**.<br><br>In Chile the new law to manage the fisheries has done a great effort to evaluate if any UoA has a significant impact on ETP species and if any known detrimental effect has increased. SUBPESCA and SERNAPESCA, the government agencies authorized to implement many different requirements on the fishery, have developed many ETP species monitoring and evaluation programs. These include general management measures for all the fisheries included longline fleet. Among the measures there are areas or temporary closures; mitigation measures for seabirds and marine mammals; codes of conduct; monitoring programs; control mechanisms by gear modifications; training and dissemination program for crews; workshops to trainee fishermen to implement protocols among others. Research plans are organized in a practical, binding and synergistic way, with the purpose of achieving the general and specific objectives of preserving ETPs as stated in all of the binding agreements in which Chile is part. (Please, see background section 3.4.7 for agreements and measures already established).<br><br>In addition there are measures in place in the "Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE)" that focus on minimising the mortality of seabirds in longline fleet.<br><br>Ever since 2002, there have been measures and strategies in place that have reduced the rate of mortality. For example, at the beginning of the project in 2002, the fishing mortality was 0.113 seabirds/1000 hooks and now it has been reduced to 0.5 seabirds/hooks. The latest information has shown that the rate has been reduced in the 50% in three years after implementation. Improvements have been reported in monitoring activities carried out by on-board observers.<br><br>The main mitigation strategies for seabirds are: | | |

| | | | | |
|---|---|---|---|---|
| **PI 2.3.2** | | **The UoA has in place precautionary management strategies designed to:**<br>• **meet national and international requirements;**<br>• **ensure the UoA does not hinder recovery of ETP species.**<br><br>**Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.** | | |
| | | - To control the speed of the deploying and hauling of the longline;<br>- To increase the depth of the weights and;<br>- To use the tori lines as described for each gear type (no less than 80-100 meters of length for Austral hake longline)<br><br>In the Austral hake fishery is also mandatory to carry out nightly fishing operations with minimal artificial light, just to guarantee the safety of the crew.<br><br>Further, the new discards program has established more guidelines to assist in preparation and implementation of tori line regulations for longline vessels. Additionally, new protocols to release alive are being put in place and trainings have been carrying out to observers and crew.<br><br>Therefore, there is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species and **SG 80 is met**.<br><br>As some of the measures were implemented recently (from 2015-2018) implemented the Assessment Team is not confident to score SG 100 yet. | | |
| **C** | Management strategy evaluation | | | |
| | **Guidepost** | The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species). | There is an **objective basis for confidence** that the measures/strategy will work, based on **information** 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 **quantitative analysis** supports **high confidence** that the strategy will work. |
| | **Met?** | Y | Y | N |
| | **Justification** | **There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.**<br><br>ETP species interactions with the fishery are directly monitored at sea by observers and enforcement agents. The interactions are defined following the impact on the species; from sightings to mortality events by fishing activities. Most of the interactions reported are classified as individuals feeding on the fishing catch or discards. Few interactions have caused mortality on ETPs and if that is the case the incidents must be reported in the logbooks. IFOP monitors every year if the strategies are working properly using these databases among others.<br><br>Consequently, quantitative analyses are available for all the species under the new discards program. For example, data is available from year 2015 when the project started. Therefore **SG 60 is met for both UoAs.**<br><br>There is existing information that there is a very low number of interactions on all of fishing gears. Also, there are measures in place to control the interactions and protocols to release alive any ETPs species that might be caught by fleets.<br>Therefore, there is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved and **SG 80 is met.** | | |

| PI 2.3.2 | | The UoA has in place precautionary management strategies designed to:<br>• meet national and international requirements;<br>• ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species. | | |
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| | | However, as some of these measures/protocols have been implemented during last year, the assessment team cannot say that there is high confidence that the strategy will work and **SG 100 is not met.** | | |
| **D** | Management strategy implementation | | | |
| | **Guidepost** | | There is some **evidence** that the measures/strategy is being implemented successfully. | There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b). |
| | **Met?** | | Y | N |
| | **Justification** | **There is some evidence that the measures/strategy is being implemented successfully**.<br><br>Most of the measures have been implemented during 2018. However, there have been reports documenting gear and ETP interactions with data from 2015 and 2016. It has been shown that a decrease of seabird's interactions has been reported in all fleets. From 2014 to 2016 the percentage of observers has increased from 22% to 66%. Thus, the quality of the data is improving making possible a better sound monitoring of the measures included in the strategy. All of these efforts are allowing IFOP to evaluates how the strategies are being successfully implemented in all the fleets therefore, **SG 80 is met.**<br><br>However, it is still soon to have a clear evidence. Therefore, following a precautionary approach the team can conclude that there is **no clear evidence** that the measures/strategy is being implemented successfully and **SG 100 is not met.** | | |
| **E** | Review of alternative measures to minimize mortality of ETP species | | | |
| | **Guidepost** | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate**.<br><br>Measures established for reducing the mortality of ETP species have been implemented over the years from 2016 to last year. The measures are listed in the background section 3.4.7 ETP management. The new discard program has set up 9 new measures to reduce the mortality and interactions with ETPs. Those measures have been implemented over 2015 to 2018 except the implementation of the video cameras that is still in process.<br><br>New protocols of releasing vulnerable species alive are documented in the regulations D.S. N° 76 from 2015 and article 7C LGPA has been implemented to ensure the release of sharks, rays and other species considered protected or vulnerable under national or international regulations.<br><br>Further, all the catches are reported in the logbook. Studies of post-mortality and science monitoring of the successful implementation are also in place. Those regulations are focused on reducing and minimising the related mortality of ETP, therefore **SG 60 is met for both UoAs**. | | |

| PI 2.3.2 | The UoA has in place precautionary management strategies designed to:<br>• meet national and international requirements;<br>• ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species. |
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| | The logbooks are reported by the fleet to IFOP and SERNAPESCA. This data had helped IFOP and SERNAPESCA in developing management measures to control gear interactions with ETPs (IOE and CIAMT logbooks). Preliminary data have shown a decrease in the number of interactions. Furthermore, mortality of the ETPs is lower than previous years. In addition, most of the data reported have shown that the ETP species specimens had not been harmed but they were seen feeding on vessels discards or catches.<br><br>Additional from 2013 to now measures focused on longline fisheries to avoid interactions with seabirds jave been developed:<br>- Use deterrents or Scarecrow line to deter birds from approaching very close to the fishing gear<br>- Augment the sinking rate on the fishing line gear to avoid the birds can get entangled.<br>- Do longline fishing operations at night<br>- To eliminate waste on the opposite side of the fishing vessel where the fishing lines are pulled back from the water in order to avoid entanglement<br><br>With the implementation of the measures above, the most affected species, Black Browed albatross, have been increasing in abundance in recent years (ATF 2014). Tori lines are mandatory for longline vessels and measures to minimise the impact are in place and scientists and enforcement bodies work closely to ensure the compliance of the measures.<br><br>There is some evidence that the strategy is being implemented successfully as it was shown in the first complete discard program report of 2017(Bernal *et al.,* 2017) following the results from 2015-2016 database. Furthermore, remedial action plans are considered in the new program if any of the measures are considered to not work successfully.<br><br>The data are collected annually and every year the technical committees analyse the data available to set up recommendations that result in limits established by SUBPESCA. Depending of the species stock status, measures are developed and follow up consultations are done every year.<br><br>Therefore, There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate and **SG 100 is met**. |
| **References** | Informe Técnico (R. PESQ.) Nº 15. Informe de descarte y captura incidental regiones X, XI, XII Chile. 2017. SUBPESCA.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesquerfas Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas: Pesquería Demersal Sur Austral Artesanal, 2017. IFOP.<br>Comisión Permanente del Pacífico Sur (CPPS). Secretaría ejecutiva del Plan de Acción del Pacífico Sudeste. Plan de Acción para la Protección del Medio Marino y Áreas Costeras del Pacífico Sudeste. 2004. |

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| **PI 2.3.2** | **The UoA has in place precautionary management strategies designed to:**<br>• **meet national and international requirements;**<br>• **ensure the UoA does not hinder recovery of ETP species.**<br><br>**Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.** |
| | Ministerio de Economía, Diciembre de 2016. Prórroga de la veda extractiva para el recurso del Lobo marino común.<br>Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE). FIP 2006-30.<br>https://www.acap.aq/en/acap-species |

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| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.3.3 – ETP species information (all UoAs- Trawls and longline)

<table>
<tr><td colspan="2">PI 2.3.3</td><td colspan="3">Relevant information is collected to support the management of UoA impacts on ETP species, including:<ul><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></td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">A</td><td colspan="4">Information adequacy for assessment of impacts</td></tr>
<tr><td>Guidepost</td><td>Qualitative information is adequate to estimate the UoA related mortality on ETP species.<br><br>OR<br><br>If RBF is used to score PI 2.3.1 for the UoA:<br><br>Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</td><td>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.<br><br>OR<br><br>If RBF is used to score PI 2.3.1 for the UoA:<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</td><td>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.<br><br>At it is stated in the FCR v2.0 GSA 3.6.3 at SG 80 information adequacy required the estimation of the impact of the UoA on the outcome of the species as it is set up in the 2.3.1. Some quantitative information is required as showed in the table GSA5 of FCR v2.0 if the fishery has at least one source of information from the higher level of verifiability and lower bias or two or more of higher bias but the species under assessment are not below limits, therefore the fishery could meet SG 80.<br>The fishery under assessment has different source of quantitative information:<ul><li>From higher level of verifiability and lower bias: Observers program with a high coverage; Electronic monitoring system (VMS) and research program are available.</li><li>From lower level of verifiability and higher bias: standardized logbooks (IEO and CIAMT), self-reporting data.</li></ul><br>Specifically, the Observer Program monitors bycatch of ETP species. Information is sufficient to determine whether the fishery may be a threat to protection and recovery of the ETP species. Observer coverage in this fishery is > 90% which is high for any fishery. Therefore SG 60 is met for both UoAs.<br>Furthermore, the information has been collected from 2013, the percentage of coverage has been increasing from 19.1% to 95.4% in 2016. Therefore, the observer program has continuity in time and more accuracy data are obtained due to improvements in the methodologies to collect the data and also trainings realized to gain better quality of the data from onboard observers and the crew of the fleets. Bernal et al., (2018; 2019) have reported the progresses done in the coverage of the observers' program.<br>Marine law enforcement is also involved with both at-sea and landing point's enforcement. Also, from 2018, it is mandatory to report any catch from those species considered ETPs or vulnerable under Chilean legislation.</td></tr>
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| | | SUBPESCA has a strong record of imposing timely regulations to mitigate threatening interactions between specific fisheries and ETP species. Furthermore, ever since the Discard plan has been in place, more effort in collecting quantitative data has been done and preliminary measures have been established in the fishery with the data gathered. As detailed above, the adequacy of the information has been proved as most of the information available is classified in FCR v2.0 GSA 3.6.3 as information of higher level of verifiability and lower bias. Therefore, some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species and **SG 80 is met for both UoAs**.<br>However, given that the monitoring program with video cameras has not fully implemented yet, the team concluded that while there have been some improvements (e.g. Increase the percentage of observer coverage over the years), the Assessment Team is not confident to score **SG 100 for neither UoAs** until the installation of the video cameras is carried out and other uncertainties are taken into consideration as the cryptic mortality for seabirds. | | |
| **B** | Information adequacy for management strategy | | | |
| | **Guidepost** | Information is adequate to support **measures** to manage the impacts on ETP species. | Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species. | Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives. |
| | **Met?** | Y | Y | N |
| | **Justification** | **Information is adequate to measure trends and support a strategy to manage impacts on ETP species**.<br><br>The Monitoring Program of the Discard Reduction Plan (*Programa de Monitoreo y Seguimiento del Plan de Reducción del Descarte,* PMSPRD) of the basic or permanent research program shall establish and monitor (for scientific purposes only) indicators to evaluate the effectiveness of the measures in this program. Likewise, it must monitor the levels of incidental catch, the use of mitigation strategies or devices, compliance with good fishing practices, among others measures under the reduction plan. In the program is considered the collection of data over the years to monitor if new measures are working.<br><br>Data gathered will be used to evaluate if the measures that define the strategy are achieving the objectives proposed in the program. There has been a major effort in reducing bycatch and incidental catches that are reported by the fleets. Currently, the coverture of the program is more than 90% in all the fleets and the goals of the program is to maintain similar high coverage levels in order to analyse the effectiveness of these implemented measures with a high accuracy.<br><br>The program also has alternative measures ready to be implemented in the case that the results are not positive as expected. Further, the enforcement system will ensure that the normative, D.S. N° 76 del 2015 and D.S. N° 193 del 2013 regarding the video cameras monitoring and on board observers, are being fulfilled.<br><br>Since December 2017 by resolution all the measures to reduce mortality and get information of the impact on ETPs species are legally enforce, therefore adequacy will be also assessed under this resolution of compliance.<br><br>For the time being, it's also showed in the technical reports (Céspedes et al 2018 and Bernal et al 2018; 2019) that trends are being positive for the species that have interactions with the fishery and therefore the measures defined in the management of the fishery are capable to reduce the impacts on ETPs. | | |

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| | | Therefore, the fishery under assessment is in compliance with the requirements to meet SG 80. As it is stated in the FCR v2.0 GSA 3.6.3 at SG 80 information adequacy required the estimation of the impact of the UoA on the outcome of the species as it is set up in the 2.3.1. Some quantitative information is required as showed in the table GSA5 of FCR v2.0 if the fishery has at least one source of information from the higher level of verifiability and lower bias or two or more of higher bias but the species under assessment are not below limits, therefore the fishery could meet SG 80.<br><br>The fishery under assessment has different sources of quantitative information as detailed in this section and summarized below:<br>- **From higher level of verifiability and lower bias:** Observers program with a high coverage; Electronic monitoring system (VMS) and research program are available.<br>- **From lower level of verifiability and higher bias:** standardized logbooks (IEO and CIAMT), self-reporting data.<br><br>Therefore, Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species and **SG 80 is met for both UoAs.** However, new measures are still being implemented and available information on cryptic mortality results from extrapolation thus high degree of uncertainty, preventing UoAs from meeting SG 100. |
| **References** | | Informe Técnico IT N° 03/2016 "Asesoría Administración Pesquería de Raya volantín y Raya espinosa, Año 2017.<br>Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. Informe Final. Convenio de desempeno 2016 Programa de Investigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesqueras Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.<br>Céspedes et al. 2017. Informe técnico final Seguimiento de las Pesquerías Demersales y Aguas Profundas Sección III: Pesquería Demersal Sur Austral Artesanal, 2016. IFOP<br>Gálvez, M., Pérez C. & F. Espíndola. 2016. Estatus y posibilidades de explotación biológicamente sustentables de los principales recursos pesqueros nacionales, 2017: Raya volantin. Informe 1 de estatus. Octubre 2016. Instituto de Fomento Pesquero (IFOP). Convenio de desempeño 2016. Subsecretaria de Economía y EMT. 120pp más anexos.<br>https://www.cms.int/sites/default/files/basic_page_documents/cms_cop12_ap%C3%A9ndices_s.pdf<br>Comisión Permanente del Pacífico Sur (CPPS). Secretaría ejecutiva del Plan de Acción del Pacífico Sudeste. Plan de Acción para la Protección del Medio Marino y Áreas Costeras del Pacífico Sudeste. 2004.<br>Ministerio de Economía, Diciembre de 2016. Prórroga de la veda extractiva para el recurso del Lobo marino común.<br>Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE). FIP 2006-30. |

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| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **80** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.4.1 – UoA 1 Industrial trawl: Habitats outcome

<table>
<tr><td colspan="2">PI 2.4.1</td><td colspan="3">The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td>a</td><td colspan="4">Commonly encountered habitat status</td></tr>
<tr><td></td><td>Guidepost</td><td>The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.</td><td>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.</td><td>There is evidence 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.</td></tr>
<tr><td></td><td>Met?</td><td>Scoring element 1- Y<br>Scoring element 2- Y</td><td>Scoring element 1- Y<br>Scoring element 2- Y</td><td>Scoring element 1-N<br>Scoring element 2- N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">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.<br><br><u>Scoring element 1– Bottom trawl</u><br>Based on the requirements of MSC SA3.13.2 the categorization of benthic habitats following three aspects ( habitat type, geomorphology and biota) is as follows:<br><br>Two main bottom surface are impacted by bottom trawl gear types:<br>1. Sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br>2. Muddy-sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br><br>Therefore, the most encountered habitats are the bottom surfaces as described above. The areas where the fishing activities are taken place are well known and defined, the footprint is well described, and no new areas are allowed to be trawled.<br><br>Ever since 2013, when the new law was revised, different modifications have been done over the years to regulate the bottom trawl fisheries. For example, Chile closed 117 seamounts to fishing activities and established in 2015 the biggest marine park in the Pacific Ocean.<br><br>Since 2016, Oceana Chile has been working close with IFOP and Subpesca to control and manage the impact of bottom trawl fisheries on the habitat. During 2016 Oceana launched a proposal to freeze the trawling footprint. From 2017 the Government approved a modification in the law where 98% of the seabed is not allowed to be trawled. Furthermore, trawling activities are completely forbidden in marine protected areas and inside waters and also the fishing grounds locations for trawling have to be in the exact same areas where the fishing activities have done in the last 16 years. According to Oceana, the total surface estimated to be affected by trawling was around 3000 km. With the new regulations, no extension of the footprint can be done. In other words, this means that no new fishing grounds or new areas can be trawled.<br><br>The areas where the bottom trawl fishery operates are muddy and sandy areas with low index of biodiversity as it was shown by Oceana in 2016. These areas were impacted many years ago and currently the biodiversity is low.<br><br>Further, during the last year Chile has participated in meetings and workshops focusing on designation of MPAs. Chile as part of the South Pacific Regional Fisheries Management Organisation- has collaborated and hosted different meetings aimed at collaborating among countries to protect VMEs and also to set up measures and regulations to preserve the habitats from fishing activities impacts.</td></tr>
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| PI 2.4.1 | | **The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.** | | |
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| | | Therefore, the footprint of the fishery is well known and the fisheries activities are operating in the same exact fishing ground locations that have been used more than 15 years ago. Therefore, 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 **and SG 80 is met**. However because most of the studies about trawling impacts are done using the data from crustacean fisheries and common hake and not on the fisheries in assessment, the team is not confident to reach SG 100.<br><br>Scoring element 2- Midwater trawl<br>**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**.<br><br>The habitat encountered by the midwater trawl is the water column and no contact with benthic habitats is taken place when the fishing activities are conducted with midwater trawl. Thus, just one main habitat is affected: water column.<br><br>Hence, the assessment team has classified water column as main habitat and the possible bottom surface present as minor. The fishing grounds are described detailed below.<br><br>The fishing grounds are well defined and enclosed in the same exact locations where fishing has been operating over the years. New areas for fisheries expansion are closed under legislation and from 2018 the footprint for any type of trawling has been frozen.<br><br>Therefore, the main habitat encountered by the gear is the water column and it is known that there is no impact on the habitats with this gear type. The possible effect that the midwater trawl can have is the removal of key species for the ecosystem needs.<br><br>Another impact that the gear can have in these ecosystems is the possibility to ghost fishing (i.e. gear lost that continues to fish). However, in the new regulation there are measures to improve the technological features of the fishing gears by increasing the selectivity and also decrease the possibility of losing or leaving them.<br><br>Therefore, 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 and **SG 80 is met.** However, due that most of the mapping efforts on the seabed have been focused on inside waters, there is scarce data on habitat distributions in offshore waters where industrial fishery occurs. Given the above, the team concludes **that SG 100 is not met**. | | |
| **b** | VME habitat status | | | |
| | **Guidepost** | The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. | 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. | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **There is evidence 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**.<br>Scoring elements 1 and 2<br>Chile is one of the countries with more extension of marine protected areas and with a higher number of seamounts protected against fishing activities. 117 seamounts were closed in 2015. | | |

<table>
<tr><th colspan="2">PI 2.4.1</th><th colspan="3">The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</th></tr>
<tr><td></td><td></td><td colspan="3">Further, Chile as part of SPRFMO along with New Zealand and Australia have agreed to work together intersessional in an ad hoc working party to recommend revisions to CMM 4.03 presented in the fourth Scientific Committee. The Work plan calls for the Scientific Committee to develop a scientifically robust spatial management approach for bottom fisheries in order to appropriately protect VMEs while enabling viable fisheries to operate therefore SG 80 is met.<br><br>Further, from 2017, the Government approved a modification in the law where 98% of the seabed is not allowed to be trawled. In addition, trawling activities are completely forbidden in marine protected areas and inside waters and also the fishing grounds for trawling have to be in the same areas where the fishing trawl activities occurred for the last 16 years. Total surface affected by fishing activities in Chile has been estimated and it was agreed that no extension of the footprint can be done. In other words, no new fishing grounds or new areas can be trawled. VMEs are completely well located and protected therefore there is evidence 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 and SG 100 is met.</td></tr>
<tr><td>c</td><td colspan="4">Minor habitat status</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td></td><td>There is evidence 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.</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>Scoring element 1-Y<br>Scoring element 2-Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3"><u>Scoring element bottom trawl</u><br><br>There is evidence 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.<br><br>As for main habits based on the requirements of MSC SA3.13.2 the categorization of benthic habitats following three aspects, habitat type, geomorphology and biota is as follows:<br><br>Two minor bottom surfaces are impacted by bottom trawl gear types and they are considered minor habitats for the scoring element 1:<br>1. Mud simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br>2. Gravel simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br>Following the recent publication by Amoroso et al., (2018), the trawled surface with different composition as detailed in main habitats correspond with less than 0.1% of trawling activities and therefore are considered minor habitats impacted.<br><br>The fishing activities are always carried out in the same areas. The footprint of the bottom trawl is well known and fishing grounds are located in the same areas where the fisheries occur for over 15 years. The composition of the seafloor is known and minor habitats can be defined as sediments less encountered by the gear type. Amoroso et al., (2018) have described that the seafloor more affected by trawling in Southern Austral Chile are sand and muddy-sand. Gravel and mud are less than 0.2% trawled. Therefore, due to the frequency and percentage of activities occurring in minor habitats, the team is confident that there is evidence 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 and SG 100 is met.</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.4.1</td><td colspan="3">The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</td></tr>
<tr><td></td><td></td><td colspan="3"><u>Scoring element midwater trawl</u><br>There is evidence 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.<br><br>However, the water column does not impact the bottom surface as minor habitats the assessment team has evaluated the possible bottom surface of fishing grounds where the fishing operations take place. Therefore, following the MSC requirements of MSC A3.13.2 the categorization of habitats following three aspects, habitat type, geomorphology and biota is as follows and two minor habitats have been identified:<br><br>1. Sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br>2. Muddy-sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br><br>Minor areas are described in this gear types as the possible bottom surface where the bottom trawl is operating and midwater operations occurs also. Therefore, it could be considered that sand and muddy-sand surfaces are minor habitats for midwater trawl. However, as described in the logbooks, the bottom is not touched by the gear type when midwater trawling is occurring. The target species are not distributed in the bottom surface and the fishing operations are monitored to not to contact the surface by means of net sensor among other technologies.<br><br>The fishing activities are always carried out in the same areas and fishing grounds and the captains have expertise in the operation procedures. The footprint of the bottom trawl is well known and is documented every year where the effort was done. In the background section the maps for every fleet show that the activities are highly located and no minor areas have been encountered by the gear midwater trawl.<br><br>Therefore, there is evidence 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 and SG 100 is met.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Propuesta para la eliminación progresiva de la Pesca de Arrastre en Chile. Oceana Chile. November 2016.<br>Subpesca- http://www.subpesca.cl/portal/617/w3-article-99167.html<br>Amoroso et al. 2018. Bottom trawl fishing footprints on the world's continental shelves. NAS October 23, 2018 115 (43) E10275-E10282; published ahead of print October 8, 2018 https://doi.org/10.1073/pnas.1802379115<br>Dr. Jaime Rovira & MSc. Jorge Herreros. Clasificación de ecosistemas marinos chilenos de la zona económica exclusiva Departamento de Panificación y Políticas en Biodiversidad División de Recursos Naturales y Biodiversidad Ministerio del Medio Ambiente, 2016.<br>Petit et al. 2018. Revista Chilena de Historia Natural (2018) 91:1 DOI 10.1186/s40693-018-0071-z.</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):</td><td>95</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):</td><td>95</td></tr>
<tr><td colspan="4">CONDITION NUMBER (if relevant):</td><td>NA</td></tr>
</table>

## PI 2.4.1 – UoA 2 longline: Habitats outcome

<table>
<tr><td colspan="2">PI 2.4.1</td><td colspan="3">The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td>a</td><td colspan="4">Commonly encountered habitat status</td></tr>
</table>

| PI 2.4.1 | | The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates. | | |
|---|---|---|---|---|
| | **Guidepost** | The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. | 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. | There is **evidence** 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** | **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.**<br><br>Longline stringing out baited hooks on enormous lengths of line to catch large fish and other marine creatures.<br>The habitat encountered by longline is the water column and minimal or negligible contact with benthic habitats or bottom surface is taken place when the fishing activities are occurring with this gear type.<br><br>However, longline can get rocky or scarpy surfaces where other gear types do not reach, the fishing grounds are defined in the same areas as for UoA1, hence as main habitat encountered the assessment team has classified water column and as minor the possible bottom surface present where the fishing grounds are described.<br><br>Although it can be a selective gear type, the habitat impacted are not the bigger problem, the issue is the bycatch of marine mammals and seabirds.<br><br>Therefore, main habitats, among the column water can be potential habitats for these species. However, Chile has regulated the areas where seabirds and marine mammals have their bigger distribution. Areas closures to protect these species are defined by the legislation.<br><br>The most obvious ecological effect of longline fishing is that individuals of the targeted species are caught and processed. Commonly harvested fish in longline industries include tuna and billfishes, such as marlin and swordfish. These species are top-level predators that play key roles in the marine ecosystem, so their fisheries must be carefully regulated to prevent overfishing. However this is not the case for this longline fishery as it doesn't catch those large pelagic predator species. However, the Austral hake is considered as a high predator in the Chilean marine ecosystems.<br><br>The bycatch is the biggest problem although longline fishermen often try to reduce bycatch by using specialized hooks and attempt to return ensnared endangered animals to the water. Iin the new discard program there are new measures implemented to reduce these negative effects indirectly contributing to protect and reduce the impact in habitats.<br><br>Therefore, 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 and **SG 80 is met.**<br><br>Minor habitats categorized as bottom surface don't have enough local information for the team to evaluate . Thus, the assessment team is not confident with the information coming from longline fishery in regards the likelihood to impact these habitats. Since there is no strong evidence that the minor habitats are not impacted as more information is needed and therefore, **SG 100 is not met**. | | |
| **b** | VME habitat status | | | |

<table>
<tr><td colspan="2">PI 2.4.1</td><td colspan="3">The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.</td></tr>
<tr><td></td><td>Guidepost</td><td>The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.</td><td>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.</td><td>There is evidence 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.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is evidence 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.<br><br>Chile is one of the countries with more extension of marine protected areas and with a higher number of seamounts protected against fishing activities. 117 seamounts were closed in 2015. Further, Chile as part of SPRFMO along with New Zealand and Australia have agreed to work together intersessional in an ad hoc working party to recommend revisions to CMM 4.03 presented in the fourth Scientific Committee. The Work plan calls for the Scientific Committee to develop a scientifically robust spatial management approach for bottom fisheries in order to appropriately protect VMEs while enabling viable fisheries to operate therefore SG 80 is met.<br><br>Further from 2017 the Government approved a modification in the law where 98% of the seabed is not allowed to be trawled. Trawling activities are completely forbidden in marine protected areas and inside waters and also the trawling operations must have to be in the same exact areas where it has been done for the last 16 years. There have been estimations of the total surface affected by fishing activities. These studies were followed by government efforts to stop the expansion of the trawl fishery to new areas. Thus the trawl foot print was frozen. In other words, no new fishing grounds or new areas can be trawled. VMEs status have been evaluated and it was found that they are completely well located and protected from fisheries activities. Therefore, there is evidence 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 and SG 100 is met.</td></tr>
<tr><td>c</td><td colspan="4">Minor habitat status</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td></td><td>There is evidence 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.</td></tr>
<tr><td></td><td>Met?</td><td></td><td></td><td>Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is evidence 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.<br><br>The assessment team has evaluated as minor habitats the bottom surface of the fishing grounds where the fishery takes place. They are the same as for UoA 1 trawl and they are described as minor because these are the habitats that the longline can impact by faulty operation or losing the gear, therefore the benthic characteristic of the habitats which could be classified as minor habitats following the MSC requirements are:<br>1. Sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br>2. Muddy-sand simple surface structure with no apparent epifauna, infauna, or flora and geomorphological unrippled/flat.<br><br>As described in the logbooks the bottom is not touched by the gear type when operating. The fishing activities are always carried out in the same areas and fishing grounds and captains have</td></tr>
</table>

| PI 2.4.1 | | **The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates.** |
|---|---|---|
| | | expertise in the operation procedures. In the background section the maps for every fleet show that the activities are specifically located and the possibility to impact minor areas is low.<br><br>Therefore, there is evidence 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 and **SG 100 is met.** |
| **References** | | Propuesta para la eliminación progresiva de la Pesca de Arrastre en Chile. Oceana Chile. November 2016.<br>Subpesca- http://www.subpesca.cl/portal/617/w3-article-99167.html<br>Amoroso *et al*. 2018. Bottom trawl fishing footprints on the world's continental shelves**.** NAS October 23, 2018 115 (43) E10275-E10282; published ahead of print October 8, 2018 https://doi.org/10.1073/pnas.1802379115<br>Dr. Jaime Rovira & MSc. Jorge Herreros. Clasificación de ecosistemas marinos chilenos de la zona económica exclusiva Departamento de Panificación y Políticas en Biodiversidad División de Recursos Naturales y Biodiversidad Ministerio del Medio Ambiente, 2016. |

| | |
|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | **95** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **95** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.4.2 – Habitats management strategy (All UoAs)

<table>
<tr><td colspan="2">PI 2.4.2</td><td colspan="3">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.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Management strategy in place</td></tr>
<tr><td>Guidepost</td><td>There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.</td><td>There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.</td><td>There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.<br><br>In Chile, the different marine areas are defined following social, economic and environmental factors and are managed by SUBPESCA and SERNAPESCA and depending on their characteristics the management is different.<br><br>Marine Protected Areas (MPAs) are established following different criteria and are regulated by the general law and also by specific committees and management plans. They are delimited and geographically defined areas whose administration and regulation allow to reach specific objectives of conservation. They are classified as four types: marine parks and marine reserves, which are essentially aquatic; and sanctuaries of nature and protected marine and coastal areas of multiple uses, which may contain portions of land. All MPAs are decreed by the Ministry of the Environment, but in the case of the first two, the Secretariat of Fisheries and Aquaculture is responsible for providing the background information for its destination, with the guidance being left to the National Fisheries and Aquaculture Service.<br><br>These areas are declared for the conservation and sustainable management of marine biodiversity, for which administrative and regulatory measures are established for access to fishing activities and others to prevent negative impacts on this biodiversity and the ecosystem, in accordance with the General corresponding Administration Plan and the general framework established in the general law (LGPA).<br><br>Marine parks are specific and delimited marine areas destined to preserve ecological units of interest for science and to protect areas that ensure the maintenance and diversity of hydrobiological species, as well as those associated with their habitat. In them, any kind of activity can be carried out, except those that are authorized for purposes of observation, research or study.<br><br>The marine reserves correspond to protected areas of the hydrobiological resources in order to protect breeding areas, fishing grounds and areas of repopulation by management. Extractive activities can only be carried out for transitory periods, after a well-founded resolution of the Secretariat of Fisheries and Aquaculture.<br><br>All areas cited above, are decreed by the Ministry of the Environment, but in the case of the first two, the Secretariat of Fisheries and Aquaculture is responsible for providing the background information for its destination, with the guidance being left to the National Fisheries and Aquaculture Service.<br><br>These areas are declared for the conservation and sustainable management of marine biodiversity, for which administrative and regulatory measures are established for access to fishing activities and others to prevent negative impacts on this biodiversity and the ecosystem, in accordance with the General corresponding Administration Plan and the general framework established in the general law (LGPA).</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.4.2</td><td colspan="3">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.</td></tr>
<tr><td></td><td></td><td colspan="3">In 2013, amendments to the Fisheries Law were adopted. One of the objectives focuses on the management of impacts to fish resulting from habitats degradation or loss. Through these amendments the objectives are to provide consistent guidance through regulations, standards and directives, and to make regulatory decisions in a timely manner. In this way, proponents will have the necessary information and direction to avoid, mitigate and offset harmful impacts to fish and fish habitat so that they will meet the goal of this policy, and thereby comply with the fisheries protection provisions of the law. Since that, SERNAPESCA have implemented policies for managing the impact these areas, access regime that assigns exclusive exploitation rights to organizations of artisanal fishermen or limited fishing activities, through a management and exploitation plan based on the conservation of the ecosystem resources present in previously delimited geographic sectors. The purpose of this policy is to help SERNAPESCA and SUBPESCA manage fisheries to mitigate impacts of fishing on sensitive habitats, avoid impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat, communities and species conservation.<br><br>Therefore, there is a partial strategy in place, if necessary that is expected to achieve the Habitat Outcome 80 level of performance or above and SG 80 is met for both UoAs.<br><br>Some of the information on habitats comes from recent research projects published in 2018 therefore, the assessment team concludes that more information is needed to develop a comprehensive strategy achieving all the impacts on habitats and therefore there is not a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats and SG 100 is not met for both UoAs.</td></tr>
<tr><td>b</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).</td><td>There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.</td><td>Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved.<br><br>The last studies published by PNAS has shown that the areas where fishing activities take places in Chile are one of the less trawled in the world with only 0.4 of trawled surface. Similar for trawling, other fishing grounds are defined for other gear types such as longline. The measures to control and monitor the areas where activities take place are well defined in the LGPA and also in the new discard program.<br><br>The use of VMS ,which makes it easy the monitoring and surveillance of the activities, is regulated by the law. Starting in 2018 the video camera system will also be monitoring the fleet activity and it would allow to document if any sensible organism is caught by the fleet and also will evaluate impacts of fisheries operations on VMS by documenting if any sensible area is affected by fisheries. Therefore ,there is some objective basis for confidence that the measures/partial strategy will work, based on information directly about the UoA and/or habitats involved and SG 80 is met for both UoAs.<br><br>However as some of the objectives or measures have been implemented during 2018, the assessment team is not confident to reach SG 100.</td></tr>
<tr><td>c</td><td colspan="4">Management strategy implementation</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>There is some quantitative evidence that the</td><td>There is clear quantitative evidence that the partial</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.4.2</td><td colspan="3">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.</td></tr>
<tr><td></td><td></td><td></td><td>measures/partial strategy is being implemented successfully.</td><td>strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some quantitative evidence that the measures/partial strategy is being implemented successfully.<br><br>There has been progress within the implementation of EBSA/protected areas. Habitat conservation measures already in place include two types of year-round closures: the habitat closure areas and groundfish closures. The habitat closure areas restrict mobile bottom-tending gears. The groundfish closures restrict all gears capable of catching groundfish. In addition, seasonal area closures are used to protect spawning habitat.<br><br>At the end of 2012, the Chilean Senate passed new fisheries regulations, the “Fisheries Act.” The main goal of the legislation is to reform Chile’s fishing industry to promote sustainable fisheries. In passing this legislation, Chile became the first country in the world to prohibit bottom trawling in areas with seamounts. The law protects 117 of Chile’s seamounts from this destructive fishing practice. There are currently 19 seamounts on the X-XII regions.<br><br>Mapping of the footprint for the three gear types under evaluation have been consulted and the distribution of fishing grounds is currently well known. Finally, in terms of trawling activities, a prohibition of extension has been approved in 2017.<br><br>Sernapesca through the VMS is in charge to enforce any non-conformity of the regulations. Therefore, there is some quantitative evidence that the measures/partial strategy is being implemented successfully and SG 80 is met for both UoAs. Due that some of the objectives have been defined in the last review of the discard program, more data are still needed to score at SG100 with clear quantitative information. Further, some quantitative information have been gained but is not completely available to all the public or is not merged to the other sources in order to have a compressive evaluation of the habitat’s management and information. Therefore SG 100 is not met.</td></tr>
<tr><td>d</td><td colspan="4">Compliance with management requirements and other MSC UoAs’/non-MSC fisheries’ measures to protect VMEs</td></tr>
<tr><td></td><td>Guidepost</td><td>There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.</td><td>There is some quantitative evidence 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.</td><td>There is clear quantitative evidence 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.</td></tr>
<tr><td></td><td>Met?</td><td>Not scored</td><td>Not scored</td><td>Not scored</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Following the FCR v2.0, GSA3.14.3 states as there is no impact on VMEs by the UoAs, other MSC UoAs or non-MSC due to the fishing activities are not allowed in VMEs and they are close to any activity by regulations, scoring issue d is not scored.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Propuesta para la eliminación progresiva de la Pesca de Arrastre en Chile. Oceana Chile. November 2016.<br>Subpesca- http://www.subpesca.cl/portal/617/w3-article-99167.html<br>Amoroso et al., 2018. Bottom trawl fishing footprints on the world’s continental shelves. PNAS October 23, 2018 115 (43) E10275-E10282; published ahead of print October 8, 2018 https://doi.org/10.1073/pnas.1802379115.</td></tr>
</table>

| 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. | |
|---|---|---|
| | Dr. Jaime Rovira & MSc. Jorge Herreros. Clasificación de ecosistemas marinos chilenos de la zona económica exclusiva Departamento de Panificación y Políticas en Biodiversidad División de Recursos Naturales y Biodiversidad Ministerio del Medio Ambiente, 2016. | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | **80** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

## PI 2.4.3 – Habitats information

<table>
<tr><td colspan="2">PI 2.4.3</td><td colspan="3">Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="3">a</td><td colspan="4">Information quality</td></tr>
<tr><td>Guidepost</td><td>The types and distribution of the main habitats are broadly understood.<br><br>OR<br><br>If CSA is used to score PI 2.4.1 for the UoA:<br><br>Qualitative information is adequate to estimate the types and distribution of the main habitats.</td><td>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.<br><br>OR<br><br>If CSA is used to score PI 2.4.1 for the UoA:<br><br>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats.</td><td>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">The types and distribution of the main habitats are broadly understood.<br><br>There have been studies in place to improve the knowledge of impacts in habitats. Also in the logbook is mandatory to collect some information about the bottom condition and the water column characteristics, these data are used by IFOP to develop research program and to define the advice given to Subpesca by the committees.<br><br>Also, the footprint is well known, mapping of fishing grounds are available and SUBPESCA manage this data to set up the measures in place for the fisheries. Further, the mapping of the fishing areas are used by Sernapesca with the VMS data to evaluate if any non-conformances are happened.<br><br>As mentioned above all the protected areas, seamounts or vulnerable ecosystems are protected and regulated by legislation and close to fishing activities.<br><br>A study recently published by Amoroso et al., (2018) which evaluated the bottom surface characteristics in Chile, where fishing activities take place, found that the percentage of bottom surface affected by trawl to be less than in most of the countries where trawling occurs. The study also states that the composition of the bottom surface is basically mud and sand and no vulnerable areas are affected.<br><br>Furthermore, in 2016, Oceana did a study on potential risks of fishing activities on bottom surface around the Chile region. The fishing grounds where considered areas where activities have been developed for more than 10 years, therefore it enables to define the condition and characteristics of the areas.<br>This study recommended a freezing of all bottom trawling activities and no extension of fishing grounds allowed. Government agencies in response to the study, acted and declared a freezing of the trawl footprint and with no expansion of new fishing grounds.<br><br>Therefore, 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 and SG 80 is met for both UoAs.</td></tr>
</table>

| PI 2.4.3 | | Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat. | | |
|---|---|---|---|---|
| | | However, regarding the distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats, the assessment team is not confident that the fishery can score SG 100 as more effort is needed to combine all the information available and make easier the understanding of the habitat's distribution in Chilean fishing grounds. | | |
| **b** | Information adequacy for assessment of impacts | | | |
| | **Guidepost** | 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.<br><br>OR<br><br>**If CSA is used to score PI 2.4.1 for the UoA:**<br><br>Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats. | 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.<br><br>OR<br><br>**If CSA is used to score PI 2.4.1 for the UoA:**<br><br>Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats. | The physical impacts of the gear on all habitats have been quantified fully. |
| | **Met?** | Y | Y | N |
| | **Justification** | **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.**<br><br>As mention above in guidepost a, the distribution of fishing grounds and the footprint are well known. The fishing activities are controlled by Subpesca and any activity outside the areas is monitored by Sernapesca and it can be penalized. The VMS reports the location constantly and any vessel can be monitored during the fishing activities. Therefore, 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, therefore **SG 80 is met for both UoAs.**<br><br>However, more efforts should be done to link relevant data (e.g. bottom surface data) that the IFOP logbooks collects with fishing effort maps that Subpesca develops in order to have a better knowledge of the habitat's distribution. Furthermore, the information should also be more accessible and available to all stakeholders to allow a better analysis and understanding of the distribution, linkages and importance of habitat., Therefore, IFOP and Subpesca should work more closely to improve the information about habitats impacted. For that reason the team is not confident to score SG 100. | | |
| **c** | Monitoring | | | |
| | **Guidepost** | | Adequate information continues to be collected to detect any increase in risk to the main habitats. | Changes in habitat distributions over time are measured. |
| | **Met?** | | Y | N |
| | **Justification** | **Adequate information continues to be collected to detect any increase in risk to the main habitats.** | | |

| PI 2.4.3 | | Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat. | |
|---|---|---|---|
| | | The information collected by VMS system is used to know the position and distribution of the fishing activity footprint of all fleets. Further, there is regulation that requires the use of the video cameras that will allow to collect information about the discard and also the presence of any vulnerable organism during fisheries activities and can be protected through the use of move on rules. This technology can be used for marine protected areas designation.<br>Therefore Adequate information continues to be collected to detect any increase in risk to the main habitats and **SG 80 is met for both UoAs.**<br><br>To score at SG 100 more effort should be done to link all the information available and make easier the understanding of the habitats. | |
| **References** | | Propuesta para la eliminación progresiva de la Pesca de Arrastre en Chile. Oceana Chile. November 2016.<br>Subpesca- http://www.subpesca.cl/portal/617/w3-article-99167.html<br>Amoroso *et al.,* 2018. Bottom trawl fishing footprints on the world's continental shelves**.** NAS October 23, 2018 115 (43) E10275-E10282; published ahead of print October 8, 2018 https://doi.org/10.1073/pnas.1802379115<br>Dr. Jaime Rovira & MSc. Jorge Herreros. Clasificación de ecosistemas marinos chilenos de la zona económica exclusiva Departamento de Panificación y Políticas en Biodiversidad División de Recursos Naturales y Biodiversidad Ministerio del Medio Ambiente, 2016. | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | | | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | | **80** |
| **CONDITION NUMBER (if relevant):** | | | **NA** |

## PI 2.5.1 – Ecosystem outcome (All UoAs)

| PI 2.5.1 | | The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function. | | |
|---|---|---|---|---|
| **Scoring Issue** | | SG 60 | SG 80 | SG 100 |
| **a** | Ecosystem status | | | |
| | **Guidepost** | The UoA is **unlikely** 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 **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. |
| | **Met?** | Y | Y | N |
| | **Justification** | **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.**<br><br>There have been extensive ecosystem modelling efforts (Arancibia *et al.,* 2003; Neira *et al.,* 2004a; Neira*.,* 2004b; Jurado *et al.,* 2016; and Marmol-Rada, 2017) on this region.<br><br>These ecosystem models indicate that fishing has had a considerable impact, in the sense that production was reduced with the decline of predators. A very recent ecosystem model assessment conducted in 2017 showed short- and long-term impacts of the industrial fishery. The study showed a decrease in the trophic levels as well as other communities early on at the beginning of fisheries activities in the 70's resulting in a shift from mature to immature ecosystems with the fishery impact effort intensifying in the 2000's. That means that several indicators normally used in models to define the ecosystems status were in the lower levels. As reported by Jurado *et al.,*( 2016), the trophic level of some areas in Chile (Humboldt Southern) was around 2.76 showing that some marine ecosystems are being dominated by small pelagic species. The study also describe that ever since industrial fisheries activities started, it seems that the number of predators and species in the high level of the trophic chain has also decreased.<br><br>The new LGAP was launched in 2013 and it was in the revised LGPA that the ecosystem-based approach has been considered to manage the fisheries as well as other aspects such as trophic levels and ecosystems needs . Nevertheless, it would be hard to argue that the ecosystem has been damaged to the point of irreversible harm as more data series from recent years is needed to evaluate if with the application of the recently revised fishing law can reverse the effects done by not only the industrial fishery but also by the artisanal fishery.<br>Hence, the team has to confirm there have been changes to the Chile South Austral Ecosystem over the past 30 years. Some of the changes include:<br>- Major structural changes in the fish community – a number of groundfish species have declined<br>- Reductions in the average body size of groundfish, with unexpectedly low improvements in condition and growth;<br><br>There is vast knowledge of the major components of the South demersal fishery. Information is also available to show the negligible impact on retained, and ETP species. Information on discards, discard mortality, and their impact on important fisheries resources as well as impacts on major and vulnerable habitats have been evaluated with the new discard program. In 2018, new measures were implemented to reduce these impacts. All these new measures have been defined by the government following the science advice which are based on ecosystem approach management plans. Therefore, ever since the implementation of the ecosystem based approach and precautionary approach on the new regulations from the new revised fisheries law of 2013, these ecosystems are being managed with a long-term goal of sustainability. All measures in place are focused on managing for sustainability which requires consideration of biology, ecology, environment, economics, social aspects, and governance issues beyond simple stock dynamics. | | |

| PI 2.5.1 | The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function. |
|---|---|
| | Based on all the information available and based on the new approach in management from the new revised fisheries law of 2013, the assessment team can confirm 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 and **SG 80 is met for both UoAs.**<br><br>However, there is new measures implemented there is no enough results yet in the study area to evaluate at SG100. The assessment team believes that to confirm that 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 more studies with updated data are needed to be published. Therefore, **SG 100 is not met**. |
| **References** | Neira, S. 2008. Assessing the effects of internal (trophic structure) and external (fishing and environment) forcing factors on fisheries of central Chile: basis for an ecosystem approach to fisheries. Ph.D. Thesis, University of Cape Town, Cape Town, South Africa.<br>Neira, S. and H. Arancibia. 2004. Trophic interactions and community structure in the Central Chile marine ecosystem (33ºS-39ºS). Journal of Experimental Marine Biology and Ecology, 312: 349-366.<br>Neira, S., H. Arancibia and L. Cubillos. 2004. Comparative analysis of trophic structure of commercial fishery species off Central Chile in 1992 and 1998. Ecological Modelling, 172 (2-4): 233-248.<br>Arancibia, H. and S. Neira. 2005a. Long-term analysis of the trophic level of fisheries landings in Central Chile. Scientia Marina, 69(2): 295-300.<br>Mármol-Rada 2017. Análisis de interacciones tróficas e impacto de la pesca en el ecosistema marino de la zona sur-austral de Chile (42°28,6'S-57°00'S) entre 1980 y 2010. Disertación presentada para optar al grado de Magister en Ciencias con Mención en Pesquerías. Danetcy Patricia Mármol- Rada. Departamento de Oceanografía. Facultad de Ciencias Naturales y Oceanográficas. Universidad de Concepción. Chile 2017.<br>http://www.indiseas.org/ecosystems/humboldt-southern |

| | |
|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **80** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 2.5.2 – Ecosystem management strategy (all UoAs)

| 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** | Management strategy in place | | | |
| | **Guidepost** | There are **measures** in place, if necessary which take into account the **potential impacts** of the fishery on key elements of the ecosystem. | There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. | There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place. |
| | **Met?** | Y | Y | N |
| | **Justification** | **There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.**<br><br>Under the New LGPA, SUBPESCA is committed to the development of large-scale and local integrated management plans for all of Chile's oceans. This includes implementation of an Ecosystem Approach to management in all activities for which it has management responsibility. The governance, regulation and management of activities within and surrounding the X-XII regions are shared between a wide variety of government departments and agencies involved in, or with an interest in, the use and management of resources within its coastal, estuarine and marine environments. The process is involving all stakeholders as it has been shown in the report of 2017 and it was said during the site visit to the assessment team.<br><br>Chile has developed policies which build on existing fisheries management practices to form a foundation for implementing an ecosystem approach in the management of its fisheries to ensure continued health and productivity while protecting biodiversity and fisheries habitat. The primary goal of the amendments of the fisheries law is to ensure that Chile's fisheries are environmentally sustainable, while supporting economic prosperity and also reducing the non-target catches and any negative effect on ETPs population to result in a way to preserve the key structure of ecosystems. Further, it is designed to foster a more rigorous, consistent, and transparent approach to decision making across all key fisheries in Chile.<br><br>The policies under the new law include: (i) A Fishery Decision-Making Framework Incorporating the Precautionary Approach (PA Framework); (ii) Policy on bycatch; and (iii) Managing Impacts of Fishing on Sensitive Benthic Areas and Precautionary Approach Framework.<br><br>The Framework requires rebuilding plans to be established when a stock has reached depleted levels, a state of high risk. A new tool – Rebuilding Plan Guidelines – will help fisheries managers develop plans for growing stocks out of a depleted state.<br><br>**Policy on Bycatch**<br>The goals of the policy are to promote conservation and improve data of bycatch and discards while minimizing the risk that bycatch and discard species could be seriously or irreparably harmed by fishing activities.<br><br>**Managing Impacts of Fishing on Sensitive Benthic Areas**<br>SUBPESCA and IFOP are collaborating in developing Ecological Risk Analyses that assists in identifying and measuring the ecological risks and impacts of fishing on sensitive benthic areas. This tool and the policy on which it is based have been developed in recognition of the importance of | | |

<table>
<tr><td colspan="2">PI 2.5.2</td><td colspan="3">There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.</td></tr>
<tr><td></td><td></td><td colspan="3">sensitive benthic areas to overall aquatic ecosystem health. Its implementation will support healthy and productive oceans and better ensure fishing is conducted sustainably.<br>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems).<br>Given that the new law started to become effective on 2013, it is still early to tell if that the measures/ partial strategy will work based on some information directly about the UoA. However, similar measures have been used on other regions such as US Northeast and many species responded positively (increases in abundance, reduction in fishing mortality).<br><br>Therefore, there is a partial strategy in place, if necessary, which considers available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance and SG 80 is met for both UoAs.<br><br>The Assessment Team believes that more effort is needed to put all the information together as a plan . Most of the works are still in progress and need to be updated. Therefore, there is a strategy in place which contains measures to address all main impacts of the UoAs on the ecosystem, and at least some of these measures are in place, but they still need improvements to work as a plan and SG 100 is not met on neither UoAs.</td></tr>
<tr><td>b</td><td colspan="4">Management strategy evaluation</td></tr>
<tr><td></td><td>Guidepost</td><td>The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).</td><td>There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved</td><td>Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved.<br><br>The new Fisheries Act was implemented on 2013. Some of the components of the new fisheries Act include ecosystem based management approaches to be added on the fisheries regulations and conservation strategies and fisheries species management plans. Some of the ecosystem based management approaches implemented included new monitoring programs to evaluate the impacts of bycatch and incidental catches on marine resources. For example, the commercial fisheries discards and incidental catch study in the Southern Austral groundfish fisheries began in 2015 and collected data for 2 years. The first report was published on late 2017. The results of the study paved the way to develop a discard reduction program for many demersal fisheries. The report showed that some of the measures in place could work on promoting the conservation of key elements of the ecosystems by reducing the impacts of the fishery.<br><br>However, some measures have been implemented few years ago and more information is needed. Some measures are very similar to what have been used on other regions such as the US Northeast and many species such as Atlantic haddock and yellowtail flounder responded positively (i.e. increases in abundance, reduction fishing mortality). Therefore, there is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved and SG 80 is met for both UoAs.<br><br>As it has been mentioned previously, some of the measures have been implemented in recent years and some of them are still in developing, it is still early to know if Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoAs and/or ecosystem involved therefore, SG 100 is not met in neither UoAs.</td></tr>
<tr><td>c</td><td colspan="4">Management strategy implementation</td></tr>
</table>

<table>
<tr><td colspan="2">PI 2.5.2</td><td colspan="3">There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.</td></tr>
<tr><td rowspan="3"></td><td>Guidepost</td><td></td><td>There is some evidence that the measures/partial strategy is being implemented successfully.</td><td>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).</td></tr>
<tr><td>Met?</td><td></td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">There is some evidence that the measures/partial strategy is being implemented successfully.<br><br>At the end of 2012, the Chilean Senate passed new fisheries regulations, the “Fisheries Act15.” The main goal of the legislation is to reform Chile’s fishing industry to promote sustainable fisheries. Additionally, the fishing reforms required fishing quotas to be set based on scientific recommendations. Proponents of Chile’s new fishing reforms argued that aligning industry standards with science-based quotas to protect ecosystems may actually produce as much as 40% more fish to benefit the fishing industry. Under the new law, monitoring on-board Chilean fishing vessels have been improving and more data have been collected to know more about non-target species ad their relationship with the fishery that results in more data to apply to ecosystem models.<br><br>Ever since new measures have been implemented, vessels had on-board observers to collect information about catches and also Good practice code of conduct handbooks have been drafted to get more information about other relevant and vulnerable species that are caught on the fisheries . These efforts would help to understand how the Chilean ecosystems work. Therefore, there is some evidence that the measures/partial strategy is being implemented successfully and SG 80 is met for both UoAs.<br><br>However, most of the measures have been implemented recently, the assessment team is not confident to confirm that 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) and SG 100 is not met for both UoAs.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Protected areas in Chile: are we managing them? Ignacio J. Petit, Ana N. Campoy, Maria Jose Hevia, Carlos F. Gaymer and Francisco A. Squeo. Revista Chilena de Historia Natural. 201891:1 https://doi.org/10.1186/s40693-018-0071-z © The Author(s). 2018. Received: 10 October 2017. Accepted: 17 January 2018. Published: 30 January 2018.<br>Dr. Jaime Rovira & MSc. Jorge Herreros. Clasificación de ecosistemas marinos chilenos de la zona económica exclusiva Departamento de Panificación y Políticas en Biodiversidad División de Recursos Naturales y Biodiversidad Ministerio del Medio Ambiente, 2016.</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):</td><td>80</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):</td><td>80</td></tr>
<tr><td colspan="4">CONDITION NUMBER (if relevant):</td><td>NA</td></tr>
</table>

## PI 2.5.3 – Ecosystem information (All UoAs)

| | | | | |
|---|---|---|---|---|
| **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** | Information quality | | | |
| | **Guidepost** | Information is adequate to **identify** the key elements of the ecosystem. | Information is adequate to **broadly understand** the key elements of the ecosystem. | |
| | **Met?** | Y | Y | |
| | **Justification** | **Information is adequate to broadly understand the key elements of the ecosystem.**<br><br>Marine ecosystem dynamics of the South Austral region (X-XII) region have been well studied, specifically, groundfish population dynamics as well as predator prey relationships (Arancibia *et al.*, 2003, Neira *et al.,* 2004a ,Neira *et al.,* 2004b, Jurado *et al.,* 2016).<br><br>Furthermore, a new program to evaluate the bycatch and incidental catches in Southern Austral demersal fisheries was implemented in 2014 and between 2015 and 2016 data have been collected. The first report was posted on 2017 and new information regarding bycatch, habitats and ecosystems have been gathered. This data will be used to run models and with these results, SUBPESCA will set limits and new measures for the fleets based on scientific advices. In addition, a monitoring program will take place in upcoming years to improve the series of data and minimize any uncertainties that can be a risk in the interpretation of the data which is used to set up limits and regulations. Therefore, information is adequate to **broadly understand** the key elements of the ecosystem and **SG 80 is met for both UoAs.** | | |
| **b** | Investigation of UoA impacts | | | |
| | **Guidepost** | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail. | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**. | Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**. |
| | **Met?** | Y | Y | N |
| | **Justification** | **Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.**<br><br>Main impacts of fishing gear for species under assessment can be inferred from existing information, like target and non-target catch removals (through individual stock assessments, especially for key groundfish species), gear effects on habitat structure and any structural changes to key commercial and non-commercial fish populations.<br><br>With the new discard program more data have been available to implement new measures based on scientific results and advice. Currently, new measures to control the impacts on seabirds and other vulnerable species such as sharks, rays and marine mammals are in place.<br><br>In addition, the observer program is working to acquire more accurate data (i.e. training, workshops) as well as to collect as much as possible fisheries information on all fleets . It is expected the observer program will continue to monitor fisheries on an annual basis given that it is an important source of data for future management tools development. Therefore, main impacts of the UoAs on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail and **SG 80 is met for both UoAs**.<br><br>However, it is still soon to know if all the information collected will be fully evaluated as the program started in 2014 and more time is needed, therefore **SG 100 is not met for both UoAs.** | | |
| **c** | Understanding of component functions | | | |
| | **Guidepost** | | The main functions of the components (i.e., P1 target species, primary, secondary | The impacts of the UoA on P1 target species, primary, secondary and ETP species and |

| PI 2.5.3 | | There is adequate knowledge of the impacts of the UoA on the ecosystem. | | |
|---|---|---|---|---|
| | | | and ETP species and Habitats) in the ecosystem are **known**. | Habitats are identified and the main functions of these components in the ecosystem are **understood**. |
| | Met? | | Y | N |
| | Justification | **The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.**<br><br>There is vast information on the biology of main targeted species that make the South Austral demersal fishery on the X-XII regions. Trophic links and fisheries interactions with this ecosystem have been documented at several levels and are well known (Arancibia *et al.,* 2003, Neira *et al.,* 2004a Neira *et al.,* 2004b, and Jurado *et al.,* 2016) and continue to be monitored at IFOP. With the new discard monitoring program, more data will be available and with the more information acquired, more accurate measures and management strategies will be in place to regulate the impacts on ecosystems, therefore, the main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known and **SG 80 is met for both UoAs**.<br><br>However, the assessment team will need more data from the new program to evaluate if the functions and impacts are fully understood, therefore, **SG 100 is not met for both UoAs.** | | |
| **d** | Information relevance | | | |
| | Guidepost | | 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 **and elements** to allow the main consequences for the ecosystem to be inferred. |
| | Met? | | Y | N |
| | Justification | **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.**<br><br>Sufficient information is available on the impacts of the fishery on the target and non-target retained catch, and ETP species and allow the main consequences of the UoA on the ecosystem to be inferred.<br><br>However, the information on discards and incidental catches is recently added to the management systems and measures. Therefore, **SG 100 is not met** (for neither UoAs). Nevertheless, with a new program recently started on 2014 to document discards on the industrial fisheries, more information have been analysed . The results of this study which covers 2015 and 2016, have been used to develop a discard reduction plan for the Chile Austral hake which was recently implemented in 2018.<br><br>Therefore, 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 and **SG 80 is met for both UoAs.** | | |
| **e** | Monitoring | | | |
| | Guidepost | | Adequate data continue to be collected to detect any increase in risk level. | Information is adequate to support the development of strategies to manage ecosystem impacts. |
| | Met? | | Y | Y |
| | Justification | **Adequate data continue to be collected to detect any increase in risk level.**<br><br>Information is adequate to support the development of strategies to manage ecosystem impacts. | | |

| PI 2.5.3 | There is adequate knowledge of the impacts of the UoA on the ecosystem. | |
|---|---|---|
| | Following the rationale above as mentioned through the report, the information on discards and incidental catches is recently added to the management systems and measures, with the new program started on 2014 to document discards on the industrial fisheries more information have been analysed and a strategy has been set up based on this new information from 2015 and 2016 **(SG 60, 80 and 100 are met**).<br><br>Therefore, 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 and **SG 100 is met for both UoAs.** | |
| **References** | Informe Técnico IT N° 03/2016 "Asesoría Administración Pesquería de Raya volantín y Raya espinosa, Año 2017.<br>Fulton, E.A. Smith A.D.M., Smith D.C. and Johnson P. 2014. An Integrated Approach Is Needed for Ecosystem Based Fisheries Management: Insights from Ecosystem-level Management Strategy Evaluation. PLoS One.<br>Fulton, E.A. 2010. Approaches to end to end ecosystem models. Journal of Marine Systems 81:171-183.<br>Neira, S. 2008. Assessing the effects of internal (trophic structure) and external (fishing and environment) forcing factors on fisheries of central Chile: basis for an ecosystem approach to fisheries. Ph.D. Thesis, University of Cape Town, Cape Town, South Africa.<br>Neira, S. and H. Arancibia. 2004. Trophic interactions and community structure in the Central Chile marine ecosystem (33ºS-39ºS). Journal of Experimental Marine Biology and Ecology, 312: 349-366.<br>Neira, S., H. Arancibia and L. Cubillos. 2004. Comparative analysis of trophic structure of commercial fishery species off Central Chile in 1992 and 1998. Ecological Modelling, 172 (2-4): 233-248.<br>Arancibia, H. and S. Neira. 2005a. Long-term analysis of the trophic level of fisheries landings in Central Chile. Scientia Marina, 69(2): 295-300. | |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 1 (Trawls):** | | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | | **85** |
| **CONDITION NUMBER (if relevant):** | | **NA** |

### 9.1.1.3 Principle 3 – Effective Management – Evaluation Tables

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

<table>
<tr><td colspan="2">PI 3.1.1</td><td colspan="3">The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>• Is capable of delivering sustainability in the UoA(s); and<br>• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>• Incorporates an appropriate dispute resolution framework.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td>a</td><td colspan="4">Compatibility of laws or standards with effective management</td></tr>
<tr><td></td><td>Guidepost</td><td>There is an effective national legal system and a framework for cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2</td><td>There is an effective national legal system and organised and effective cooperation with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2.</td><td>There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.</td></tr>
<tr><td></td><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2.<br><br>There is a legal framework in the General Law of fisheries and aquaculture (LGPA) contained in Decree No. 430 of 1991 of the Ministry of Economy, amended in 2013 by Law No. 20.657, which establishes regulations allowing to achieve consistent results with Principles 1 and 2 of the MSC. On the other hand, Article No. 1C of the LGPA clearly establishes the considerations that the fishery management agencies must have at the moment of adopting conservation regulations to make them sustainable.<br><br>The management rules will apply to all the vessels that are involved in activities within areas of national jurisdiction.<br><br>The General Law of Fishery and Aquaculture (LGPA) establishes mandatory procedure and the cooperation between the parties involved in the management of the fisheries. For example: i) the scientific technical committees of each fishery will establish the definition of the biological reference points (PBR=puntos biologicos de referencia) and the range within which the catch quotas are set, (ii) Management committees are responsible for the Management Plan which aims to establish guidelines to take or maintain the fishery to the maximum sustainable yield. Participants of the fishery and members of the scientific technical committees are actively involved. , (iii) regulations taken by the fisheries management authorizes should be communicated to the corresponding National Fishery Council and the Scientific Technical Committee.<br><br>The General Law of Fishery and Aquaculture requires compliance of the standards and requirements set out in international agreements to which Chile is part of.<br><br>The main international agreements which Chile is a part of are: the United Nations Convention on the Law of the Sea - UNCLOS, joined by Chile in August 1997; and United Nations Fish Stocks Agreement- New York agreement, joined in June 2014.<br><br>Participates in the following regional fisheries organizations: Convention for the Conservation of Antarctic Marine Living Resources - CCAMLR, joined in July 1981; and the South Pacific Regional Fisheries Management Organization - SPRFMO, effective since August 2012.</td></tr>
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| PI 3.1.1 | | **The management system exists within an appropriate legal and/or customary framework which ensures that it:**<br>• **Is capable of delivering sustainability in the UoA(s); and**<br>• **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and**<br>• **Incorporates an appropriate dispute resolution framework.** | | |
| | | It is part of the following environmental forums with emphasis on aquatic biodiversity: Convention on Biological Diversity - CBD; Convention of Migratory Species - CMS; Convention on International Trade in Endangered Species of Wild Fauna and Flora - CITES; International Whaling Commission - IWC; Agreement on the Conservation of Albatrosses and Petrels - ACAP; Inter-American Convention for the Protection and Conservation of Sea Turtles - IAC; Memorandum of Understanding on the Conservation of Migratory Sharks - MOU<br><br>In addition, participates in the following international forums: Sustainable Fisheries Resolutions adopted by the United Nations General Assembly; Oceans and the Law of the Sea Resolutions adopted by the United Nations General Assembly; United Nations Conference on Sustainable Development; Committee on Fisheries (COFI) of the Food and Agriculture Organization (FAO); COFI Sub-Committee on fish trade of FAO; Agreement to Promote compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas – agreement compliance with FAO, Agreement on Port State Measures to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing of FAO, ratified the 2012.<br><br>Within the framework of the implementation of the Code of Conduct for Responsible Fisheries, FAO, Chile has produced three national action plans: National Action Plan to reduce the bycatch of birds in artisanal longline, National Action Plan for the conservation of sharks, and National Action Plan to prevent, deter and eliminate illegal unreported and unregulated fishing.<br><br>Participation in the Fishery Committee of the Organization for Economic Cooperation and Development - OECD; and the Permanent Commission for the South Pacific (Commission Permanente del Pacífico Sur - CPPS ); and in the Oceans and Fisheries Working Group of the Asia-Pacific Economic Cooperation – APEC.<br><br>Therefore, in the presence of an effective national legal system with binding procedures governing cooperation with other parts, to participate and respect major international agreements, which provides consistent management results with the Principles 1 and 2 of the MSC, **therefore complies with the SG 60, 80 SG and SG 100.** | | |
| **b** | Resolution of disputes | | | |
| | **Guidepost** | The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system. | The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** 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 **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.**<br><br>The General Law of Fishery and Aquaculture (LGPA) considers different aspects to minimize conflicts of interest that may occur between the users of the fisheries, such as: | | |

<table>
<tr><td colspan="2">PI 3.1.1</td><td colspan="3">The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>• Is capable of delivering sustainability in the UoA(s); and<br>• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>• Incorporates an appropriate dispute resolution framework.</td></tr>
<tr><td></td><td></td><td colspan="3">• Establishment of a strip of 5 miles from the coast and inland waters, for the exclusive use of artisanal fisheries, that is, for boats up to 18 meters in length. This is intended to minimize the interaction and possible conflicts between the industrial and artisanal sectors.<br>• Establishment of a strip of 1 nautical mile, to be used exclusive by artisanal fishers using vessels of an overall length of less than 12 meters. This is to minimize conflicts with artisanal fishermen who use different size vessels.<br>• Division of the main hydrobiological resources by law of catch quotas which are shared between the artisanal sector and the industrial sector.<br>• Include in the management plans the ability to adopted agreements that will allow to solve conflicts of interest that may arise.<br><br>On the other hand, options to solve conflicts that may arise between users and fisheries authority are:<br>• All administrative acts established by the fishery management authority, can be challenged in administrative headquarters of the Ministry of Economy, according to Law 19.880, Law of Administrative Procedures, through replenishment resources and hierarchical, and review resources, considered in the law.<br>• Also, at the administrative headquarters, administrative acts can be claimed at the Office of the Comptroller General.<br>• Also, the effects that may cause the administrative acts of the Fisheries Authority, can be claimed and a correction can be requested through court, using the Resources of Protection.<br>The decisions taken in any of the instances, are mandatory for the administrative authority and are of a public nature.<br><br>Evidence of this is presented by 2 evidences of resources for protection that were presented in the Chile Supreme Court of Justice for the next items:<br>Recurso de Protección en contra del Subsecretaría de Pesca por plan de reducción del descarte y captura de pesca de anchoveta y sardina.<br>http://www.diarioconstitucional.cl/noticias/accion-de-proteccion/2018/03/27/cs-confirmo-sentencia-que-rechazo-proteccion-contra-subsecretario-de-pesca-por-plan-de-reduccion-del-descarte-y-captura-de-pesca-de-sardina-y-anchoveta<br>Recurso de Protección en contra de la Subsecretaría de Pesca por disponer cuota exclusiva para PYMES en licitación pesquera.<br>http://www.diarioconstitucional.cl/noticias/accion-de-proteccion/2018/05/04/cs-confirmo-sentencia-que-rechazo-proteccion-contra-subsecretaria-de-pesca-y-acuicultura-por-disponer-cuota-exclusiva-para-pymes-en-una-licitacion-pesquera/<br><br>These settlement mechanisms are transparent and have proven to be effective for the settlement of disputes, whether between managed and between managed and the Administration, is therefore reached the SG 60, 80 SG and SG100.</td></tr>
<tr><td>c</td><td colspan="4">Respect for rights</td></tr>
<tr><td></td><td>Guidepost</td><td>The management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a</td><td>The management system has a mechanism to observe the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the</td><td>The management system has a mechanism to formally commit to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a</td></tr>
</table>

| PI 3.1.1 | | The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>• Is capable of delivering sustainability in the UoA(s); and<br>• Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>• Incorporates an appropriate dispute resolution framework. | | |
|---|---|---|---|---|
| | | manner consistent with the objectives of MSC Principles 1 and 2. | objectives of MSC Principles 1 and 2. | manner consistent with the objectives of MSC Principles 1 and 2. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **The management system has a mechanism to formally commit 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**.<br><br>The General Law of Fishery and Aquaculture (LGPA) clearly sets out the rights that each user has to exert harvesting fishing, depending on the regime of administration with which the fishery is managed, also formally and explicitly establish the obligations that they generate these rights and sanctions and grounds for revocation, either total or partial. The holder of a right has an administration of the authority that guarantees their right in legal form.<br><br>In the case of the transferable fishing licenses, used by the majority of national industrial fisheries, these are granted by means of a Resolution of the Undersecretary of Fishery, and according to the law has the following characteristics: the transferable fishing licenses Class A, are obtained by historic rights of the catches made during the three years prior to their application, are made by 20-year, renewable subject to compliance by the holder. Transferable fishing licenses Class B, are obtained by public auction of 15% of the Class A one-time loss, are awarded by auction fixed 20-year periods. All With the transferable fishing licenses, the industrial sector can catch a number of tons each year resulting from multiplying the coefficient indicated in resolution by the established quota for the industrial sector; they are fully transferable, divisible, communicable, and susceptible of any legal business. Transferable fishing license holders should register their vessels with the National Fishery Service Registry.<br><br>In the case of artisanal rights, both the vessels and the fishermen must be registered by region in the National Fishery Service Registry. Registration guarantees their rights in a permanent, transmissible, and transferable character.<br><br>Existing fishery legislation considers, according to Law 20.249, granting communities of aboriginals who request it, the delivery of an area called Aboriginals Marine Coastal Space, whose fundamental objective safeguard the customary use of such spaces, in order to maintain the traditions and the use of natural resources by the communities linked to the coastal zone. Aboriginals Marine Coastal Space, is bestowed to the community through a use agreement which has priority over other uses for the area. According to the Undersecretary of Fishery webpage, to date there have been granted 9 areas of Aboriginals Marine Coastal Space, of which 8 belong to Region X. There are 70 requests in different stages of processing.<br><br>Consistent with the foregoing, management system considered mechanisms to formally engage with the legal rights created for the different agents involved in harvesting activities, and recognizing aboriginals rights which depend on fishing as a means of life, consistent with the above, **it meets the SG60, SG 80 and SG 100 for both UoAs.** | | |
| **References** | | Ministerio de Economía, Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.<br>Subsecretaría de Pesca, Plan de acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/Chile). Diciembre de 2006. | | |

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| **PI 3.1.1** | **The management system exists within an appropriate legal and/or customary framework which ensures that it:**<br>• **Is capable of delivering sustainability in the UoA(s); and**<br>• **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and**<br>• **Incorporates an appropriate dispute resolution framework.** |
| | Ministerio de Economía, Decreto N° 136 de 2007. Aprueba el Plan de acción nacional para reducir la captura incidental de aves en pesquerías de palangre.<br>Ministerio de Economía, Decreto 267 de 2005, Aprueba el plan nacional para prevenir y desalentar y eliminar la pesca ilegal, no declarada, y no reglamentada.<br>Subsecretaría de Pesca, Dic 2006. Plan de acción nacional para la conservación de tiburones, 64 pp.<br>Ministerio de Economía, Decreto 198 de 2007, Aprueba el plan de acción nacional para la conservación de tiburones.<br>Ley 20.249, de 2008. Crea el espacion costero marino de los pueblos originarios.<br>Ley 19.880, Ley de Procedimiento Administrativo.<br>Ministerio de Economía, Decreto N° 635 de 1991 y sus modificaciones. Crea Registro nacional de pescadores artesanales.<br>Ministerio de Economía, Decreto N° 163 de 2013. Aprueba reglamento del registro público de licencias transables de pesca, LTP. |

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| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **100** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **100** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 3.1.2 – Consultation, roles and responsibilities

| PI 3.1.2 | | **The management system has effective consultation processes that are open to interested and affected parties.**<br>**The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties** | | |
|---|---|---|---|---|
| **Scoring Issue** | | SG 60 | SG 80 | SG 100 |
| **a** | Roles and responsibilities | | | |
| | **Guidepost** | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.**<br><br>The General Law of Fishery and Aquaculture (LGPA) expressly set forth the roles, functions and responsibilities of each of the institutions that participate in fisheries management, whether these are governmental institutions such as the Ministry of Economy, Development and Tourism, the Undersecretary of Fishery, the National Fishery Service, the Institute of Fishery Development, and the Fishery Research, as well as the advisory committees of the Fishery Management Administration, consisting of Management Committees, Scientific Technical Committees, National Fishery Council, and the 8 Zonal Fishery Council.<br><br>For each of these organizations, the law establishes functions, duration period of its members in office, as well as its conformation and participation of its members, which can be supplemented with regulations to determine procedure, requirements and the form of election of its members. The process of election of the members of each of these entities are absolutely transparent.<br><br>In the section 3.5 b) of this report, are the designated functions and roles of each of the bodies involved in management. Functions, roles and responsibilities are defined explicitly and understood, so that the stakeholders know how management works, the roles of each one of the organizations participating, and where to go if there are questions. Therefore, **it meets the SG 60 the SG 80 and SG 100.** | | |
| **b** | Consultation processes | | | |
| | **Guidepost** | The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**. |
| | **Met?** | Y | Y | N |
| | **Justification** | **The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained**. | | |

<table>
<tr><td colspan="2">PI 3.1.2</td><td colspan="3">The management system has effective consultation processes that are open to interested and affected parties.<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</td></tr>
<tr><td></td><td></td><td colspan="3">The LGPA, establishes procedures of consultation for different institutions Advisory for the adoption of different measures for Administration and management, either through consultations or requests for technical reports, which the authority must have in consideration and in some cases are mandatory to the adopter a measure of management.<br><br>Relevant information is obtained through consulting, such as information provided by the Scientific Technical Committees. All information collecting is available on the Undersecretary of Fishery webpage.<br><br>Previous communication with the corresponding Scientific Technical Committee is necessary before the adoption of regulations such as seasonal of spatial closures, prohibition of temporary or permanent capture of protected species by international agreements, quotas, determination of marine parks and marine reserves, and percentages of landing as bycatch; in addition to the technical report of the Undersecretary of Fishery. The National Fishery Council should also be notified with anticipation regarding regulations such as determination of quota assigned for research to each fishery unit.<br><br>The Scientific Technical Committee is in charge of proposing a range within which the fishery management authority may establish the quota for a calendar year, as well as the biological reference points of the fishery.<br><br>For regulations such as minimum sizes of harvest, dimensions and characteristics of the fishing gear types, use of devices to minimize capture and release of bycatch, the Undersecretary of Fishery must consult with the corresponding Zonal Fishery Council and inform the appropriate Scientific Technical Committee before establishing such regulations.<br><br>To establish conservation and management regulations for Vulnerable Marine Ecosystems, the Ministry of Economy may establish them after seen the Undersecretary of Fishery technical report and after communicating with the appropriate Zonal Fishery Council.<br><br>Resources whose fisheries qualify as demersal fishing, which could affect vulnerable marine ecosystems, is determined according to the decision made by corresponding Scientific Technical Committee.<br><br>The Undersecretary of Fishery can consult the Scientific Technical Committee regarding the design of conservation and management regulations and the preparation of management plans. The Scientific Technical Committee reports should consider information provided by the Institute of Fishery Development (IFOP), as well as from other sources. Therefore, it meets the SG 60 and SG 80.<br><br>Management includes consultation processes that regularly seek and accept relevant information, including local knowledge, but management cannot show how information is considered or explain how it is used or not used, therefore, does not comply with SG 100.</td></tr>
<tr><td>c</td><td colspan="4">Participation</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>The consultation process provides opportunity for all interested and affected parties to be involved.</td><td>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.</td></tr>
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<table>
<tr><td colspan="2">PI 3.1.2</td><td colspan="3">The management system has effective consultation processes that are open to interested and affected parties.<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td>N</td></tr>
<tr><td></td><td>Justification</td><td colspan="3">The consultation process provides opportunity for all interested and affected parties to be involved.<br><br>The General Law of Fishery and Aquaculture offers the opportunity and encourages the interested parties to participate in management through Management Committees and the Scientific Technical Committees by fishery or group of fisheries, the National Fishery Council and the 8 Zonal Fishery Councils.<br>The participation of different agents involved in management activity whether these are involved or not, occurs through the following bodies:<ul><li>The stakeholders such as representatives of the industrial sector, the artisanal sector and processing plants, can participate through the National Fishery Council, the pertinent Zonal Fishery Council, and Management Committees.</li><li>Academics related to the marine sciences can participate through: National Fishery Council, the Zonal Fishery Council, and the Scientific Technical Committees.</li><li>NGOs can participate through the Zonal Fishery Council and the National Fishery Council.</li><li>Scientists specialized in fishery management can participate through the Scientific Technical Committee.</li><li>Scientists from the Institute of Fishery Development can participate through the Scientific Technical Committees.</li><li>National Fishery Service, as the oversight agency, is involved through the National Fishery Council, Zonal Fishery Council and the Management Committees.</li><li>Members of the National Fishery Council, can make the fishery management authority aware of any facts which, in its opinion, affect fishing activities, resources and the environment. Also, by a majority of its members, may require initiatives to the Undersecretary of Fishery, in any matter within its competence, request that only may be refused by Resolution.</li></ul>Considering that organizations and staff involved in the management process are well defined, the law establishes functions, roles and responsibilities which are expressly defined and have been well covered. The consultation procedure offers the opportunity to all those affected to participate, meets the SG80.<br><br>Through modifications to Regulation, which establishes the functions of the Scientific Technical Committees, it has been established the obligation for the Scientific Committee to consider within its annual meetings, a meeting with the Management Committee. (Decree No. 87 of 2015 of the Ministry of Economy).<br><br>After the amendment of the Fisheries Act, at the beginning of 2013, which created the Management Committees, 32 management committees have been created to date. Fifteen correspond to benthic resources harvested exclusively by the artisanal sector; 17 corresponded to crustaceans and fish, harvested both by the artisanal and industrial sector. As a result, there has been a decline in the interest for participating in the Zonal Fishery Councils since the functions and roles of the Management Committees are of greater relevance. Consequently, according to the information available in the Undersecretary of Fishery webpage, there are many vacancies in the Zonal Fishery Councils. It is important to add that in the last modification to the Fisheries Act, substantial changes were made to fishery management through the creation of transferable fishing licenses and new responsibilities were given to the Scientific Technical Committees. For the Zonal Fishery Councils, these changes meant the loss of power.<br><br>However, despite that there have been management committees for all fisheries and 8 scientific technical committees formed, there has been no efforts in promoting participation in the</td></tr>
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<tr><td colspan="2">PI 3.1.2</td><td>The management system has effective consultation processes that are open to interested and affected parties.<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</td></tr>
<tr><td></td><td></td><td>local/regional fishery councils (Consejo Zonales de Pesca). Thus, it cannot be said that the consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. Thus, SG100c is not scored</td></tr>
<tr><td colspan="2">References</td><td>Ministerio de Economía, Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.<br>Ministerio de Economía, Decreto 85 de 2003, Reglamenta la elección de los consejeros del Consejo Nacional de Pesca.<br>Ministerio de Economía, Decreto 453 de 1992, y sus modificaciones, establece reglamento para la elección de los Consejeros de los Consejos Zonales de Pesca.<br>Ministerio de Economía, Decreto 77 de 2013, y sus modificaciones, establece reglamento de funcionamiento, toma de decisiones, e integración de los Comités Científico Técnico.<br>Ministerio de Economía, Decreto 95 de 2013 y sus modificaciones, establece reglamento de designaciones de los integrantes y funcionamiento de los Comités de Manejo.</td></tr>
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| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 3.1.3 – Long term objectives

<table>
<tr><td colspan="2">PI 3.1.3</td><td colspan="3">The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Objectives</td></tr>
<tr><td>Guidepost</td><td>Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.</td><td>Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.</td><td>Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>Y</td></tr>
<tr><td>Justification</td><td colspan="3">Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy.<br><br>LGPA, Article 1º B establishes that the objective of the fisheries regulation is the conservation and sustainable use of the hydrobiological resources, through the application of the precautionary approach and an ecosystem approach.<br><br>LGPA ,Article 1 º C expressly and explicitly states that in order to achieve the objective of the law, the fishing authority shall take into account when adopting conservation and management measures, as well as to interpret and apply the law, the following considerations:<br>a) Establish long-term objectives for the conservation and management of fisheries and the protection of their ecosystems, as well as the periodical evaluation of the effectiveness of the measures implemented.<br>b) apply the precautionary approach in the administration and conservation of hydrobiological resources and the protection of their ecosystems, understanding as such: i) It should be more cautious in the administration and conservation of resources when scientific information is uncertain, not reliable or incomplete, and ii) The lack of sufficient, unreliable or incomplete scientific information should not be used as a reason for postponing or not adopting conservation and management measures.<br>c) consider the impact of fishing on associated or species and the preservation of the ecosystems<br><br>Furthermore, LGPA Article 3 letter c) states that when establishing the annual catch quota, it must always maintain the fishery at maximum sustainable yield (MSY) set up by the Committees.<br><br>The long-term objectives are clear and consistent with the MSC fisheries requirements, therefore SG 80 is met. Further a precautionary approach is explicit within the requirements of the management policy therefore, clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach, are explicit within and required by management policy and SG 100 is met.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Ministerio de Economía, Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.<br>Article No. 1B of the General Law of Fishery and Aquaculture.<br>Article No. 1C, the General Law of Fishery and Aquaculture.<br>Article 3 letter c) of the General Law of Fishery and Aquaculture.</td></tr>
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| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **100** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **100** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 3.2.1 – Fishery-specific objectives

<table>
<tr><td colspan="2">PI 3.2.1</td><td colspan="3">The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</td></tr>
<tr><td colspan="2">Scoring Issue</td><td>SG 60</td><td>SG 80</td><td>SG 100</td></tr>
<tr><td rowspan="4">a</td><td colspan="4">Objectives</td></tr>
<tr><td>Guidepost</td><td>Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system.</td><td>Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.</td><td>Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system.<br><br>The General Law of Fishery and Aquaculture (LGPA) establishes the long-term goals for the management of the Chile Austral Hake fishery, establishing the obligation to use the precautionary approach, and the ecosystem approach; as well as protecting marine ecosystems in which they are.<br><br>In addition, the fisheries management agencies must be taken into account the following when adopting regulations for conservation and management:<br>- Set long-term goals for the conservation and management of the fishery and protection of its ecosystems as well as the regular evaluation of the effectiveness of the measures taken.<br>- Apply the precautionary principle in management and conservation of biological resources and the protection of its ecosystems.<br>- Apply the ecosystem approach to the conservation and management of fishery resources and the protection of its ecosystems.<br>- Consider the impact of fishing on associated or dependent species and the preservation of the aquatic environment.<br>- Seek to prevent or eliminate overfishing and excess fishing capacity.<br>- Overseeing the effective implementation of conservation and management regulations.<br>- Minimize discarding both target species and bycatch, and bycatch capture.<br><br>The short-term goals in the management of the Chile Austral Hake fishery are materialized through the requirements to establish catch quotas annually, whose magnitude always must carry or keep the fishery to the biological reference point and maximum sustainable yield.<br><br>The law required the establishment of a Management Plan for the Chile Austral Hake fishery, which was approved by the Resolution No. 3069 of 2016 of the Undersecretary of Fishery.<br><br>The purpose of the Management Plan is to contribute to the "conservation and sustainable use of Chile Austral Hake resource, which will reach greater social and economic value over time". To achieve this purpose, goals are established in biological/ecological, economic, and social sectors. The main objectives in each of the goals, were detailed in Section 3.5g of this report.<br><br>In accordance with Resolution No. 291 of 2015 of the Undersecretary of Fishery, the biological reference point for the Chile Austral Hake fishery is as follows:<br>$F_{RMS} = F_{45\%BDPR}$<br>$BD_{RMS} = 40\%\ BDo$<br>$BD_{LIM} = 20\%\ BDo$</td></tr>
</table>

<table>
<tr><td>PI 3.2.1</td><td>The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.</td></tr>
<tr><td></td><td>In addition to the above, the Management Plan regulates the harvest strategy applicable to the fishery, in order to comply with the law, to take or maintain the fisheries to maximum sustainable yield.<br><br>Harvesting strategy: according to the relationship of the indicator (BDt/B0) * 100, where: BDt is spawn biomass at time t and B0 is spawn Virgin biomass, are following scenarios:<br>- Case 1): If the indicator is ≥ 20%, apply a strategy of constant-mortality equal to F = $F_{MSY}$.<br>- Case 2) if the indicator is ≥10% and < 20%, apply a strategy of constant fishing mortality F = 0.8 * $F_{MSY}$<br>- Case 3) if indicator is < 10%, apply a strategy of equal to F constant fishing mortality = 0.5 * $F_{MSY}$<br>Risk levels will be the average applied from the year 2013.<br><br>The deadline for the recovery of the fishery is 16 years from 2016, according to the dynamics of the resource and in accordance with the corresponding strategy.<br><br>With regard to Principle 2, the General Law of Fishery and Aquaculture establishes a regulation for discards and incidental catch , which consists first of establishing a discard research program in order to quantify and determine its causes, both for the target species and bycatch, as well as, the capture of bycatch. Once research is done, a discard Reduction Plan must be set.<br><br>The Discard Reduction Program of the Chile Austral Hake fishery was established through technical report (R Pesq.) 244/2017 and officialized by Resolution No. 4479 from 2017, the Undersecretary of Fishery.<br><br>Also the General Law of Fishery and Aquaculture stipulates the protection of Vulnerable Marine Ecosystems, being empowered to establish special regulations in such areas. Consistent with this, it has been established within the territorial sea and the EEZ of Chile the identification of the areas corresponding to 113 seamounts, where fishing is prohibited using fishing gear that affect the seabed. Prior to authorize the harvesting activities in these areas, research should demonstrate that the activity does not generate adverse effects on the seabed.<br><br>According to the above, the team concluded that objectives are broadly consistent with the achievement of results expressed by the Principles 1 and 2 of MSC, and are embedded within the specific management of the fishery. SG 60 and SG 80 are met.<br><br>Considering that the majority of short- and long-term goals are quantifiable, well defined and explicit for Principle 1 and 2, and the Management Plan and the Discard Reduction Plan. However, since they have never been quantified, the SG 100 is not reached.</td></tr>
<tr><td>References</td><td>Ministerio de Economía, Subsecretaría de Pesca, Documento Bases de información para la elaboración del Plan de manejo de la pesquería de merluza del sur, abril 2016.<br>Subsecretaría de Pesca, Resolución Nº 3.069 de 2016, aprueba el Plan de Manejo de la pesquería de Merluza del sur.<br>Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.<br>Subsecretaría de Pesca, Resolución 291 de 2015 y sus modificaciones, establece los puntos biológicos de referencia de las principales pesquerías nacionales, entre ellas Merluza del sur.<br>Subsecretaría de Pesca, Informe Técnico (R.Pesq.) Nº 244 de 2017, Plan de Reducción del descarte y de la captura de Pesca Incidental para las pesquerías de merluza del sur (Merluccius australis) y Congrio dorado (Genypterus blacodes) y su fauna acompañante entre los paralelos 41º 28,6' LS y %7º LS. 96 paginas.</td></tr>
</table>

  

| PI 3.2.1 | The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2. |
|---|---|
| | Subsecretaría de Pesca, Resolución Nº 4.479 de 2017, autoriza el Plan de Reducción del descarte de Merluza del sur y Congrio dorado.<br>Subsecretaría de Pesca, Resoluciones N° 451 de 2015, modificada por la resolución N° 687 de 2016, identifica montes submarinos y prohíbe las actividades extractivas en ellos con artes de pesca que afecten el fondo marino. |

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|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **80** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **80** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 3.2.2 – Decision-making processes

| PI 3.2.2 | | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery. | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | Decision-making processes | | | |
| | Guidepost | There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives. | There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. | |
| | Met? | Y | Y | |
| | Justification | **There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.**<br><br>The process of decision-making of the Chile Austral Hake fishery for the adoption of management regulations and strategies to achieve management objectives are expressly defined in the legal regulation. This establishes the participation of each of the institutions and agencies, such as the Undersecretary of Fishery in its role of establishing regulation, require information, establish research programs, require the opinion of the Scientific Technical Committees on the various measures of administration, as well as establishing the year annual catch quota, and requesting the participation of the Management Committee on the outlining of the fishery management plan and their evaluation.<br><br>The participation of Zonal Fishery Councils and the National Fishery Council is also expressly defined. Consistent with the foregoing, **therefore SG 60 and SG 80 are met.** | | |
| b | Responsiveness of decision-making processes | | | |
| | Guidepost | Decision-making processes respond to **serious issues** 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 **serious and other important issues** 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 **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. |
| | Met? | Y | Y | N |
| | Justification | **Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.**<br><br>The process of decision-making of the Chile Austral Hake fishery responds to the materials identified in the research in a transparent and timely manner. These fisheries are managed with annual catch quotas that must be established during the previous year, for which the relevant research should be developed.<br><br>To determine the above, the Undersecretary of Fishery considers in its annual research program other projects. For example, according to the Resolution No. 4346 of 2017 of the Undersecretary of Fishery, the following projects from the Institute of Fisheries Development (IFOP) and the Institute of Fishery and Aquaculture Research and (Fondo de Investigación Pesquera y Acuícola, FIPA) were considered.<br>• Discard and Capture of Bycatch in Demersal Fisheries Research Program. Monitoring and evaluation program for the plans of reduction of the discard of bycatch 2018-2019. (IFOP)<br>• Hydroacoustic evaluations: Evaluation of stock spawn of Chile Austral hake, Hoki, and Southern Blue Whiting on outside waters of Regions X and XII, year 2018. (IFOP). | | |

<table>
<tr><td>PI 3.2.2</td><td colspan="4">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.</td></tr>
<tr><td></td><td></td><td colspan="3">
<ul>
<li>Status and Indirect Assessments of Stocks: status and possible biologically sustainable harvesting of major national fisheries resources, year 2019. (IFOP)</li>
<li>Economic monitoring: Economic monitoring of national fishery and aquaculture, year 2018. (IFOP).</li>
<li>Study: Productive use of captured non-commercial species (Bycatch). (FIPA)</li>
<li>Study: Economic assessment of discards, bycatch, and sub-report of some national fisheries. (FIPA).</li>
<li>Biological fishery study on tadpole codling and warehou resources between Regions X and XII. (FIPA)</li>
<li>Direct evaluation of Chile Austral Hake and Hoki in interior waters interiors or Regions X and XI. (FIPA)</li>
<li>Fishery Research and Integrated Ecological of demersal communities from the shelf and continental slope in waters of the South-Central and South – Austral zones, Phase I. (FIPA)</li>
</ul>
On the other hand, the requirement of cameras to record images was established on board vessels of more than 15 meters in length, which in the case of the Chile Austral Hake analysis, corresponds to all industrial vessels, and almost no artisanal vessels. This requirement will be enforced during the first quarter of 2019, according to the meeting with the National Fishery Service.
Another important aspect considered in the regulation to minimize discarding, constitutes the obligation of all stakeholders involved in this fishery to have, before the start of the fishing season of a calendar year, fishing quota for the species that are caught by effects of fishing gear used, like Hoki, Southern Blue Whiting, and Pink Cusk Eel, so catch can be attribute to the quotas for the resource.
The fishery is also administered with annual seasonal and spatial closures for the protection of the reproductive process, regulation of the characteristics of the fishing gear and size minimum of harvest.
Consistent with the above, it is estimated that for the Chile Austral Hake fishery decision-making processes respond to the serious and important issues identified in the research, monitoring, assessment and relevant consultations, in an appropriate manner. Having incorporated in existing fisheries legislation the necessary mechanisms, therefore SG 60 and SG 80 are met.
Considering that while there is an established discard reduction program, but camera recording images are not yet implemented, which have as main objective to make appropriate disposal control. However, there is not enough information about habitat, or the state of primary species such as the warehou, by which the SG 100 is not reached.
</td></tr>
<tr><td>c</td><td colspan="4">Use of precautionary approach</td></tr>
<tr><td></td><td>Guidepost</td><td></td><td>Decision-making processes use the precautionary approach and are based on best available information.</td><td></td></tr>
<tr><td></td><td>Met?</td><td></td><td>Y</td><td></td></tr>
<tr><td></td><td>Justification</td><td colspan="3">Decision-making processes use the precautionary approach and are based on best available information<br>The General Law of Fishery and Aquaculture, Article No. 1C makes the fishery management authority, at the moment of adopting conservation and management measures, as well as when interpreting and applying the law, to consider the protection of its ecosystems and the precautionary principle; which entails to be more cautious in the management and conservation of resources when scientific information is uncertain, not reliable or incomplete, and the lack of</td></tr>
</table>

| PI 3.2.2 | | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery. | | |
|---|---|---|---|---|
| | | scientific information must not be a reason for postponing or not adopting conservation and management measures.<br><br>Therefore, the precautionary approach is used in the decision-making process and decisions are based on the best information available, **the SG 80 is met.** | | |
| **d** | Accountability and transparency of management system and decision-making process | | | |
| | **Guidepost** | Some information on the fishery's performance and management action is generally available on request to stakeholders. | **Information on the fishery's performance and management action is available on request**, 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 **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity**<br><br>According to the General Law of Fishery and Aquaculture, all the information relating to the decision-making process is public and is available on the Undersecretary of Fishery webpage. Administration regulations must also be published in the Daily official. Also technical reports, minutes of the management committees, proceedings of the scientific technical committees, and proceedings of National Fishery Council are also published on the Undersecretary of Fishery webpage. One of the considerations set out in Article 1C of the General Law of Fishery and Aquaculture for the achievement of the objectives of the law, is that management of fishery resources is made in a transparent, responsible and inclusive.<br><br>The Institute of Fishery Development (IFOP), according to the law, should also have available the results of research done for monitoring on its webpage.<br><br>On the other hand, the Law 20.285 regarding access to public information of all public services in Chile, allows that anyone either interested or affected may request the information deemed relevant, from the Undersecretary of Fishery, the National Fishery Service, and the Institute of Fishery Development (IFOP).<br><br>In the month of March of each year, the Undersecretary of Fishery should inform and make available in its webpage a report on the state of affairs of the major fisheries in the country, in which the Chile Austral Hake fishery is found, in which must specify at least the following:<br>• Administration, control and monitoring of fisheries<br>• Fishery management regulations.<br>• Status of the fishery, including: biological framework, status of the resource, biologically acceptable capture ranges<br>• Research carried out during the previous year. | | |

| PI 3.2.2 | | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery. | | |
|---|---|---|---|---|
| | | The National Fishery Service has the obligation to report periodically on their webpage, control of quotas captured by fishery and assignment units.<br>In addition, the National Fishery Council, and the Directorate-General for maritime territory, as supervisory organizations, must report in March of each year the activities and oversight actions carried out during the previous year. Both reports must be published on its webpage.<br><br>The team has officially informed all the parties concerned over the performance of the fishery and measures of applicable management. Therefore, **SG 60, the SG 80 and SG 100 are met.** | | |
| **e** | Approach to disputes | | | |
| | **Guidepost** | Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery. | The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges. | The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges**.<br>According to the established procedure and the participation of stakeholders and affected parties at various levels of participation, National Fishery Council, Zonal Fishery Council, Management Committees, Scientific Technical Committees, there are many instances in which, all interested parties and those affected, take knowledge of the steps that the fishery management authority is performing, and in those instances they can present different problems which in their opinion could be generated inside of the fishery.<br><br>However, if disputes arise, the interested or affected can go to the Ministry of Economy or the Undersecretary of Fishery. Decisions taken either the Ministry of Economy through the "hierarchical resource", or the "opinions" of the Office of the Comptroller General are mandatory for the Undersecretary of Fishery, who must comply with them within a limited period.<br><br>Another instance to resolve some differences, that in the opinion of those concerned or affected may cause conflicts, corresponds to the courts through the "resources of protection". The decision taken by the Courts of Justice must also be met by the Undersecretary of Fishery or Ministry of Economy, as appropriate, as soon as possible.<br><br>Another option for the solution of conflicts between users correspond to Management Plans. With its strategies to achieve the goals and targets raised, the management plan is considered in addition to other measures of conservation and management.<br><br>The fishery management system acts proactively to avoid disputes or conflicts and quickly implements judicial or administrative decisions arising from disputes. Therefore, **complies with the SG 60, SG 80 and SG 100.** | | |
| **References** | | Subsecretaría de Pesca, Resoluciones N° 451 de 2015, modificada por la resolución N° 687 de 2016, identifica montes submarinos y prohíbe las actividades extractivas en ellos con artes de pesca que afecten el fondo marino.<br>Subsecretaría de Pesca, Resoluciones N° 451 de 2015, modificada por la resolución N° 687 de 2016, identifica montes submarinos y prohíbe las actividades extractivas en ellos con artes de pesca que afecten el fondo marino. | | |

| PI 3.2.2 | **The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.** |
|---|---|
| | Subsecretaria de Pesca, Resolución Nº 4.346 de 2017, aprueba programa de investigación para la regulación de la pesca y acuicultura, año 2018.<br>Ministerio de Economía, Decreto N° 76 de 2015, aprueba reglamento del dispositivo de registro de imágenes para detectar y registrar descarte.<br>Subsecretaría de Pesca, Resolución N° 3.200 de 2013, modificada por Resolución 1.475 de 2016, establece porcentaje de especies asociadas que se debe tener para desarrollar la actividad en las diferentes pesquerías administradas con Licencias transables de Pesca y Permisos Extraordinarios.<br>Ministerio de Economía, Decreto N° 140 de 1996, establece veda biológica anual.<br>Ministerio de Economía, Decreto N° 245 de 1990, establece tamaño mínimo de extracción de merluza del sur.<br>Ministerio de Economía, Decreto N° 144 de 1980, establece regulación artes de pesca para merluza del sur.<br>Subsecretaría de Pesca, Informe Técnico (R.Pesq.) Nº 244 de 2017, Plan de Reducción del descartey de la captura de Pesca Incidental para las pesquerías de merluza del sur (Merluccius australis) y Congrio dorado (Genypterus blacodes) y su fauna acompañante entre los paralelos 41º 28,6’ LS y %7º LS. 96 paginas.<br>Subsecretaría de Pesca, Resolución Nº 4.479 de 2017, autoriza el Plan de Reducción del descarte de Merluza del sur y Congrio dorado.<br>Ley 20.285 de 2008, Sobre acceso a la información pública.<br>Subsecretaría de Pesca, Documento, Estado de situación de las principales pesquerías chilenas, año 2017. Marzo de 2018. 92 páginas.<br>Servicio Nacional de Pesca, Documento, Fiscalización en pesca y acuicultura. Informe de actividades 2017. Marzo de 2018. 82 páginas. |

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|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **95** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **95** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## 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 **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective. | A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. | A **comprehensive** 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 | N |
| | **Justification** | **A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules**<br><br>The LGPA provides various tools to the supervisory authority to develop a monitoring, control and surveillance system of Chilean fisheries. Tools currently required by the holders of fishing rights and vessels which are involved in the Chile Austral hake fishery are positioner satellite, certification of landings, scientific observers on board and in processing plants, (Chambers of registration of images on board, electronic logbooks, such as are designated in point 3.5 ltra k) to the present report.<br><br>The current mechanisms implemented for the monitoring control and surveillance of the extractive activity of the Chile Austral hake fishery in analysis, allows the authority:<br>- have knowledge and certainty that the operation takes place in the authorized areas<br>-the reported catches to correspond to the real ones in terms of species and quantities of each<br>-reliable activity information may be collected when dealing with scientific observers<br><br>Only remains that image analysis cameras are installed on board in order to corroborate estimates of catch with the landings and in this way monitor illegal discarding.<br><br>In addition to the above, there is another mechanism of control, in particular, the volume of landings and type of landed hydrobiological resource, through the guides of free transit that are required for the transfer of the landings. On the other hand process plants have an obligation to provide the information of the species and quantity entering their plants, indicating the legal origin of the hydrobiological resources processing, as well as the production derived from these through the system of traceability which is carried out by electronic means.<br><br>All information on catch capture, landings, supply and marketing of the hydrobiological resources must have a legal origin, which must be accredited by SERNAPESCA pursuant to the resolution No. 1319 of 2014 from the Servicio Nacional de Pesca therefore a monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules and Sg 80 is met.<br><br>Considering that currently there are no cameras on board, there are no scientific observers on all of the vessels that may allow obtain a detailed information of fishing operations of all the hauls, the assessment team has concluded that there is not a **comprehensive** monitoring, control and surveillance system has been implemented in the fishery that demonstrates a consistent ability to enforce relevant management measures, strategies and/or rules and therefore **SG 100 is not met.** | | |
| **b** | Sanctions | | | |

| PI 3.2.3 | | Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with. | | |
|---|---|---|---|---|
| | **Guidepost** | Sanctions to deal with non-compliance exist and there is some evidence that they are applied. | Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence. | Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence. |
| | **Met?** | Y | Y | Y |
| | **Justification** | **Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence**<br><br>The LGPA establishes administrative penalties for major violations of the fishery for Chile Austral hake for the industrial sector. Administrative sanctions were established from the year 2002 to the industrial sector and from 2012 for the Artisanal sector and have proven to be effective for the compliance with the established regulations.<br><br>Administrative penalties currently typify the major breaches, establishing sanctions to the tradable of fishing license holder or the holder of the artisanal harvest regime, as well as to the master of the offending vessel. Sanctioned administratively violations are as follows: exceed the assigned quota, disembark and not reporting catches, not to comply with the certification procedure, where appropriate, fishing activities with a fishing vessel not registered, Carrying out disposal of some of the catch in violation of the standard guidelines, extractive activities in areas of the artisanal reserve the case of the industrial sector, and fishing in an area other than the registered fishery is allowed.<br><br>The sanctions are fines in cash and discount of tons that is exceeded over the following year. In the case of the industrial sector, if there are more than 4 violations within a period of 10 years, the LTP not may be renewed for a further period at the end of the 20 years of life.<br><br>According to information provided by the National Fisheries Service regarding complaints about violations of industrial Chile Austral hake fisheries for the period 2016 and 2017, In the industrial sector there were no breaches during the years 2016 and 2017.<br><br>According to the above, it can be concluded that there are penalties for non-compliance, which are applied consistently and in the case of the Industrial sector have a proven deterrent effect, but in the artisanal sector are expected to produce a deterrent effect **SG60 is met**.<br><br>The sanctions that are set to violations are applied consistently to the type of damage caused, since fines are applied in cash and discount of the assigned quota. By way of example, in the case of exceeding the assigned quota, the penalty fine is three times the value of the catch in cash, in addition to the discount to the following year's exceeded catch, article 40 B of the LGPA. In the case of discarding, is punishable by a fine to any event of 1000 UTM (approximately US$ 70.350) and 3 times the value of tons discarded in violation, article 40 C of the LGPA. Consistent with the foregoing sanctions that are intended to produce a deterrent effect, therefore sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence and **SG 80 is met**.<br><br>According to the regulations, the sanctioning procedures, especially the administrative one, is applicable to the most serious breaches of sustainability for all the industrial fleets, are applied with coherence and deal with the non-compliance, therefore, sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence<br>Evidence of demonstrable effective deterrence is based on information from SERNAPESCA document Oficio Nº 121.888 de 2018 (SERNAPESCA 2018) where it lists the number of sanctions applied to fishermen in the Industrial and Artisanal Chile Austral hake fishery for year 2015-2016. | | |

<table>
<tr><td colspan="2">PI 3.2.3</td><td colspan="3">Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.</td></tr>
<tr><td></td><td></td><td colspan="3">For the years 2015-2016, there were no sanctions applied for non conformances in the Industrial fishery. Therefore, SG 100b is met.</td></tr>
<tr><td rowspan="4">c</td><td colspan="4">Compliance</td></tr>
<tr><td>Guidepost</td><td>Fishers are generally thought 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.</td><td>Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.</td><td>There is a high degree of confidence that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery.</td></tr>
<tr><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery.<br><br>Following the article 4 of the LGPA, SERNAPESCA has to publish every year (normally in March) a report describing all the activities and control actions carried out in the areas where fishing activities take place, in the previous year. The report shall include the results of enforcement actions carried out and compliance with the administration and management measures.<br><br>No issues were found for the fishery under assessment in March 2017 report. According to information provided by the National Fisheries Service there is no evidence of breaches of this fishery in relation to the industrial fishing sector, which is consistent with the non-existence of breaches during 2016 and 2017.<br><br>According to the technical report on the Plan of reduction of discarding (R.Pesq.) No. 244 of 2017 of SUBPESCA, which designates discards made during the years 2015 and 2016 in the framework of fisheries research to determine the causes of discarding, It can be observed, that all fleets targeting austral hake documented different amount of discarding, both from species target, austral hake, as well other non-target species which were not accounted, because they were discarded during the research study.<br><br>Consistent with the above, it is estimated that some evidence showing that the fleets comply with the management measures of the fishery, providing information of importance for the management, therefore SG60 and SG80 are met.<br><br>However there is no certainty that there is a high degree of confidence that fishermen fully comply with the measures to reduce discards, considering that images recording cameras which can detect fully compliance are not in use yet and SG 100 is not met.</td></tr>
<tr><td rowspan="4">d</td><td colspan="4">Systematic non-compliance</td></tr>
<tr><td>Guidepost</td><td></td><td>There is no evidence of systematic non-compliance.</td><td></td></tr>
<tr><td>Met?</td><td></td><td>Y</td><td></td></tr>
<tr><td>Justification</td><td colspan="3">There is no evidence of systematic non-compliance<br>According to the information provided by SERNAPESCA (2018), it is estimated that evidence of systematic non compliance in the fishery for Chile Austral hake. SG80 is met</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Ministerio de Economía, Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.</td></tr>
</table>

| PI 3.2.3 | **Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.** |
|---|---|
| | Ministerio de Economía, Decreto N° 139 de 1998 y sus modificaciones, Reglamento del sistema de posicionamiento automático de naves pesqueras y de investigación pesquera.<br>Servicio Nacional de Pesca y Acuicultura, Resolución Nº 1.324 de 2013. Establece frecuencia de transmisión del reporte básico por pesquería y tipo de flota.<br>Ministerio de Económia, Decreto N° 129 de 2013, establece reglamento para la entrega de información de pesca y acuicultura y la acreditación de origen.<br>Ministerio de Economía, Decreto 308 de 2004 y sus modificaciones. Aprueba reglamento de observadores científicos.<br>Ministerio de Economía, Decreto N° 76 de 2015, aprueba reglamento del dispositivo de registro de imágenes para detectar y registrar descarte.<br>Ministerio de Económia, Decreto N° 129 de 2013, establece reglamento para la entrega de información de pesca y acuicultura y la acreditación de origen.<br>Servicio Nacional de Pesca y Acuicultura, Resolución N° 1.319 de 2014, estable los requisitos para la acreditación de origen legal de los recursos.<br>Servicio Nacional de Pesca, Resolución Nº 2.523 de 2017, establece obligatoriedad de uso del sistema de trazabilidad y fija gradualidad de implementación.<br>Ministerio de Economía, Decreto Nº 114 de 2005, y sus modificaciones, establece el Régimen Artesanal de Extracción, RAE, en la XI región.<br>Ministerio de Economía, Decreto Nº 741 de 2011, establece el Régimen Artesanal de Extracción, RAE, en la XII región.<br>Ministerio de Economía, Decreto Nº 846 de 2011, establece el Régimen Artesanal de Extracción, RAE, en la X región.<br>Ministerio de Economía, Decreto N° 296 de 2004 y sus modificaciones. Aprueba reglamento del régimen artesanal de extracción, RAE.<br>Subsecretaría de Pesca, Informe Tecnico (R.Pesq.) Nº 244 de 2017, Plan de Reducción del descartey de la captura de Pesca Incidental para las pesquerías de merluza del sur (Merluccius australis) y Congrio dorado (Genypterus blacodes) y su fauna acompañante entre los paralelos 41º 28,6’ LS y %7º LS. 96 paginas.<br>Servicio Nacional de Pesca, oficio Nº 121.888 de 2018, da respuesta a consulta sobre incumplimiento del sector industrial y artesanal durante los años 2016 y 2017.<br>Servicio Nacional de Pesca, SIAC 460276518 de 2018. Respuesta a consulta por transpareciasobre desembarques de merluza del sur de la flota artesanal por viaje de pesca. |

| | |
|---|---|
| **OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):** | **85** |
| **OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):** | **85** |
| **CONDITION NUMBER (if relevant):** | **NA** |

## PI 3.2.4 – Monitoring and management performance evaluation

| PI 3.2.4 | | There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.<br>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 **some** parts of the fishery-specific management system. | There are mechanisms in place to evaluate **key** parts of the fishery-specific management system | There are mechanisms in place to evaluate **all** parts of the fishery-specific management system. |
| | **Met?** | Y | Y | N |
| | **Justification** | **There are mechanisms in place to evaluate key parts of the fishery-specific management system**<br>In regard to research on Chile Austral hake, as one of the major components of the fisheries management in Southern Chile Austral , the LGPA gives responsibility to the Ministry of economy to ensure the quality of the research applied for the management of fisheries, and must submit the research developed by IFOP for review by external evaluators who must determine if the research complies with the technical terms of reference, verify the technical quality of the research carried out, as well as the results obtained; This review is carried out to all research projects ever since 2013.<br><br>The Ministry must also ensure that methodologies, data collection, and the procedures used are subject to external peer review to ensure its quality. This review may also be requested by the technical scientific Committee, respectively<br>On the other hand, the research funded by the Fund of fisheries research and aquaculture, must also be evaluated by external consultants.<br><br>On the other hand, the National Fisheries Service, uses risk analysis to determine annually which will be the strategy to oversee each one of the fisheries considering the risks of non-compliance with each of the applicable management measures to the Chile Austral hake industrial fishery.<br><br>In relation to the component of evaluating fisheries management, the article 1 C of the LGPA, establishes that every five years must evaluate the effectiveness and implementation of conservation and management measures established. Meanwhile in the Management Plan for the fishery Chile Austral hake it considers also the permanent evaluation of the management measures.<br><br>According to the functions and powers of the committee of fisheries management and the technical Scientific Committee, which involves all stakeholders, they have the opportunity to review the operations of the management of the fishery.<br><br>Consistent with the foregoing, the fishery have established evaluation mechanisms of the main parts of the management of the fishery, **so it meets the SG60 and SG80**.<br><br>On the other hand the management plan Chile Austral hake, considered goals, with objectives and actions expressly established, for all parts of the management of the fishery, however they still not are evaluated by the fisheries management Committee,<br><br>Considering the recent establishment of the management plan, through which it can be assessed by all parts of the management system and that to date there is not yet an assessment on the subject, **the SG100 is not met**. | | |
| **b** | Internal and/or external review | | | |
| | **Guidepost** | The fishery-specific management system is subject to **occasional internal** review. | The fishery-specific management system is subject to **regular internal** and **occasional external** review. | The fishery-specific management system is subject to **regular internal** and **external** review. |

<table>
<tr><td colspan="2">PI 3.2.4</td><td colspan="3">There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.<br>There is effective and timely review of the fishery-specific management system.</td></tr>
<tr><td rowspan="2"></td><td>Met?</td><td>Y</td><td>Y</td><td>N</td></tr>
<tr><td>Justification</td><td colspan="3">The fishery-specific management system is subject to regular internal and occasional external review.<br><br>The Chile Austral hake fishery in according to according to the LGPA, is subject to an internal review pursuant to article 1 c of the LGPA, where every 5 years at most, an internal and external inspection by the technical Scientific Committee is carried to establish the main measure of administration, which is the overall share of capture for the following year.<br><br>The Scientific Technical Committee of the fishery, hast to evaluate periodically the research carried on and suggest the range of the catch quota for the following year. Furthermore, it corresponds to the Management Committee, where most of the stakeholders in the fishery, to evaluate periodically and follow up other n provisions of the management plan of the fishery. The SG60 and SG80 are met.<br><br>In regard of the periodic review to be carried out by the Secretariat every five years that it should correspond to perform it during the second half of the year 2018 and considering that on the date of the site visit, it was notified to the team that the revision was not done but was considered, SG 100 is not met.</td></tr>
<tr><td colspan="2">References</td><td colspan="3">Ministerio de Economía, Decreto Supremo N° 430 de 1991, fija el Texto coordinado y sistematizado de la ley 18.892 de 1980 y sus modificaciones, Ley General de Pesca y Acuicultura, LGPA.<br>Subsecretaría de Pesca, Documento, Plan de Manejo para la Pesquería de Merluza del Sur desde el paralelo 41º 28,6’ al 57º L.S. Subsecretaría de Pesca, Octubre de 2016. 45 páginas.</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA1 (Trawls):</td><td>80</td></tr>
<tr><td colspan="4">OVERALL PERFORMANCE INDICATOR SCORE UoA 2 (Longline):</td><td>80</td></tr>
<tr><td colspan="4">CONDITION NUMBER (if relevant):</td><td>NA</td></tr>
</table>

### 9.1.2. Appendix 1.2 Risk Based Framework (RBF) Outputs

For this assessment the use of RBF was announced on August 20th, 2018. The assessment team has announced the use of RBF for 2.2.1 and 2.4.1 PIs. However, after the site visit and with the information gathered the RBF is not needed for 2.4.1 as new information has been available and the announcer for not using the RBF for 2.4.1 has been posted on MSC website on December 5th, 2018.

Consequently, the assessment team has used the RBF for 2.2.1 in the UoA 1 – bottom trawl and midwater trawl components.

The reason to use the RBF is because there is no enough information regarding the stock status of some secondary species, in concrete for the species Silver warehou (*Cojinoba moteada*). No reference points or proxies are available and the assessment team triggered the table 3 of the FCR 7.7.6 and it was shown that the use of RBF was necessary to evaluate and score this PI.

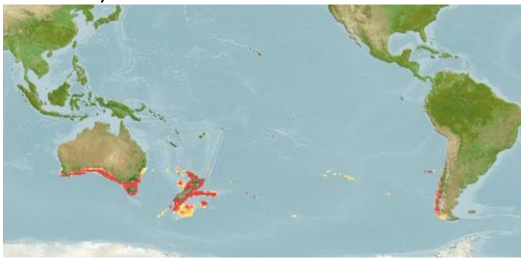
Although catch statistics of most of the species retained are available for some areas of the fishing area. However, it has been reported that it is often confused between species retained, and the catches of Silver warehouse (*C.moteada*) are not accurate, landing data are hard to collate and management difficult.

*C. moteada* has a percentage of catches around 8% with bottom trawl and midwater trawl being considered as main secondary species in these components of the UoA 1. The PSA has been used to evaluate the species and more information is detailed below (Table 43, Table 44).

### 9.1.2.1 Appendix 1.2.2 Productivity-Susceptibility Analysis (PSA)

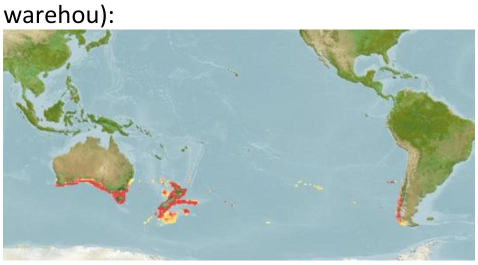
Table 43Table 44 shows the MSC PSA worksheet for 2.2.1 used during the evaluation of the fishery. The PSA has been used in both component of UoA 1: bottom trawl and midwater trawl and one species has been scored in both. Table 43 and Table 44 show the rationales for each scoring given to the productivity and susceptibility indicators.

**Table 43**. PSA Rationale Table- Bottom trawl component.

| **PI number** | **2.2.1** | |
|---|---|---|
| **A. Productivity** | | |
| **Scoring element (species)** | ***Seriolella punctata*- Silver warehou** | |
| **Attribute** | **Rationale** | **Score** |
| **Average age at maturity.** | 7 years (FISHBASE) | **2** |
| **Average maximum age** | 11 years (FISHBASE) | **2** |
| **Fecundity*** | 100-1000 (FISHBASE) | **2** |
| **Average maximum size** | 60 cm (FISHBASE) | **1** |
| **Average size at maturity** | 40 cm (FISHBASE) | **2** |
| **Reproductive strategy** | Broadcast spawner (FISHBASE) | **1** |
| **Trophic level** | 3.5 | **3** |
| **Density dependence** | [To be used when scoring invertebrate species only – delete if not applicable] | **NA** |
| *Fecundity studies for Silver warehou are not available. Therefore the assessment team has used the estimation made for Blue warehou (*Seriolella brama*) in South East of Australia. Knuckey, Ian & P. Sivakumaran, K. (2001). Reproductive characteristics and per-recruit analyses of blue warehou (*Seriolella brama*): Implications for the South East Fishery of Australia. Marine and Freshwater Research. 52. 575-587. 10.1071/MF00022. | | |
| **B. Susceptibility** | | |
| Fishery only where the scoring element is scored cumulatively | The assessment team has considered just the UoA because following PF4.4.3.3 the UoA does not have secondary main species with catches at 10% or more of the total catch by weight of the UoA, therefore the team elects to conduct the PSA on the UoA only. | |
| **Attribute** | **Rationale** | **Score** |
| **Areal Overlap** | During the meetings the assessment team were told by several key stakeholders that the overlapping of the UoA was low. Both species are benthopelagic but the range of distribution of Chile austral hake is deeper than the silver warehou. Therefore, overlapping with the gear bottom trawl is less than with other gear types. Normally Silver warehou is caught by artisanal vessels because of the distribution of the species. The percentage of Silver warehou in the total catch species composition of the industrial fleet in 2017 was shown by IFOP to be of 0.6%. Catches are minimal because the distribution of the species is not overlapping with the footprint of the industrial fleet (IFOP 2017, Seguimiento de las pesquerías demersal y aguas profundas: sección iv: pesquería demersal sur austral industrial, 2017).<br>The map (figure 1) shows the global distribution of *S.punctata* (Silver warehou):<br><br>Figure 1. Distribution of S.punctata. Source Fishbase. Reviewed distribution maps for *Seriolella punctate* (Silver warehou), with modelled year 2100 native range map based on IPCC A2 emissions scenario. www.aquamaps.org, version of Aug. 2016. Web. Accessed 21 Dec. 2018. | **1** |

| | | |
|---|---|---|
| | Relative probabilities of occurrence are decreasing from red colour (0.8-1) to yellow (0.01-0.19) Therefore, it can be observed following this scales that the maximum distribution is in areas FAO 51 and 81 rather than FAO 87 where the fishery takes place below. Further, during the meeting, all the stakeholders agreed in an overlapping less than 10 %. Therefore, the assessment team has concluded that a low level of risk should be scored. | |
| **Encounterability** | Not too much is known about the distribution of Silver warehou and the overlapping with the fishery. However, after consideration of all the information gathered during the RBF meetings, the encounterability with the bottom trawl was scored as medium level. The rationale for the scoring is because the bottom trawl touch the surface bottom and normally silver warehou is not associated with the bottom, the risk should be low based on vertical distribution and overlapping of the fishery but there are few studies in the area the assessment team has taken a precautionary approach evaluating the risk at medium. Therefore, the bottom trawl gear type is more effective beneath the potential distribution of silver warehou. However as mentioned above the conclusion is due to the lack of biological studies of Siver warehou in the fishery area the assessment team has conclude that the risk should be medium rather than low. | **2** |
| **Selectivity of gear type** | The selectivity is evaluated by considering the gear potential to retain immature fish. The type of mesh gives the opportunity to not to catch individuals below this size. Furthermore, on the last report of demersal fisheries monitoring by IFOP (IFOP, 2017), the size distribution of Silver warehou was bigger than the last years and a trend on individuals getting bigger sizes is shown. Therefore both indicators were scored at low level of risk.<br>a) Individuals < size at maturity are rarely caught<br>b) Individuals < size at maturity can escape or avoid gear<br><br>Individuals with sizes smaller than 40 cm were very rarely caught. In the last report of demersal fisheries status (IFOP, 2017) shows that 0.6 % of the total catch species composition in industrial fleet targeting Chile Austral hake corresponds to Silver warehou and the distribution of sizes showed a trend to catch bigger sizes. The smaller size class was represented at 43 cm. During 2017, the size distribution of the catches of Silver warehou reported by the industrial fleet has shown a size-class of 43-55 cm; Average sizes for 2016 and 2017 were (45.7 cm) and and (45. 4 cm) respectively (IFOP, 2017. *Informe técnico final: seguimiento de las pesquerías demersales y aguas profundas: sección iv: pesquería demersal sur austral industrial, 2017*). Therefore, the assessment team concludes that inmature individuals can avoid the gear and they are not part of the catch. | **1** |
| **Post capture mortality** | This indicator was the one with more inputs by the stakeholders. Fishermen and the client group suggested the post mortality cannot be scored at a high level of risk. However, the assessment team is not confident to score less than high because Silver warehou is a benthopelagic species with a distribution in deep waters where normally is fished in a range of more than 100 m and the mortality is very high due to dramatically changes in the pressure whichi is common for fishes living in deeper waters. Consequently,with the current fishing operations is not possible that the fish can get alive into the deck. Therefore, due to the uncertainty in the data the assessment team is confident to evaluate high level of risk. | **3** |
| **Catch (weight) only where the scoring element is scored cumulatively** | No weight has been considered as the UoA does not have catches at 10% or more of secondary main species. The only species considered as main is Silver warehou and the percentage is less than 8%. | **NA** |

**Table 44**. PSA Rationale Table- Midwater trawl component.

| **PI number** | **2.2.1** | |
|---|---|---|
| **A. Productivity** | | |
| **Scoring element (species)** | ***Seriolella punctata*- Silver warehou** | |
| **Attribute** | **Rationale** | **Score** |
| **Average age at maturity.** | 7 years (FISHBASE) | **2** |
| **Average maximum age** | 11 years (FISHBASE) | **2** |
| **Fecundity*** | 100-1000 (FISHBASE) | **2** |
| **Average maximum size** | 60 cm (FISHBASE) | **1** |
| **Average size at maturity** | 40 cm (FISHBASE) | **2** |
| **Reproductive strategy** | Broadcast spanwer (FISHBASE) | **1** |
| **Trophic level** | 3.5 | **3** |
| **Density dependence** | [To be used when scoring invertebrate species only – delete if not applicable] | **NA** |
| * Fecundity studies for Silver warehou are not available. Therefore, the assessment team has used the estimation made for Blue warehou (Seriolella brama) in South East of Australia. Knuckey, Ian & P. Sivakumaran, K. (2001). Reproductive characteristics and per-recruit analyses of blue warehou (Seriolella brama): Implications for the South East Fishery of Australia. Marine and Freshwater Research. 52. 575-587. 10.1071/MF00022. | | |
| **B. Susceptibility** | | |
| Fishery only where the scoring element is scored cumulatively | The assessment team has considered just the UoA because following PF4.4.3.3, the UoA does not have secondary main species with catches at 10% or more of the total catch by weight of the UoA, therefore, the team elects to conduct the PSA on the UoA only. | |
| **Attribute** | **Rationale** | **Score** |
| **Areal Overlap** | During the meetings the assessment team were told by several key stakeholders that the overlapping of the UoA was low however it could have a slightly increase in the midwater trawl. Both species are benthopelagic but the range of distribution of Chile austral hake is deeper than the silver warehou. Normally Silver warehou is caught by artisanal vessels because of the distribution of the species that also its more common inside waters where the industrial fishery cannot realised its activities.<br>Catches are minimal because the distribution of the species is not overlapping with the mid water trawls (IFOP 2017, Seguimiento de las pesquerías demersal y aguas profundas: sección iv: pesquería demersal sur austral industrial, 2017) as most of the catches of Silver warehou take place in the canyons placed in inside waters where industrial vessels have not access.<br>The map (figure 1) shows the global distribution of S.punctata (Silver warehou):<br><br>Figure 1. Distribution of S.punctata. Source Fishbase. Reviewed distribution maps for Seriolella punctate (Silver warehou), with modelled year 2100 native range map based on IPCC A2 emissions scenario. www.aquamaps.org, version of Aug. 2016. Web. Accessed 21 Dec. 2018.<br><br>Relative probabilities of occurrence are decreasing from red colour (0.8-1) to yellow (0.01-0.19) Therefore, it can be observed following this scales that | **2** |

| | | |
|---|---|---|
| | the maximum distribution is in areas FAO 51 and 81 rather than FAO 87 where the fishery takes place as it was mentioned for bottom trawl already. However, during the meetings, all the stakeholders agreed in an overlapping less than 10 % but it could be slightly bigger than for bottom trawl due to the range of depth, although that is considered in encounterability, the assessment team has considered that midwater trawl can have more risk and it score at medium risk rather than low risk as was scored for bottom trawl. | |
| **Encounterability** | No too much is known about the distribution of Silver warehou and the overlapping with the fishery. However, after careful consideration of all the information gathered in RBF meetings, the encounterability with the bottom trawl and midwater trawl is very similar and in both cases the key stakeholders evaluated the encounterability to be less than 10%. However due to the uncertainty, the assessment team has decided that it should be scored as medium level. Furthermore, the distance covered in each haul is the same in both components of the UoA; time of fishing operation is the same for both gear types. However due to some uncertainty encountered the assessment team has scored medium level of risk. | **2** |
| **Selectivity of gear type** | The selectivity is evaluated by considering the gear potential to retain immature fish. The size/type of mesh gives the opportunity to not to catch individuals below this size. On the last report of demersal fisheries monitoring by IFOP, the size distribution of Silver warehou was bigger than the last years and a trend on individuals getting bigger sizes is shown. Therefore, both indicators were scored at low level of risk<br>c) Individuals < size at maturity are rarely caught<br>d) Individuals < size at maturity can escape or avoid gear<br>Individuals with sizes smaller than 40 cm were very rarely caught. The last report of Southern Austral demersal fisheries status (IFOP 2017) shows that 0.6 % of the total catch in industrial fleet targeting Chile Austral hake corresponds to Silver warehou and the distribution of sizes shows a trend to catch bigger sizes. The smaller sizes was representing at 43 cm. During 2017, the size distribution of the catches of Silver warehou reported by the industrial fleet has shown a size-class of 43-55 cm; Average sizes for 2016 and 2017 45, 7 cm and 45, 4 cm respectively (IFOP, 2017. *Informe técnico final: seguimiento de las pesquerías demersales y aguas profundas: sección iv: pesquería demersal sur austral industrial, 2017*). Therefore the assessment team concludes that inmature individuals can avoid the gear and they are not part of the catch. | **1** |
| **Post capture mortality** | This indicator was the one with more inputs from the stakeholders. Fishermen and the client group suggested that the post mortality cannot be scored at a high level of risk. However, the assessment team is not confident to score less than high because Silver warehou is a benthopelagic species with a distribution in deep waters where normally is fished in a range of more than 100 m and the mortality is very high due to dramatically changes in the pressure which is common for fishes living in deeper waters. Consequently, with the current fishing operations is not possible that the fish can get alive into the deck. Therefore, due to the uncertainty in the data the assessment team is confident to evaluate high level of risk. | **3** |
| **Catch (weight) only where the scoring element is scored cumulatively** | No weight has been considered as the UoA does not have catches at 10% or more of secondary main species. The only species considered as main is Silver warehou and the percentage is less than 8%. | **NA** |

Only main species scored? Yes

| 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 |
|---|---|---|---|---|---|---|---|---|
| 1 | First | | | Centrolophidae | Seriolella punctata | Silver warehou/Cojinoba | Non-invertebrate | Bottom trawling |
| 2 | First | | | Centrolophidae | Seriolella punctata | Silver warehou/Cojinoba | Non-invertebrate | Midwater trawling |

| | Productivity Scores [1-3] | | | | | | | | | Susceptibility Scores [1-3] | | | | | Cumulative only | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scoring element | Average age at maturity | Average max age | Fecundity | Average max size | Average size at Maturity | Reproductive strategy | Trophic level | Density Dependance | 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 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | | 1.71 | 1 | 2 | 1 | 3 | 1.13 | 2.05 | 3000 | 1.00 | 2.05 | 2.05 | 95 | Low | ≥80 |
| 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | | 1.71 | 2 | 2 | 1 | 3 | 1.28 | 2.14 | 3000 | 1.00 | 2.14 | 2.14 | 93 | Low | ≥80 |

| | |
|---|---|
| MSC score | 80 |
| Status | Unconditional Pass |

**Figure 46.** MSC PSA worksheet for 2.2.1 obtained during the RBF evaluation of Silver Warehou.

### 9.1.2.2 Appendix 1.2.1 Consequence Analysis (CA) for Principle 1

### 9.1.3. Appendix 1.3 Conditions

**Table 45**. Conditions 1 – 2.

**Condition 1- For all UoAs**

| | |
|---|---|
| **Performance Indicator** | PI 1.1.1 Stock Status<br>**The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing**<br>Guidepost b) The stock is at or fluctuating around a level consistent with MSY. |
| **Score** | 70 |
| **Rationale** | On the latest stock assessment (SUBPESCA 2017), it was found that for Chile Austral hakes, the 2017 SSB is below the biomass Target reference point 40%$SSB_0$ and has been below since the 1990's, therefore the stock is not fluctuating around reference points. |
| **Condition** | By the 4th surveillance audit after reassessment, the Assessment Team shall be provided with evidence that the stock is at or fluctuating around a level consistent with MSY in the Industrial trawl (bottom and midwater trawl) and longline fishery. |
| **Milestones** | The team considered that completing the milestones for 1.1.1 in 4 years could be difficult to achieve given that the rebuilding strategy was implemented in 2016 with a rebuilding timeframe of no more than 16 years. The team considered to apply FCR 7.11.1.3 where when exceptional circumstances occur allowing to set milestones longer than the period of certification.<br><br>**MSC FCR v2.0; 7.11.1.3**<br>*The CAB shall draft conditions to result in improved performance to at least the 80 level within a period set by the CAB but no longer than the term of the certification unless:*<br>*a. There are exceptional circumstances, and the CAB determines that achieving a performance level of 80 may take longer than the period of certification.*<br>*i. The CAB shall interpret exceptional circumstances in 7.11.1.3.a to refer to situations in which, even with perfect implementation, achieving the 80 level of performance may take longer than the certification period.*<br>*ii. In exceptional circumstances, the CAB shall specify conditions that spell out:*<br>*A. The significant and measurable improvements (in terms of milestones or outcomes) that must be achieved and the score that must be reached during the certification period and at the end of the certification period.*<br>*B. What constitutes a successful overall outcome to achieve the 80 performance level over a longer, specified time period*<br><br>In this case the exceptional circumstances are that the Chile Austral hake rebuilding strategy was implemented in 2016 with a rebuilding timeframe of no more than 16 years. This allows the team to set milestones longer than the period of certification.<br><br>**<u>By Year 1:</u>**<br>In the first year following grant of certification, the Client Group will work actively with SUBPESCA, IFOP and SERNAPESCA to elaborate a proposal that allows to evaluate and monitor the current exploitation strategy and decide if other (new) measures as may be appropriate, with the aim of being able to demonstrate that this strategy is resulting in sufficiently low fishing mortality to maintains high productivity and ensure the stock will be at or fluctuating around the target reference point.<br>(Score remains to 70)<br><br>**<u>By Year 2:</u>**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that the current partial strategy to reduce Chile Austral hake mortality by Industrial trawl and longline fisheries and it has been reviewed and corrective adjustments (if any) have been proposed.<br>(Score remains to 70) |

| | |
|---|---|
| | **By Year 3:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that the current partial strategy to reduce Chile Austral hake mortality by Industrial trawl and longline fisheries and it has been reviewed and corrective adjustments (if any) have been proposed.<br>(Score remains to 70)<br><br>**By Year 4:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains to 70)<br><br>**Before the end of the re-assessment process:**<br>The Assessment Team shall be provided with up-dated evidence that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains to 70)<br><br>**By Year 1 after re-assessment:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains to 70)<br><br>**By Year 2 after re-assessment:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains to 70)<br><br>**By Year 3 after re-assessment:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains to 70)<br><br>**By Year 4 after re-assessment:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit that the relative fishing mortality for Chile Austral hake Industrial trawl and longline fisheries has been maintained at levels that does not hinder the recovery and the stock is fluctuating at or around a level consistent with MSY.<br><br>The Assessment Team shall be provided with enough evidence that SG 80 is met at the end of the year 4$^{th}$ after re-assessment.<br>(Score reaches 80) |
| **Client action plan** | Currently, the Chile Austral hake fishery has an approved management plan, which contains, among other issues, the exploitation strategy in force for this fishing resource. The Chile Austral Hake Fishery Management Committee (SHFMC) is responsible for the implementation and assessment of this fishery management plan (FMP). Fipes and the companies, part of the client group, intended to be covered by the MSC certification, are active members of this SHFMC, together with representatives of the Undersecretariat for Fisheries (SUBPESCA), National Fisheries Service (Sernapesca) and artisanal fishermen.<br><br>To comply with the milestones established by the CAB under this condition, the following client action plan will be implemented: |

| | |
|---|---|
| | **By year 1,** within the framework of the Southern Hake Fishery Management Committee, it will be provided evidence, FIPES is actively working to require the elaboration of a proposal that allows to evaluate and monitor the current exploitation strategy.<br><br>**By year 2**, having developed the proposal to evaluate and monitor the current exploitation strategy in the previous period, it will be provided evidence, Fipes is actively working in the Management Committee to this proposal will be consulted and discussed with the relevant Scientific Committee as to this proposal can be taking into account on the exploitation strategy decisions.<br><br>**By year 3,** it will be provided evidence, Fipes will work on the Management Committee in order to the current exploitation strategy can be evaluated according to the proposal developed in previous period and corrective adjustments would be proposed to achieve the target reference point (MSY), if applicable. Also, Fipes will require the results of this process can be submitted to the Management Committee and related Scientific Committee.<br><br>If the results of the evaluation would recommend changes, Fipes will request to the Management Committee to modify existing Management Plan to incorporate a modified exploitation strategy and will carry out the legal procedure required to the implementation.<br><br>**By Year 4**, it will be provided evidence, Fipes will work within the Management Committee, to ensure the new exploitation strategy (if applicable) can be implemented and its monitoring can be carried out in a proper manner.<br><br>**Before the end of the re-assessment process and by Years 1 to 3 after re-assessment**, Fipes will provide evidence, the Management Committee will monitor and evaluate performance of the exploitation strategy implemented. Also, Fipes will submit evidence corrective actions are proposed and implemented to the exploitation strategy, if applicable, following the procedure explained in previous-years actions of this plan.<br><br>**By Year 4 after re-assessment**, Fipes will work with the Fishery Management Committee to prepare a report demonstrating the Chile Austral hake spawning biomass is increasing and moving towards at the target level (MSY) and will be submitted to the CAB. |
| **Consultation on condition** | Comité de Manejo de merluza austral. Please see appendix 1.4 support letters |

## Condition 2- UoA 1- Industrial Trawl

| | |
|---|---|
| **Performance Indicator** | UoA 1- Industrial trawl<br>**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**.<br><br>Guidepost a) SG 80 - 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 |
| **Score** | Scoring element 1– Bottom trawl – 75<br>Scoring element 2 – Midwater trawl – 75 |
| **Rationale** | The primary species in this UoA 1 were evaluated by elements. Component 1 (Bottom trawl) has 4 scoring elements, one of them (Hoki) doesn't reach SG 80.<br><br>Component 2 (Midwater trawl) has three scoring elements; also one of them (Hoki) doesn't reach SG 80. Therefore in both components the overall outcome scores by elements is resulted in less than SG 80. The primary species which does not met SG 80 is the same in both component- Hoki. Therefore the rationale given is: |

| | |
|---|---|
| | **Hoki** [(*Macruronus magellanicus*) - merluza de cola] - Spawning stock biomass (SSB) estimated shows a decreasing trend, with exploitation rates above target levels from 2006 to 2013. SSB has decreased around 19 % in recent years and there is a high risk of being below limits in a short time. The stock is overexploited and in risk of depletion, age structure shows predominance of juveniles and recruitment levels are very low since 2000. Therefore, hoki stock status is below the PRI, **SG 80 is not met**. |
| **Condition** | By the 4th surveillance, the assessment team shall be provided with evidence that Main primary species (i.e. Hoki) in the Industrial Trawl Fishery (UoA1) 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 |
| **Milestones** | **By Year 1:**<br>In the first year following grant of certification, the Client Group will work actively with SUBPESCA, IFOP and SERNAPESCA to develop a management plan with measures focus on adopting a partial strategy, and other (new) measures as may be appropriate, with the aim of being able to demonstrate that this strategy is resulting in sufficiently low fishing mortality such that the fishery does not hinder recovery and rebuilding.<br>(Score remains in midwater trawl and 75 in bottom trawl)<br><br>**By Year 2:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit (as per the range of evidence described for year 1 above); that the current partial strategy to reduce Hoki mortality by retained catch/discards in Chile Austral hake Industrial trawl fisheries has been implemented and adjustments (if any) have been proposed.<br>(Score remains in midwater trawl and 75 in bottom trawl)<br><br>**By Year 3:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit (as per the range of evidence described for year 1 above); that any revised measures of the partial strategy have been implemented and monitoring activity in place to assess their implementation.<br>(Score remains in midwater trawl and 75 in bottom trawl)<br><br>**By Year 4:**<br>The Assessment Team shall be provided with up-dated evidence available at the time of surveillance audit (as per the range of evidence described for year 1 above); that the relative fishing mortality for hoki Industrial trawl fisheries has been maintained at levels that does not hinder their recovery.<br><br>The Assessment Team shall be provided with enough evidence that SG 80 is met at the end of the year 4th.<br>(Score reaches 80 for both components) |
| **Client action plan** | Currently, the Hoki Fishery Management Committee is working to develop the fishery management plan for this fishery, which will contain, among other issues, the exploitation strategy for this fishing resource. Fipes and the companies, part of the client group, intended to be covered by the MSC certification, are active members of both, the Hoki Fishery and Southern Hake Fishery Management Committees, together with representatives of the Undersecretariat for Fisheries (SUBPESCA), National Fisheries Service (Sernapesca) and artisanal fishermen.<br><br>To comply with the milestones established by the CAB under this condition, the following action plan will be implemented:<br><br>**By Year 1**, within the framework of the Hoki Fishery Management Committee (HFMC), evidence will be submitted that FIPES will actively work to complete the elaboration of the management plan for this fishery. |

| | |
|---|---|
| | **By Year 2,** evidence will be provided that FIPES will work within the HFMC in order to implement the Management Plan for the fishery.<br><br>**By Year 3,** there will be evidence that FIPES will work with the HFMC as to the exploitation strategy performance can be monitored and evaluated. Also, FIPES will promote that corrective actions can be proposed and implemented to modify the exploitation strategy, if applicable.<br><br>**By Year 4,** evidence will be provided that FIPES will work with the HFMC to prepare a report demonstrating that Hoki stock is above PRI or, if that condition can´t be achieved, there will be evidence that relative fishing mortality of industrial trawl fisheries on hoki, has been maintained at levels that does not hinder the recovery and will be submitted to the CAB. |
| **Consultation on condition** | Hoki Fishery Management Committee (Please see appendix 9.1.4)<br>Subpesca<br>Sernapesca |

### 9.1.4. Support letters for Conditions 1 and 2

#### 9.1.4.1 Condition 1 Letter from the Technical Committee

**ACTA SINTÉTICA**

**COMITÉ DE MANEJO MERLUZA DEL SUR**

**PUERTO AYSÉN, 16 DE ENERO DE 2019**

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En Pto Aysén, con fecha 16 de enero de 2019, siendo las 10:30 horas, se dio inició a la primera Reunión Comité de Manejo de Merluza del Sur del año 2019.
Los objetivos de la reunión fueron entre otros presentar la estrategia de explotación (el nuevo nivel de riesgo), modificación a la cuota 2019, presentación del proyecto FIPA 2017-07 y planificación de reuniones y temáticas para las próximas reuniones de comité del año 2019.

Los acuerdos suscritos por los asistentes del comité fueron los siguientes:

- Enviar las actas extendidas de CM al menos dos días antes de cada sesión.
- Se debe incluir en acta anterior, la exigencia del establecimiento de un procedimiento de manejo de la pesquería.
- Los miembros del CM Sres A Franco y A. Zuleta, debieran presentar en próxima sesión, carta para ser enviada a la SSPA, con las observaciones al sistema de evaluación y que se formalice el procedimiento de manejo de la pesquería.
- Se reitera solicitud del CM, que participe, en próxima sesión, los evaluadores del recurso de IFOP (seguimiento, Ev directa, Ev de stock), con tal de discutir evaluación 2018.
- Asimismo, se solicita a IFOP, la participación permanente en el CM de un profesional y que este Instituto realice en lo posible, difusión a nivel local, (bases), de sus resultados.
- En próximas sesiones de CM, se solicitará a la SSPA una presentación al Departamento de Análisis Sectorial, (DAS), con los proyectos y presupuestos de investigación biológico-pesqueros de la zona sur austral.
- Diseñar como CM, un indicador de rendimiento económico, que permita identificar la eficiencia económica que genera el recurso en la pesquería.
- Modificar en el plan de manejo nivel de riesgo aplicado a la pesquería, actualmente de un 42% a un 50%.
- Cada miembro del CM deberá enviar, a más tardar el 30 de enero, respuesta a propuesta de brechas que enviará el consultor del FIP 2017-07.
- Se sancionó programa de trabajo, incorporando la necesidad de trabajar en cada sesión propuestas para hacer frente a la pesca ilegal.
- Apoyar el desarrollo del plan de acción comprometido en el marco del proceso de certificación de la pesquería industrial bajo los estándares del MSC.
- Próximo año se deberá realizar consulta de la temporalidad de la cuota del sector artesanal. Respecto del presente año, se realizará consulta a la División Jurídica para modificar resolución en un solo período (enero-diciembre), de lo contrario se procederá como ha sido hasta el 2018, mediante carta solicitud de la organización.

**MAURO URBINA VELIZ**
Presidente Comité de Manejo de Merluza del Sur

## 9.1.5. Letters between FIPES and SUBPESCA

FIPES
INDUSTRIAS PESQUERAS DEL SUR AUSTRAL

Santiago, 21 de enero de 2019

Señor
Eduardo Riquelme Portilla
Subsecretario de Pesca y Acuicultura
Bellavista 168, Piso 18
Valparaíso
**PRESENTE**

REF.: Certificación MSC Pesquería industrial de merluza del sur.
- Adjunto -

De nuestra consideración,

Por este intermedio, junto con saludarle, tengo a bien señalar a Ud. que la pesquería industrial de merluza del sur, se encuentra en la fase final del proceso de evaluación bajo el Estándar del Marine Stewardship Council (MSC), que fue requerido por Fipes a la certificadora SAI Global y que se pronunciará, entre otras materias, sobre la sostenibilidad del recurso merluza del sur, el impacto de su pesquería en el medio ambiente y sobre otros recursos, y la efectividad del manejo pesquero.

El proceso, que concluirá en el mes de abril del presente año, requiere que Fipes elabore un Plan de Acción para las condiciones determinadas por la certificadora y que dicho plan cuente con el apoyo de la institucionalidad correspondiente.

En este contexto, Fipes desarrolló el Plan de Acción adjunto, el cual fue expuesto la semana pasada en los comités de manejo de las pesquerías de merluza del sur y merluza de cola y sobre el cual solicito a Ud., si lo tiene a bien, manifestar el compromiso y apoyo institucional con el desarrollo del plan de acción en comento.

Agradeciendo desde ya vuestra disposición, le saluda atentamente,

Valeria Carvajal Oyarzo
Gerente General
FIPES F.G.

Cc.:
- Sr. Mauro Urbina, Pdte. Comité de Manejo Pesquería Merluza del sur
- Sr. Jurgen Bertzhold, Pdte. Comité de Manejo Pesquería Merluza de cola

Subsecretaría de Pesca y Acuicultura

Gobierno de Chile

(D.P.) Carta Nº 350 /

VALPARAÍSO, 2 4 ENE 2019

Señora
Valeria Carvajal O.
Gerente General
FIPES F.G.
**PRESENTE**

Ref.: Carta C.I. Nº 923 de 2019, solicitando pronunciamiento respecto a plan de acción.

De mi consideración,

Por este intermedio y en atención a lo requerido mediante carta individualizada en la REF., tengo a bien informar a Ud., que el Comité de Manejo de la Pesquería de Merluza del Sur, el cual preside el señor Mauro Urbina, acordó apoyar la realización del plan de acción presentado en la pasada sesión del 16 de enero (se adjunta acta sintética), para acceder a la certificación de sustentabilidad bajo el estándar de la Marine Stewardship Council, (MSC), de la pesquería industrial de merluza del sur.

Al respecto, esta Subsecretaría valora la iniciativa llevada adelante por FIPES y espera contribuir positivamente para la obtención de la certificación de la pesquería antes señalada.

REPÚBLICA DE CHILE

**EDUARDO RIQUELME PORTILLA**
Subsecretario de Pesca y Acuicultura

MUV/LFV/arw
Carta Nº 13-2019

## 9.2. Appendix 2. Data from on-board observers program.

Data from on-board observers program carried out by IFOP used to define species in P2 section.

### 9.2.1. UoA 1 – Industrial Trawls

#### 9.2.1.1 Scoring element 1 – Bottom Trawl

| Code | Species-Spanish Common name | Av catch (t)* | % |
|---|---|---|---|
| 4 | Merluza cola | 15119.585 | 38.88718 |
| 3 | Merluza de tres aletas | 9951.9655 | 25.5962 |
| 29 | Cojinoba moteada | 3150.2595 | 8.102386 |
| 2 | Merluza austral | 2212.466 | 5.690405 |
| 41 | Cojinoba | 1551.1 | 3.989389 |
| 5 | Brotula | 988.7925 | 2.543149 |
| 96 | Cojinoba del Sur | 833.13725 | 2.142807 |
| 99 | Otras especies,no identificadas | 704.3113 | 1.81147 |
| 6 | Congrio dorado | 588.0176 | 1.512366 |
| 226 | Cabrilla;chancharro;vieja colorada | 462.5996 | 1.189794 |
| 27 | Reineta | 447.58765 | 1.151184 |
| 7 | Chancharro | 431.6869 | 1.110288 |
| 8 | Cabrilla | 250.71345 | 0.644829 |
| 88 | Tiburon Sardinero | 209.9095 | 0.539882 |
| 59 | Tollo Negro | 200 | 0.514395 |
| 56 | Raya | 151.02222 | 0.388425 |
| 35 | Jibia | 149.217385 | 0.383783 |
| 81 | Raya Volantin | 105.48883 | 0.271315 |
| 106 | Tiburon Marrajo | 100 | 0.257197 |
| 873 | Raya sin identificar | 96.7310265 | 0.24879 |
| 25 | Tollo de cachos | 92.57058 | 0.238089 |
| 165 | Icefish | 91.8 | 0.236107 |
| 58 | Raya de Los Canales | 80.75095 | 0.207689 |
| 796 | Pintaroja del sur | 80.66765 | 0.207475 |
| 24 | Tollo, tollo comun,tollo blanco | 76.83335 | 0.197613 |
| 323 | Tollo Pajarito | 67.9111 | 0.174666 |
| 101 | Lobo marino | 65 | 0.167178 |
| 53 | Sierra | 53.5 | 0.137601 |
| 103 | Raya Espinuda | 49.850705 | 0.128215 |
| 43 | Raya magallanica o austral | 49.28333 | 0.126755 |
| 9 | Calamar rosado | 48.034535 | 0.123544 |
| 16 | Granadero patagonico | 47.991775 | 0.123434 |
| 108 | Granadero Escamoso | 37.823755 | 0.097282 |
| 143 | Ostion del Sur | 37 | 0.095163 |
| 34 | Calamar | 27.3603335 | 0.07037 |
| 18 | pejerrata grande | 25.98125 | 0.066823 |
| 46 | Medusas | 23.7 | 0.060956 |
| 806 | Raya de magallanes | 23 | 0.059155 |
| 11 | Pejegallo | 21.025 | 0.054076 |
| 844 | Raya de manchas blancas | 20.74127 | 0.053346 |
| 55 | Torito de los canales | 20.61646 | 0.053025 |
| 85 | Peje de Humo | 18.75 | 0.048225 |
| 841 | Pequen de hocico blanco | 14.54 | 0.037397 |
| 23 | Pintarroja | 11.81498 | 0.030388 |
| 17 | Granadero chileno | 11.625 | 0.029899 |
| 325 | Chascon; pez chancho | 8.083712 | 0.020791 |
| 38 | Nototenia argentina | 8.00857 | 0.020598 |
| 842 | Pequen espinoso | 7.986111 | 0.02054 |
| 37 | Bacalao | 6.42875 | 0.016535 |
| 40 | Lenguado del sur | 5.660715 | 0.014559 |
| 104 | Raya | 4.95 | 0.012731 |
| 194 | Tollo negro | 4.5625 | 0.011735 |

| Code | Species-Spanish Common name | Av catch (t)* | % |
|---|---|---|---|
| 236 | Black Fish | 4 | 0.010288 |
| 807 | Raya aserrada | 3.9227275 | 0.010089 |
| 884 | Tollo negro raspa | 3.65 | 0.009388 |
| 79 | Raya Torpedo | 3.5 | 0.009002 |
| 12 | Pez coco | 2.084375 | 0.005361 |
| 130 | Congrio Pardo | 1.71 | 0.004398 |
| 845 | Raya gris | 1.7 | 0.004372 |
| 202 | Congrio de profundidad | 1.5833335 | 0.004072 |
| 15 | Peje rata | 1.5 | 0.003858 |
| 19 | Chancho | 1.24416665 | 0.0032 |
| 49 | Centolla | 1.1666665 | 0.003001 |
| 30 | Pulpo | 1 | 0.002572 |
| 69 | lenguado Pintado | 1 | 0.002572 |
| 270 | Unknown | 1 | 0.002572 |
| 39 | lenguado de ojo chico | 0.8833335 | 0.002272 |
| 26 | Jurel | 0.8 | 0.002058 |
| 1 | Merluza comun | 0.5 | 0.001286 |
| 131 | Palometa | 0.5 | 0.001286 |
| 338 | Estrella de profundidad | 0.45525 | 0.001171 |
| 963 | Calderon de aleta corta | 0 | 0 |
| 999 | Viaje sin captura | 0 | 0 |

*Av of total catch reported in logbooks from 2015 to 2016.

### 9.2.1.2 Scoring element 2 – Midwater trawl

| Code | Species-Spanish Common name | Av catch (t)* | % |
|---|---|---|---|
| 4 | Merluza cola | 15845.753 | 57.43907 |
| 3 | Merluza de tres aletas | 5847.9305 | 21.19809 |
| 29 | Cojinoba moteada | 2479.8305 | 8.989106 |
| 2 | Merluza austral | 1610.968 | 5.839578 |
| 5 | Brotula | 612.54715 | 2.220414 |
| 99 | Otras especies,no identificadas | 323.34385 | 1.172085 |
| 6 | Congrio dorado | 311.3827 | 1.128727 |
| 96 | Cojinoba del Sur | 219.59595 | 0.796011 |
| 226 | Cabrilla;chancharro;vieja colorada | 91.43045 | 0.331425 |
| 27 | Reineta | 85.45725 | 0.309773 |
| 7 | Chancharro | 76.46866 | 0.27719 |
| 88 | Tiburon Sardinero | 15.1805 | 0.055028 |
| 8 | Cabrilla | 13.0371 | 0.047258 |
| 81 | Raya Volantin | 11.405855 | 0.041345 |
| 35 | Jibia | 7.5324 | 0.027304 |
| 25 | Tollo de cachos | 7.08105 | 0.025668 |
| 9 | Calamar rosado | 4.678205 | 0.016958 |
| 58 | Raya de Los Canales | 3.24835 | 0.011775 |
| 41 | Cojinoba | 3.1022 | 0.011245 |
| 796 | Pintaroja del sur | 2.918055 | 0.010578 |
| 103 | Raya Espinuda | 2.06475 | 0.007484 |
| 16 | Granadero patagonico | 2.039665 | 0.007394 |
| 873 | Raya sin identificar | 1.93096 | 0.007 |
| 844 | Raya de manchas blancas | 1.3067 | 0.004737 |
| 323 | Tollo Pajarito | 1.1204 | 0.004061 |
| 108 | Granadero Escamoso | 0.88585 | 0.003211 |
| 24 | Tollo, tollo comun,tollo blanco | 0.763 | 0.002766 |
| 23 | Pintarroja | 0.737775 | 0.002674 |
| 56 | Raya | 0.5934 | 0.002151 |
| 43 | Raya magallanica o austral | 0.3517 | 0.001275 |
| 18 | pejerrata grande | 0.2537 | 0.00092 |
| 55 | Torito de los canales | 0.243445 | 0.000882 |
| 59 | Tollo Negro | 0.2 | 0.000725 |
| 165 | Icefish | 0.1836 | 0.000666 |
| 325 | Chascon pez chancho | 0.1699 | 0.000616 |
| 38 | Nototenia argentina | 0.16818 | 0.00061 |
| 53 | Sierra | 0.1605 | 0.000582 |
| 106 | Tiburon Marrajo | 0.15 | 0.000544 |
| 34 | Calamar | 0.110405 | 0.0004 |
| 841 | Pequen de hocico blanco | 0.10905 | 0.000395 |
| 842 | Pequen espinoso | 0.07975 | 0.000289 |
| 46 | Medusas | 0.0711 | 0.000258 |
| 101 | Lobo marino | 0.065 | 0.000236 |
| 11 | Pejegallo | 0.05115 | 0.000185 |
| 17 | Granadero chileno | 0.0465 | 0.000169 |
| 807 | Raya aserrada | 0.04315 | 0.000156 |
| 40 | lenguado del sur | 0.039625 | 0.000144 |
| 85 | Peje de Humo | 0.0375 | 0.000136 |
| 143 | Ostion del Sur | 0.037 | 0.000134 |
| 12 | pez coco | 0.03335 | 0.000121 |
| 806 | Raya de magallanes | 0.023 | 8.34E-05 |
| 37 | Bacalao | 0.020015 | 7.26E-05 |
| 194 | Tollo negro | 0.01825 | 6.62E-05 |
| 130 | Congrio Pardo | 0.017 | 6.2E-05 |
| 202 | Congrio de profundidad | 0.0095 | 3.44E-05 |
| 104 | Raya | 0.00495 | 1.79E-05 |
| 236 | Black Fish | 0.004 | 1.45E-05 |

| Code | Species-Spanish Common name | Av catch (t)* | % |
|---|---|---|---|
| 884 | Tollo negro raspa | 0.00365 | 1.32E-05 |
| 49 | Centolla | 0.0035 | 1.27E-05 |
| 79 | Raya Torpedo | 0.0035 | 1.27E-05 |
| 270 | Codigo Desconocido | 0.003 | 1.09E-05 |
| 39 | lenguado de ojo chico | 0.00265 | 9.61E-06 |
| 19 | Chancho | 0.002465 | 8.94E-06 |
| 338 | Estrella de profundidad | 0.001821 | 6.6E-06 |
| 845 | Raya gris | 0.0017 | 6.16E-06 |
| 26 | Jurel | 0.0016 | 5.8E-06 |
| 15 | Peje rata | 0.0015 | 5.44E-06 |
| 30 | Pulpo | 0.001 | 3.62E-06 |
| 69 | lenguado Pintado | 0.001 | 3.62E-06 |
| 1 | Merluza comun | 0.0005 | 1.81E-06 |
| 131 | Palometa | 0.0005 | 1.81E-06 |
| 963 | Calderon de aleta corta | 0 | 0 |
| 999 | Viaje sin captura | 0 | 0 |

*Av of total catch reported in logbooks from 2015 to 2016.

### 9.2.2. UoA 2 – Longline

| Code | Species-Spanish Common name | Av catch (t)* | % |
|---|---|---|---|
| 2 | Merluza austral | 1200.722308 | 81.91192 |
| 6 | Congrio dorado | 218.3601704 | 14.89628 |
| 27 | Reineta | 11.85407639 | 0.808672 |
| 18 | Granadero de ojos grandes | 8.514573133 | 0.580855 |
| 5 | Bacalao criollo;brotula;renacuajo de mar | 6.184730717 | 0.421915 |
| 37 | Bacalao de profundidad | 5.855140027 | 0.399431 |
| 99 | Varios,otras especies | 5.264356983 | 0.359129 |
| 4 | Merluza de cola | 3.746696575 | 0.255595 |
| 7 | Chancharro de juan fernandez;penegal | 1.828291366 | 0.124724 |
| 29 | Cojinoba azul;cojinoba del sur;moteada | 1.283529764 | 0.087561 |
| 81 | Raya volantin | 0.625671156 | 0.042683 |
| 96 | Austral;cojinoba del sur;ploma | 0.440372845 | 0.030042 |
| 103 | Raya espinosa | 0.388068236 | 0.026474 |
| 41 | Cojinoba violeacea | 0.259428659 | 0.017698 |
| 25 | Tollo de cachos | 0.15763033 | 0.010753 |
| 226 | Cabrilla;chancharro;vieja colorada | 0.12015179 | 0.008197 |
| 91 | Cabrilla rubia;rubio | 0.058973585 | 0.004023 |
| 3 | Merluza de tres aletas | 0.082618135 | 0.005636 |
| 106 | Marrajo dientuso;tiburon marrajo | 0.045745865 | 0.003121 |
| 23 | Pintarroja | 0.033399993 | 0.002279 |
| 8 | Cabrilla;cabrilla española | 0.024912206 | 0.001699 |
| 35 | Jibia | 0.01763696 | 0.001203 |
| 15 | Peje rata | 0.010196368 | 0.000696 |
| 111 | Congrio negro | 0.00771617 | 0.000526 |
| 30 | Sin identificar | 0.000551155 | 3.76E-05 |
| 999 | Viaje sin captura | 0.000551155 | 3.76E-05 |

*Av of total catch reported in logbooks from 2015 to 2016.

### 9.2.3. Species codes used in the logbooks

| Code | Latin name | Spanish Common name |
|---|---|---|
| 1 | *Merluccius gayi gayi* | Merluza común |
| 2 | *Merluccius australis* | Merluza del sur |
| 3 | *Micromesistius australis* | Merluza de tres aletas |
| 4 | *Macruronus magellanicus* | Merluza de cola |
| 5 | *Salilota australis* | Brótula |
| 6 | *Genypterus blacodes* | Congrio dorado |
| 7 | *Helicolenus lengerichi* | Chancharro de juan fernandez |
| 8 | *Sebastes oculatus* | Cabrilla española |
| 9 | *Moroteuthis ingens* | Calamar rosado |
| 10 | *Psammobatis sp* | Raya (Psammobatis) |
| 11 | *Callorhinchus callorynchus* | Pejegallo |
| 12 | *Psychrolutes marmoratus* | Anko |
| 13 | *Retrotapes lenticularis* | Almeja |
| 14 | *Coelorinchus fasciatus* | Peje rata |
| 15 | *Macruroplus sp* | Peje rata |
| 16 | *Coelorinchus fasciatus* | Granadero Patagónico |
| 17 | *Coelorinchus chilensis* | Granadero chileno |
| 18 | *Macrourus holotrachys* | Granadero de ojos grandes |
| 19 | *Congiopodus peruvianus* | Pez chancho |
| 21 | *Cancer coronatus* | Jaiba reina |
| 23 | *Schroederichthys chilensis* | Pintarroja |
| 24 | *Mustelus mento* | Tollo comun |
| 25 | *Squalus acanthias* | Tollo de cachos |
| 26 | *Trachurus murphyi* | Jurel |
| 27 | *Brama australis* | Reineta |
| 28 | *Scomber japonicus* | Caballa |
| 29 | *Seriolella punctata* | Cojinoba moteada |
| 31 | *Stromateus stellatus* | Pampanito |
| 32 | *Beryx splendens* | Alfonsino |
| 33 | *Strangomera bentincki* | Sardina común |
| 34 | *Loligo gahi* | Calamar |
| 35 | *Dosidicus gigas* | Jibia |
| 36 | *Breviraja sp* | Raya (Breviraja) |
| 37 | *Dissostichus eleginoides* | Bacalao de profundidad |
| 38 | *Patagonotothen ramsayi* | Trama |
| 39 | *Paralichthys microps* | Lenguado de ojos chicos |
| 40 | *Achiropsetta tricholepis* | Lenguado del sur |
| 41 | *Seriolella violacea* | Cojinoba violeacea |
| 42 | *Octopus mimus* | Pulpo del norte |
| 43 | *Raja magallanicus* | Raya magallanica |
| 44 | *Polyprion oxygeneios* | Bacalao de J. Fernandez |
| 45 | *Spongia sp* | Esponja |
| 46 | *Cnidaria* | Medusas |
| 47 | *Prolatilus jugularis* | Blanquillo |
| 48 | *Heterocarpus reedi* | Camaron nailon |
| 49 | *Lithodes santolla* | Centolla |
| 50 | *Paralomis granulosa* | Centollón |
| 51 | *Lithodes murrayi* | Centolla espinuda |
| 52 | *Libidoclaea granaria* | Centolla falsa |
| 53 | *Thyrsites atun* | Sierra |
| 54 | *Epigonus crassicaudus* | Besugo |
| 55 | *Cottoperca gobio* | Torito de los canales |
| 56 | *Raja sp* | Raya |
| 57 | *Sin nombre cientifico* | Langostino rayado |
| 58 | *Bathyraja brachyourops* | Raya de los canales |
| 59 | *Etmopterus granulosus* | Tollo negro narigón |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 60 | *Physiculus marginatus* | Brotola de altura |
| 61 | *Apristurus nasutus* | Tiburón narigón |
| 62 | *Athyonidium chilensis* | Pepino de mar |
| 63 | *Hippoglossina macrops* | Lenguado de ojos grandes |
| 64 | *Centroselachus crepidater* | Tiburón negro |
| 65 | *Eleginops maclovinus* | Róbalo |
| 66 | *Cancer edwardsii* | Jaiba marmola |
| 67 | *Squilla sp* | Pateador |
| 68 | *Echinodermata* | Erizo sin identificar |
| 69 | *Mancopsetta maculata* | Lenguado pintado |
| 70 | *Mugiloides chilensis* | Rollizo |
| 71 | *Cilus gilberti* | Corvina |
| 72 | *Gadidae* | Carboneros sin identificar |
| 73 | *Sin nombre cientifico* | Peje fantasma |
| 74 | *Pseudoxenomystax spp* | Congrio austral |
| 75 | *Chimaera fulva* | Quimera negra |
| 76 | *Echinodermata* | Estrella de mar sin identificar |
| 77 | *Cheilodactylus variegatus* | Bilagay |
| 78 | *Cnidaria* | Corales petreos |
| 79 | *Torpedo tremens* | Raya torpedo |
| 80 | *Myclophum sp* | Pez linterna |
| 81 | *Zearaja chilensis* | Raya volantin |
| 82 | *Euphausia superba* | Krill |
| 83 | *Sin nombre cientifico* | Anfipodo rojo |
| 84 | *Alargireus sp.* | Sin nombre comun |
| 85 | *Hexanchus griseus* | Peje humo |
| 86 | *Maurolicus sp* | Sardina fosforescente |
| 88 | *Lamna nasus* | Tiburon sardinero |
| 89 | *Renilla spp* | Renila |
| 90 | *Sin nombre cientifico* | Latigo |
| 91 | *Emmelichthys sp* | Cabrilla rubia |
| 92 | *Paralichthys adspersus* | Lenguado fino |
| 93 | *Sprattus fuegensis* | Sardina austral |
| 94 | *Seriolella porosa* | Cojinoba porosa |
| 95 | *Campylonotus sp* | Camaron del sur |
| 96 | *Seriolella caerulea* | Cojinoba del sur |
| 97 | *Pseudopentaceros richardsoni* | Espinudo |
| 98 | *Alopias vulpinus* | Tiburon pejezorro |
| 99 | *NI* | Varios |
| 100 | *Navodon paschalis* | Cochinilla |
| 101 | *Otaria flavescens* | Lobo marino comun |
| 102 | *Tursiops sp* | Tonina |
| 103 | *Dipturus trachyderma* | Raya espinosa |
| 104 | *Bathyraja scaphiops* | Raya |
| 105 | *Prionace glauca* | Tiburon azulejo |
| 106 | *Isurus oxyrhinchus glaucus* | Marrajo |
| 107 | *Echinodermata* | Estrella fragil de mar |
| 108 | *Macrourus carinatus* | Granadero escamoso |
| 109 | *Trachipterus fukuzakii* | Pez bandera |
| 110 | *Genypterus chilensis* | Congrio colorado |
| 111 | *Genypterus maculatus* | Congrio negro |
| 112 | *Normanichthys crockeri* | Bacaladillo |
| 113 | *Ethmidium maculatum* | Machuelo |
| 114 | *Engraulis ringens* | Anchoveta |
| 115 | *Sardinops sagax* | Sardina española |
| 116 | *Scomberesox saurus* | Agujilla |
| 117 | *Odontesthes regia* | Pejerrey de mar |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 118 | *Paralabrax humeralis* | Cabrilla común |
| 119 | *Seriola mazatlana* | Vidriola |
| 120 | *Coryphaena hippurus* | Dorado de altura |
| 121 | *Isacia conceptionis* | Cabinza |
| 122 | *Cynoscion analis* | Ayanque |
| 123 | *Menticirrhus ophicephalus* | Pichiguen |
| 124 | *Sciaena deliciosa* | Corvinilla |
| 125 | *Mugil cephalus* | Lisa |
| 127 | *Sarda chiliensis chiliensis* | Bonito |
| 128 | *Thunnus alalunga* | Atun aleta larga |
| 129 | *Xiphias gladius* | Pez Espada |
| 130 | *Pseudoxenomystax albescens* | Congrio pardo verdadero |
| 131 | *Nemadactylus gayi* | Breca |
| 132 | *Haliporoides diomedeae* | Gamba |
| 133 | *Rhynchocinetes typus* | Camaron de roca |
| 134 | *Jasus frontalis* | Langosta de Juan Fernandez |
| 135 | *Pleuroncodes monodon* | Langostino colorado |
| 136 | *Cervimunida johni* | Langostino amarillo |
| 137 | *Cancer setosus* | Jaiba peluda |
| 138 | *Homalaspis plana* | Jaiba mora |
| 139 | *Austromegabalanus psittacus* | Picoroco |
| 140 | *Loxechinus albus* | Erizo rojo |
| 141 | *Ostrea chilensis* | Ostra chilena |
| 142 | *Ensis macha* | Huepo |
| 143 | *Chlamys patagonica* | Ostion del sur |
| 144 | *Robsonella fontaniana* | Pulpito |
| 146 | *Thais chocolata* | Caracol locate |
| 147 | *Rapana (chorus) giganteus* | Caracol trumulco |
| 148 | *Concholepas concholepas* | Loco |
| 149 | *Aulacomya ater* | Cholga |
| 150 | *Choromytilus chorus* | Choro zapato |
| 151 | *Mytilus chilensis* | Chorito |
| 152 | *Argopecten purpuratus* | Ostion del norte |
| 153 | *Protothaca thaca* | Almeja taca |
| 154 | *Venus antiqua* | Almeja |
| 155 | *Retrotapes exalbidus* | Almeja |
| 156 | *Retrotapes rufa* | Almeja blanca |
| 157 | *Tagelus dombeii* | Navajuela |
| 158 | *Mesodesma donacium* | Macha |
| 159 | *Pyura chilensis* | Piure |
| 160 | *Kiphosus analogus* | Pez acha |
| 161 | *Pimelometopon maculatus* | Pejeperro |
| 162 | *Panulirus pascuensis* | Langosta de I.de Pascua |
| 163 | *Graus nigra* | Vieja |
| 164 | *Projasus bahamondei* | Langosta enana |
| 165 | *Chaenocephalus aceratus* | Draco antártico |
| 166 | *Champsocephalus gunnari* | Draco rayado |
| 167 | *Chionodraco rastrospinosus* | Draco ocelado |
| 168 | *Chaenodraco wilsoni* | Draco espinudo |
| 169 | *Channichthys rhinoceratus* | Draco rinoceronte |
| 170 | *Anchoa nasus* | Anchoveta blanca |
| 171 | *Etrumeus teres* | Sardina redonda |
| 172 | *Pseudochaenichthys georgianus* | Draco cocodrilo |
| 173 | *Sharks* | Cazones y tollos sin identificar |
| 174 | *Channichthyidae* | Dracos nep |
| 175 | *Aphos porosus* | Bagre de mar |
| 176 | *Phocoena sp* | Tonina |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 177 | *Chromis crusma* | Castañeta comun |
| 178 | *Turtle NI* | Tortuga sin identificar |
| 179 | *Sula variegata* | Piquero |
| 180 | *Sula leucogaster* | Piquero cafe |
| 181 | *Sula nebouxii* | Piquero de patas azules |
| 182 | *Larosterna inca* | Gaviotin monja |
| 183 | *Oceanites gracili* | Golondrina de mar chica |
| 184 | *Oceanodroma tethys* | Golondrina de mar peruana |
| 185 | *Oceanodrama hornby i* | Golondrina de mar de collar |
| 186 | *Sterna hirundinacea* | Gaviotin sudamericano |
| 187 | *Phalacrocorax bougainvillii* | Guanay |
| 188 | *Phalacrocorax brasilianus* | Pato yeco |
| 189 | *Phalacrocorax gaimardi* | Pato lile |
| 190 | *Vinciguerria sp* | Pez linterna |
| 191 | *Squatina californica* | Pez angel |
| 192 | *Hemilutjanus macrophthalmus* | Apañado |
| 193 | *Anisotremus scapularis* | Sargo |
| 194 | *Centroscyllium nigrum* | Tollo negro peine |
| 195 | *Lepidopus caudatus* | Basurero negro |
| 196 | *Neocyttus rhomboidalis* | Spiky oreo |
| 197 | *Cnidaria* | Actinias |
| 198 | *Chauliodus vasnetzovi* | Quecho |
| 199 | *Apristurus brunneus* | Pejegato de profundidad |
| 200 | *Polyprion sp* | Mero |
| 201 | *Mora moro* | Fofo |
| 202 | *Bassanago nielseni* | Congrio de profundidad |
| 203 | *Gadella obscurus* | Brotulín |
| 204 | *Caelorinchus cf. Kaiyoman* | Granadero campana |
| 205 | *Nezumia pulchella* | Granadero pulgar |
| 206 | *Centroscymnus cryptacanthus* | Pailona ñata |
| 207 | *Squalus mitsukurii* | Tiburon galludo |
| 209 | *Bajacalifornia megalops* | Talisman de ojos grandes |
| 210 | *NI* | Alepocefalidos sin identificar |
| 211 | *Pentaceros sp* | Cabeza de armadura |
| 213 | *Notacanthus sexspinis* | Anguila espinosa |
| 215 | *Argyropelecus olfersii* | Hachita |
| 216 | *Aristostomias lunifer* | Dragón barbudo |
| 217 | *Idiacanthus sp* | Dragón negro |
| 218 | *Magnisudis atlantica* | Barrancudina |
| 219 | *Trachipterus sp.* | Pez cinta |
| 220 | *Tripterophycis svetovidovi* | Cola plana |
| 221 | *Lepidion ensiferus* | Bacalao de la patagonia |
| 222 | *Halargyreus johnsonii* | Bacalao esbelto |
| 223 | *Monocentris reedi* | Cachito |
| 224 | *Zenopsis conchifer* | San pedro plateado |
| 225 | *Pseudocyttus maculatus* | Smooth oreo |
| 226 | *Sebastes capensis* | Cabrilla |
| 227 | *Pterygotrigla picta* | Diabillo |
| 228 | *Diretmoides parini* | Aleta espinosa |
| 229 | *Epigonus robustus* | Cardenal robusto |
| 230 | *Tegula atra* | Caracol negro |
| 231 | *Epigonus denticulatus* | Cardenal lapicero |
| 232 | *Emmelichthys nitidus cyanescens* | Mugil |
| 233 | *Melanostigma gelatinosum* | Willy |
| 234 | *Ruvettus pretiosus* | Mantecoso |
| 235 | *Rexea antefurcata* | Escolar de aleta larga |
| 236 | *Centrolophus niger* | Blackfish |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 237 | *Nemichthys scolopaceus* | Anguila agachadiza delgada |
| 238 | *Paranthias colonus* | Pez frances del pacifico |
| 240 | *Enteroctopus megalocyathus* | Pulpo del sur |
| 241 | *Familia caristiidae* | Peces con melena |
| 242 | *Eptatretus polytrema* | Anguila babosa |
| 243 | *Ophichthus sp* | Anguila morena |
| 244 | *Caelorinchus aconcagua* | Granadero aconcagua |
| 245 | *Nansenia sp* | Nansenido |
| 246 | *NI* | Fume |
| 247 | *Larus belcheri* | Gaviota peruana |
| 248 | *Larus atricilla* | Gaviota reidora |
| 249 | *Stercorarius pomarinus* | Salteador pomarino |
| 250 | *Stercorarius parasiticus* | Salteador chico |
| 251 | *Sterna elegans* | Gaviotin elegante |
| 252 | *Sternula lorata* | Gaviotin chico |
| 253 | *Phaethon rubricauda* | Ave del tropico de cola roja |
| 254 | *Cinclodes nigrofumosus* | Churrete costero |
| 255 | *Haematopus ater* | Pilpilén negro |
| 256 | *Creagrus furcatus* | Gaviota de las galápagos |
| 257 | *Phocoena spinipinnis* | Marsopa espinosa |
| 258 | *Steno bredanensis* | Delfin de dientes rugosos |
| 259 | *Lagenorhynchus cruciger* | Delfin cruzado |
| 260 | *Stenella attenuata* | Estenela tropical moteada |
| 261 | *Stenella longirostris* | Estenela giradora de rostro largo |
| 262 | *Cephalorhynchus eutropia* | Delfin chileno |
| 263 | *Cephalorhynchus commersoni i* | Tonina overa |
| 264 | *Feresa attenuata* | Orca pigmea |
| 265 | *Bassanago* | Lusiato |
| 266 | *Leptonotus blainvilleanus* | Agujilla de mar común |
| 267 | *Nothogenia fastigiata* | Lluyo |
| 300 | *Decapterus macrosoma* | Jurel ecuatoriano |
| 302 | *Pendiente* | Plomizo |
| 303 | *Glyphocrangon alata* | Camarón acorazado |
| 304 | *Campylonotus semistriatus* | Camaron navaja |
| 306 | *Tawera gayi* | Juliana |
| 307 | *Acanthopleura echinata* | Chiton espinudo |
| 308 | *Macrocystis sp* | Huiro flotador sin especificar |
| 309 | *Macrocystis integrifolia* | Huiro canutillo |
| 310 | *Lessonia sp* | Huiro sin especificar |
| 311 | *Lessonia trabeculata* | Huiro palo |
| 312 | *Salmo salar* | Salmon del atlantico |
| 313 | *Paraxanthus barbiger* | Pancora |
| 314 | *Paralomis otsuae* | Centolla de profundidad |
| 315 | *Crustacea* | Langostinos sin especificar |
| 316 | *Sinum cymba* | Oreja de mar |
| 317 | *Homolodromia robertsi* | Cangrejo blanco |
| 318 | *Stereomastis shumi* | Langosta polichelida |
| 319 | *Merluccius hubbsi* | Merluza del atlantico |
| 320 | *Sardine spp.* | Sardinas sin identificar |
| 321 | *Xenomystax atrarius* | Wlaky |
| 322 | *Guttigadus kongi* | Gutigaidido |
| 323 | *Deania calcea* | Tollo pajarito |
| 324 | *Bythaelurus canescens* | Tollo gato |
| 325 | *Psychrolutes sio* | Pez chancho |
| 326 | *Hydrolagus macrophthalmus* | Quimera de ojo grande |
| 327 | *Paracrangon areolata* | Paracrangon |
| 328 | *Nephropsis occidentalis* | Pacific lobsterette |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 329 | *Alopias superciliosus* | Tiburon pejezorro |
| 330 | *Pasiphaea acutifrons* | Camaron vidrio |
| 331 | *Lithodes turkayi* | Centolla ( juvenil ) |
| 332 | *Munidopsisspp* | Munidopsido |
| 333 | *Discopyge tschudii* | Torpedo |
| 334 | *Antimora rostrata* | Antimora |
| 335 | *Bathybembix humboldti* | Caracol de humbold |
| 336 | *Bathybembix macdonaldi* | Caracol macdonald |
| 337 | *Aerothyris venosa* | Braquiopodo |
| 338 | *Hippasteria hyadesi* | Estrella de profundidad |
| 339 | *Myxoderma qawashqari* | Estrella flaca |
| 340 | *Sterechinus agassizi* | Erizo de profundidad |
| 341 | *Colossendeissp* | Araña de mar |
| 342 | *Uroptychus milnedwardsi* | Langostino de patas largas |
| 343 | *Pagurus imarpe* | Paguro de profundidad |
| 347 | *Cubiceps caeruleus* | Pez medusa |
| 348 | *Cosmasterias lurida* | Estrella de mar morada |
| 363 | *Myliobatis peruvianus* | Raya aguila |
| 407 | *Durvillaea antarctica* | Cochayuyo |
| 408 | *Luvarus imperialis* | Emperador |
| 410 | *Paralonchurus peruanus* | Rococo |
| 411 | *Thalassarche cauta* | Albatros de frente blanca |
| 500 | *Hoplostethus atlanticus* | Orange roughy |
| 501 | *Gari solida* | Culengue |
| 502 | *Semele solida* | Tumbao |
| 503 | *Notophycis marginata* | Carbonero |
| 504 | *Illex argentinus* | Pota |
| 505 | *Patagonotothen ramsayi* | Marujito |
| 510 | *Mulinia sp* | Almeja traquilla |
| 511 | *Taliepus marginatus* | Jaiba patuda |
| 512 | *Cancer porteri* | Jaiba limón |
| 515 | *Taliepus dentatus* | Panchote |
| 516 | *Taliepus spp* | Cangrejo taliepus sin especificar |
| 519 | *Larus maculipennis* | Gaviota cahuil |
| 520 | *Larus pipixcan* | Gaviota de franklin |
| 521 | *Larus modestus* | Gaviota garuma |
| 522 | *Oncorhynchus kisutch* | Salmon coho |
| 543 | *Pleuroncodes monodon pelagicus* | Langostino colorado enano |
| 544 | *Benthoctopus longibrachus* | Pulpo de brazos largos |
| 545 | *Opisthoteuthis sp* | Pulpo opistoteudido |
| 546 | *Stichaster striatus* | Estrella de mar naranja |
| 550 | *Mursia sp.* | Jaiba sin especificar |
| 561 | *Mursia gaudichaudi* | Jaiba paco |
| 575 | *Sicyases sanguineus* | Peje sapo |
| 615 | *Fissurella bridgesi* | Lapa de arena |
| 616 | *Fissurella maxima* | Lapa reina |
| 617 | *Fissurella pulchra* | Lapa rosada |
| 625 | *Fissurella costata* | Lapa costata |
| 626 | *Hoplostethus mento* | Pez guardaña |
| 634 | *Oceanites oceanicus* | Golondrina de mar |
| 635 | *Fissurella crassa* | Lapa marisco |
| 645 | *Fisurella limbata* | Lapa blanquilla |
| 655 | *Fissurella latimarginata* | Lapa negra |
| 665 | *Fissurella cumingi* | Lapa frutilla |
| 666 | *Fissurella picta* | Lapa picta |
| 675 | *Fissurella spp* | Lapa sin especificar |
| 676 | *Fissurella nigra* | Lapa nigra |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 710 | *Xanthochorus cassidiformis* | Caracol rubio |
| 730 | *Argobuccinum argus* | Caracol picuyo |
| 731 | *Odontocymbiola magellanica* | Caracol picuyo |
| 732 | *Adelomelon ancilla* | Caracol piquilhue |
| 740 | *Trophonsp* | Caracol trophon |
| 741 | | Caracol sin identificar |
| 742 | *Nacellasp* | Maucho |
| 743 | *Balaenoptera acutorostrata* | Ballena minke |
| 744 | *Caranx lugubris* | Jurel negro |
| 745 | *Aeneator loisae* | Caracol de profundidad |
| 746 | *Pelecanus occidentalis* | Pelicano pardo |
| 747 | *Hygrosoma hoplacantha* | Erizo boina |
| 779 | *Gelidium sp* | Chascón |
| 780 | *Trochita trochiformis* | Chocha |
| 781 | *Gracilaria sp* | Pelillo |
| 782 | *Iridaea sp* | Luga-luga |
| 783 | *Gigartina chamissoi* | Chicoria de mar |
| 784 | *Sarcothalia crispata* | Luga negra |
| 785 | *Chiton sp* | Chiton |
| 786 | *Gigartina skottsbergii* | Luga roja |
| 787 | *Mazzaella laminarioides* | Cuchara |
| 788 | *Chondracanthus chamissoi chauvini* | Chicoria |
| 792 | *Macrocystis pyrifera* | Huiro |
| 793 | *Sp* | Alga sin especificar |
| 795 | *Ovalipes trimaculatus* | Jaiba remadora |
| 796 | *Schroederichthys bivius* | Pintaroja del sur |
| 797 | *Rhinobatos planiceps* | Pez guitarra |
| 798 | *Carcharhinus brachyurus* | Tiburon cobrizo |
| 799 | *Isurus paucus* | Marrajo de aletas largas |
| 803 | *Notorynchus cepedianus* | Tollo pinto |
| 804 | *Amblyraja frerichsi* | Raya de hondura |
| 805 | *Sp* | Pancora sin identificar |
| 806 | *Bathyraja magellanica* | Raya de magallanes |
| 807 | *Bathyraja multispinis* | Raya aserrada |
| 808 | *Histioteuthis oceani* | Calamar centro sur |
| 834 | *Crusma chromis* | Castañeta |
| 835 | *Fregetta grallaria* | Golondrina de mar de vientre blanco |
| 836 | *Oceanodroma markhami* | Golondrina de mar negra |
| 841 | *Psammobatis rudis* | Pequen de hocico blanco |
| 842 | *Psammobatis scobina* | Pequen espinoso |
| 843 | *Sympterygia lima* | Raya costera |
| 844 | *Bathyraja albomaculata* | Raya de manchas blancas |
| 845 | *Bathyraja griseocauda* | Raya gris |
| 846 | *Gurgesiella furvescens* | Raya mariposa |
| 847 | *Rajella nigerrima* | Raya negra |
| 848 | *Bathyraja peruana* | Raya peruana |
| 849 | *Aculeola nigra* | Tollo negro |
| 850 | *Rajella sadowski* | Raya morada |
| 851 | *Phoebetria palpebrata* | Albatros oscuro de manto blanco |
| 852 | *Puffinus gravis* | Fardela capirotada |
| 853 | *Pterodroma lessoni* | Fardela de frente blanca |
| 854 | *Larus dominicanus* | Gaviota dominicana |
| 855 | *Fregetta tropica* | Golondrina de mar de vientre negro |
| 856 | *Garrodia nereis* | Golondrina de mar subantártica |
| 857 | *Pelecanus thagus* | Pelicano peruano |
| 858 | *Pelecanoides urinatrix* | Yunco de los canales |
| 859 | *Pelecanoides magellani* | Yunco de magallanes |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 860 | *Spheniscus humboldti* | Pingüino de humboldt |
| 861 | *Spheniscus magellanicus* | Pingüino de magallanes |
| 863 | *Pterodroma defilippiana* | Fardela blanca de mas a tierra |
| 865 | *Aplodactylus puntactus* | Jerguilla |
| 869 | *Lophorochinia parabranchia* | Jaiba mochilera |
| 870 | *Lophorochinia sp.* | Jaiba sin identificar |
| 871 | *Sympterigia sp.* | Raja (sympterigia) |
| 872 | *Bathyraja sp* | Raja (bathyraja) |
| 873 | *Raja s.* | Raja sin identificar |
| 874 | *Pterygosquilla armata* | Zapateador |
| 875 | *Phaethon lepturus* | Ave del tropico de cola blanca |
| 876 | *Pelecanoides garnotii* | Pato yunco |
| 877 | *Stercorariusmaccormicki* | Skua polar del sur |
| 878 | *Stercorarius chilensis* | Skua chileno |
| 879 | *Sula dactylatra* | Piquero blanco |
| 880 | *Allothunnus fallai* | Atun lanzon |
| 881 | *Taractes rubescens* | Reineton |
| 882 | *Nesiarchus nasutus* | Escolar narigudo |
| 883 | *NI* | Pucho |
| 884 | *Centroscyllium granulatum* | Tollo negro raspa |
| 885 | *Munida subrugosa* | Langostino de los canales |
| 888 | *Ifoping ifopero* | |
| 900 | *NI* | Almeja sin especificar |
| 901 | *Chlamys vitrea* | Ostion del sur |
| 902 | *Thunnus albacares* | Atun aleta amarilla |
| 903 | *Gasterochisma melampus* | Atun chauchera |
| 904 | *Katsuwonus pelamis* | Atun listado |
| 905 | *Lepidocybium flavobrunneum* | Atun negro |
| 906 | *Ruvettus pretiosus* | Atun negro escofina |
| 907 | *Thunnus obesus* | Atun ojo grande |
| 908 | *Thunnus spp* | Atunes sin clasificar |
| 909 | *Gempylus serpens* | Barracuda chica |
| 910 | *Alepisaurus ferox* | Barracuda grande |
| 911 | *Makaira indica* | Marlin negro |
| 912 | *Tetrapturus audax* | Marlin rayado |
| 913 | *Tetrapturussp.* | Marlin sin identificar |
| 914 | *Tetrapturus angustirostris* | Marlin trompa corta |
| 915 | *Mola mola* | Pez luna |
| 916 | *Lampris guttatus* | Pez sol |
| 917 | *Istiophorus platypterus* | Pez vela del pacifico |
| 918 | *Pteroplatytrygon violacea* | Raya violeta |
| 919 | *Acanthocybium solandri* | Sierra altamar (atun peto) |
| 921 | *Pseudocarcharias kamoharai* | Tiburon cocodrilo |
| 922 | *Isistius brasiliensis* | Tiburon galletero |
| 923 | *Carcharhinus galapagensis* | Tiburon jaqueton |
| 924 | *Sphyrna zygaena* | Tiburon martillo |
| 925 | *Sharks* | Tiburones sin identificar |
| 926 | *Balaenoptera musculus* | Ballena azul |
| 927 | *Caretta caretta* | Tortuga cabezona |
| 928 | *Dermochelys coriacea* | Tortuga laud |
| 929 | *Lepidochelys olivacea* | Tortuga olivacea |
| 930 | *Chelonia mydas* | Tortuga verde |
| 931 | *Thalassarche bulleri* | Albatros buller |
| 932 | *Thalassarche chrysostoma* | Albatros de cabeza gris |
| 933 | *Thalassarche melanophris* | Albatros de ceja negra |
| 934 | *Thalassarche eremita* | Albatros de las islas Chatham |
| 935 | *Thalassarche salvini* | Albatros de salvin |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 936 | *Diomedea exulans* | Albatros errante |
| 937 | *Diomedea epomophora* | Albatros real |
| 938 | *Puffinus creatopus* | Fardela blanca |
| 939 | *Pterodroma externa* | Fardela blanca de J. Fernandez |
| 940 | *Pterodroma cooki* | Fardela blanca de cook |
| 941 | *Balaenoptera edeni* | Ballena de bryde |
| 942 | *Puffinus bulleri* | Fardela de dorso gris |
| 943 | *Pterodroma longirostris* | Fardela de mas afuera |
| 944 | *Procellaria cinerea* | Fardela gris |
| 945 | *Puffinus griseus* | Fardela negra |
| 946 | *Pterodroma neglecta* | Fardela negra de Juan Fernandez |
| 947 | *Puffinus carneipes* | Fardela negra de patas palidas |
| 948 | *Oceanites gracilis* | Golondrina de mar |
| 949 | *Halobaena caerulea* | Petrel azulado |
| 950 | *Procellaria westlandica* | Petrel de westland |
| 951 | *Macronectes giganteus* | Petrel gigante antartico |
| 952 | *Macronectes halli* | Petrel gigante subantartico |
| 953 | *Daption capense* | Petrel moteado |
| 954 | *Procellaria aequinoctialis* | Petrel negro |
| 955 | *Pachyptila sp* | Petrel paloma |
| 956 | *Fulmarus glacialoides* | Petrel plateado |
| 957 | *Balaenoptera physalus* | Ballena fin |
| 958 | *Eubalaena australis* | Ballena franca austral |
| 959 | *Megaptera novaeangliae* | Ballena jorobada |
| 960 | *Balaenoptera bonaerensis* | Ballena minke |
| 961 | *Balaenoptera borealis* | Ballena sei |
| 962 | *Physeter catodon* | Cachalote |
| 963 | *Globicephala macrorhynchus* | Calderon de aleta corta |
| 964 | *Globicephala melas* | Calderon negro |
| 965 | *Lagenorhynchus australis* | Delfin austral |
| 966 | *Delphinus delphis* | Delfin comun |
| 967 | *Delphinus capensis* | Delfin comun de rostro largo |
| 968 | *Grampus griseus* | Delfin de risso |
| 969 | *Lissodelphis peronii* | Delfin liso |
| 970 | *Lagenorhynchus obscurus* | Delfin obscuro |
| 971 | *Arctocephalus australis* | Lobo fino austral |
| 972 | *Arctocephalus philippii* | Lobo fino de Juan Fernandez |
| 973 | *Orcinus orca* | Orca |
| 974 | *Pseudorca crassidens* | Orca falsa |
| 975 | *Tursiops truncatus* | Delfin boca de botella |
| 976 | *Lessonia nigrescens* | Huiro negro |
| 977 | *Chondracanthus chamissoi* | Pelo |
| 979 | *Alepocephalus sp* | Barba negra |
| 980 | *Munidopsis barrerai* | Langostino de profundidad |
| 981 | *Crustacea* | Crustaceos sin identificar |
| 982 | *Hippocampus sp* | Caballo de mar |
| 984 | *Coelorinchus fasciatus* | Granadero chico |
| 985 | *Coelorinchus innotabilis* | Cola de latigo notable |
| 986 | *Coryphaenoides ariommus* | Granadero de humboldt |
| 987 | *Coryphaenoides armatus* | Granadero abisal |
| 988 | *Coryphaenoides delsolari* | Granadero pichirata |
| 990 | *Discard* | Desechos de pescado |
| 991 | *Nezumia convergens* | Granadero peruviano |
| 992 | *Nezumia pudens* | Granadero atacama |
| 993 | *Nezumia loricata* | Granadero loro |
| 994 | *Nezumia stegidolepis* | Granadero california |
| 995 | *Lucigadus nigromaculatus* | Granadero negro manchado |

| Code | Latin name | Spanish Common name |
|---|---|---|
| 996 | *Trachyrincus helolepis* | Granadero cabeza de armadura |
| 997 | *Trachyrincus villegai* | Granadero gris |
| 998 | *Trachyrincussp.* | Granadero sin identificar |

SAI GLOBAL

# 9.3. Appendix 3 Peer Review Reports

## 9.3.1. Peer Reviewer A

### 9.3.1.1 General Comments

| Fishery | Assess-ment Start Year | Peer Reviewer (A/B/C) | Question | Yes/No | Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables. | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) |
|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR A | Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report? | Yes | There are two UoAs and numerous elements. The P1 and P3 scoring is well articulated and scores supported to meet the MSC standard in most respects excpet where I have raised issues or commented. For P2, broadly the scoring and rationale is adequate. I have raised concerns in some PIs that the articulation needs improvement. This is a small but complex fishery - the assessment team have done a good job identifying the the primary and secondary species between three gear types but improvements are needed in places to demonstrate consistency with the MSC standard. | Comments by reviewer A are duly noted by the team. The revised version will articulate the findings to be more focused on the requirments of the MSC 2.0 standard |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR A | Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses] | Yes | There are two conditons - for 1.1.1 and 2.2.1 both are apporpriately drafted to meet SG80 outcome within certification period. | No response needed |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR A | Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses] | Yes | Client action plan is repsonsive and has the support of the appropriate Chilean ministries and research organisations | No response needed |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR A | Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities? | No | NA | No response needed |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR A | Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) | N/A | | No response needed |

  

## 9.3.1.2 Performance Indicator(PI) Comments

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fishery | Assess-ment Start Year | Insert extra rows for P1 PIs if separate scores given for different UoA stocks | Insert extra rows for P2 PIs if separate scores given for different UoA gear types | Peer Reviewer (A/B/C) | 3PE name | Performance Indicator (PI) | Has all available relevant information been used to score this PI? | Does the information and/or rationale used to score this PI support the given score? | Will the condition(s) raised improve the fishery's performance to the SG80 level? | PRs should provide support for their answers in the left three columns by referring to specific scoring issues and/or scoring elements, and any relevant documentation as appropriate. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells using the Alt-return key combination.<br><br>Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores). | CABs should summarise their response to the Peer Reviewer comments in the CAB Response Code column and provide justification for their response in this column.<br><br>Where multiple comments are raised by Peer Reviewers with more than one row for a single PI, the CAB response should relate to each of the specific issues raised in each row.<br><br>CAB responses should include details of where different changes have been made in the report (which section #, table etc). | See codes page for response options |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 1.1.1 | Yes | Yes | Yes | Score 70: Trawl : The score is appropriate and rationale good. This raises a conditon (see later comments). Applies to both trawl and longline (UoAs) dealing with singke stock. Noted also inclusion of MW trawl which does not change the interpretation related to the stock impacted | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 1.1.1 | Yes | Yes | Yes | Score 70 Longline : The score is appropriate and rationale good | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 1.1.2 | Yes | Yes | NA | Score 80 Trawl: The score is approriate and the rationale good. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 1.1.2 | Yes | Yes | NA | Score 80 : The score is approriate and the rationale good. Applies to both trawl and longline dealing with single stock | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | **Trawl** | **PR A** | | **1.2.1** | **No (scoring implications unknown)** | **No (no score change expected)** | **NA** | **Score 95 : Trawl - The score is approriate and the rationale good. Applies to both trawl and longline dealing with single stock. Reference is made to sea-based sampling related to use of observers. Overall it is assumed there is 25% coverage but later in the report different levels of coverage are stated 90 / 95 % but nowhere in the report is the extent of observer coverage shown (excpet for in the scoring rationale later in P2). In P2 there is also reference made to Observer coverage and these data are used to determine primary, secondary levels of bycatch. It is likely that observer coverage on longline differs from that of trawl - the report, either in P1 or best in P2 should respond to this and articulate the actual observer sampling levels, the number of observer reports used as reference as this goes to the veracity of information used.Also relating to SIa and fishing mortality, the assessment and information provided would seem sound. However it is difficult to reconcile that a high discard of 7016 t was reported in 2013 and in 2016 it was 5472 t. The reported TAC in 2016 was 10 000 t so in effect mortality based on discards alone is at least 50% of the TAC. This is probably adequately covered in the stock assessment and discard mortality reduced by increased levels of monitoring. I would suggest that some articulation in the rationale and the background material related to the HCR could be strengthened.** | **Paragraph was modified to The *estimates of total catch as well as the retained and discards proportions are obtained by statistical models and in the case of Austral hake, these estimates are very informative. For example, for years 2015 and 2016 a total 325 t and 79 t of Austral hake was discarded accounting for 3.9% and 0.7 % of the total volume of the catch respectively (Quiroz., 2017).*** | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | **Longline** | **PR A** | | **1.2.1** | **Yes** | **No (no score change expected)** | **NA** | **Score 95 : Longline The score is approriate and the rationale good. Applies to both trawl and longline dealing with single stock. See also comment above re veracity of sea-based sampling to justify implementation of harvest strategy.** | | |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Trawl | PR A | | **1.2.2** | **Yes** | **Yes** | **NA** | **Score 80: Trawl - The score is appropriate and the rationale provided good.** | | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Longline | PR A | | **1.2.2** | **Yes** | **Yes** | **NA** | **Score 80 : Longline - The score is appropriate and the rationale provided good** | | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Trawl | PR A | | **1.2.3** | **Yes** | **Yes** | **NA** | **Score 80 : Trawl - Score is appropriate and the rationale provided sound. Note comment in 1.2.1** | | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Longline | PR A | | **1.2.3** | **Yes** | **Yes** | **NA** | **Score 80 : Longline - The score is appropriate and the rationale provided good** | | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Trawl | PR A | | **1.2.4** | **Yes** | **Yes** | **NA** | **Score 100 : Trawl - The score is appropriate and the rational sound. I have not been able to verify the references** | | **Accepted (no score change)** |
| **Chile Austral hake (Merluccius australis) industrial trawl and longline fishery** | 2017 | Chile Austral hake | Longline | PR A | | **1.2.4** | **Yes** | **Yes** | **NA** | **Score 100 : Longline - The score is appropriate and the rational sound. I have not been able to verify the references** | | **Accepted (no score change)** |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.1.1 | No (scoring implications unknown) | No (scoring implications unknown) | Yes | Score 75: Trawl (bottom and midwater) - Primary species - 3 elements (species as main) and two gears under Trawl. There are two sets of data available - the one which the assserors use is the log book data and what I assume is landed (reported) catch. Appendix 2 is Observer data. The rationale for the former data set being used preferentially needs to be explained. Also the veracity of the Observer data needs clarity - ref. is made to Bernal et al 2017. The observer data suggest there is another main primary species - seriola punctata or C. moteada (which is classified as main secondary in the scoring - see also para 9.1.2 which contradicts the classification by the assessment team i.e. is it main primary or was it classified a main secondary due to poor infirmation and PSA applied). Based on the three elements included for both gears the score is correctly given as 75. Inclusion of another element is unlikely to materially affect the outcome as the aggregate score will be lower but should be included.The inclusion of primary minor species (cusk eeel and brama) is consistent with MSC defined proportions. Also noting that for trawl, the UoA is a small proportion of the catch (5.7% reported by observers) - so the target species is not M australis - it is Hoki for both midwater and bottom trawl (vessels carry both gears and switch gear). | The assessment team has included a statement following the PR comment to clarify the source of the observed data and the data used to classified the species. *The species* Silver warehou or *C. moteada* cannot be defined as primary spcies because does not comply with the MSC requirements. There are no reference points and/or management tools defined to manage the stock as per FCR v2.0 SA3.1.3. For that reason, by following the FCR, it was classified as secondary. The lack of information to evaluate the species as a main secondary led to perform the PSA to score the species. To conclude the comment, Chile Austral hake fishery is the species defined as a target in the UoAs. However, as a multispecies fishery, the fleet does not define a target species previous a trawl fishing trip but the assessment is carried out to evaluate Chile Austral hake as target species in all the UoA defined in the report. | Not accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.1.1 | Yes | Yes | NA | Score 80: Longline - There are two main primary elements one of which is bait. The rationale for the score is good. Assessors identify 4 primary minor species - scoring adequate and based on very small catch proportions. The targeting is clear (87% M. australis) | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.1.2 | Yes | Yes | Yes | Score : 85 Trawl : The scoring and rationale is adequate | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.1.2 | Yes | Yes | NA | Score : 85. Longline :The scoring and rationale is adequate | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.1.3 | Yes | No (scoring implications unknown) | NA | Score 85. Trawl - some confusion here - refer also to 2.1.1. For trawl observer data used from 90%n coverage, reference is also made to 25% coverage in background text (what is it). The observer programme relates to discard species only? Or does it include target, primary and secondary species? | The Assessment Team has reviewed the information and some modifications have been done in the background section. There are also new tables/figures included to ensure a better understanding. The percentage of coverage for target species is nearly 100% . All the catches are reported in a logbook to SERNAPESCA. Furthemore, IFOP also collects fisheries data with different logbook where the percentage of coverage is reported in its annual reports by fleet. IFOP performs biological samples plus monitor ETPs interactions and estimate total catch composition by fleet and areas. Observer program coverage has increased over the years by obtaining data on more than 78% of all trips. The sentence stated in the P1 background section (3.3.5) has been also corrected with the data from the discard report published by IFOP last year ("Pesquerías Demersales y Aguas Profundas, 2012. Sección I: Enfoque Metodológico y Gestión de Muestreo 2017" published in August 2018) | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.1.3 | Yes | No (scoring implications unknown) | NA | Score 85. Longline - what is the observer coverage on longline - probably lower then trawl? Clarity is needed on the information used - does the discard programme include longline which unlike the trawl component targets M. australis. | The Assessment Team used the information from IFOP. This agency collect information and report annualy the information from the observer program. The percentage of coverage in all the industrial fleet is more than 60% with increasing trends from 2014. In the last report the percentage on the longline vessels targeting Chile hake was 68%, table 15 of the report "Pesquerías Demersales y Aguas Profundas, 2012. Sección I: Enfoque Metodológico y Gestión de Muestreo 2017" published in August 2018. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.2.1 | No (scoring implications unknown) | No (scoring implications unknown) | NA | Score 80 : Trawl - refer to 2.1.1 - based on available information reclassify silver warehou as main primary ? Noted RBF used. | Following the FCRv2.0 SA3.1.3 Silver warehou is defined as secondary species as there are no managament tools(ie. Biological Reference points) to manage the stock. Therefore, the species does not comply with the requirements set up to be described as primary. | Not accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.2.1 | Yes | Yes | NA | Score 80 : Longline - scoring and rationale good | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.2.2 | Yes | Yes | | Score 90 Trawl : scoring and rationale adequate | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.2.2 | Yes | Yes | NA | Score 80 Longline : Scoring and rationale is adequate. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.2.3 | Yes | Yes | | Score 80 Trawl : Scoring and rationale is adequate. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.2.3 | Yes | Yes | NA | Score 80 Longline :Scoring and rationale is adequate. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.3.1 | Yes | No (score increase expected) | NA | Score 80 : Bottom and midwater trawl - see scoring guidepost score of 85 - check? Scoring and rationale good. | Bottom trawl and midwater are defined as two scoring elements following the MSC requirements dscribed in the MSC Fisheries Standard v2.0 G7.4.7-G7.4.9 defining the Uniti of Certification and Unit of Assessment. CABs can include two different gears type used in the same UoA. The impact of the gears will be reported as scoring elements. When two gear types are scored together, the result that will be used is the one coming from the gear type with the lower score.. Therefore, in the table 2.3.1 the score given is 80 becasue is the lowest one. | Not accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.3.1 | Yes | Yes | NA | Score 80 : Longline - scoring and rationale good | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.3.2 | Yes | No (no score change expected) | NA | Score 80 Trawl : Scoring OK. However I find that emphasis is on UoA 2 for longline. While measures are in place for both UoAs, information on Trawl impacts is poor (bird strikes on warps and sonde cables certainly occurs). I would expect some disucssion on this aspect, is it reported by obervers, what is the frequency of bird strikes? | Measures to protect seabirds have been implemented for all industrial fisheries in Chile.However, as mentioned in the report, the longline fishery has more detrimental impacts on seabirds than trawls. The information reported in the CIAMT logbook (IFOP and SUBPESCA) has shown few interactions with protected seabirds in the direct Austral hake fishery. From 1997 to 2007, aproximately 800 observations were reported during trawling operations. Observers documented that the interactions consisted of seabirds feeding around the fishing catch but with no detrimental effect on them. The species mostly encountered by trawling is the Black-browed albatross and Southern giant-petrel and measures have been implemented in all the fleets operating in the area to decrease the negative impacts on these populations. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.3.2 | Yes | Yes | NA | Score 80 Longline :Scoring and rationale is adequate. | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.3.3 | Yes | Yes | NA | Score 80 Trawl : Scoring and rationale is good. Reference to my previous comments on observer coverage - these tables should be in the text - the assessors refer to Bernal et al 2017 frequently. The details presented in the scoring rationale is needed in the description of fishery. | The Assessment Team has moved the table 1 and 2 in the rationale to the background section. The rationale has beenreviewed to reference the most relevant data showed in the table in regards with 2.3.3. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.3.3 | Yes | Yes | NA | Score 80 : Longline - as above. | Please see the comment above | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.4.1 | Yes | No (scoring implications unknown) | NA | Score 95 : Trawl. Both elements. I largely agree with the scoring rationale - the reference to % areas needs to be better contextualised. % quoted from Amoroso study refers to the whole EEZ ? The 98% reres to whole EEZ? The figures are not helpful but it appears as though the effective area trawled on the shelf is higher than described, Check. The ringfencing of trawl grounds is noted as is the substrate type with assumed relatively low impact of trawl gear. | The study of Amoroso *et al.*, (2018) represents all the EEZ areas in Chile as the data used for the research comes from SERNAPESCA reports. The fleet operating in both Northern and Southern areas analised in the study, has a mandatory obligation to report the fishing operation, also monitored by VMS. Therefore the coverage include the EEZ. The trawled area in 0.4% of the total EEZ analised. Chile has very well defined the fishing grounds where trawling is allowed. Also the new mandate to freeze the footprint has reduced the possibilities to increase these areas. | Not accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.4.1 | Yes | Yes | NA | Score 95 Longline - as above for trawl. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.4.2 | Yes | Yes | NA | Score 80 : Trawl - the score and rationale provided is adequate | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.4.2 | Yes | Yes | NA | Score 80 : Longline - the score and rationale provided is adequate. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.4.3 | Yes | Yes | NA | Score 80 : Trawl - the score and rationale provided is adequate | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.4.3 | Yes | Yes | No | Score 80 : Longline - the score and rationale provided is adequate. | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.5.1 | Yes | No (scoring implications unknown) | NA | Score 80 : Trawl - the score and rationale provided is adequate to meet SG80. The assessor should be more specific regarding SG100 - the statement that the assessor is "not confident" is not explicit. The guidepost requires "evidence". | The Assessment team has reviewed the rationale and it has been reviewed to clarify why the Assessment team is not confident to score that is higly unlike to disptrupt any key element of the ecosystem. However new measures are inplace, and same 2013 the new Law has beenn taken in considferation ecosystem apporach, update results are needed to confirm that the capacity of the ecosystem to deliver ecosystem service which can include many aspects (i.e. trophic cascade, top predators depletation, cahnges in the diversity of the community, cahnges in the genetic diversity, etc. ) is not affected. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.5.1 | Yes | No (scoring implications unknown) | NA | Score 80 : Longline - see above - vague reference to "not confident" - is there evidence or not to score at SG100? | Please see the comment above | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.5.2 | Yes | No (scoring implications unknown) | NA | Score 80 : Trawl - The text needs to be more explicit. The language is vague and does not address the guidepost for Sib (for example) clearly. As with P2..5.1 the articulation could be improved. At SG80 for example measures are provided as examples, but these do not provide the objective basis for confidence required. The rationale appears contradictory (in the second last para statements relate to SG100 not being met and then in the last para information is provided that supports SG80). As it stands Sib should score only at SG60. | The Assessment Team has reviewed the rationale following the PR comments to clarify the information and the scoring given in the PI. However, the scoring has not been changed to SG 60 in Sib because the fishery has a a partial strategy already in place to consider ecosystems needs in the management plan. Furthermore, ever since 2013, all the regulations that have been developed have ecosystem approach considerations . The fishery cannot meet SG100 because they still need improvements to put all the strategies together as a plan but Sg 80 is fully met and no condition is needed in this PI. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.5.2 | Yes | No (scoring implications unknown) | NA | Score 80: Longline - See above related to Trawl. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Trawl | PR A | | 2.5.3 | Yes | No (scoring implications unknown) | NA | Score 85 : Trawl. As with the previous PI, the articulation needs redrafting to folow in a logical sequence. The rational presented supports meeting SG80 for Sid (for example), but again the assessor refers to the SG100 criteria before SG80. | The Assessment Team has reviewed the rationale to ensure the comprenhension. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | Longline | PR A | | 2.5.3 | Yes | No (scoring implications unknown) | NA | Score 85 : Longline - see above as for Trawl | Please see the comment above | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.1.1 | No (scoring implications unknown) | No (scoring implications unknown) | NA | Score 100 : For S1b no evidence is provided that "the fishery has been tested and proven to be effective". The rationale provided is extensive relating to measures and legislation but to score100 the test of tranaparency and evidence of effectiveness is needed. References provided are in Spanish, but none would seem to relate of evidence. | For scoring 100b The team included 2 evidences of resources for protection that were presented in the Chile Supreme Court of Justice as evidence that the fishery has been tested and proven effective . | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.1.2 | Yes | No (scoring implications unknown) | NA | Score 85: For Sic = 80. The language used in rational for Sic could be improved. The suggestion that "it is possible that the fishery management authority is not encouraged...in nthe ZFC" etc To score the fishery down in this Si© strengthen the rationale (noting this may be a language / translation issue only) | Additional text was included on SG100c where it says that "*despite that there have been management committees for all fisheries and 8 scientific technical committees formed, there has been no efforts in promoting participation in the local/regional fishery councils (Consejo Zonales de Pesca* )". Thus, it cannot be said that the consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. Thus SG100c is not scored | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.1.3 | Yes | Yes | NA | Score 100. I find the rational and references suport the scoring adequately. Rational also dofferentiated between long term and fishery specifc objectives adequately | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.2.1 | Yes | Yes | NA | Score 80: Without being completely familiar with the references (in Spanish mostly) the assessors logic that the the fishery specific objectives are measureable and that there is no quantifiable evidence that these have been "demonstrated" a fair judgement. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.2.2 | Yes | Yes | NA | Score 95: Noted tha SA4.8.6 and 4.8.7 covered for Sid. There is an extensive reference list (in Spanish) - I have not verified if these fully support the rationale, howver the text provided articulates and supports the scoring adequately. | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.2.3 | Yes | Yes | NA | Score : 85 Sia - description could be improved - opening statement suggest LGPA has authority to develop a "comprehensive" MCS system - scored at SG80 relates as there is issues suggesting there is NOT a comprehensive MCS system (check contradiction). Otherwise the scoring and rationale are good. reference list is extensive but I have been unable to verify these. | Sentence was corrected at the first paragraph on PI3.23 SGa. | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | All UoAs | PR A | | 3.2.4 | Yes | Yes | NA | Score 80: I find the scoring and rationale appropriate for the score given | | Accepted (no score change) |

### 9.3.2. Peer Reviewer B

#### 9.3.2.1 General Comments

| Fishery | Assessment Start Year | Peer Reviewer (A/B/C) | Question | Yes/No | Peer Reviewer Justification (as given at initial Peer Review stage). Peer Reviewers should provide brief explanations for their 'Yes' or 'No' answers in this table, summarising the detailed comments made in the PI and RBF tables. | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) |
|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR B | Is the scoring of the fishery consistent with the MSC standard, and clearly based on the evidence presented in the assessment report? | Yes | | No response needed. |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR B | Are the condition(s) raised appropriately written to achieve the SG80 outcome within the specified timeframe? [Reference: FCP v2.1, 7.18.1 and sub-clauses] | Yes | Yes. However, for the 1st condition- this reviewer included text edits to the condition as stated by the CAB suggesting more detailed analyses be considered (i.e., MSE to evaluate full uncertainty suite, appropriate risk levels and made available for audit purposes. | Reviewer comments on the action plan are duly noted by the team. As an MSC CAB the team cannot write the action plan for the client but only set up the milestones. Neverthless We will send the reviewer comments to the client for his input. |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR B | Is the client action plan clear and sufficient to close the conditions raised? [Reference FCR v2.0, 7.11.2-7.11.3 and sub-clauses] | No | Client action plan is quite vauge indicating only that "Currently, the Chile Austral hake fishery has an approved management plan, which contains, among other issues, the exploitation strategy in force for this fishing resource" . It would be more informative to learn what the Client anticipates is needed to 'elaborat' this plan. Perhaps, just expand on this- who will they meet with and what type of analyses will be considered? | Reviewer comments on the action plan are duly noted by the team. As an MSC CAB the team cannot write the action plan for the client but only set up the milestones. Neverthless We will send the reviewer comments to the client for his input. |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR B | Enhanced fisheries only: Does the report clearly evaluate any additional impacts that might arise from enhancement activities? | | Note: Include this row for assessments completed against FCR v1.3 and v2.0, but not for FCP v2.1 (in which the client action plan is only prepared at the same time as the peer review). Delete this text from the cell for FCR v1.3/v2.0 reviews or delete it. | Changes suggested by reviewer done by the team. |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | PR B | Optional: General Comments on the Peer Review Draft Report (including comments on the adequacy of the background information if necessary) | N/A | Overall, the asessment team did a good, comprehensive evaluation of the 'stock' under consideration. The quality of the individual report varies considerably by chapter. A good thorough editoral review is needed to improve the overall readability and presentation of information. The overall concern relates to the scores for P1- I found that the level of uncertainty as indicated by the material presented is quite high leading me to the conclusion that the stock may actually be scored lower in some of the P1 components if the uncertainties had been presented fully. | More information on uncertainty,diagnostics, and preliminary results of the MSE evaluation is presented on the evaluation . However the team feels that this additional information by the reviewer wont change the PI scores . |

## 9.3.2.2 Performance Indicator Comments

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fishery | Assess-ment Start Year | Insert extra rows for P1 PIs if separate scores given for different UoA stocks | Insert extra rows for P2 PIs if separate scores given for different UoA gear types | Peer Revie-wer (A/B/C) | 3PE name | Perfor-mance Indica-tor (PI) | Has all available relevant information been used to score this PI? | Does the information and/or rationale used to score this PI support the given score? | Will the condition(s) raised improve the fishery's performance to the SG80 level? | PRs should provide support for their answers in the left three columns by referring to specific scoring issues and/or scoring elements, and any relevant documentation as appropriate. Additional rows should be inserted for any PIs where two or more discrete comments are raised e.g. for different scoring issues, allowing CABs to give a different answer in each case. Paragraph breaks may also be made within cells using the Alt-return key combination.<br><br>Detailed justifications are only required where answers given are one of the 'No' options. In other (Yes) cases, either confirm 'scoring agreed' or identify any places where weak rationales could be strengthened (without any implications for the scores). | CABs should summarise their response to the Peer Reviewer comments in the CAB Response Code column and provide justification for their response in this column.<br><br>Where multiple comments are raised by Peer Reviewers with more than one row for a single PI, the CAB response should relate to each of the specific issues raised in each row.<br><br>CAB responses should include details of where different changes have been made in the report (which section #, table etc). | See codes page for response options |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.1.1 | Yes | No (scoring implications unknown) | | I generally agree with the scoring for 1.1.1b- however the score may have actually been a 60 if the Assessment Team (hereafter abbreviated as 'AT' had fully taken into context the sensitivity analyses conducted which would very likely have brought the SSB current estimate down considerably below the target. | The assessment team is assuming the reviewer was referring to 111a . Based on the Kobe plot (Figure 19) the probability of SSB being below 0.5SSBMSY is above 95% as there is no overlap on the 95% contour plot in the LRP phase. Therefore the team disagrees with the reviewer in that there is a need to change the scoring to 60. | Not Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.1.2 | No (scoring implications unknown) | No (scoring implications unknown) | | Information on unquantified discard levels not inclulded in the stock assessment explicitly which would have no doubt led to increases in F estimates and lower SSB levels. However it is noted that the ABC advice was adjusted in 2018 to include a 'low' level of discard mortality. Further it is noted that the retrospective analysis results not presented either- this may have affected this score. Additionally, confidence intervals around estimates are quite large indicating high uncertainty in estimates. | Although it is not well explained on Perez and Quiroz., (2018b) where it includes the model selected No.3 for fishery advice on year 2019, ever since 2015, the landings time series are corrected/adjusted by the estimates of discards from the South Austral Demersal Fisheries Discards program using the methodology by Paya (2015) for the years before the beginning of the program. According to Quiroz., (2017) The levels of discards and under reporting represent the second source of the evaluation of the stock. TheScientific Technical Committee agreed in using weighted values of discards/under report by fleet. Based on these weighting values the official landings by year were corrected by IFOP fisheries scientists and adjusted to the selected model for stock evaluation | |
| | | | | | | | | | | | On the revised version more information was included on analysis of restropective patterns and their impact on estimates. Fishing mortality (F) have been considerably reduced in recent years (2014-2018). The current FMSY is 0.24 (IFOP, 2018b) . The current fishing mortality for 2018 is 0.23. Thus F 2018 is below FMSY Therefore, there is evidence that the current strategy is likely helping in rebuilding Chile hake stocks, based on the information on the lower exploitation rates in recent years. | |
| | | | | | | | | | | | Some of the relevant information requested by the reviewers such as retrospective analyses, projections of SSB under different management scenarios and recrutiement episodes were explored on the model and on the MSE, all stochastic projections showed that SSB reach target MSY before 2 generations times even in low periods of recruitment | |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Response Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.2.1 | Yes | Yes | | With regards to 1.2.1.4-- "There is a biennial 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." It is strongly encouraged that the AT/CAB encourage the further review of this componeth of the stock assessmetn both in terms of quantifying the level of discard mortality as well as the effect of this uncertainty on the stock condition and appropriate harvest strategy in context with the uncertainty level and the probability of achieving the expected target RPs. | Text was revised on PI 1.21d | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.2.2 | No (no score change expected) | No (no score change expected) | | This reviewer does not feel 1.2.2b or 1.2.2c meets an SG80 (but 70) as all the uncertainty not accounted for in the development of the HCR however even if it only merits 70 the overall score would likely not change. More simulation work is needed. MSE work not presented by the AT- would enhance the HCR section possibly. | The team disagree with the reviewer interpretation. According to MSC2.0 "Section SA2.5.6 requires that teams examine the current exploitation levels in the fishery, as part of the evidence that the HCRs are working. Evidence that current F is equal to or less than FMSY should usually be taken as evidence that the HCR is effective" . Current F is below FMSY . F2018=0.23 FMSY=0.24. Some of the relevant information requested by the reviewers such as retrospective analyses, projections of SSB under different management scenarios and recrutiement episodes were explored on the model and on the MSE, all stochastic projections showed that SSB reach target MSY before 2 generations times even in low periods of recruitment. Therefore SGb and SGc can be scored to 80 | Not Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.2.3 | Yes | Yes | | | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chile Austral hake | trawl and longline | PR B | | 1.2.4 | No (no score change expected) | No (no score change expected) | | AT did not include in the report all the results that the stock assmt' addressed on uncertainties, sensitivite, and the MSE work. While it is expected the overall score would not change, this information could enhance the support re' appropriateness of the methods/approach/inputs. | Some of the information requested by the reviewers such as retrospective analyses,Projections of SSB depletion across different time scale with different recruitment episodes were explored. MSE preliminary results, projections were included on the PI background of the revised version | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Hoki | Bottom trawl | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Southern Blue W | Bottom trawl | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Pink cusk eel | Bottom trawl | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Hoki | Midwater trawl | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Southern Blue W | Midwater trawl | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Pink cusk-eel | Longline | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Common sardin | Longline | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Hoki | Longline | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Southern rays b | Longline | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Patagonian toot | Longline | PR B | | 2.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.1.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.1.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.1.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.1.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.1.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.1.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.2.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.2.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.2.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.2.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.2.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.2.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.2.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.2.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.2.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Yellownose skate | Bottom trawl | PR B | | 2.3.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Sea Lion | Bottom trawl | PR B | | 2.3.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Sea Lion | Midwater trawl | PR B | | 2.3.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Chondricthes | Longline | PR B | | 2.3.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | Seabirds | Longline | PR B | | 2.3.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.3.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | | | 2.3.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | | | 2.3.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | | | 2.3.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | | | 2.3.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.3.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.4.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.4.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.4.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.4.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.4.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.4.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.4.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.4.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.4.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.5.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.5.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.5.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.5.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.5.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.5.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

| Fishery | Year | UoA stock | UoA gear | PR (A/B/C) | 3PE | PI | PI Information | PI Scoring | PI Condition | Peer Reviewer Justification (as given at initial Peer Review stage) | CAB Response to Peer Reviewer's comments (as included in the Public Comment Draft Report - PCDR) | CAB Res-ponse Code |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Bottom trawl | PR B | | 2.5.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Midwater trawl | PR B | | 2.5.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | Longline | PR B | | 2.5.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.1.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.1.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.1.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.2.1 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.2.2 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.2.3 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |
| Chile Austral hake (Merluccius australis) industrial trawl and longline fishery | 2017 | all species | All UoAs | PR B | | 3.2.4 | Yes | Yes | | Scoring Agreed | | Accepted (no score change) |

## 9.4. Appendix 4 Stakeholder submissions

### 9.4.1. Birdlife submission on May 20th 2019 on th PCDR

| **Contact Information** Make sure you submit your full contact details at the first phase you participate in a specific assessment process, subsequent participation will only need your name unless these details have changed. | | | | | |
|---|---|---|---|---|---|
| **Contact Name** | *First* Rory | | *Last* Crawford | | |
| **Title** | Mr. | | | | |
| **On behalf of (organisation, company, government agency, etc.)** – *if applicable* | | | | | |
| **Organisation** | *Please enter the legal or registered name of your organisation or company.*<br>BirdLife International | | | | |
| **Department** | Marine Programme | | | | |
| **Position** | *Please indicate the position or function you exert within your organisation or company.*<br>Bycatch Programme Manager | | | | |
| **Description** | *Please provide a short description of your organization.*<br>BirdLife International is a global Partnership of independent organisations working together as one for nature and people.<br>The overarching objectives of the Marine Programme are:<br>• Promote the collaborative international action that is vital to arrest seabird declines<br>• Advocate for the conservation of seabirds at national, regional and global levels<br>• Work directly with fishermen and other stakeholders to reduce seabird bycatch and other threats to seabird populations<br>BirdLife is also a member of the MSC's Stakeholder Advisory Council | | | | |
| **Mailing Address, Country** | c/o RSPB, The Lodge, Potton Road, Sandy, Bedfordshire. SG19 2DL | | | | |
| **Tel** | + 44 141 331 9081 | **Mob** | + | **Fax** | + |
| **Email** | **rory.crawford@rspb.org.uk** | | | **Web** | www.birdlife.org/marine |

| **Assessment Details** | |
|---|---|
| **Fishery** | Chile Austral hake (Merluccius australis) industrial trawl and longline |
| **Certification Body** | SAI Global |

  

• **SECTION 5** • Return to Page 3

| Assessment Stage | Fishery | Date | Name of Commenter or Organisation |
|---|---|---|---|
| **Public review of the draft assessment report**[ix] *Opportunity to review and comment on the draft report, including the scoring of the fishery* | Chile Austral hake (Merluccius australis) industrial trawl and longline | 02/05/2019 | Rory Crawford, BirdLife International |

☒ I wish to comment on the evaluation of the fishery against specific Performance Indicators.
*A table with these indicators and the scores and rationales provided by certifiers can be found as an appendix to the report.*

**Nature of comment** *(Please code below)*

1. I do not believe all the relevant information[x] available has been used to score this performance indicator *(please provide details and rationale)*
2. I do not think the information and/or rationale used to score this performance indicator is adequate to support the given score[xi] *(please provide details and rationale)*
3. I do not believe the condition(s) set for this performance indicator are adequate to improve the fishery's performance to the SG80 level[xii] *(please provide details and rationale)*
4. Other *(please specify)*

| Performance Indicator | Nature of Comment<br>Indicate relevant code(s) from list above. | Justification<br>Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. |
|---|---|---|
| *Example: 1.1.2* | *2* | *The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.* |

| | | |
|---|---|---|
| 2.3.1; 2.3.2 (Trawl and longline for both) | 1 | Key bycatch information has not been included in the production of this report, and the majority of our comments are made in the context of the absence of this information, which demonstrates a substantial impact of the trawl elements of the UoA on albatrosses. We have appended the relevant report (Richard, Y & L Adasme (2019) Assessment of the risk of trawl and longline fisheries to ACAP-listed seabirds in Chile. 9th Meeting of the Seabird Bycatch Working Group (SBWG9 Inf 08), Agreement for the Conservation of Albatrosses and Petrels (ACAP). Florianópolis, Brasil) to our submission for the CAB's information; this was submitted to the recent Agreement on the Conservation of Albatrosses and Petrels (ACAP) meeting, and is the result of a collaboration between the Instituto de Fomento Pesquero (IFOP) in Chile and Dragonfly Science in New Zealand, using IFOP observer data from the peer-reviewed literature published in February this year (Adasme, L. M.; Canales, C. M.; Adasme, N. A. (2019). Incidental seabird mortality and discarded catches from trawling off far southern Chile (39–57°S). ICES Journal of Marine Science). The key findings of this work (relevant to this certification) are:<br><br>- the two factory vessels in this fleet that use netsonde cables are responsible for 7,880 'observable' captures of seabirds annually, with 'Annual Potential Fatalities (APF)' (accounting for the cryptic mortalities typical of trawl fisheries bycatch) estimated at 62,900 seabirds annually; fresher vessels (three) were responsible for 364 'observable' captures, increasing to an APF of an estimated 2,800 birds killed annually<br><br>- black-browed albatross were the most-caught species (90% of captures), with the APF figure at 55% of the population sustainability threshold (i.e. as the report notes, it "may therefore exceed the productivity of the local population")<br><br>- additionally, the combined APFs for the factory vessels using netsonde cables were 124.1 for the near threatened Buller's albatross, 607 for the endangered grey-headed albatross and 173 for the vulnerable Salvin's albatross (among other captured species)<br><br>The implications of this information on the scores suggested for the trawl fishery in particular are highlighted below, though the bycatch information on longliners found in this paper should also be considered and incorproated. |

| | | |
|---|---|---|
| 2.3.1 (trawl) | 2 | It is of great concern that the ETP species caught by this fishery are not considered to be covered by national/international limits. Chile is a party to ACAP, an agreement under the Convention on the Conservation of Migratory Species, the overall purpose of which (Article 2) is '…to achieve and maintain a favourable conservation status for albatrosses and petrels', requiring parties to (Article 3) 'develop and implement measures to prevent, remove, minimize or mitigate the adverse effects of activities that may influence the conservation status of albatrosses and petrels;' - this does not offer specific numbers of birds that may 'acceptably' be killed, but is clear in the need to achieve favourable conservation status for affected bird species (some of which are denoted in the bullets above).<br><br>Regardless, the CAB has scored scoring issue (B) ('known effects are highly likely to not hinder recovery…'), and considered that all trawl segments meet SG80. In light of the information presented above, this score is clearly inappropriate, as the aforementioned report specifically highlights the concern that black-browed albatrosses are being caught at levels (by factory vessels using netsonde cables) that exceed the productivity of the local population; it is even questionable whether these vessels achieve the SG60 level given the substantial scale of estimated impacts. The CAB must review its scoring of this scoring issue and decrease the proposed score (to at least sub-80) based on the information provided.<br><br>Conditions are required under this and the management SIs to ensure that the ample observer data flowing from the IFOP observer programme continue to be used to understand the impact of this fishery on seabirds and to fully implement mitigation strategies to minimise seabird bycatch. It is unusual that seabird bycatch data are not presented for the trawl fleet in the report, in spite of the fact that figures were published in the peer-reviewed literature in February this year (further commentary on this issue below).<br><br>N.B. the rationale for the longline UoA scores of this scoring issue reference the 'trawl' fleet, which is presumably a typo. |

| | | |
|---|---|---|
| 2.3.2 (trawl) | 2 | An 80+ score for scoring issue (A) requires there to be a strategy in place managing impacts on ETP that is highly likely to achieve national and international requirements. Note that 'B' has not been scored here, although seabirds were not deemed to meet the criteria to be scored under 2.3.1 (A), and seabirds are not adequately mentioned in the rationale for this score in spite of substantial impacts.<br><br>Again, the above noted report clearly justifies more explicit mention of how the fishery is (and intends to) reduce their impacts. Part of the CAB's rationale for the fishery meeting SG80 is that there are draft national plans for the reducion of discards and bycatch (PRDCI) in Chile which account for the need to tackle seabird (and other non-target taxa) bycatch. This is clearly inappropriate, as these plans remain in a draft state; the final versions are not yet pubclically available and the current timetable is that these plans will not become mandatory until July. There are therefore presently no obligations for vessels to use best practice mitigation measures (i.e. bird scaring lines for warp cables; the use of a snatch block to reduce the aerial extent of the netsonde cable), and no evidence that these are being used in the asbence of mandatory rules (i.e. the bycatch is very high). In addition, the drafts of the PRDCIs that we have seen contained unproven and potentially concerning mitigation measures for seabirds (i.e. lasers) and do not properly account for mortality of seabirds on the netsonde cable. Similar issues with an Argentinean seabird bycatch regulation resulted in the placement of a condition on the fishery to deal with seabird bycatch on the netsonde cable during their recent re-certification (see https://fisheries.msc.org/en/fisheries/argentine-hoki-macruronus-magellanicus-bottom-and-mid-water-trawl-fishery/@@assessments). There is therefore no strategy in place at present and the fishery should score less than 80 for 2.3.2 (A), and similarly, given that the most recent draft of the PRDCI contained unsuitable measures (i.e. lasers), did not address netsonde bycatch (seemingly the most substantive issue for this fishery given the data noted above) and is not yet in place, it is not reasonable to assess the fishery as achieving SG80 for scoring issue (C) - which requires there to be an objective basis for confidence that the measures/strategy work.<br><br>Scoring issue (D) focuses on the implementation of management measures, and while the increase in observer coverage is clearly welcome, it is evident that implementation of mitigation measures for seabirds has not occurred given the high levels of bycatch highlighted. Again, SG80 is not met here for the trawl fleet. Given that the implementation of measures has not occurred in the trawl fleet, there is not yet an effective system of reviewing measures to ensure they are in line with ACAP best practice (as referenced in the MSC certification requirements), much less implementation. Indeed, as noted above, the draft PRDCI included non-best practice mitigation measures, so has evidently not yet been reviewed against best practice criteria. The trawl UoA does not meet SG80.<br><br>Conditions need to be introduced that require the implementation of best practice seabird bycatch mitigation measures on vessels (regardless of what any eventual PRDCI says - which is uncertain at the time of the PCDR being published) given the scale of the impact of the trawl fleet, particularly on black-browed albatrosses. |

| Comment | | Nature of Comment | Justification Please attach additional pages if necessary. |
|---|---|---|---|
| ☐ | I wish to comment on the adequacy of the consultation process used to gather information about this fishery (for example, related to the RBF process, selection of stakeholders consulted, etc.) | | |

| Comment | | Nature of Comment | Justification Please attach additional pages if necessary. |
|---|---|---|---|
| ☒ | I wish to comment on other portions of the report (e.g. background information, species biology, peer review reports and CB responses, list of consultees, etc.) | 4 - inaccuracies in the background information | There are several inaccuracies in the ETP section of the background information in the body of the report. On page 78 it is stated that 'Few protected species inhabit the environment within the industrial trawl and longline management units' and 'Incidental capture of seabirds is relatively low in the Chilean industrial fisheries'. This is completely inaccurate - Chile holds globally important colonies of endangered and endemic seabirds, which along with nonbreeding globally vulnerable seabirds, extensively use waters overlapping the footprint of this fishery. The scale of bycatch highlighted in the appended report (along with the total number of ACAP-listed seabird species recorded caught - 16) emphasises the inaccuracy of these statements, and they should be amended. See also Robertson, G., C.A. Moreno, J.A. Arata, S.G. Candy, K. Lawton, J. Valencia, B. Wienecke, R. Kirkwood, P. Taylor & C.G. Suazo (2014) Black-browed albatross numbers in Chile increase in response to reduced mortality in fisheries. Biological Conservation, 169: 319–333.<br><br>On p82, it is stated that there are 'low' interactions of trawlers with black-browed albatrosses. Again, this is incorrect and should be amended. On p83, the Albatross Task Force (ATF)'s work with purse-seine vessels has no bearing on this assessment and does not need to be included here. The team have provided training and support to IFOP in seabird bycatch monitoring.<br><br>On p83/84, much is made of the new Bycatch and Discard Reduction Plans (PRDCI) - as noted above, these are not yet in place and final versions have not yet been confirmed. This certification relies too heavily on these yet-to-be-introduced plans which, as already noted, previously contained references to non-best practice mitigation approaches and did not previously address bycatch of seabirds on the netsonde cable - the most pressing issue for the trawl fleet in terms of seabird bycatch.<br><br>It is also curious that while observer coverage levels are referenced in a number of places, no seabird bycatch data have been presented in the body of the report or under the scoring issue tables. This should be rectified to transparently show the scale of the issue and the work required to resolve it. |

### 9.4.2. Assessment team response to Birdlife submission on PCDR

6/12/2019

Mr. Rory Crawford
Bycatch Programme Manager
BirdLife International Marine Programme
UK Headquarters / outposted to RSPB Glasgow Office 10 Park Quadrant, Glasgow, G3 6BS

*Re: Birdlife submissions: Assessment of Chile Austral Hake Industrial Trawl Longline Fisheries*

Dear Mr. Crawford,

Thank you for your detailed letter of May 20th, 2019. The assessment team has given the content of the letter much thought in undertaking the assessment of these fisheries. As you know, the MSC has prescribed timeframes to allow for proper consideration of new, additional information and research, and to solicit commentary and perspective from the client and, if necessary, to consult management authorities such as Subsecretaria de Pesca y Acuacultura (SUBPESCA).

In your letter, you raised a number of concerns in relation to the potential impact of the Chile Austral Hake Industrial Trawl Longline Fisheries on marine birds populations including declines in population trends, excessive human induced mortalities on different life stages, increased injury events caused by entanglement from fishery gear, and the imperative need to revise approaches to the monitoring and management of species-at-risk.

I trust that you will carefully consider our response to your commentaries on the PCDR and that we will continue to remain engaged as further information becomes available during the annual surveillance audit processes. That said, we are confident that we have given these subjects appropriate consideration as required under the MSC's Standard.

In our response to your letter, we have endeavoured where possible to deal with the comments in the order in which they have been presented.

**Concerns on P2.3.1**

- **Birdlife International comments on 2.3.1 UoAs 1 & 2**

*Key bycatch information has not been included in the production of this report, and the majority of our comments are made in the context of the absence of this information, which demonstrates a substantial impact of the trawl elements of the UoA on albatrosses. We have appended the relevant report (Richard, Y & L Adasme (2019) Assessment of the risk of trawl and longline fisheries to ACAP-listed seabirds in Chile. 9th Meeting of the Seabird Bycatch Working Group (SBWG9 Inf 08), Agreement for the Conservation of Albatrosses and Petrels (ACAP). Florianópolis, Brasil) to our submission for the CAB's information; this was submitted to the recent Agreement on the Conservation of Albatrosses and Petrels (ACAP) meeting, and is the result of a collaboration between the Instituto de Fomento Pesquero (IFOP) in Chile and Dragonfly Science in New Zealand, using IFOP observer data from the peer-reviewed literature published in February this year (Adasme, L. M.; Canales, C. M.;*

*Adasme, N. A. (2019). Incidental seabird mortality and discarded catches from trawling off far southern Chile (39–57°S). ICES Journal of Marine Science). The key findings of this work (relevant to this certification) are:*

*- the two factory vessels in this fleet that use netsonde cables are responsible for 7,880 'observable' captures of seabirds annually, with 'Annual Potential Fatalities (APF)' (accounting for the cryptic mortalities typical of trawl fisheries bycatch) estimated at 62,900 seabirds annually; fresher vessels (three) were responsible for 364 'observable' captures, increasing to an APF of an estimated 2,800 birds killed annually*

*- black-browed albatross were the most-caught species (90% of captures), with the APF figure at 55% of the population sustainability threshold (i.e. as the report notes, it "may therefore exceed the productivity of the local population")*

*- additionally, the combined APFs for the factory vessels using netsonde cables were 124.1 for the near threatened Buller's albatross, 607 for the endangered grey-headed albatross and 173 for the vulnerable Salvin's albatross (among other captured species)*

*The implications of this information on the scores suggested for the trawl fishery in particular are highlighted below, though the bycatch information on longliners found in this paper should also be considered and incorporated.*

**CAB Response**: 2.3.1
The CAB has used the information of bycatch species posted by IFOP and documented in Bernal et al, 2017. The information from the IFOP logbooks as mentioned in the comment has been used to score the ETP PIs for this fishery.

The information enclosed in this submission was drafted after the publication of the PCDR of this fishery in April 2019 and therefore it was not available at the time of the scoring of the fishery and also for the writing of the PCDR. As it is previously mentioned in the Agenda of the SBWG Inf, 08 of May 2019, the information was still considered as preliminary. Therefore, the assessment team is not confident to include very preliminary results. Nevertheless, most of the information cited in the SBWG9 has been already included in the IFOP logbooks and this information was used to score this fishery.

Information used in this report to score ETPs PIs:

Informe técnico (R. PESQ) N. 244/2017: "Plan de reducción del descarte y de la Captura de pesca Incidental para las pesquerías de merluza del sur (*Merluccius australis*) y congrio dorado (*Genysterus Blacodes*) y su fauna acompañante entre los paralelos 4128,6' y 57 LS (December 2017) "

Bernal C., C. Bravo, V. Escobar, H. Lagos, J. Lopez, C. Roman, J. Saavedra, M. San Martin y C. Vargas. 2017. lnforme Final. Convenio de desempeno 2016 Programa de lnvestigacion del Descarte y Captura de Pesca Incidental, 2016-2017. Programa de monitoreo y evaluacion de los planes de reduccion del descarte. Seccion Pesqueras Sur Australes SUBSECRETARIA DE ECONOMIA Y EMT I noviembre- 2017. 196 pp. + Anexos.

IFOP logbooks and information reported by the observed program from the last 5 years.

- **Birdlife International comment on 2.3.1 –UoA 1-Trawls**

*It is of great concern that the ETP species caught by this fishery are not considered to be covered by national/international limits. Chile is a party to ACAP, an agreement under the Convention on the Conservation of Migratory Species, the overall purpose of which (Article 2) is '…to achieve and maintain a favorable conservation status for albatrosses and petrels', requiring parties to (Article 3) 'develop and implement measures to prevent, remove, minimize or mitigate the adverse effects of activities that may influence the* *conservation status of albatrosses and petrels;' - this does not offer specific numbers of birds that may 'acceptably' be killed, but is clear in the need to achieve favorable conservation status for affected bird species (some of which are denoted in the bullets above).*

*Regardless, the CAB has scored scoring issue (B) ('known effects are highly likely to not hinder recovery…'), and considered that all trawl segments meet SG80. In light of the information presented above, this score is clearly inappropriate, as the aforementioned report specifically highlights the concern that black-browed albatrosses are being caught at levels (by factory vessels using netsonde cables) that exceed the productivity of the local population; it is even questionable whether these vessels achieve the SG60 level given the substantial scale of estimated impacts. The CAB must review its scoring of this scoring issue and decrease the proposed score (to at least sub-80) based on the information provided.*

*Conditions are required under this and the management SIs to ensure that the ample observer data flowing from the IFOP observer programme continue to be used to understand the impact of this fishery on seabirds and to fully implement mitigation strategies to minimize seabird bycatch. It is unusual that seabird bycatch data are not presented for the trawl fleet in the report, in spite of the fact that figures were published in the peer-reviewed literature in February this year (further commentary on this issue below).*

*N.B. the rationale for the longline UoA scores of this scoring issue reference the 'trawl' fleet, which is presumably a typo.*

**<u>CAB's response</u>**

Following the MSC 2.0 standard requirements, to score SI (a) there have to be a quantitative limit. In other words, the limits it must be a number.

SA3.10.1 In scoring issue (a), "where national and/or international requirements set limits" refers to limits set for protection and rebuilding, provided through the national legislation or binding international agreements, as defined in SA3.1.5 and subclasses.

> SA3.10.1.1 if there is no applicable national legislation or binding international agreement, scoring issue (a) shall not be scored.

MSC interpretations regarding the ETP limit published by MSC in the followed link:

https://mscportal.force.com/interpret/s/article/ETP-and-limits-PI-2-3-1-1527262007441

**Title:**
*ETP and 'limits' (FCR v2.0 - Annex SA PI 2.3.1, SA 3.10.1)*
**Question:**
*Does the word 'limits' in scoring issue (a) in PI 2.3.1 (ETP outcome) and SA3.10.1 mean quantitative limits?*
**Answer:**
*Yes, the intent is that the scoring issue (a) in PI 2.3.1 is scored when there are quantitative mortality limits for that species*".
However some of the seabirds listed in in the ACAP agreement don't have national or international limits.

Therefore, following the MSC 2.0 requirements, the status of seabirds encountered in the fishery must be evaluated under the SI (b) for both UoAs and also for both scoring elements in the UoA 1: trawl [bottom and midwater trawl].

The team assessed the available evidence supporting the performance indicator scoring guidepost 80 which relates to "Known direct effects of the UoA are highly likely to not hinder recovery of ETP species".

In the case of the ETP species, black-browed albatrosses, the team evaluated evidences if the Chile Austral industrial trawl and longline fishery does not hinder the recovery of the species. The data used to score the fishery came from IFOP observed program.

Black-browed albatrosses has a global population of mature individuals of 1,400,000 and in the last assessment posted in the IUCN website it was considered as a species of least concern. This statement is attributed to (i) recent increasing population abundance trends, (ii) populations are not considered severely fragmented (iii) Abundance decline of mature individuals was found not to be happening (BirdLife International 2018. *Thalassarche melanophris*. The IUCN Red List of Threatened Species 2018).

Measures to control and minimize the interactions with seabirds in both UoAs are **already in place** and are detailed in the: **Informe técnico (R. PESQ) N. 244/2017: "Plan de reducción del descarte y de la Captura de pesca Incidental para las pesquerías de merluza del sur (*Merluccius australis*) y congrio dorado (*Genysterus Blacodes*) y su fauna acompañante entre los paralelos 4128,6' y 57 LS (December 2017) "**

Among 9 measures defined in the reduction plan one of them is completely aimed at reducing mortality of seabirds:

***M6****. With respect to the mortality of seabirds due to cable collision (cove, netsonder, etc.), the use of streamer lines, tori lines and/or laser deterrent systems will be mandatory throughout the fishing operation. Additionally, in the case of vessels that use cable netsonder, the cable must be marked or painted, the operating voltage must be reduced and/or the use of wireless netsonder must be evaluated. Implement lines for the separation of net's buoys and marking or elimination of in the corresponding cases*.

Vessels included in the certification process are using Seabird saver and different type of cable are used to prove which one has the less impact on seabirds' populations.

No discard are allowed during the fishing operations, and all the waste must to be treated as MARPOL procedures to avoid the attraction of seabirds.

The observer program has improved over the years from 2013 to now the coverage in the fleet has increased resulting in more than 90 % of trips observed as reported in the Bernal et al. 2017 (Table 46). Bernal et al. 2019 also has reported that the coverage in 2017 was nearly 100 % therefore, a big effort to collect data are being carried out by IFOP observer program.

Table 46. Summary of the observer program from 2013 to 2016 and the logbooks reported to IFOP with information of the incidental catches from the Chile Austral hake industrial trawl fleet.

| Flota hielera | | | | | | |
|---|---|---|---|---|---|---|
| Año | Viajes totales con OC | Viajes CIAMT | % Viajes Obs. | Lances totales viajes CIAMT | Lances obs. CIAMT | % lances obs. |
| 2013 | 68 | 13 | **19,1** | 188 | 18 | **9,6** |
| 2014 | 73 | 31 | **42,5** | 423 | 137 | **32,4** |
| 2015 | 58 | 41 | **70,7** | 652 | 508 | **77,9** |
| 2016 | 108 | 103 | **95,4** | 1697 | 1102 | **64,9** |
| Flota fábrica | | | | | | |
| Año | Viajes totales con OC | Viajes CIAMT | % Viajes Obs. | Lances totales viajes. CIAMT | Lances obs. CIAMT | % lances obs. |
| 2013 | 18 | 5 | **27,8** | 547 | 95 | **17,4** |
| 2014 | 13 | 12 | **92,3** | 1355 | 310 | **22,9** |
| 2015 | 22 | 21 | **95,5** | 2084 | 1161 | **55,7** |
| 2016 | 21 | 20 | **95,2** | 2351 | 1583 | **67,3** |

*2017 had a coverage of 100 %. Bernal et al. 2019.

In the last year, number of incidental reported can be higher than in 2013 but that is resulted of the number of observers on board and the quality of the data collected as is reported by IFOP in the last plan of reduction published in January 2019.

Data are still being collecting and it's one of the measures implemented, the observer program will be evaluated every year and measures already in place have shown positive results in all the fleet.

Further, in longline fisheries are similar measures are detailed below:

1. Evaluate and improve the sinking speed of hooks
2. Evaluate the use of deterrent devices: streamer lines, lasers, noise.
3. Throwing waste into the water is not allowed
4. Release protocol are in place and crew has been formed according the protocols for birds and mammals

Based on the evidence above**,** the team scored 80 and considers not necessary to open a condition in this PI in neither UoAs.

Continuing collection of information from the observed program carried out by IFOP will be reviewed at each surveillance audit to evaluate any changes on impacts on ETPs species from the fisheries in assessment.

In the last report published by Bernal eta al. 2019 has shown that the general results observed for the fleet that operates in the south southern demersal trawl fishery, suppose moderate level of risk of the incidental capture of seabirds. Observed data during the year 2017 amounted to 28 captured specimens on the fresh vessels. On the contrary, and as usual, the factory trawler fleet showed a clear and important difference in the incident capture levels, with 2,002 counts accounted for. The increase of absolute values of incident captures could be related to the effort of coverage of the observe program, On the other hand, it is necessary to say that, although during 2017 the total number of seabirds captured by this fleet was high (n= 2002) with respect to 2016 (n = 4283) the catches have decreased. This decrease could be explained by fishing operations oriented towards the mitigation and decreasing on the impacts caused by the fishing operations (Bernal et al. 2019).

Therefore, at this stage of the certification process, the Assessment Team does not consider appropriate in opening a condition as the fishery complies with the requirements stated in the FCR v2.0 for this PIs.

- **Birdlife International comment on 2.3.2 –UoA 1-Trawls**

*An 80+ score for scoring issue (A) requires there to be a strategy in place managing impacts on ETP that is highly likely to achieve national and international requirements. Note that 'B' has not been scored here, although seabirds were not deemed to meet the criteria to be scored under 2.3.1 (A), and seabirds are not adequately mentioned in the rationale for this score in spite of substantial impacts.*

*Again, the above noted report clearly justifies more explicit mention of how the fishery is (and intends to) reduce their impacts. Part of the CAB's rationale for the fishery meeting SG80 is that there are draft national plans for the reduction of discards and bycatch (PRDCI) in Chile which account for the need to tackle seabird (and other non-target taxa) bycatch. This is clearly inappropriate, as these plans remain in a draft state; the final versions are not yet publically available and the current timetable is that these plans will not become mandatory until July. There are therefore presently no obligations for vessels to use best practice mitigation measures (i.e. bird scaring lines for warp cables; the use of a snatch block to reduce the aerial extent of the netsonde cable), and no evidence that these are being used in the asbence of mandatory rules (i.e. the bycatch is very high). In addition, the drafts of the PRDCIs that we have seen contained unproven and potentially concerning mitigation measures for seabirds (i.e. lasers) and do not properly account for mortality of seabirds on the netsonde cable. Similar issues with an Argentinean seabird bycatch regulation resulted in the placement of a condition on the fishery to deal with seabird bycatch on the netsonde cable during their recent re-*

*certification:*
*(see: [https://fisheries.msc.org/en/fisheries/argentine-hoki-macruronus-magellanicus-bottom-and-mid-water-trawl-fishery/@@assessments).](https://fisheries.msc.org/en/fisheries/argentine-hoki-macruronus-magellanicus-bottom-and-mid-water-trawl-fishery/@@assessments) There is therefore no strategy in place at present and the fishery should score less than 80 for 2.3.2 (A), and similarly, given that the most recent draft of the PRDCI contained unsuitable measures (i.e. lasers), did not address netsonde bycatch (seemingly the most substantive issue for this fishery given the data noted above) and is not yet in place, it is not reasonable to assess the fishery as achieving SG80 for scoring issue (C) - which requires there to be an objective basis for confidence that the measures/strategy work.*

*Scoring issue (D) focuses on the implementation of management measures, and while the increase in observer coverage is clearly welcome, it is evident that implementation of mitigation measures for seabirds has not occurred given the high levels of bycatch highlighted. Again, SG80 is not met here for the trawl fleet. Given that the implementation of measures has not occurred in the trawl fleet, there is not yet an effective system of reviewing measures to ensure they are in line with ACAP best practice (as referenced in the MSC certification requirements), much less implementation. Indeed, as noted above, the draft PRDCI included non-best practice mitigation measures, so has evidently not yet been reviewed against best practice criteria. The trawl UoA does not meet SG80.*

*Conditions need to be introduced that require the implementation of best practice seabird bycatch mitigation measures on vessels (regardless of what any eventual PRDCI says - which is uncertain at the time of the PCDR being published) given the scale of the impact of the trawl fleet, particularly on black-browed albatrosses.*

**CAB's response**

The first part of this comment has been addressed as it was stated previously that due to the lack of quantitative limits (i.e. numbers of individuals) the fishery cannot be evaluated under the SI (a). Therefore, following the FCR v2.0 clause SA 3.11.2.1, the fishery was not scored in SI (a) but in SI (b). The assessment team acknowledges this mistake and it has been corrected in the final report. However the overall outcome of the Si (b) has not changed.

It is also important to make it clear that The PRCDI, the plan to reduce bycatch and incidental catches in the Austral hake/Conger eel demersal fisheries, is NOT A DRAFT. It is already in place with basically all the measures/strategies implemented since 2018, including measures to manage and control the interaction and impact on ETPs species such as seabirds. The information cited in the Birdlife submission that is in draft and it will be published in July is not the same information that the team used to score the management measures in the fishery for ETPs.

The PRCDI is the publication detailed below and is already published and available on SUBPESCA website:

**Informe técnico (R. PESQ) N. 244/2017: "Plan de reducción del descarte y de la Captura de pesca Incidental para las pesquerías de merluza del sur (*Merluccius australis*) y congrio dorado (*Genysterus Blacodes*) y su fauna acompañante entre los paralelos 4128,6' y 57 LS (December 2017)**

In the report, information directly from the fishery, has been used to evaluate and implement measures to reduce the bycatch and incidental catches of seabirds among other species. In the background section, the assessment team has enumerated the measures and when they were implemented. Most of these measures were implemented during 2017 and 2018. Of all of these measures, there is a major one which has not been implemented yet (e.g. video camera monitoring). This is the reason why the fishery in assessment did not score higher in some PIs of P2.

The Assessment team also evaluated evidence to support the next clause "*There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species."* As it was mentioned before in the case of Black browed albatross, the population is increasing in recent years. There is a strategy in place to reduce the incidental catches of seabirds and marine mammals that it was presented and discussed and agreed in the Committees for the fishery and it was implemented in the Management plan for the fishery. Further in Bernal et al. 2019 has been shown that the measures are working as the impacts on Black browed albatross have decreased nearly 50% from 2016 to 2017.

Regarding seabirds the strategy focuses on technological measures led to reduce the interactions with the gears such as: mandatory use of lasers in all the vessels from 2018 (Mustad Seabird Saver) and use of Tori lines and bright colours buoys. Further, there is a code of good practice for the vessels and some of the measures that they follow are detailed below:

- In areas where there is a high abundance of seabirds, the vessels modify their fishing operations to avoid the interactions with the seabirds. The use the lateral fishing poles with bright colours ropes in the fishing operation in order to separate most of the birds form the vessels and decrease any interaction.
- The net is cleaned up and shaken after each haul to prevent the retention of fish after the operations that can attract the seabirds for feeding being trapped and submerge with the net during the fishing operation.
- All organic waste from daily activities (crew garbage, kitchen, etc.) is incinerated on board as well as all inorganic waste such as threads, ropes, etc., where the birds may get entangled.
- During the fishing operation any discard is completely forbidden to avoid the call of the seabirds to the surrounding areas of the fishing activity.
- Control of the fishing areas to avoid high concentrations of seabirds depends on the period of the year.

Thus, based on the evidences examined the team does not consider that at this time, the Chile Austral hake Industrial fishery is hindering the recovery of the species as there is a strategy in place to control the detrimental interactions of the fishery on the seabirds population. The Black-browned Albatross population is increasing and in the last report published by IUCN and realised by Birdlife was considered as least concern:

*The population trend appears to be increasing, and hence the species does not approach the thresholds for Vulnerable under the population trend criterion (>30% decline over ten years or three generations). For these reasons the species is evaluated as Least Concern.* (*BirdLife International 2018. Thalassarche melanophris. The IUCN Red List of Threatened Species 2018: e.T22698375A132643647)*

Further Bernal eta al 2017 showed there are geographical areas where interactions have happened more frequently in the studies from 2013 to 2016. These areas where the interactions were higher are located in the south. As a measures, fleets avoid the areas with high abundance of seabirds depends on the seasons of the year and carry out their fishing operations in fishing ground where the concentration of seabirds are less than other located further south. Consequently, the team considers that the fishery in assessment complies with the requirements for SG80 with no need to open a condition at this stage.

In closing, we would like to once again thank you for having taken the time to formally participate in the audit process for the Chile Austral hake Industrial trawl and longline fishery, and for providing commentary in the report. SAI Global values the input of all stakeholders to the MSC assessment process.

Yours truly,

SAI GLOBAL

Ivan Mateo

Ivan Mateo, Ph.D.
Fisheries Assessment Officer, SAI Global Assurance Services Ltd.
Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland
Cc: Mr. Dave Garforth, SAI Global
Dr. Geraldine Criquet, SAI Global
Ms. Valeria Carvajal, FIPES

### 9.4.3. WWF submission on PCDR received on May 25th 2019

| Contact Information Make sure you submit your full contact details at the first phase you participate in a specific assessment process, subsequent participation will only need your name unless these details have changed. | | | | | |
|---|---|---|---|---|---|
| Contact Name | *First* Emma | | *Last* Plotnek | | |
| Title | Ms | | | | |
| On behalf of (organisation, company, government agency, etc.) – *if applicable* | | | | | |
| Organisation | *Please enter the legal or registered name of your organisation or company.*<br>World Wildlife Fund (WWF) | | | | |
| Department | Fisheries Programme | | | | |
| Position | *Please indicate the position or function you exert within your organisation or company.*<br>Fisheries Officer | | | | |
| Description | *Please provide a short description of your organization.*<br>Conservation NGO | | | | |
| Mailing Address, Country | General Lagos 1355, Valdivia, Chile | | | | |
| Tel | + | Mob | + 56 9 9500 9508 | Fax | + |
| Email | emma.plotnek@wwf.cl | | | Web | |

| Assessment Details | |
|---|---|
| Fishery | Chile Austral hake (Merluccius australis) industrial trawl and longline |
| Certification Body | SAI Global |

• **SECTION 5** • Return to Page 3

| Assessment Stage | Fishery | Date | Name of Commenter or Organisation |
|---|---|---|---|
| **Public review of the draft assessment report**[ix] *Opportunity to review and comment on the draft report, including the scoring of the fishery* | Chile Austral hake (Merluccius australis) industrial trawl and longline | 22 May 2019 | WWF Chile |

☒ I wish to comment on the evaluation of the fishery against specific Performance Indicators.
*A table with these indicators and the scores and rationales provided by certifiers can be found as an appendix to the report.*

**Nature of comment** *(Please code below)*

1. I do not believe all the relevant information[x] available has been used to score this performance indicator *(please provide details and rationale)*
2. I do not think the information and/or rationale used to score this performance indicator is adequate to support the given score[xi] *(please provide details and rationale)*
3. I do not believe the condition(s) set for this performance indicator are adequate to improve the fishery's performance to the SG80 level[xii] *(please provide details and rationale)*
4. Other *(please specify)*

| Performance Indicator | Nature of Comment Indicate relevant code(s) from list above. | Justification Please support your comment by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary. |
|---|---|---|
| *Example: 1.1.2* | *2* | *The certifier gave a score of 80 for this PI. The 80 scoring guidepost asks for a target reference point that is consistent with maintaining the stock at Bmsy or above, however the target reference point given for this fishery is Bpa, with no indication of how this is consistent with a Bmsy level.* |

| | | |
|---|---|---|
| 3.2.3 – Compliance and enforcement | 1 & 2 | The certifier gave an overall score of 85 for both UoAs. WWF believes that the current scores are not justified and that there is clear evidence of ongoing IUU fishing within the artisanal sector that has not been considered. Despite the artisanal sector not forming part of the UoC for this fishery assessment, the impacts of the activities of the artisanal fleet affect the performance of the UoA, and as stated in the MSC FCR 2.0 (SA4.1.1), and must be considered in the UoA. The evaluation teams should determine and state which jurisdictional category, or combination of jurisdictional categories, apply to the management system of the UoA). Thus, consideration of effective management of required for the entire fishery. Four key examples of evidence are listed at the end of this text, with a short summary in parentheses of the details of each report.<br>3.2.3<br>Scoring issue a:<br>The first line of the justification section reflects the requirement at SG60, which we feel is more appropriate for this fishery. The justification presented does not address the effectiveness of MCS mechanisms nor a demonstrated ability to enforce management measure, strategies, and/or rules. In addition, the report notes that illegal discards are not yet monitored, and presents no logical justification for a score of SG80.<br>Scoring issue b:<br>Likewise, 3.2.3b is not justified at SG100. Although sanctions to deal with non-compliance exist, they are widely acknowledged by key stakeholders (evidence 2) to be inconsistent, as IUU fishing continues to be an issue – see evidence 1 & 3. Thus, they do not provide effective deterrence in the artisanal sector. Additional to the reported incidences of IUU, it is common knowledge of the key major stakeholders working in this fishery that unreported non-compliance is an issue (evidence 4). Thus, a conclusion of "effective deterrence" is not justified in the report as no evidence is presented in this regard.<br>Scoring issue c:<br>Again, 3.2.3c should not exceed SG80 - as again the artisanal sector is not considered, where persistent IUU activities exist (both reported - evidence 1, 2 & 3; and unreported – evidence 4). Thus, the available mechanisms to ensure compliance are not effective.<br>Evidence:<br>1. http://www.sernapesca.cl/noticias/sernapesca-incauta-2-mil-kilos-de-pescados-provenientes-de-la-pesca-ilegal-y-avaluados-en (Report from Sernapesca, Fisheries Compliance and Enforcement Agency, of a seizure of a significant movement of illegal fish originating from the fishery under assessment)<br>2. http://www.subpesca.cl/portal/616/articles-93150_documento.pdf (The Fishery Management Plan, developed by the multistakeholder- and government-led Management Committee, acknowledges that the first issue the fishery faces is illegal fishing - see p. 6 of the management plan)<br>3. https://ciperchile.cl/wp-content/uploads/PESCA_ILEGAL_DESDE_EL_ESTADO.pdf (independent investigative journalism report on illegal fishing of small pelagic species that are used as bait for the hake fishery)<br>4. Internal report commissioned by WWF Chile (attached).<br>5.2.3 Illegal Trade?<br>"Those acquainted with this industry have suggested the possible existence of illegal practices in this business, such as illegal catch flows, that are aimed to the domestic market. The catch certification requirements of the EU market require traceability to the licensed harvesting vessels (including collectors) and the sanitary authorization of all vessels in the value chain is a necessity for the health certification, and both are a sine quanon market access condition. |

| | | |
|---|---|---|
| | | Partial unloading of fish from fishers to buyers other that the ones they hold the exclusivity agreement is one of the practices been discussed. In this case some of the fish enters the less-controlled domestic market while the other part enters the controlled one, but only the later is recorded and low catch rates are attributed to a variety of potential causes.<br>No evidence is available for a close analysis of the empirical relevancy of the fraud options suggested. However, it is still worth arguing that the existing informal commercial relations, especially at the start of the production chain, along with the fact that more than one good or service are traded in a number of transactions, as a general rule, make possible to operate illegally." |
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### 9.4.4. Assessment team response to WWF submission on PCDR

6/12/2019
Eva Plotnek, Fisheries Officer
World Wildlife Fund Fisheries Programme
General Lagos, 1355 Valdivia Chile

Dear Ms Plotnek

Thank you for your detailed letter of May 25th, 2019. The assessment team has given the content of the letter much thought in undertaking the assessment of these fisheries. As you know, the MSC has prescribed timeframes to allow for proper consideration of new, additional information and research, and to solicit commentary and perspective from the client and, if necessary, to consult management authorities such as Subsecretaria de Pesca y Acuacultura (SUBPESCA).

In your letter, you raised a number of concerns in relation to the scoring of performance indicator PI 3.2.3[Compliance and Performance]. More specifically, the comments were focused on the impacts of the activities of the artisanal fleet affecting the performance of the UoAs [e.g.UoA1: Industrial Chile Austral hake trawl UoA2: Industrial Chile Austral hake Longline]

I trust that you will carefully consider our response to your commentaries on the PCDR and that we will continue to remain engaged as further information becomes available during the annual surveillance audit processes. That said, we are confident that we have given these subjects appropriate consideration as required under the MSC's Standard.

In our response to your letter, we have endeavoured where possible to deal with the comments in the order in which they have been presented.

**WWF Comments:** received in May 25th, 2019

**Performance indicator:**

3.2.3 – Compliance and enforcement

**Nature of comment:** 1 & 2

**Justification:**

*The certifier gave an overall score of 85 for both UoAs. WWF believes that the current scores are not justified and that there is clear evidence of ongoing IUU fishing within the artisanal sector that has not been considered. Despite the artisanal sector not forming part of the UoC for this fishery assessment, the impacts of the activities of the artisanal fleet affect the performance of the UoA as all and it should be considered as it is stated in the MSC FCR 2.0 (SA4.1.1 Teams shall determine and state which jurisdictional category or combination of jurisdictional categories apply to the management system of the UoA) Thus, consideration of effective management of required for the entire fishery. Four key examples of evidence are listed at the end of this text, with a short summary in parentheses of the details of each report.*

*3.2.3*

*Scoring issue a:*

*The first line of the justification section reflects the requirement at SG60, which we feel is more appropriate for this fishery. The justification presented does not address the effectiveness of MCS mechanisms nor a demonstrated ability to enforce management measure, strategies, and/or rules. In addition, the report notes that illegal discards are not yet monitored, and presents no logical justification for a score of SG80.*

*Scoring issue b:*
*Likewise, 3.2.3b is not justified at SG100. Although sanctions to deal with non-compliance exist, they are widely acknowledged by key stakeholders (evidence 2) to be inconsistent, as IUU fishing continues to be an issue – see evidence 1 & 3. Thus, they do not provide effective deterrence in the artisanal sector. Additional to the reported incidences of IUU, it is common knowledge of the key major stakeholders working in this fishery that unreported non-compliance is an issue (evidence 4). Thus, a conclusion of "effective deterrence" is not justified in the report as no evidence is presented in this regard.*

*Scoring issue c:*
*Again, 3.2.3c should not exceed SG80 - as again the artisanal sector is not considered, where persistent IUU activities exist (both reported - evidence 1, 2 & 3; and unreported – evidence 4). Thus, the available mechanisms to ensure compliance are not effective.*

*Scoring issue d:*
*There is in fact evidence that systematic non-compliance occurs in the artisanal sector and therefore SG80 is not met.*
*Thus - the fishery does not merit a score of above 80 for this performance indicator. A relevant and urgent condition to address issues of IUU in the artisanal sector must be applied - i.e. tough measures in a short time frame to ensure SG80 is met and IUU is eradicated in all sectors of the fishery.*

*Evidence:*
*1. http://www.sernapesca.cl/noticias/sernapesca-incauta-2-mil-kilos-de-pescados-provenientes-de-la-pesca-ilegal-y-avaluados-en (Report from Sernapesca, Fisheries Compliance and Enforcement Agency, of a seizure of a significant movement of illegal fish originating from the fishery under assessment)*
*2. http://www.subpesca.cl/portal/616/articles-93150_documento.pdf (The Fishery Management Plan, developed by the multistakeholder- and government-led Management Committee, acknowledges that the first issue the fishery faces is illegal fishing - see p. 6 of the management plan)*
*3. https://ciperchile.cl/wp-content/uploads/PESCA_ILEGAL_DESDE_EL_ESTADO.pdf (independent investigative journalism report on illegal fishing of small pelagic species that are used as bait for the hake fishery)*
*4. Internal report commissioned by WWF Chile (attached).*

5.2.3 Illegal Trade?

*"Those acquainted with this industry have suggested the possible existence of illegal practices in this business, such as illegal catch flows, that are aimed to the domestic market. The catch certification requirements of the EU market require traceability to the licensed harvesting vessels (including collectors) and the sanitary authorization of all vessels in the value chain is a necessity for the health certification, and both are a sine quanon market access condition.*
*Partial unloading of fish from fishers to buyers other that the ones they hold the exclusivity agreement is one of the practices been discussed. In this case some of the fish enters the less-controlled domestic market while the other part enters the controlled one, but only the later is recorded and low catch rates are attributed to a variety of potential causes.*
*No evidence is available for a close analysis of the empirical relevancy of the fraud options suggested. However, it is still worth arguing that the existing informal commercial relations, especially at the start of the production chain, along with the fact that more than one good or service are traded in a number of transactions, as a general rule, make possible to operate illegally."*

**CAB Response:**
According to GSA4.1, the intent of P3 is to ensure that there is an institutional and operational framework appropriate to the size and scale of the UoA for implementing Principles 1 and 2, and that this framework is capable of delivering sustainable fisheries in accordance with the outcomes articulated in these Principles.

A MSC UoA might include only a sub-set of fishers within a wider fleet of fishers where a fleet is a group of fishers fishing for the same stock, using the same type of fishing activities (gear types, seasons etc.), under the same or similar management system or arrangements. Please see this MSC interpretation this which is helpful:

https://mscportal.force.com/interpret/s/article/GSA-4-1-Definition-of-fleet-GSA-4-1-1527262007952

It gives an example of a fleet as: *"a fleet may be all the purse seine vessels in a specific sardine fishery, or all the fishers setting nets from the shore in a tropical multispecies fishery. "*

In our case the "fleet" is the industrial fleet as defined by the UoA. The artisanal fleet is not part of the UoA and while they fish the same stock and use different gears (i.e. Industrial: trawls and longlines; Artisanal: Small scale Longline (Espinel), they have different management arrangements and operate in different areas and may also have different quota systems and seasons.

Therefore, scoring for PI 3.2.3 Compliance and enforcement should focus on whether monitoring, control and surveillance mechanisms ensure the management measures in the [industrial] fishery are enforced and complied with.

After a brief discussion about the WWF comments on Performance indicator 3.2.3 SI a, b, c. The team felt that most of the comments were focused about the issue of IUU, Ilegal discards, and monitoring of artisanal fisheries which team considers not applicable to PI 3.2.3. PI 3.2.3 is a fishery-specific management system PI so the issue with the IUU in artisanal fishery does not have to be considered here, but only the enforcement and compliance for the Industrial Trawl and Longline Chile Austral hake fishery.

In closing, we would like to once again thank you for having taken the time to formally participate in the audit process for the Chile Austral hake Industrial trawl and longline fishery, and for providing commentary on the report. SAI Global values the input of all stakeholders to the MSC assessment process.

Yours truly,

Ivan Mateo, Ph.D.
Fisheries Assessment Office
SAI Global Assurance Services Ltd./Global Trust Certification Ltd.
Quayside Business Park, Mill Street
Dundalk, County Louth, Ireland
Cc:
Mr. Dave Garforth, SAI Global
Ms. Geraldine Criquet, SAI Global
Ms. Valeria Carvajal , FIPES

## 9.5. Appendix 5 MSC Technical Oversight

MSC's Technical Oversight (provided by the Fishery Standards Team) has been included in its entirety in the following table. Note some distinct topics under the same finding have allocated to separate rows so that they may be responded to directly.

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| 29287 | 267 | Guidance | | Under weaknesses of the assessment, the point on Austral hake SSB being below the target Spawner Stock Biomass (SSBMSY) is listed twice. Additionally, this is listed as being on page 267 of the report, but in all actuality, it is at the beginning of the report (page 11) and numerous pages are listed as being pg 267, so it appears that the page numbering for this report is off. | | The statement *Austral hake SSB being below the target Spawner Stock Biomass (SSBMSY)* was included on two unit of assessments that were evaluated under the P1 on Tables 1 and 2 of the PCR. Page numbering on the report was corrected. |
| 29290 | 128 | Minor | FCR-7.12.1.4 v2.0 | The risk of "other eligible fishers" selling their product as MSC certified is not properly addressed. In table 32 page 128 the description of the "Potential for vessels outside of the UoC or client group fishing the same stock" is mainly a copy of the text above and does not mention the other eligible fishers at all. Please explain in more detail how this risk is mitigated. | | New text was added on Table 32. |
| 29291 | 134 | Minor | FCR_7.12.1.5.c v2.0 | Section "Point from which Chain of Custody is required" Please clarify if all trawl fishing vessels will need CoC, no matter if they are factory vessels. Also clarify if only factory longline vessels will need CoC, not the non-factory longline vessels? This section is not very clear since a later sentence only states processing on board requires CoC. Further, it states in the section "Point of intended change of ownership" that land-based transport from landing to the processing facility will be covered by the fishery certificate when it fact, it should be covered by CoC certification if CoC starts on board the vessel. Finally, if any land-based activities are included in the fishery certificate, even if only in certain scenarios, then these should be assessed as part of the traceability risk assessment. However, section 5.2 states that only "traceability up to the point of first landing | | Section was modified clarifying all trawl fishing vessels (both factory and non factory ) would need COC. Only Factory longline fishing vessels would only need COC . There are not non factory longline vessels. Wording on Section 5.2 and Table 32 were modified |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| | | | | has been scrutinized as part of this assessment." Please clarify which parties, at which point will need CoC and amend section 5.2 and Table 32 accordingly. | | |
| 29292 | 134 | Minor | FCR_7.12.2.1 v2.0 | "Conclusion for product eligibility" It is the first time that you mention that industrial longline fisheries targeting Chile hake and Chile Seabass would not be eligible to sell Chile Austral hake caught as MSC certified. How will the risk be mitigated that this Austral hake will not be sold as certified? Please clarify this section in case this refers to the "other eligible fishers" or discuss how this risk factor will be mitigated in Table 32. | | A paragraph was included at the beginning on the section of definition of UoCs below table 6 explaining that industrial longline fishing companies normally go out fishing targeting only Chile hake as a directed fishery or Chilean Seabass separately . These fishing operations differs on type of fishing gear, locations, depth, and season. Thus, it is extremely rare that Chile Austral hake is caught on Chilean Seabass fishing. |
| 29293 | 126 | Guidance | | Refers to "inshore scallop fishery" which must be an error. Please correct. | | Words deleted |
| 29294 | 134 | Minor | FCR_7.12.2.1 v2.0 | In the section "Conclusion for product eligibility to be sold as under-assessment product…", the wording is unclear and it is not possible to determine what hake is eligible to be sold as certified and when. For example, it appears that client group vessels targeting hake are eligible to sell product as certified. But it is not clear when hake is caught as bycatch what the process is to determine eligibility, on what grounds, and how product is clearly identifiable as eligible to be sold as certified upon landing and sale. | | Wording on the section "Conclusion for product eligibility … has been modified. |
| 29295 | 245 | Minor | FCR-7.10.6.1 v2.0 | PI 3.1.2 SI b. It is not clear from the rationale how regularly the management system seeks and accepts relevant information including local knowledge. | 3.1.2, | In the National Fisheries Regulation (Fishery Law) it is explicitly established how local knowledge is regularly sought and accepted management system. There are different management bodies involved in the consultation process such as: Local Councils, the Management Committees and the Scientific and Technical Committees. Composition and functions of these organisms are indicated in the sections 3.5.2 and 3.5.4 of the report. The Assessment team could reach a conclusion of mechanism in place through the minutes of the meetings carried out by the different management bodies available on SUBPESCA website. This information shows the frequency of the meetings and how is the |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| | | | | | | participation of each body in the consultation process. Given the reasons above, the Assessment team estimated that there was sufficient background information in the national legislation to score this SI at SG 80. |
| 29296 | 252 | Minor | FCR-7.10.6.1 v2.0 | PI 3.2.2 SI b. It is not clear from the rationale how decision making processes respond in a transparent, timely and adaptive manner. | 3.2.2, | In the Chile Austral hake fishery is considered that decision-making processes respond to serious and and important issues identified in the research, monitoring and evaluations of the fishery. Recently, the fishery has been submitted to a review of the process in the Committees and processes developed to ensure the management system. As a result of these processes, a new Management Plan for the fishery has been implemented by the Resolution No. 3069 of October 2016. , and subsequently amended by the Resolution No. 4499 of December 2018, through a transparent process, providing a timely response to many of the aspects identified as serious and other important issues.<br><br>The Chile Austral hake management plan has considered quantifiable objectives in regards with biological, environmental, economic and social aspects. In addition, the Discard and Incidental Catch Reduction Plan was established for the Chile Austral Hake and Golden Conger fishery, by the Resolution No. 4479 of December 2017, to deal with one of the biggest issues identified by the management bodies for the fishery. On the other hand, in December 2015 a new regulation was drafted to give more functions and power to the National Fisheries Service (SERNAPESCA), the management body in charge of, among other issues, the inspection of fishing activities. The law was finally approved in January 2019 (Law 21.132). This law governs new measures of landings obligations and possible infringements that could result in non-compliances. That said, the Assessment team considered there was sufficient background to score this SI at SG 80. |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| 29297 | 257 | Major | FCR-7.10.6.1 v2.0 | PI 3.2.3 SI a. Whilst the MCS system has been described in the rationale, it is unclear how the team has concluded that the system unambiguosly (SG80) demonstrated an ability to enforce relevant management measures, strategies and/ or rules that consider both P1 and P2. | 3.2.3, | In the Chile Austral hake fishery  is considered that decision-making processes respond to serious and and important issues identified in the research, monitoring and evaluations of the fishery. Recently, the fishery has been submitted to a review of the process in the Committees and processes developed to ensure the management system. As a result of these processes, a new Management Plan for the fishery has been implemented by the Resolution No. 3069 of October 2016. , and subsequently amended by the Resolution No. 4499 of December 2018, through a transparent process, providing a timely response to many of the aspects identified as serious and other important issues.<br><br>The Chile Austral hake management plan has considered quantifiable objectives in regards with biological, environmental, economic and social aspects. In addition, the Discard and Incidental Catch Reduction Plan was established for the Chile Austral Hake and Golden Conger fishery, by the Resolution No. 4479 of December 2017, to deal with one of the biggest issues identified by the management bodies for the fishery. On the other hand, in December 2015 a new regulation was drafted to give more functions and power to the National Fisheries Service (SERNAPESCA), the management body in charge of, among other issues, the inspection of fishing activities. The law was finally approved in January 2019 (Law 21.132). This law governs new measures of landings obligations and possible infringements that could result in non-compliances. That said, the Assessment team considered there was sufficient background to score this SI at SG 80. |
| 29298 | 258 | Major | FCR-7.10.6.1 v2.0 | PI 3.2.3 SI b. The rationale cites an absence of violations recorded, and then goes on to state that 'there are penalties for non-compliance, which are applied consistently and in the case of the Industrial sector have a proven deterrent effect but in the artisanal sector are | 3.2.3, | In the Industrial sector, sanctions of an administrative nature have been applied progressively from 2002 to 2012 (Law 19,713). Due to effectiveness showed in reducing the number of non-compliances, these sanctions were again established, now permanent, through Law 20,657. Further, the law has included a |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| | | | | expected to produce a deterrent efftect'. This phrase is not entirely clear and implies that sanctions may not be being consistently applied. Whilst penalties have been outlined, it is not clear from the rationale what evidence is used to conclude that penalties are applied consistently and demonstrably provide effective deterrence. | | clauses where it said that recognition of 4 infractions in a period of 10 years will result in a suspension of the fishing license in the course of 20 years. (Article 26 B of the law of fishing). The licenses will not be renewed for this period of time. Therefore, the sanctions established for the industrial sector have proven to be dissuasive.<br><br>Sanctions set up for artisanal fishery are relatively recent in national fisheries regulation, even they are designed to produce a deterrent effect the results will have to be proven in a period of time. It should be noted that during the first years of the establishment of sanctions in 2002, some measures applied had very positive results being so dissuasive and the infractions have not occurred in the last few years, as indicated by the National Service in its annual report. Thus, the team considered the sanctions established to the industrial sector have had an effective deterrence and because of the above a score of 100 is given. |
| 29299 | 266 | Minor | PF 4.4.6.1 v2.0 | PF 4.4.6.1 Table 37. When assessing areal overlap in the PSA, the rationale refers to depth ranges of the species and the catch composition of the fleet, as well as providing a relative comparison of occurrence of the species between FAO areas 51, 81 and 87, however it is not clear how the final score of 10% has been determined for this attribute based on the areal overlap between the fishery activity and the species distribution, accounting for species concentration, as required in PF 4.4.6 and associated guidance. | 2.2.1, | In table 37 is explained why the fishery has an a overlap of 10 % and is considered of being at low risk. The spatial distribution of the species of Austral hake, and Silver Warehou are different. Therefore, the footprint of the fishery doesn't overlap with the distribution of S warehou. Also, S warehou is more abundant in other areas where the fishery does not take place. Furthermore, the total catch composition shows that Silver warehou represents less than 0.6%, from all the total volume of the catch. Together. Finally the assessment team also considered the input of the stakeholders during the workshop meeting where everyone also agreed that the overlap was around 10 %, |
| 29300 | 256 | Minor | PF4.4.7.1 v2.0 | PF 4.4.7.1 Table 37. The rationale concludes that 'due to the uncertainty, the medium score was not given'. This is confusing as the medium score of 2 has been assigned here. | 2.2.1, | The rationale has been reviewed. Medium risk was scored because although the fishery has low overlapping, there is a lack of biological studies of the species in the fishing area. Therefore |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| | | | | | | the assessment team has taken a precautionary approach and scored it at medium risk. |
| 29301 | 266 | Minor | PF 4.4.6.1 v2.0 | PF 4.4.6.1. Table 38. When assessing areal overlap in the PSA, the rationale refers to depth ranges of the species and the potential for interactions with the gear relative to bottom trawl but not the distribution of the stock relative to the fishing activity. As such, it is not clear exactly how the concluding score has been reached which should be determined based on what proportion of the distribution of the stock is overlapping with the fishery activity, accounting for concentration of the stock, as required in PF 4.4.6 and associated guidance. | 2.2.1, | The rationale has been reviewed and corrected the rationale on why medium risk score was given to midwater trawl. |
| 29302 | 164 | Major | FCR-7.10.6.1 v2.0 | PI 1.2.3 SI c: Per guidance (GSA2.6.1), fishery removals can include consideration of the levels of unreported, unregulated,and illegal catch. As there are noted gaps in knowledge on discards and ghost fishing, and discards and under-reporting are taken into consideration in the stock assessment using weighted values (Section 3.3.2), the team does not give suficient arguments to whether there is adequate information with regards to all other fishery removals to support that there is comprehensive information at SG80. | 1.2.3, | New text on discard estimates from the Southern Austral groundfish fishery (industrial and artisanal) and how this data is used for management decision was included on 1.2.3 |
| 29303 | 161 | Minor | FCR-7.10.6.2 v2.0 | PI 1.2.2 Sia: The HCRs are noted to be designed in such a way that they are expected to, once the stock has rebuilt, keep the stock fluctuating around a target level consistent with (or above) MSY. Provided that the stock is currently rebuilding and is not fluctuating around MSY (triggering the rebuilding PI), per GSA2.3, rebuilding strategies are to be scored in the management component of Principle 1, particularly PI 1.2.2. The rationale does not mention any rebuilding strategies nor does it mention how the HCR acts to cause the stock to rebuild to the target reference point, as it is below it (GSA2.5). | 1.2.2, | New text was added that describes the strategies under the management plan to rebuild the Chile Austral hake spawner biomass to MSY levels in a specific timeframe. |

| SubID | Page Ref. (of PCDR) | Grade | Requirement Version | Oversight Description | PI | CAB Comment |
|---|---|---|---|---|---|---|
| 29304 | | Guidance | | There are several instances of missing references with the message (Error! Reference source not found.) | | All graphs and tables were cross referenced to avoid getting these errors on the manuscript |
| 29305 | 82 PDF | Guidance | | It would improve the report to elaborate in the details of "The development of a fishing technique validated by scientists and fishermen". | | Additional text were added on that paragraph. The team reviewed some of details on P2 sections and Figure 10 and 15. |
| 29306 | 110 PDF | Guidance | | The report reads "The Panamanian fishery does not represent an overlapping fishery", this must be an error please correct. | | Sentence Deleted |

## 9.6. Appendix 6 Surveillance Frequency

**Table 47. Surveillance level rationale**

| Year | Surveillance activity | Number of auditors | Rationale |
|---|---|---|---|
| Year 1 | On-site surveillance audit | 2/3 auditors on-site | There are 2 Conditions. Given the level of stakeholder interest as well as the particular issues on which Conditions 1 and 2 have been placed, the Assessment Team have determined that an on-site audit is appropriate. |
| Year 2 | On-site surveillance audit | 2/3 auditors on-site | There are 2 Conditions. Given the level of stakeholder interest as well as the particular issues on which Conditions 1 and 2 have been placed, the Assessment Team have determined that an on-site audit is appropriate. |
| Year 3 | On-site surveillance audit | 2/3 auditors on-site | There are 2 Conditions. Given the level of stakeholder interest as well as the particular issues on which Conditions 1 and 2 have been placed, the Assessment Team have determined that an on-site audit is appropriate. |
| Year 4 | On-site surveillance audit | 2/3 auditors on-site | There are 2 Conditions. Given the level of stakeholder interest as well as the particular issues on which Conditions 1 and 2 have been placed, the Assessment Team have determined that an on-site audit is appropriate. |

**Table 48. Timing of surveillance audit**

| Year | Anniversary date of certificate | Proposed date of surveillance audit | Rationale |
|---|---|---|---|
| 1 | TBD | TBD | The fishery generally runs from May to October so conducting audit towards the start of the calendar year would allow time for all information relating to the past fishing season to become available |
| 2 | TBD | TBD | |
| 3 | TBD | TBD | |
| 4 | TBD | TBD | Allow sufficient time for re-assessment to be completed before cert expiry date |

**Table 49. Fishery Surveillance Program**

| Surveillance Level | Year 1 | Year 2 | Year 3 | Year 4 |
|---|---|---|---|---|
| Level 6 | On-site surveillance audit | On-site surveillance audit | On-site surveillance audit | On-site surveillance audit & re-certification site visit |

## 9.7. Appendix 7 Objections Process

### 9.7.1. Independent Adjudicator – Notice of Acceptance

**MARINE STEWARDSHIP COUNCIL**

**IN THE MATTER OF AN OBJECTION TO THE FINAL REPORT ON THE PROPOSED CERTIFICATION OF THE CHILE AUSTRAL HAKE INDUSTRIAL TRAWL AND LONGLINE FISHERY UNDER THE MSC PRINCIPLES AND CRITERIA FOR SUSTAINABLE FISHING**

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**DECISION BY THE INDEPENDENT ADJUDICATOR ON ADMISSIBILITY OF THE NOTICE OF OBJECTION OF BIRDLIFE INTERNATONAL**

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1. On July 16, 2019, I was advised by the MSC Executive that a Notice of Objection (the "NOO") to the Final Report on the proposed certification of the Chile austral hake industrial trawl and longline fishery had been received from the organization BirdLife International (the "objector"). I am appointed Independent Adjudicator for this matter. Having considered the objector's submission, I now make the rulings set forth below in accordance with the MSC Objections Procedure.

2. In accordance with the MSC Objections Procedure, in order to permit an objection to proceed further, I must first determine whether the NOO (1) has been submitted by a qualified party, *e.g.*, a person who submitted written comments during the assessment process (PD 2.3.1), (2) is timely, *i.e.*, whether it has been submitted within fifteen (15) working days after posting of the Final Report on the MSC website (PD 2.3.2), (3) has been submitted in the form prescribed by the MSC Executive (PD 2.3.3), and (4) "sets out clearly and precisely the basis on which PD 2.7.2 is said to apply" (PD 2.3.4).[1]

3. The objector is a qualified party, since, among other things, it made written submissions to the conformity assessment body, SAI Global (the "CAB"), during the assessment process. In particular, as the objector avers, these included comments on the Public Comment Draft Report, provided on May 20, 2019. The Final Report was posted on the MSC website on June 24, 2019. The closing date of the objections period was July 16, 2019. The NOO was received electronically at MSC Headquarters before 5:00 p.m. Greenwich Mean Time on July 16, 2019. Accordingly, the NOO was timely filed. It is also in the form prescribed by the MSC Executive.

4. Additionally, I believe that the NOO meets the requirements for clarity and precision set out in PD 2.3.4 of the Objections Procedure. Although the NOO is sufficiently

[1] References are to Version 2.0 of the Objections Procedure, which corresponds with the version of the process requirements against which the fishery was assessed.

clear and precise to allow the objection to move forward at this stage, nonetheless one relatively minor deficiency deserves mention in this regard. While there are two Units of Assessment ("UoAs") under review in the Final Report, one for the trawl fishery (UoA1) and one for the longline fishery (UoA 2), the NOO, which challenges the scores for Performance Indicator ("PI") 2.3.2 and PI 2.3.3, does not expressly distinguish between the two. The focus of the NOO, however, especially the PI 2.3.2 claim, appears primarily to be the former and not the latter. As the objection proceeds, the objector will be expected to differentiate more explicitly between the two UoAs and specify with greater precision the UoAs upon which it focuses.[2]

5. Finally, under PD 2.4.1 of the MSC Objections Procedure, I must be satisfied that the NOO has a "reasonable prospect of success." This means, as defined in PD 2.4.2, that the NOO is not "spurious or vexatious" and presents "[s]ome evidence . . . on the basis of which the independent adjudicator could reasonably be expected to determine that one or more of the conditions set forth in PD 2.7.2 are satisfied."

6. PD 2.7.2 of the Objections Procedure provides that a remand can only be ordered where the Independent Adjudicator determines that one or more of the following circumstances applies:

> PD 2.7.2.1 There was a serious procedural or other irregularity in the fishery assessment process that made a material difference to the fairness of the assessment; or
>
> PD 2.7.2.2 The setting of conditions by the CAB in relation to one or more performance indicators cannot be justified because the conditions fundamentally cannot be fulfilled, and the condition setting decision was arbitrary or unreasonable in the sense that no reasonable CAB could have reached such a decision on evidence available to it; or
>
> PD 2.7.2.3 The score given by the CAB in relation to one or more performance indicators cannot be justified, and the effect of the score in relation to one or more of the particular performance indicators in question was material to the outcome of the determination because either:
>
> a. The CAB made a mistake as to a material fact.
>
> b. The CAB failed to consider material information put forward in the assessment process by the fishery or a stakeholder.
>
> c. The CAB failed to consider material information put forward by the peer reviewer(s).

[2] The NOO states that it objects to an overall score of "80" on PI 2.3.2 for "the trawl fishery." NOO, p. 7. The Final Report, however, indicates that the trawl fishery (UoA 1) received a score of 85 for this PI. *See* Final Report, p.195. For PI 2.3.3, the assessment of the two UoAs was combined, with the score given being an 80. Final Report, p. 203.

d. The scoring decision was arbitrary or unreasonable in the sense that no reasonable CAB could have reached such a decision on the evidence available to it.

At the same time, PD 2.7.3 provides:

It is necessary to remand the determination in order to enable the CAB to consider additional information described in PD 2.6.5.2 and described in the notice of objection.

PD 2.7.3.1 In such a case, the remand shall be limited to a request to the CAB to consider the impact of the additional information on its original determination and to provide a response in accordance with PD 2.8.2.

7. Having considered the NOO, I find that the objector has raised issues which are not spurious or vexatious, and has presented "some evidence" on which I might rule in its favor under PD 2.7.2. The objector has thus shown a "reasonable prospect of success" as defined in the Objections Procedure.

8. In accordance with PD 2.4.7.1 of the Objections Procedure, I direct that this decision, together with the NOO, be posted on the MSC website and, pursuant to PD 2.4.7, the CAB, the fishery client and the objector shall be promptly notified of the decision. For purposes of this proceeding, the date the NOO is published on the MSC website, which I understand to be July 23, 2019, is the "date of publication" under PD 2.4.7.2.

9. In accordance with PD 2.4.8 of the Objections Procedure, the fishery client and any stakeholders who participated in the assessment process (other than the objector) may, within fifteen (15) working days from the date of publication, "submit written representations on the matters raised in the notice of objection." In addition, in accordance with PD 2.5.1.1 of the Objections Procedure, the CAB shall have twenty (20) working days from the date of publication to provide a written response to the matters raised in the NOO. For the avoidance of doubt, I wish to inform the CAB, the fishery client and all stakeholders that the relevant dates for such submissions will be August 13, 2019, and August 20, 2019, respectively. I remind the parties that, in accordance with PD 2.10.1.1 and 2.10.1.3, submissions must be made by 5:00 p.m. British Summer Time on the due date to be considered timely.

10. In accordance with PD 2.5.3 of the Objections Procedure, upon receipt of the response by the CAB, I shall consult with the objector, the fishery client and the CAB in order to determine whether the response of the CAB, including any proposed changes to the Final Report, adequately addresses the issues raised in the NOO, *i.e.*, to determine whether there is a possibility of settlement. I anticipate that these consultations will take place primarily during the weeks of August 19 and August 26, 2019. I would like to hold a short, initial teleconference with the parties on either August 22 or August 23 at a time between 9:30 a.m. and 12:00 p.m. Eastern Daylight Time, to discuss the consultation process. I would appreciate it if the parties would, prior to August 16, 2019, advise me (via the e-mail address established by the MSC for this proceeding) of their availability for such a teleconference. I will then provide a call-in number and passcode. If the objection cannot be resolved through the consultation process, I shall proceed to adjudication in accordance with PD 2.6 of the Objections Procedure.



  

11. In accordance with established procedure, the MSC Executive has established a special e-mail address for all correspondence relating to this objection at ChileAustralHakeObjection@msc.org. It will assist the process if all e-mail is in the future sent to this address alone.

Eldon V.C. Greenberg
MSC Independent Adjudicator

Dated: July 23, 2019

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### 9.7.2. SAI Global – Response to accepted NOOs

**SAI Global**
Quayside Business Park
Mill Street, Dundalk,
Co. Louth, Ireland.
www.saiglobal.com

Date: 20th August 2019
Email: ChileAustralHakeObjection@msc.org

To: Eldon Greenberg,
Independent Adjudicator

**Re: Objection to the certification of Chile Austral hake Industrial Trawl and Longline**

Dear Mr. Greenberg,

In accordance with MSC procedure, SAI Global has reconsidered the Final Report taking account of the matters raised in the accepted Notice of Objection and all additional written representations; having done so, SAI Global is pleased to provide the following response.

The Independent Adjudicator is charged with examining the claims made as to whether SAI Global made an error as described in Section 2.7.2 of the Objections Procedure. SAI Global is confident that in this case no such error occurred and as such the Independent Adjudicator should not set aside SAI Global's conclusions.

Fundamentally there are two issues contained in the accepted Notice of Objection:

1. What the objectors perceive to be "best practice" seabird bycatch mitigation measures are not in place in the fishery.
2. Seabird bycatch data is inadequate due to the manner in which it is collected by observers.

Basically, what the objectors are asking of SAI Global in response to these two issues is as follows:

1. Require the client to implement those measures they see as "best practice".
2. Require a change in the way seabird bycatch data are recorded to better account for cryptic mortality.

Neither of the two issues identified by the objectors are required by MSC; therefore, SAI Global has absolutely no remit to require the desired response of the client. While the objectors might not like it, the role of SAI Global is quite simply to apply the MSC requirements as written to the fishery under assessment–to do otherwise would be to overstep SAI Global's role as a CAB.

In addition, in several areas, the objectors have stated that the SAI Global has made a mistake as to the material facts with no evidence of any such mistake being presented. SAI Global is strongly of the opinion that, where specific evidence has not presented, these grounds for objections should be disallowed going forward.

Finally, SAI Global feel that these issues are clear enough that the objectors may wish to resolve them prior to proceeding to adjudication. As such SAI Global feel that in this instance further consultation prior to proceeding could be very useful.

If anything in the below response is unclear, please feel free to respond and we will endeavour to clarify the issues as quickly as possible.
Kind regards,

**Dr. Ivan Mateo**
Fisheries Assessment Officer
**SAI Global/Global Trust Certification**

## Introduction

**Note the MSC Objections procedures applicable to this assessment are those outlined in Annex PD of MSC Fisheries Certification Requirements (FCR) v2.0.**

One Notice of Objection (NOO) to the proposed certification of this fishery was received having been submitted by Birdlife (hereafter referred to as the objectors). Having met the primary threshold of having been submitted in the form required and having a "reasonable prospect of success" (as determined by the assigned Independent Adjudicator (Eldon Greenberg)), the NOO was accepted on the 23th July 2019.

With it having been accepted, the fishery client and other stakeholders previously involved in the assessment process were invited to submit written representations on the matters raised in the NOO. Following this invitation, one submission was made by the following:

1. Federacion de Pesquerias del Sur Austral (FIPES) (The Fishery Client).

SAI Global was required to reconsider its Final Report and Determination considering the matters raised in the NOO and provide a written response to the NOO taking into account any additional written representations.

SAI Global has considered the submission of the Fishery Client but as it effectively represents a standalone document and is supportive of SAI Global's position it is not specifically referenced or responded to here in.

The contents below represent SAI Global's written responses to the accepted NOO as well as to the additional written submissions (aside from the Fishery Client's). To facilitate responding to each point raised, SAI Global has included the Objection/Submissions verbatim in the various tables on the following pages and has thereafter responded to each point in turn. The Table of Contents on the following page is intended to facilitate the easy navigation between relevant sections.

Finally, before proceeding, SAI Global would like to re-iterate some important points:

1. It is not the role of CABs to question MSC process or requirements.
    a. CABs simply measure fisheries against requirements using defined process.
2. Some aspects of what stakeholders may wish from the Chile Austral hake Industrial Trawl and Longline fishery (e.g. 100% observer coverage, position of observer on the fishing boat, etc.) are simply not requirements of the MSC FCR and as such cannot be required of the fishery client by the CAB (SAI Global).
3. Some aspects of the fishery that might be perceived to be deficient in the eyes of stakeholders may still meet the SG80 (or higher) level according to the MSC FCR.

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# 1 Objection 1 – Birdlife

## 1.1 Objection Pursuant to PD2.7.2.3

**The score given by the CAB in relation to one or more performance indicators cannot be justified, and the effect of the score in relation to one or more of the particular performance indicators in question was material to the determination.**

### 1.1.1 PI 2.3.2 ETP Management

| | Notice of Objection | SAI Global Response |
|---|---|---|
| **Performance Indicator** | 2.3.2 | |
| **Reason** | The trawl fishery was scored 80 overall for this performance indicator, a score which no reasonable CAB could have awarded on the basis of the available information. | 1. There is no mistake as to material facts nor have the objectors identified one.<br>2. The Assessment Team's conclusions are fully supported by the data presented in the Final Report.<br>3. The objectors do not seem to fully understand the MSC requirements in some areas. |
| | While seabird bycatch mitigation measures appear to have been introduced on trawl warp cables, best practice mitigation is currently not in place for the 'third wire' or netsonde cable utilised by some vessels in the factory trawler fleet segment. Instead, these vessels are using unproven measures, contrary to best practice advice. | It is not a requirement of PI 2.3.2 that "best practice" measures be in place; therefore, SAI Global (as a CAB) has no remit to require this of the client.<br>The only requirement relevant to ETPs that mentions "best practice" relates to the "Review of alternative measures" Scoring Issue (i.e. SIe). This requirement stipulated under MSC FCR v2.0; GSA3.5.3.1 states that: "Where best practice measures in a gear/species/region have been established (….) these measures should be included in the review."<br><br>In this instance recent reviews of alternative measures have considered the measures that the objectors deem to be "best practice". Bernal et al 2017; SUBPESCA 2017 and Bernal et al 2019 provide a review of mitigation measures for consideration to reduce seabird bycatch based on literature research/public consultations/workshops.<br><br>Bird Strikes/entanglement on trawl warp cables<br>• bird scaring lines<br>• laser<br>Bird strikes on netsonde<br>• bird scaring lines (tori lines) on the netsonde cable |

| | Notice of Objection | SAI Global Response |
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| | As the netsonde cable represents the biggest ongoing threat to seabirds in this fishery (and appears to be responsible for the vast majority of seabird bycatch), there is therefore no objective basis for confidence that the proposed measures/strategy will work, based on information directly from this fishery and/or the species involved. | • paint or mark cable<br>• reduce tension on netsonde cables<br>• use of snatch block<br>• elimination of the netsonde<br>• laser<br>Managing offal discharge and discards<br>Reduction in trawl effort hours<br><br>Some of these mitigation measures are also included on the recommendation of best practices for seabird mortality mitigation included in international binding agreements under the Convention on Migratory Species (CMS) such as Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP).<br><br>Some of these measures recommended by ACAP and reviewed in Bernal et al 2019 are currently in place or being tested by industrial trawl fisheries vessels such as scaring lines, in warp cables or netsondes. painting of cables among others.<br><br>Information from the fishery has shown a reduction on seabirds' bycatch and populations of black browed albatross, the most captured species have shown increasing abundance trends leading to update their IUCN status to species of least concern.<br><br>The measure of effectiveness at play here is whether or not the fishery has reduced the mortality of the seabirds. There is clear evidence that is happening as the number of seabirds has decreased since the bycatch program was implemented and by virtue of the fact that the populations of the main impacted species are increasing. |
| **Rationale** | Three scoring issues (a, c and e) have been scored too highly in the CAB's final report, principally because the CAB has accepted the use of a non-best practice measure (specifically a laser) to reduce bycatch on the netsonde cable. | Firstly, scoring issue a) was not initially scored as shown in the Final Report posted on MSC website (June 24th 2019).. However, following comments on PCDR submitted by Birdlife on May 20th, 2019 and two subsequent conference calls with BirdLife on the 3rd and 10th of July 2019, the team amended the report by scoring SIa in PI 2.3.2. |

| | Notice of Objection | SAI Global Response |
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| | The CAB considers the fishery to meet SG80 under 2.3.2a, which requires a '*comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species*'. Though we strongly support the work done to introduce bird-scaring lines, discard management and other measures in this fleet, no strategy can be considered 'comprehensive' if it does not tackle the principal source of bycatch in the fleet. The netsonde cable represents the biggest ongoing threat to seabirds in this fishery, with bycatch probability on vessels using netsonde cables three times higher than those that do not (see Adasme *et al* (2019) for this fishery, but also recognised in established literature – Weimerskirch *et al* (2000) showed bycatch rates to be six times higher on vessels using netsonde cables).<br><br>There are presently no legal requirements (or evident plans) to follow best practice and either: eliminate use of this cable altogether; implement the use of a bird-scaring line specifically for this cable; introduce a snatch block to reduce the aerial extent of this cable. It has been demonstrated in the literature that bird-scaring lines can significantly reduce seabird bycatch on the third wire (see Tamini *et al*, 2016, which studied this in a similar fishery in Argentina). The lasers currently being used, on the other hand, lack comprehensive scientific testing demonstrating their efficacy in reducing seabird bycatch, and critically, do not form part of what is considered 'best practice' bycatch mitigation by the Agreement for the Conservation of Albatrosses and Petrels (ACAP) – see p18 https://acap.aq/en/resources/bycatch-mitigation/mitigation-advice/3241-acap-2017-review-and-best-practice-advice-for-reducing-the-impact-of-pelagic-and-demersal-trawl-fisheries-on-seabirds/file – '***Unproven and not recommended, bird welfare issues need to be addressed***. *Preliminary research using lasers in a North Pacific trawl fishery did not show a detectable response in daylight hours, and that reactions to the laser at night varied between species, and whether the seabirds were feeding in the offal plume or following the vessel.*'. Note that ACAP's best practice advice involves comprehensive review of the peer-reviewed literature by a group of experts to determine the best available measures to minimise seabird bycatch in fisheries.<br>In combination with the issues with the observer data (see comments on 2.3.3), this fishery does not meet SG80 for 2.3.2a, which requires a strategy to meet international and national requirements for the protection of ETP species. The existing measures can only equate to a partial strategy at best (SG60), because they do not address the major outstanding issue of seabird bycatch on the third cable. | The revised 2.3.2 scoring table along with the revised background section of ETPs species were sent to Birdlife on July 9th 2019. Therefore after taking into account some comments made by Birdlife the assessment team has been scored 2.3.2 Sia following the FCR v2.0 clause SA 3.11.2.1.<br><br>Secondly, and as discussed previously, **it is not a requirement of PI 2.3.2 that "best practice" measures be in place**; therefore, it would not be appropriate for SAI Global to require this of the client.<br><br>As mentioned above, nevertheless in the final report the 2.3.2 Si (a) was not scored, in the amended report shared with Birdlife this Si (a) was scored at SG 80.<br><br>The objectors have incorrectly quoted SG80 for PI 2.3.2 Sia—a comprehensive strategy is only required at the SG100 level. At SG 80 there is the need to have a strategy in place. As states in MSC requirements V2.0 Table SA 8:<br><br>*A "strategy" represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.*<br><br>*A "comprehensive strategy" (applicable only for ETP component) is a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses.*<br><br>Therefore, the fishery has implemented measures designed to minimize the mortality of seabirds and aimed at a specific component meeting SG 80. |

| | Notice of Objection | SAI Global Response |
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| | We acknowledge that this has critical elements of a strategy, but falls short of a 'comprehensive strategy' because a fundamental issue of conservation importance is not covered. Taking this into account, a score of 70-75 for 2.3.2a would be more accurate. | The assessment team agreed that the fishery cannot meet SG 100 and never has evaluated the measures as a comprehensive strategy as the objector states.<br><br>Quite simply, while the objectors may not agree with the SAI Global's findings, SAI Global can only make said findings in relation to the MSC requirements as outlined in MSC FCR v2.0. If there is no MSC requirement then SAI Global <u>cannot</u> make a finding. |
| | Regarding 2.3.2c, there can be no objective basis that the measures will work to eliminate/reduce seabird bycatch in the fishery (SG80) as lasers are not a demonstrably effective means of tackling the major issue of bycatch on the netsonde cable. Indeed, it is perhaps questionable whether the fishery meets SG60 for this scoring issue, as bycatch of seabirds seems likely to continue if bird-scaring lines, a snatch block or elimination of the netsonde cable are not implemented. The CAB considers in the final report that two years of bycatch data collected for this fishery constitutes a 'trend' as justification that measures are working. While bycatch would undoubtedly appear to be moving in the right direction (i.e. going down), figures are not given with confidence intervals, so there is no clarity over the statistical significance of this assertion. Further, two years of data do not demonstrate a trend, and it is evident that more data are required before making such assertions. | *MSC 2.0 defines Objective basis for confidence", as used at the SG80 level in the P2 management PIs (Management Strategy Evaluation scoring issue) refers to the levels of information required to evaluate the likelihood that the management partial strategy will work.*<br>• *The SG60 level for these PIs requires "plausible argument" based on expert knowledge;*<br>• *The SG80 level requires expert knowledge augmented by some information collected in the area of the UoA about the specific component(s) and/or UoA*<br><br>Scoring issue c relates to objective evidence which it was clearly examined on information from the fishery (reduction on bycatch (Bernal et al 2019, Cespedes et al 2018) and independent data (population monitoring by abundance census (Robertson *et al* 2014, 2017).<br><br>We would like to clarify that Birdlife is mistakenly referring to 2.3.3 b on which states *Information is adequate to measure trends and support a strategy to manage impacts on ETP species to bring their arguments* about trends in bycatch mortality. The team never inferred the bycatch data as trends on the report given that demersal fishery discards study have been recently implemented. However, the team used time series of data and information from population surveys on seabirds peer reviewed journals and agency reports data to infer whether the current strategy is not hindering recovery of ETP species. |

| | Notice of Objection | SAI Global Response |
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| | We consider that updating the strategy (via a condition on the fishery) to include established best practice mitigation measure requirements for the third cable (e.g. bird-scaring lines, snatch block or removal of netsonde cable) to meet SG80 for 2.3.2a would result in 2.3.2c being met at SG80. However, as it stands, this fishery does not meet SG80 for the bycatch of ETP seabirds. | The team examined populations trends data and found increasing population abundance for Black Browed Albatross in Chile (Robertson et al 2014; Robertson et al 2017) and Falkland Islands (Catry et al. 2011; Wolfaardt 2013). Furthermore, the number of greyheaded albatrosses (*Thalassarche chrysostoma*) at Diego Ramırez Chile also increased, by 23 % (Robertson *et al* 2017). Currently Black Browed Albatross is listed as a species of least concern (IUCN 2019). There have been documentation that seabirds bycatch have been significantly reduced in more than 60% from 2016 and 2017 (Bernal *et al* 2019; Cespedes *et al* 2018).<br><br>**<u>it is not a requirement of PI 2.3.2 that "best practice" measures be in place</u>**; therefore, it would not be appropriate for SAI Global to require this of the client.<br>SAI Global scored PI 2.3.2 SG80a which states:<br><br>*"There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species"*<br><br>Evidence of this strategy working is shown on reductions by more than a half of bycatch of most encountered species, increasing abundances of black browed albatross and grey headed albatross, plan of mitigation measures that are reviewed annually to identify gaps and better practices of reduction bycatch of seabirds |
| | As noted above, we also consider that 2.3.2e is not met at SG80. This requires that '*There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate*'. The MSC standard guidance notes that '*The requirement is that the measures selected for review are those that have been shown to reduce unwanted catch levels to the 'lowest achievable levels'. Where best practice measures in a gear/species/region have been established as achieving the lowest achievable levels....these measures should be included in the review*'. ACAP is specifically referenced in MSC's guidance (under GSA3.5.3.1) as an international forum with relevant expertise. Given that ACAP recommends that a snatch block, combined with bird-scaring lines, be used to minimise bycatch on the | Scoring e describes if there was a regular review of alternate methods to minimize bycatch for the fishery in assessment. MSC 2.0 intention on examining alternative approaches for reducing gear interactions on P2 species was:<br>a. *To motivate fishers to continually "think smart" about their impact on the environment (species and habitats); both in delivering the sustainable impact most efficiently, and continuing to reduce their impact beyond that.*<br>b. *To balance this desire with efficiency by not spending a lot of money and time generating only marginal improvements.* |

  

  

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<tr><td></td><td>netsonde cable (see https://acap.aq/en/resources/bycatch-mitigation/mitigation-advice/3241-acap-2017-review-and-best-practice-advice-for-reducing-the-impact-of-pelagic-and-demersal-trawl-fisheries-on-seabirds/file; note also that ACAP made similar recommendations in the previous best practice advice from 2016, so this information has been available for some time - https://acap.aq/en/bycatch-mitigation/mitigation-advice/bycatch-mitigation-review-and-bpa-archive/trawl), and has specifically not recommended the use of lasers, it is inappropriate for the CAB to have allowed this fishery to meet SG80, when at best it meets SG60 (i.e. there has been review, but implementation is lacking). The aggregate effect of a more accurate scoring of this fishery under these scoring issues brings the PI below 80.</td><td>In order to achieve this, the scoring issue e for (2.12,222,232) was created to require fisheries to continually review alternative measures to encourage the development and implementation of technologies and operational methods that minimise mortality of unwanted catch or ETP species, taking into account the practicality of the measures, their potential impact on other species and habitats and on the overall cost of implementing the measures<br><br>That being said, there is evidence of a review of potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species. Bernal et al. 2017; SUBPESCA 2017 and Bernal et al. 2019 provide a review of mitigation measures for consideration to reduce seabird bycatch based on literature research/ public consultations/workshop.<ul><li>Bird Strikes/entanglement on trawl warp cables:<ul><li>bird scaring lines</li><li>laser</li></ul></li><li>Bird strikes on netsonde:<ul><li>bird scaring lines (tori lines) on the netsonde cable</li><li>paint or mark cable</li><li>reduce tension on netsonde cables</li><li>Use of snatch block</li><li>elimination of the netsonde</li><li>laser</li></ul></li><li>Managing offal discharge and discards</li><li>Reduction in trawl effort hours</li></ul>Some of these mitigation measures are also included on the recommendation of best practices for seabird mortality mitigation included in international binding agreements under the Convention on Migratory Species (CMS) such as Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP).<br><br>This review of performance is regularly discussed on technical committees and management boards. However, it is not a requirement of PI 2.3.2 that "best practice" measures be in place.</td></tr>
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| | Notice of Objection | SAI Global Response |
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| | | Finally, the Chile Austral hake discards reduction plan requires annual analysis of the bycatch data and annual review its effectiveness of the current methods to minimize ETP species mortality. The results are normally discussed and reviewed on the Scientific Technical committee and regional management boards. There have been documentation that seabirds bycatch have been significantly reduced in more than 60% from 2016 and 2017(Bernal et al 2019; Cespedes et al 2018). Both reports mention the use of laser, especially in the factory freezer trawler as an important factor in reducing bycatch. Furthermore there is evidence that some species such as black browed and grey head albatross populations have been increasing in Chile. Thus the assessment team don't see reasons to change score in 2.3.2e |

### 1.1.2 PI 2.3.3 ETP Monitoring and Information

| | Notice of Objection | SAI Global Response |
|---|---|---|
| **Performance Indicator** | 2.3.3 | |
| **Reason** | The fishery was scored 80 for this performance indicator, a score which no reasonable CAB could have awarded on the basis of the available information. Although information is undoubtedly improving in this fishery through increasing observer coverage, there is an issue with the adequacy of seabird bycatch data collection by observers, specifically in the trawl fleet, owing to the cryptic nature of seabird bycatch in this gear type. | Birdlife may have some issues with how IFOP bycatch data are recorded and cryptic mortality accounted for (or not) but that does not mean that the relevant SG80s are not met. It was never the intention of the Team that the existing data be presented as 'perfect'; therefore, in order to ensure this is not the case, additional discussion of the issue were added to the relevant background section in the final report.<br><br>Some quantitative information is available, data collected from 2015 in the logbook from IFOP observers report other types of interactions of seabirds with vessels as detailed in the report. Note that no all the information can be collected from stern of the vessels due to safety crew reasons and it is not mandatory on MSC v2.0 requirements that the information to score ETPs must to be taken from any specific part of the vessel.<br><br>The adequacy of the information meets SG 80 as defined in the clause SA 3.6.3.1. Table GSA5 detail the data collection methods according with their level of verifiability.<br><br>**Table GSA5: Examples of data collection methods according to their level of verifiability**<br>Column A / Column B:<br>Observer programmes / Standardised logbooks<br>Electronic monitoring of location/position (e.g., VMS, AIS) / Interviews with fishers<br>Other technologies to monitor impact/compliance (e.g., cameras) / Enforced mandatory retention of all catch with full dockside monitoring<br>Independent research projects or programmes / Information obtained from co-management and community based management.<br><br>In this case, the Chile Austral hake industrial trawl longline fishery has all the elements of Column A which characterize high quality data |

| | Notice of Objection | SAI Global Response |
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| | | collection methods that have higher validity as they are less subject to bias than those in Column B:<br>• Observer programs<br>• Electronic monitoring of location/position (e.g., VMS, AIS)<br>• Other technologies to monitor impact/compliance (e.g, cameras)<br>• Independent research projects or programs<br><br>Based on the information above, the team concludes there is some evidence based on population surveys, well sampling designed fishery discards studies with high precision (average CV<30% across years) showing<br>1) seabird population increasing abundance trends showing that the fishery impacts do not hinder the recovery and mortality has been reduced<br>2) sources of information includes both Column A and B information from table GS5<br>3) there is evidence interactions have decreased, so all combined evidence meet SG80.<br>Therefore, the information to score PI 2.3.3 comes can be consider adequate to meet SG 80 following MSC v2.0 requirements. |
| **Rationale** | Issues with the underlying observer data call into question the CAB's decision to score the trawl fishery as meeting SG80 for both 2.3.3a and 2.3.3b. The quantitative data available through the observer programme do not record the nature of seabird interactions with trawl cables and the subsequent outcomes (i.e. whether the bird was uninjured, injured or killed) (see Annex II, p233 Bernal et al., 2019).<br><br>It is well established that, because of the cryptic nature of large numbers of seabird mortalities in trawl fisheries (i.e. birds catching and breaking wings on warp/netsonde cables and drowning, then subsequently not being brought up in the net at the end of the operation), dedicated observation time at the stern of the vessel is required, cataloguing the types of interactions between birds and the gear (light or heavy) and the fate of the birds interacting (i.e. bird not apparently | SAI Global does not agree with Birdlife on the issue of the quality of the observer program in recording impact/ magnitude of trawl gear on bird mortality. The counting bird methodologies follows recommendations for standardized recording techniques (Tasker et al. 1984, Sullivan et al 2006 Tamini et al 2015 a) that are used with modifications to allow for detecting sources of seabird mortality: entanglements with the trawl net; or the trawl cables (corpses hauled aboard); and collisions with trawl cables (birds observed killed or injured).<br><br>SAI Global is providing text from the Bernal report 2019 section 1 and 2.<br><br>Page 37. 5.7.3 Levantamiento de información Bernal et al 2019 Seccion II:<br>*"El registro, en el caso de las aves, se desprende de aquellos ejemplares capturados **tanto por la red como por los enredados en los cables de*** |

| | Notice of Objection | SAI Global Response |
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| | affected; bird apparently killed and dragged under) (see (Wienecke and Robertson, 2002; Sullivan et al 2006)). | ***cala y net sonda.*** *Para los mamíferos, el registro correspondió a aquellos ejemplares enredados en la red o capturados dentro del copo. Para ambos grupos de animales* ***se registró la condición al momento de observar la captura, separándolos entre vivos o muertos. Lesiones visualmente graves, como alas o picos rotos en el caso de las aves****, o heridas que imposibilitan el nado de los mamíferos, fueron considerados como muertos"*<br><br>*"The records, in the case of birds, comes from those captured both by the net and by those entangled in the warp cables and* ***netsonde cables****. For mammals, the records corresponded to those individuals entangled in the net or caught inside the cod end. For both groups of animals the condition was recorded at the time of observing the capture, separating them between the living or the dead. Visually serious injuries, such as broken wings or beaks in the case of birds, or wounds that make it impossible for swim in mammals, were considered dead"*<br><br>**Page 119 11.1.1 Capturas incidentales observadas de aves marinas Bernal et al 2019 Seccion II**<br>*"Los registros de capturas incidentales correspondieron a aquellos ejemplares que llegaron a bordo al momento del* ***virado del arte de pesca, al interior de la red o copo, enredados en ella, o en los cables de cala y net sonda"***<br>*"The records of bycatch corresponded to those specimens that came on on board at the time of the turning of the fishing gear, inside of the net or codend, and got entangled with it , or on the warp cables and netsonde cables*<br><br>**Evaluación de las interacciones de aves y mamíferos marinos con las pesquerías en estudio**<br>*"Sobre esta última información, los datos de abundancia utilizados pertenecen al estudio de Albatross Task Force – Chile, llevado a cabo sobre la misma flota de arrastre industrial entre 2011 y 2013 (ATF-Chile 2013, Cabezas et al., en prep.). Estas abundancias relativas corresponden a conteos instantáneos directos y diurnos, realizados al inicio de las operaciones de arrastre, una hora después de iniciado el lance y al final durante el virado de la red, por períodos de 10 minutos,* |

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| | | *extendiendo el registro del número de aves por especie dentro de un semicírculo* ***de hasta 250 metros de radio desde la popa de la embarcación, extendiéndose hacia babor y estribor*** *(Sullivan et al., 2006a, Tamini et al., 2015"*<br>"On this latest information, the abundance data used belong to the study of Albatross Task Force – Chile, carried out on the same industrial trawl fleet between 2011 and 2013 (ATF-Chile 2013, Cabezas et al., in prep.). These relative abundances correspond to direct and daytime instant counts, performed at the beginning of drag operations, one hour after launch and at the end during the network turn, for periods of 10 minutes, extending the record of the number of birds per species within ***a semicircle of up to 250 meters radius from the stern of the boat, extending to port and starboard*** (Sullivan et al., 2006a, Tamini et al., 2015 )"<br><br>Protocolo general de observación para aves mamíferos y tortugas para embarcaciones arrastreras y palangreras<br>*Ítem Descripción*<br>*Horario: La observación será diurna.*<br>*Lugar de Obs: Sobre cubierta principal o lugar más elevado, de mejor visualización y seguro.*<br>***Orientación: La observación tendrá orientación hacia popa***.<br>*Lance: La selección de observación del lance se realizará de manera aleatoria según Tabla 1.*<br>*3.3.1 Metodología de conteo: La composición y abundancia de aves marinas se estimará mediante un conteo instantáneo desde un punto fijo de la embarcación,* ***con vista hacia popa*** *y* ***cubriendo un arco de 180º de visibilidad a una distancia límite de 200 m****. La observación tendrá un tiempo estimado de 10 min, siendo una modificación del método descrito por Tasker et al., (1984)".*<br><br>*"General observation protocols for birds, mammals and turtles for trawlers and longliners*<br><br>*Item Description*<br>*Hours: The observations will be on daytime.* |

| | Notice of Objection | SAI Global Response |
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| | | *Place of Observation: On main deck or higher place for better viewing and safety.*<br><br>*Orientation:* ***The observation will be stern oriented.***<br>*Lance: The launch observation selection will be performed randomly according to Table 1.*<br><br>*3.3.1 Counting Methodology: The composition and abundance of seabirds shall be estimated by an instant count from a fixed point of the vessel,* ***with a view towards the stern and covering an arc of 180°*** *of visibility at a limit distance of 200 m. The observation will have an estimated time of 10 min, being a modification of the method described by Tasker et al., (1984)".* |
| | We also understand from communications with fisheries observer and data managers in Chile (IFOP) that observers frequently did not record data from the stern of the vessel (this is necessary to properly record the types of interactions noted above) and that there have been issues with species identification (i.e. black-browed albatross potentially over-represented in the data set, see page 30 of ACAP's Seabird Bycatch Working Group report https://acap.aq/en/documents/advisory-committee/ac11/ac11-meeting-documents/3490-ac11-doc-10-sbwg-report/file). | Birdlife is using information that was NOT available around the time of the PCDR submittal to MSC (March 2019). Thus SAI Global won't respond to these comments. |
| | Noting that many birds killed through trawl interactions are not brought on board (as they are in longline fisheries), dedicated data collection is necessary (as utilised in the well-known studies referenced above (Wienecke and Robertson (2002); Sullivan *et al* (2006)) as well as Maree *et al* 2014 – which is a study of an MSC- | It is also noteworthy to say that Bernal et al 2019, Cespedes et al 2018 and SUBPESCA 2017 have documented that the major source of seabird mortalities in trawlers are the interactions with netsonde. |

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| | certified trawl fishery). We consider that the CAB has not given the available bycatch information sufficient scrutiny (BirdLife flagged this issue to the CAB in web conferences on the 3rd and 10th of July) and has over-scored the fishery on this performance indicator. | Furthermore, all of these demersal fisheries monitoring programs were developed based on sound sampling designs accounting for estimates with higher precisions CV.<br>As a result, conclusions were made that:<br>• For the seabird populations that commonly interact with the fishery(black browed albatross), there have been increasing abundance trends showing that the fishery impacts do not hinder the recovery<br>• Sources of information collected from the fishery and population census from independent surveys defined by table GSA5 have shown a range of high quality data (low bias, etc) included in both Column A and B information for lower bias<br>• Recent information show that interactions decreased, so all combined evidence meet SG80. |
| | Scoring issue 2.3.3a requires that '*Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species*.', while scoring issue 2.3.3b requires that '*Information is adequate to measure trends and support a strategy to manage impacts on ETP species*'. Clearly there are observer data available for this fishery, and commendably at an increasing rate. However, as noted above, there remain issues with the levels of detail in this data and how it was recorded. In particular, it is clear that if information has been mis-recorded (i.e. the true mortality levels of seabirds are unknown because cable interactions were not properly recorded and species have been misidentified because observers were not in the correct observation locations), it is not possible to say with confidence whether the fishery is impacting ETP species (e.g. Grey-headed albatross, Salvin's albatross) and certainly not sufficient to properly measure trends and, crucially, support a strategy to manage ETP impacts. We agree that there is sufficient information to support measures to manage ETP impacts (i.e. the fishery meets SG60), but the doubts around the available information mean the fishery does not meet SG80 for scoring issue a or b. | On MSC 2.0 The performance indicator 2.3.3 SG80a states<br>*Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.*<br>Therefore, teams shall evaluate what data collections methods are currently in use for determining the adequacy of the information in relation to its ability to determine and to detect changes in the outcome indicator score<br>Some examples of data collection methods include (but are not limited to) those specified in Table GSA5 from MSC 2.0. Column A contains data collection methods that have higher validity as they are less subject to bias than those in Column B.<br>On MSC 2.0 The performance indicator 2.3.3 SG80a states<br>*At the SG80 and 100 level in scoring issue (a), where a species is close to or below its limit or its status is uncertain, the team should expect that the UoA uses at least one method from Column A or an equivalent data source, and one or more from Column B to collect information to support the Outcome score for that species. However, where there is a high level* |

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| | | *of certainty that a species is well above its limit, less precaution is necessary and only two or more methods from Column B could be acceptable.* |

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## 2 Stakeholder submissions

### 2.1 Stakeholder submission on Section 6.2

For each issue identified in question 6.1, please state why you or your organisation believes that the effect of the score in relation to one or more of the particular performance indicators in question was material to the determination such that the determination should be altered.
The Birdlife's section 6.2 submitted to the Independent Adjudicator on July 16th, 2019 has been broken into paragraphs for ease of response;

| Notice of Objection | SAI Global Response |
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| BirdLife International believes that the fishery should still receive MSC certification, but with adjusted scores and new conditions to: (a) improve data collection protocols to ensure that trawl warp and netsonde cable interactions with seabirds are recorded to properly assess direct effects of the fishery on seabird species and inform the strategy to tackle the issue (2.3.3, though influencing 2.3.1 and 2.3.2 too); and (b) develop a plan for implementing best practice mitigation measures to reduce seabird mortality on the netsonde cable, either through elimination of the cable or implementation of a snatch block and bird-scaring line, as per ACAP best practice (relevant to 2.3.2). | Fundamentally there are two issues contained in the accepted Notice of Objection by Birdlife:<br>3. What the objectors perceive to be "best practice" seabird bycatch mitigation measures are not in place in the fishery.<br>4. Seabird bycatch data is inadequate due to the manner in which it is collected by observers.<br><br>Basically, what the objectors are asking of SAI Global in response to these two issues is as follows:<br>3. Require the client to implement those measures they see as "best practice".<br>4. Require a change in the way seabird bycatch data are recorded to better account for cryptic mortality.<br><br>Neither of the two issues identified by the objectors are required by MSC; therefore, SAI Global has absolutely no remit to require the desired response of the client.<br><br>Sources of monitoring data and information for the fishery in assessment are characterized by high quality data collection methods such as Observer programmes, Electronic monitoring of location/position (e.g., VMS, AIS), Other technologies to monitor impact/compliance (e.g., cameras), Independent research projects or programmes (Population bird census, biological monitoring marine mammals, studies on predator prey dynamics, impact/magnitude of bycatch)<br><br>There is some objective evidence based on population surveys, well sampling designed fishery discards studies with high precision (average CV<30% across years) showing: |

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| | • seabird population increasing abundance trends showing that the fishery impacts do not hinder the recovery<br>• sources of information includes both Column A and B information from table GSS<br>• there is evidence that interactions have decreased by 60% , so<br><br>Therefore, the information can be considered adequate to meet SG 80 following MSC v2.0 requirements |
| In brief, we believe the fishery should score, overall, less than 80 (but more than 60) for 2.3.2 and 2.3.3 because of the use of non-best practice mitigation for vessels using a netsonde cable (in spite of ample sufficient information available to implement other measures) and additionally because of inadequacies in the observer information, which has not been collected in a way to assess actual, direct impacts of the fishery. Overall scores of between 60 and 80 for performance indicators would still allow the fishery to pass but require that conditions are set to bring scores up to the SG80 standard. | As mentioned above, the information collected by the fishery meets the requirements defined under SG 80 and there are information from different sources of high and lower verifiability and bias and the information is in review annually to improve deficient in the collections, trainings and protocols are taught by IFOP and other management/scientific organisms to ensure the quality of the data. |
| 2.3.2 This performance indicator should receive a sub-80 score because the measures in place to deal with seabird mortality on the netsonde cable are not best practice, and may not be adequately addressing impacts on ETP seabirds. Given that the vessels using netsonde cables are responsible for the majority of seabird mortality caused by this fishery, it cannot be said there is a strategy in place that will not hinder the recovery of ETP species, and it cannot be said that best practice measures have been reviewed and implemented. As noted above, under scoring issue (e), the MSC guidance specifically refers to ACAP's best practice advice as documentation to refer to, and for several years, this advice has been clear about the preference to eliminate netsonde cables – or failing that, to implement a snatch block/bird-scaring line. It is evident that this advice has not formed part of the mitigation measure review/implementation process in this fishery | As discussed previously, **it is not a requirement of PI 2.3.2 that "best practice" measures be in place**; SAI Global can only make said findings in relation to the MSC requirements as outlined in MSC FCR v2.0. If there is no MSC requirement then SAI Global **cannot** make a finding. |
| 2.3.3 This performance indicator should receive a sub-80 score because the information available on bycatch from the fishery (through the national observer programme), is not sufficient to fully establish whether the UoA is a threat to the protection and recovery of ETP species, and cannot adequately inform a strategy to manage impacts. This is because observers do not record trawl cable interactions in the way necessary to understand impacts. This is manifest in the utilisation of non-best practice mitigation measures on vessels using netsonde cables (see above).<br>Concerns around the use of non-best practice mitigation measures on the netsonde cable were raised by BirdLife International through specific comments made on the Public Comment Draft | As discussed previously, **it is not a requirement of PI 2.3.2 that "best practice" measures be in place**; SAI Global can only make said findings in relation to the MSC requirements as outlined in MSC FCR v2.0. If there is no MSC requirement then SAI Global **cannot** make a finding.<br><br>Birdlife may have some issues with how IFOP bycatch data are recorded and cryptic mortality accounted for (or not) but that does not mean that the relevant SG80s are not met. As mentioned above, the |

### 9.7.3. FIPES – Response to accepted NOOs

FIPES
INDUSTRIAS PESQUERAS DEL SUR AUSTRAL

Santiago of Chile, 13 August 2019

Mr.
Eldon V.C. Greenberg
MSC Independent Adjudicator
By Email
ChileAustralHakeObjection@msc.org

**Re: Representation of Federación de Industrias Pesqueras del Sur Austral (FIPES) to the Objection to the Final Report on the proposed certification of the Chile Austral Hake Industrial Trawl and Longline Fishery under the MSC Principles and Criteria for Sustainable Fishing.**

Dear Ms. Greenberg,

This constitutes the written representation of the client, Federación de Industrias Pesqueras del Sur Austral ("FIPES"), on the matters raised in the notice of objection ("NOO") (**MSC Notice of Objection Form, Doc / 20190716**) to the Final Report on the proposed certification of the Chile Austral Hake Industrial Trawl and Longline Fishery (**Final Report, MSC 031-01**), presented by the organization BirdLife International ("Birdlife"), after its acceptance by you, as the Independent Adjudicator appointed for this matter (**MSC, Doc/20190723**).

In the final step of the MSC certification process of this fishery, initiated in October 2017, FIPES maintains its high interest in obtain the certification for the Chile Austral Hake industrial trawl and longline fishery and become part of the process of continuous improvement of it in the framework of the Marine Stewardship Council ("MSC") provides. However, regarding the NOO presented, FIPES does not share the position of Birdlife, considering it without merit as will explain below and as also stated in the response of the Conformity Assessment Body ("CAB"), represented by SAI GLOBAL S.A. ("SAI")

Birdlife's objection focuses on aspects of the evaluation related to seabird incidental mortality, based on the fact that, in their opinion, two Performance Indicators ("PI") of Principle 2 of the MSC, PI 2.3.2 and PI 2.3.3 obtained a score of 80, not justified by the CAB. FIPES considers that the score granted by the CAB to these indicators is adequate, adhering to the CAB regarding the application of the MSC standard in light of the information contained in the **Public Comment Draft Report (PCDR)**.

It is in this context that FIPES considered it pertinent -given the possibility of the process- to present its arguments that supports its disagreement with the NOO.

For these purposes, for each indicator whose score was questioned in the NOO the following are analyzed: i) the definition according to the MSC standard[1]; ii) the *ad-hoc* information that justifies the score granted; and iii) the specific position of FIPES in each case.

**RESPONSE OBJECTION PURSUANT TO PD 2.7.2.3**

## 1. ETP species management strategy (PI 2.3.2)

**Table 1:** PI 2.3.2 ETP species management strategy. Source: MSC Fisheries Standards (Annexes S) and Guidance, 1 October 2014.

| Component | PI | Scoring issues | SG60 | SG80 | SG100 |
|---|---|---|---|---|---|
| ETP species | Management strategy<br><br>2.3.2<br><br>The UoA has in place precautionary management strategies designed to:<br>- meet national and international requirements; and<br>- ensure the UoA does not hinder recovery of ETP species.<br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species. | (a) Management strategy in place (national and international requirements) | There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species. | There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species. | There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species. |
| | | (b) Management strategy in place (alternative) | There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species. | There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species. | There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species. |
| | | (c) Management strategy evaluation | The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/ species). | There is an objective basis for confidence that the partial strategy/ strategy will work, based on information directly about the UoA and/or the species involved. | The strategy/ comprehensive strategy is mainly based on information directly about the UoA and/or species involved, and a quantitative analysis supports high confidence that the strategy will work. |
| | | (d) Management strategy implementation | | There is some evidence that the measures/strategy is being implemented successfully. | There is clear evidence that the strategy/ comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b). |
| | | (e) Review of alternative measures to minimise mortality of ETP species | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species. | There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate. | There is a biannual review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate. |

[1] References are to MSC Fisheries Certification Requirements and Guidance. Version 2.0, 1st October, 2014.

## 1.1. Management strategy in place (alternative) (PI 2.3.2 b)

<u>Evidence</u>:

In accordance with Title II, Paragraph 1 bis and the provisions of Article 7°A of the Chilean General Law of Fisheries and Aquaculture ("LGPA"), the operations of the fleets of UoA 1 – Trawl, must comply with the measures contained in the **Plan for the Reduction of Discards and the Incidental mortality for the Austral Hake (*Merluccius australis)* and Golden kingklip (*Genypterus blacodes)* and their bycatch between parallels 41°28,6' L.S. and 57° L.S. ("PRDIM"),** which are fully contained in the "Informe Técnico (R.PESQ.) No. 244/2017" **(SUBPESCA 2017)** and approved by Resolution EX. N° 4479 of 29 December 2017, of the Undersecretariat for Fisheries ("SUBPESCA"). The PRDIM is binding for all industrial fleets operating on the Chilean Austral Hake (*Merluccius australis*): trawl fresher; trawl factory and longline factory.

PRDIM was drawn up by SUBPESCA with participation of the fishermen and representatives of the industrial fishing fleets, based on the information generated by the **Discard Research Program (San Martín *et al*. 2015, Bernal *et al.* 2017, Bernal *et al.* 2019)** and information collected in participatory work meetings with fishermen from the Chile Austral Hake fishery within the Management Committee[2]. The aforementioned program, led by the Instituto de Fomento Pesquero ("IFOP")[3], collected information through of scientific observers on board of all fleets (trawl fresher, trawl factory and longline factory) to conduct studies with the purpose of: i) to quantify the discards of the target species and the bycatch, ii) to quantify the incidental mortality[4], iii) to identify the causes of these practices and determine how they occur and, iv) to propose actions and measures aimed at their reduction and mitigation.

[2] Management Committee is a consultive body part of the Chilean fishing administration and adviser of the Undersecretary for Fisheries, in which participate representatives of the artisanal and industrial fleets; representatives from Subpesca and from the National Fisheries Service (Sernapesca). Each fishery has a Management Committee.

[3] The Instituto de Fomento Pesquero ("IFOP") is a private non-profit corporation with a public role, dedicated to scientific research in the area of marine sciences (fisheries, aquaculture, oceanography, biodiversity), and whose mission is to "advise the decision making of the national fisheries and aquaculture institutions, through the development of scientific and technical background of public value for the administration and sustainability of fisheries, aquaculture resources and their ecosystems"

[4] Incidental mortality is that catch made up of species that are not part of the bycatch and which is made up of marine reptiles, seabirds and marine mammals. (LGPA, Article 2°, numeral 21 bis)

The PRDIM establishes for each of the objective components: i) measures and technological means necessary to reduce the discard of both the target species and bycatch and incidental mortality, ii) a monitoring program of the plan, iii) an evaluation of the reduction measures adopted and, iv) a training and dissemination program. It also includes a code of best practice in fishing operations as a complementary mitigation measures and incentives for innovation in fishing systems and gears that aim to mitigate discards, bycatches and incidental mortality.

The measures specifically defined in order to reduce the incidental mortality of seabirds and marine mammals, and to improve the chances of survival of the live released specimens, constitute the **Action Plan for the Reduction of incidental mortality in the Chilean Austral Hake and Golden kingklip fishery on the industrial vessels that use longline and trawls (Fresher and factory fleets) ("AP-RIM")**, which is part of the PRDIM for this fisheries and is contained in the "Informe Técnico (R.PESQ.) No. 244/2017" (Annex 1) (**SUBPESCA 2017**).

Specifically regarding incidental mortality of seabirds, the AP-RIM considers nine measures, focusing in the two types of mortality categorized by **ACAP (2017)**: i) cable-related mortality, including collisions with net monitoring cables, warp cables and paravanes; and ii) net-related mortality, which includes net entanglement.

The Measure N°6 ("M6") of the AP-RIM, which is for reduce the mortality of seabirds for cable strikes (warp cable, net monitoring cable) and establishes the mandatory use of bird scaring lines and/or laser deterrent systems during the entire fishing operation. Additionally, in the case of vessels that use a net monitoring cables, they must paint or mark the cable, reduce its aerial extend and/or evaluate the use of wireless net monitoring (netsonder). Additionally, they must to implement helmet separation lines and marking or removal of gutters in the corresponding cases.

The Measure N° 8 ("M8") of the AP-RIM, establish the prohibition of discharge of offal and discards while fishing gear is deployed and hauling.

Also, the AP-RIM has a section named "Code of best practices for reduce the incidental mortality", in which there are measures such as move-on when there is a high presence of seabirds; clean nets after every shot; minimize the time the net is on the water surface during hauling, among others.

SUBPESCA and Management Committee, recognizing that there are no unique or static strategies to solve the international problem of discards and incidental mortality inherent to the fishing activity, establishes that both the PRDIM and the AP-RIM are subject to improvements, and consider the latter in particular, an adaptive plan, which is directly feedback by the specific Monitoring and follow-up Program of the



  

Implementation of the PRDIM and complemented by the Fisheries Monitoring Program historically developed by IFOP. The monitoring carried out by on-board IFOP scientific observers is fully operational since the plan was issued, complemented by the mandatory cameras on board of all fleet, aimed at continuously recording the fishing operation, supervising the full compliance with the provisions of the plan. The onboard camera system is already installed in most of the ships and operating under the trial mode supervising by the Chilean National Fisheries Service.

Finally, is important to mention that Chile is part of the Agreement for the Conservation of Albatrosses and Petrels ("ACAP") and as part of the implementation of its National Plan of Action for Seabirds, Chile has introduced mandatory measures to avoid the incidental mortality of seabirds in its fisheries and has made significant contributions to develop new and improved mitigation methods (**ACAP 2014**). In the same way, **ACAP (2014)** highlights from Chile, the wide use of scientific observers at sea providing valuable data that benefit the species included in the agreement. The success of its mitigation measures of bycatch in longline fisheries in the southern part of the country has been fundamental to the recent reversal in the decline of some Chilean colonies of black-browed albatrosses.

**Conclusion:**

In relation with **PI 2.3.2 (b)**, FIPES states that there are sufficient bases to grant an **SG80** score, since:

- It is clear that there is **strategy** in place (AP-RIM) for managing the UoA 1-Trawl's impact on the seabirds which is designed to be highly likely to achieve this objective. It is part of the national regulations and considers the international recommendations engaged. The **strategy** has an objective adequately defined, management and conservation measures, a monitoring and evaluation of the measures program and a code of best practices. The strategy is defined under a flexible regulatory framework that allows its adaptability and continuous improvement in favor of the defined objectives.
- The AP-RIM assimilates satisfactorily and fully to the definition of strategy established in the MSC standard[5].
- Given the characteristics of the strategy, it is very likely expected that the UoA 1 – Trawl does not hinder the recovery of ETP species.

[5] A strategy represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome, and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.

- Chile has been successful in establishing strategies for managing the impact of fishing activity on seabirds species, which were established by the same institutions and following the same procedures as the strategy recently implemented for UoA 1 - Trawl, so it is reasonable to have a high degree of confidence regarding your suitability and likelihood of success.

### 1.2. Management strategy evaluation (PI 2.3.2 c)

Evidence:

In September of 2012, the Chilean government enacted the Law N°20.625, which modified the regulatory framework for the Chile Austral Hake Fishery, adding the discard and incidental mortality concepts.

The new regulatory framework established that SUBPESCA should approve, through a Resolution and prior technical report, the development of Research Programs aimed at compiling the technical background that would allow the elaboration of the Discard Reduction Plans, for the target species, bycatch and incidental mortality. These programs should at least contemplate the quantification of discard, bycatch and incidental mortality, the determination of their causes and the way in which they are carried out, as well as the means through which the information would be recorded, considering the biological fisheries information collected by scientific observers on board the fleet. Those scientific observers should be designated by SUBPESCA in accordance with Title VIII of the LGPA and the D.S. N°193 of 2013 that approved the regulation of observers on board (**SUBPESCA 2017**).

In 2014, under Resolution EX. No. 1046, the Discard Research Program for the Chile Austral Hake trawl fleet was started. The resolution established the elements that the research should cover, the information that should be provided by the scientific observers on board of the fleet (from IFOP) and the information that should be provided by the fishermen through research logbooks. Also, the resolution contained provisions on publicity and use of the information and indicated the obligations of the fishermen to guarantee the obtaining of the "best" records on discards, bycatch and incidental mortality (**SUBPESCA 2017**).

During the development of the Discard Research Program (2013 - 2017), information on discards, bycatch and incidental mortality (birds and marine mammals) was collected by scientific observers of IFOP, on board of all vessels of the Chile Austral Hake industrial trawling fleet: trawl fresher and trawl factory. The trawl fresher fleet operated between the parallel 41°28,6' L.S. to 57° L.S., consisting of three ships with a length of 44 to 47 m

6

in length. The trawl factory fleet operated from parallel 44° L.S. to the 57° L.S. made up of four vessels, between 70 and 98 m of length on average.

The coverage of the observation of trips and hauls of both trawler fleets to register the incidental mortality, was increasing during the program (Table 2), also gradually incorporating improvements in the methodologies for recording such events and in the training of scientific observers to address these tasks (**SUBPESCA 2017, Bernal *et al.* 2017**).

**Table 2.** Cover of Observation of Incidental Catches of Seabirds, Mammals and Turtles (CIAMT) in the trawlers fleets of the demersal austral fishery. Source: Bernal *et al*. 2017, 2019. COOB: Scientific Observer on Board; CIAMT: Incidental Catches of Seabirds, Mammals and Turtles.

| FRESHER FLEET | | | | | | |
|---|---|---|---|---|---|---|
| Year | Total Trips with COOB | Trips with CIAMT sampling | % Trips CIAMT sampling | Total hauls with COOB | Hauls with CIAMT sampling | % hauls CIAMT sampling |
| 2013 | 68 | 13 | 19.1 | 188 | 18 | 9.6 |
| 2014 | 73 | 31 | 42.5 | 423 | 137 | 32.4 |
| 2015 | 58 | 41 | 70.7 | 652 | 508 | 77.9 |
| 2016 | 108 | 103 | 95.4 | 1697 | 1102 | 64.9 |
| 2017 | 118 | 89 | 75.0 | 1542 | 983 | 64.0 |
| | | | | | | |
| FACTORY FLEET | | | | | | |
| Year | Total Trips with COOB | Trips with CIAMT sampling | % Trips CIAMT sampling | Total hauls with COOB | Hauls with CIAMT sampling | % hauls CIAMT sampling |
| 2013 | 18 | 5 | 27.8 | 547 | 95 | 17.4 |
| 2014 | 13 | 12 | 92.3 | 1355 | 310 | 22.9 |
| 2015 | 22 | 21 | 95.5 | 2084 | 1161 | 55.7 |
| 2016 | 21 | 20 | 95.2 | 2351 | 1583 | 67.3 |
| 2017 | 19 | 18 | 95.0 | 2529 | 1475 | 58.0 |

The information collected shows a higher interaction with seabirds on the factory fleet, however this and the increase in both the number of seabirds captured, and the number of seabird caught resulting in dead over the years, is directly related to the number of units sampled (hauls), which was much higher in the case of the factory fleet and increasing from 2013 to 2017, as noted and highlighted in **Bernal *et al.* (2017).** The number of deaths recorded in the samples considering the total number of hauls sampled (CBPUE) shows a trend throughout the study period decreasing in both fleets, but with greater variability in the case of the factory fleet (Table 3; Figure 1).

**Table 3.** Summary of catches, seabird's mortality and Cath of seabirds per units of effort (CBPUE) recorder in Discard Research Program for Chile Austral Hake Industrial trawling fleet. Source: Bernal *et al*. 2017, 2019.

| Year | Fresher Fleet | | | Factory Fleet | | |
|---|---|---|---|---|---|---|
| | N° Catch | N° Deaths | CBPUE (N°Deaths/N°Haul) | N° Catch | N° Deaths | CAPUE (N°Deaths/N°Haul) |
| 2013 | 16 | 16 | 0.89 | 306 | 294 | 3.09 |
| 2014 | 84 | 82 | 0.6 | 668 | 665 | 2.15 |
| 2015 | 24 | 21 | 0.04 | 1026 | 1002 | 0.86 |
| 2016 | 115 | 114 | 0.22 | 4287 | 4272 | 2.7 |
| 2017 | 28 | 28 | 0.03 | 1974 | 1948 | 1.32 |

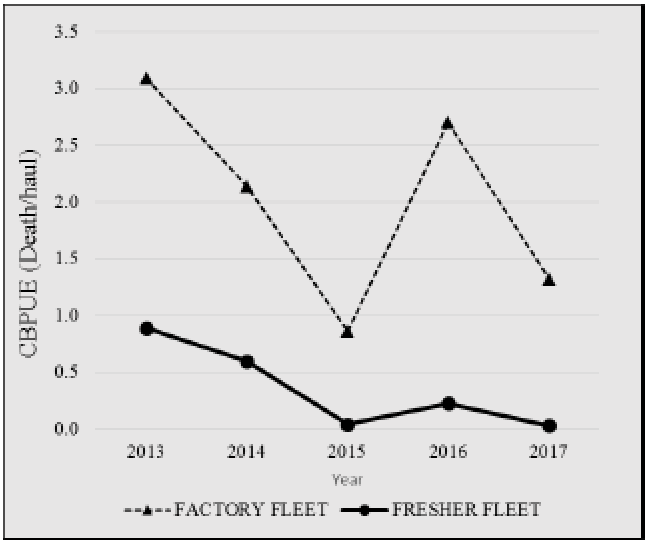


**Figure 1.** Seabird capture with result of death per unit (haul) observed in the CIAMT sampling of Discard Research Program for Chile Austral Hake Industrial trawling fleet 2013- 2017.

The PRDIM, contained in Technical Report (R.PESQ.) No. 244 of 2017, was approved in December 2017 by Resolution EX. No. 4479 of the Chilean Undersecretary for Fisheries, and was based on the analysis, conclusions and recommendations of the Discard Research Program before described. Therefore, it is developed based on quantitative and quality information referred directly to the Chile Austral Hake fishery, therefore, the UoA 1- trawl, which has a high value considering the causes of mortality in trawling fisheries depend on the nature of the fishery, the target species and the fishing area. Additionally, as can be seen in Annex 1, the measures considered in the action plan to reduce the incidental mortality of seabirds and mammals (AP-RIM) of the PRDIM is focused on the two types of mortality: cable-related mortality, including collisions with network monitoring cables, warp cables and paravanes; and network-related mortality that includes deaths caused by entanglements. Seabirds interactions have been shown to decrease significantly by implementing mitigation measures that include discharge and discard management, cable protection and reduction of surface exposure time (ACAP 2017).

In parallel to the PRDIM, on February 2 of 2018, the Chilean government established a Marine Protected Area (MPA), the "Parque Marino Diego Ramírez y Paso Drake", located in the archipelago Diego Ramírez and the Drake Pass, in the Chilean southern Region, with an approximate area of 144,390.6 $km^2$ (Decreto N°9 of 2018). Among the conservation objects identified are the marine ecosystem and biodiversity of the archipelago Diego Ramírez Islands; the feeding and nesting areas of black-browed albatross (*Thalassarche melanophris*) and gray-browed albatross (*Thalassarche chrysostoma*); the feeding and breeding areas of yellow-headed penguin (*Eudyptes chrysocome*) and macaroni penguin (*Eudyptes chrysolophus*); and the feeding areas of marine mammals present in the area, such as whales, dolphins and sea lions. The Diego Ramírez Archipelago is home to the southernmost breeding sites in the world for black-browed albatross (*Thalassarche melanophris*) and gray-headed albatross (*T. chrysostoma*). The gray-headed albatross breeding colony (*Thalassarche chrysostoma*) in the Islas Diego Ramírez archipelago is the largest in Chile and the second largest population in the world (**Arata *et al.*, 2004, Robertson *et al.*, 2007**). These albatrosses are highly mobile, but at certain times they concentrate their radius of action, this is especially notable in the gray-headed albatross that during its nesting season concentrates its radius of action around the Diego Ramírez Islands (**SUBPESCA 2017a**).

The previous background allows us to say -with an objective basis of confidence- that the exclusion of fishing operations in the MPA will contribute positively to the conservation of the indicated seabird populations, complementing the action of the measures established in the AP-RIM /PRDIM.

**Conclusion**:

In relation with **PI 2.3.2 (c)** FIPES states that there is an objective basis for confidence[6] to grant **SG80** score since:

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[6] Objective basis for confidence, as used al the SG80 level in the P2 management PIs (Management Strategy scoring issue) refers to the levels of information required to evaluate the likelihood that the management partial strategy will work.

- The SG60 level for these PIs requires "plausible argument" based on expert knowledge;
- The SG80 level requires expert knowledge augmented by some information collected in the area of the UoA and about the specific component(s) and/or UoA;

- The strategy (PRDIM), is based on direct information from UoA 1 – Trawl,
- That information indicates a decrease in the number of interactions with seabirds and of the number of total dead seabirds caused by UoA 1 - Trawl in the period observed,
- Considers internationally recognized measures as appropriate to mitigate the impact of trawling fishing on the ETP species affected by Uoa 1 – Trawl, and
- Although the recent implementation of the PRDIM and its monitoring program does not yet allow quantitative evidence to assess the degree of effectiveness of the Action Plan for reducing the incidental mortality of seabirds (AP-RIM), it can be argued that with the current strategy, there is a high probability of reducing the negative effects of UoA 1 – Trawl on ETPs.

### 1.3. Review of alternative measurers to minimize mortality of ETP species (PI 2.3.2 e)

**Evidence:**

The AP-RIM in its part "Program for the plan's monitoring and evaluation of the measures", establishes that a permanent research program must be development for establish and monitor scientifically indicators to evaluate the effectiveness of the measures, levels of the incidental mortality, use of disposals or reducing strategies and the compliance of the practices considered in the Best Practices Code.

It is also established, in its component "Innovation and technological improvements in fishing gear that increase the selectivity of the fleet" of the AP-RIM, the need to evaluate and apply improvements to the characteristics and dimensions of fishing gears to reduce incidental mortality, including the use of escape devices, deterrent systems, among others. Following the above, it is that the fishermen are evaluating modifications to the fishing gears and also testing new devices used internationally in similar fleets and with similar objectives.

At present, all trawl fresher vessels use netsonder to be able to operate the net and have implemented, according to the M6 of the AP-RIM, the use of bird scaring lines, elimination of gutters and decrease of aerial extent of the net monitoring cable. Although in the opinion of the fishermen of this fleet, the degree of interaction with seabirds is not significant, their goal is to eradicate the mortality of seabirds during their operations. For the above, they are conducting experiences with the device called Tamini Table. Tamini Table off-setting towed device for Bird Scaring Lines, is a measure

- The SG100 level requires all preceding information augmented by relativity complete information on the component, much of which comes from systematic monitoring and/or research.



  

under development (ACAP 2017). In order to improve the performance of Bird Scaring Lines, an off-setting towed device (Tamini Table) is under development in Argentina (Tamini *et al.* 2015). This device is attached to the terminal end of the BSL and has a buoyant upper board with three 45 ° vertical keels, which are weighted for stability. Under forward motion of the vessel, the keels cause the device to move outward of the trawl cables and therefore maintain the BSL from entangling with trawl cables.

In the case of the trawl factory fleet, only two vessels use netsonder with cable and they are evaluating the use of Tori Lines (Annex 2: Tori Line considered to be implemented), starting the tests as of August of this year. The two remaining trawl factory vessels, didn't use netsonder with cable and, during the setting and hauling have incorporated two "tangones" that have ropes that reach the sea in order to separate most part of the seabirds from the ship's wake to reduce the risk of being trapped in the net or being damaged (Figure 2).

**Figure 2.** System of "tangones" with ropes on trawler Factory vessel.

**Conclusion:**

In relation with **PI 2.3.2 (e)** FIPES states that on the basis of the backgrounds and the definition of regular review[7] of the MSC standard, the score granted **SG80** is correct, since the AP-RIM:

- Includes a program of monitoring and permanent evaluation of the measures implemented;
- Have legal mechanism which allows its modification and adaptation to the outputs of the monitoring program and new scientific information;
- Despite its recent implementation and entry into force, there is already evidence of tests and actions to evaluate new measures in order to increase the level of reduction of the incidental mortalities and for being included into the strategy.

## 2. ETP species information PI (PI 2.3.3)

**Table 4:** PI 2.3.3 ETP species information. Source: MSC Fisheries Standards (Annexes S) and Guidance, 1 October 2014.

| Component | PI | Scoring issues | SG60 | SG80 | SG100 |
|---|---|---|---|---|---|
| ETP species | Information<br><br>2.3.3<br><br>Relevant information is collected to support the management of UoA impacts on ETP species, including:<br>- information for the development of the management strategy;<br>- information to assess the effectiveness of the management strategy; and<br>- information to determine the outcome status of ETP species | (a)<br>Information adequacy for assessment of impacts | Qualitative information is adequate to estimate the UoA related mortality on ETP species.<br><br>OR<br><br>If RBF is used to score PI 2.3.1 for the UoA<br>Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species. | Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.<br><br>OR<br><br>If RBF is used to score PI 2.3.1 for the UoA:<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species. | Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species. |
| | | (b)<br>Information adequacy for management strategy | Information is adequate to support measures to manage the impacts on ETP species | Information is adequate to measure trends and support a strategy to manage impacts on ETP species | Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives. |

[7] The "regular review" al SG80 may be met if at least one review of alternative measures has been undertaken, that measures are implemented as appropriate, and there is a commitment from the client or the management body to have another review within the 5 years.

### 2.1. Information adequacy for assessment of impacts (2.3.3 a)

<u>Evidence</u>:

As stated previously, the PRDIM has a monitoring and follow-up program based on the information taken by scientific observers on board of the fleet, which is complemented by the Demersal and deep-sea fisheries monitoring program in the southern zone also carried on board by scientific observers from IFOP and the registration of census fishing data required of the fleet through fishing logbooks.

Data recording is done by filling out specific forms for each type of information and fleet, following a two-stage cluster sampling design. The first step corresponding to trips made by the fleet and the second, the hauls made on trips, considering an annual time scale for the entire area of operation of the respective fleets (Bernal *et al.* 2017).

Scientific observation coverage has been improving over time, reaching a high degree of representativeness as temporal (Table 2) and spatial coverage. The incidental mortality observation in the trawl fresher fleet covered 75% of total trips and 64% of hauls made on 2017 (Table 5). In the case of the trawl factory fleet, the travel coverage was almost total, covered 58% of the hauls in the same year (Table 5). The observation also takes into account the interannual dynamics of the fleet, intensifying during the second half of the year due to the greater fishing activity in this period, covering over 80% of trips in the fresher fleet and 100% in the case of factory vessels (Table 5). The entire regular latitudinal extension of operation was covered spatially (Figure 3) (Bernal *et al.* 2017, Bernal *et al.* 2019).

Table 5. Coverage of Observation of Incidental Catches of Seabirds, Mammals and Turtles (CIAMT) on the trawler's fleets of the demersal austral fisheries during 2017. Source: Bernal *et al*. 2019. COOB: Scientific Observer on Board; CIAMT: Incidental Catches of Seabirds, mammals and turtles.

| | FRESHER FLEET | | | FACTORY FLEET | | |
|---|---|---|---|---|---|---|
| | First Semester | Second Semester | Annual | First Semester | Second Semester | Annual |
| Total trips of fleet | 55 | 63 | 118 | 5 | 14 | 19 |
| Trips with CIAMT sampling | 37(67%) | 52(83%) | 89(75%) | 4(80%) | 14(100%) | 18(95%) |
| Total hauls with COOB | 643 | 899 | 1542 | 709 | 1820 | 2529 |
| Hauls with CIAMT sampling | 403 (63%) | 580 (65%) | 983 (64%) | 374 (53%) | 1101 (60%) | 1475 (58%) |

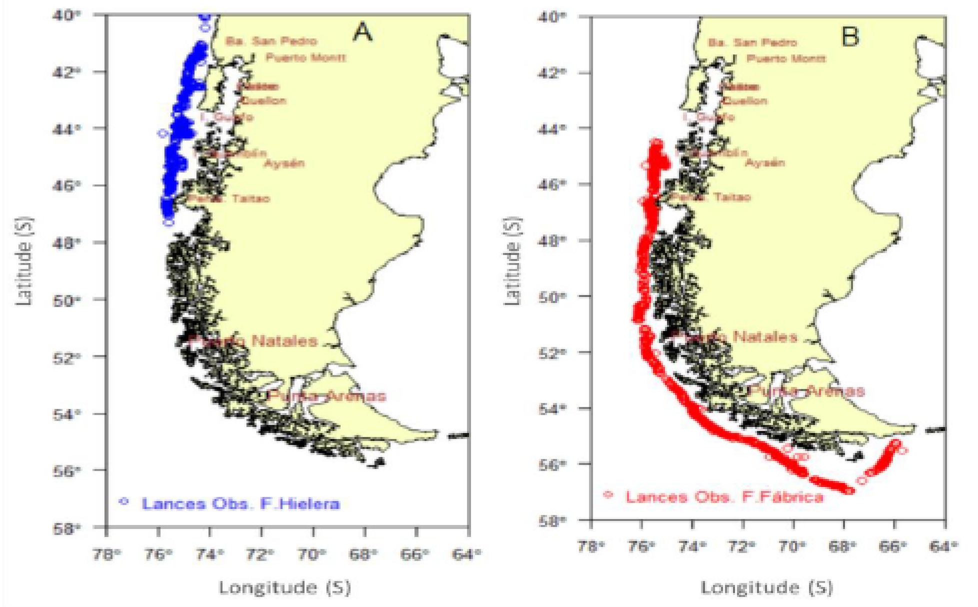


**Figure 3.** Spatial cover of AP-RIM 2017.

The registration of the incidental mortality data is made by distinguishing at the species level, following specific protocols and is carried out by scientific observers who had *ad hoc* training by international experts and internal workshops (Bernal *et al.* 2019). The "Guide for the Identification of *Procellariiforms* and other common seabirds in Chilean sea fishing areas" is used as reference material for seabird recognition, as a result of the experience of observers in the program and the information contained in the "Photographic Identification Guide for Atlantic Seabirds" and the "Identification Guide for catched seabirds, updated in August 2015" (ACAP, 2015) and the Albatross Task Force (ATF).

The records of incidental catches of seabirds corresponded to those specimens that arrived on board at the time of the hauling fishing gear, inside the net or flake, entangled in it, or in the warp and net monitoring cables. The observation procedure is carried out during the hauling of the net, until the arrival of the flake on deck and subsequent emptying. The condition is also recorded at the time of observing the capture, classifying the specimens as living or dead according to the degree and number of injuries they present. Finally, the catch information has the record of the fishing data of the haul in which they were observed (date, time, geographical position, catch, etc.). The complementarity between the information of the direct observations of the incidental mortality with detailed data of the operation at the hauls level allows to have catches rates and know their intra-temporal evolution (Table 6 and interannual and, spatial by species (Table 7).

Table 6. Temporal evolution of seabird bycatch in the southern demersal trawl fishery, 2017. Note: In parenthesis they show up rates of catch (n°seabird/haul). Source: Bernal *et al.* 2019.

| Month | Fresher Fleet | Factory Fleet |
|---|---|---|
| January | 0 | - |
| Febrery | 8 (0.088) | 0 |
| March | 1 (0.011) | 1 (0.014) |
| April | 0 | 130 (0.963) |
| May | 3 (0.048) | 226 (1159) |
| June | 5 (0.057) | 177 (0.717) |
| July | 0 | 131 (0.704) |
| August | 8 (0.048) | 137 (1.257) |
| September | 1 (0.090) | 240 (1.387) |
| October | 2 (0.0028) | 631 (4.352) |
| November | 0 | 300 (2.098) |
| December | 0 | 1 (0.019) |

Table 7. Spatial evolution of seabird bycatch in the southern demersal trawl fishery, 2017. Note: In parenthesis they show up rates of catch (n°seabird/haul). Source: Bernal *et al.* 2019.

| | Fresher Fleet | Factory Fleet |
|---|---|---|
| Latitude °S | | |
| 40-42 | 12 (0.063) | - |
| 42-44 | 2 (0.008) | - |
| 44-46 | 11 (1.024) | 124 (0.331) |
| 46-48 | 3 (0.037) | 418 (1.608) |
| 48-50 | - | 58 (0.866) |
| 50-52 | - | 128 (1.208) |
| 52-54 | - | 505 (4.55) |
| 54-56 | - | 486 (1.206) |
| 56-58 | - | 255 (1.667) |
| Total | 28 | 1974 |

Given the high degree of interest that exists internationally on some of the seabird species impacted by UoA 1 - Trawl, such as black-browed albatrosses and gray-headed albatrosses, which records the highest degree of interactions with the trawling fleet in the area of the fishery, there is enough scientific information about their populations, areas of distribution, nesting sites and colonies, status of their populations and aspects of their life stories, among others (**Arata *et al.* 2004, Robertson *et al.* 2007, Robertson *et al.* 2017**).

**Conclusion:**

In relation with **PI 2.3.3 (a)** FIPES states that, on the basis of backgrounds and the stablishes in the GSA3.6.3 Scoring the adequacy of information, from the Document: MSC-MSCI Vocabulary, including in the MSC standard, the score granted **SG80** is correct, since;

- There is information available on ETPs mostly impacted by UoA 1 - Trawl on the status and trend of their populations,
- The information is provided by a system of scientific observers on board, is representative of the UoA 1- Trawl, follows sampling protocols according to international standards and presents adequate spatial and temporal coverage,
- This quantitative information allows to directly assess the impact of UoA 1-Trawl on species that have significant interactions and identify changes in their patterns over time;
- This program is annual and permanent, which allows monitoring of the indicators over time.

### 2.2. Information adequacy for management strategy (2.3.3 b)

**Evidence:**

*The fundamental backgrounds that funds the FIPES's position with relation of the score of this part of the indicator 2.3.3, has been stated in the previous sections of this document.*

**Conclusion:**

In relation with **the PI 2.3.3 (b)** FIPES states that, on the basis of the backgrounds, the score granted **SG80** is correct, since:

- The available information is adapted to the strategy and allows quantitative indicators to assess the effectiveness of the measures implemented and the overall strategy,
- The AP-RIM considers the evaluation of alternative measures prior to its implementation and has information that allows independent evaluation of measures and units of operation within the fleet, period and geographical area.

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Annex 1: Plan of Action for the reduction of the Incidental Mortality in the Chile Austral Hake and Golden kingklip fisheries on the trawlers and longliners industrial vessels (Fresher and Factory fleets). Source: SUBPESCA, 2017.

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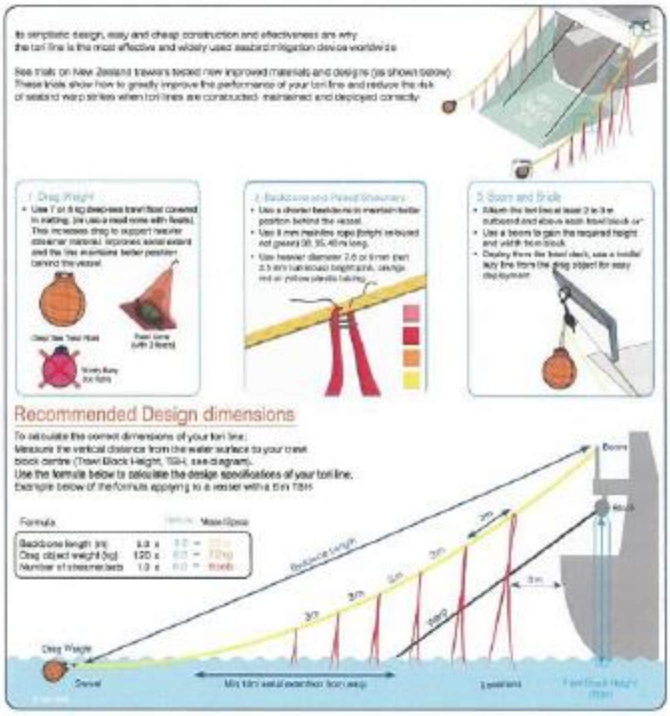
Annex 2: Tori Line considered to be implemented in trawl factory vessels

# TORI LINES

## MATERIALS




### Materials for Streamer / Tori Lines

| Product Code | Product |
|---|---|
| 17400008 | 9 mm Tori Line / Backbone x 136m Length - Swivel Spacing @ 3.0m |
| 17566703 | New Kraton Orange Lumo Tubing - 9.5 mm OD x 30m coil |
| 17478344 | BST - 120 mm x 4 mm Cable Ties - Black |
| 09668606 | 6 mm Eye to Eye Swivel - 316 S/S - Approx Breaking Load 150 kg |
| 09668608 | 8 mm Eye to Eye Swivel - 316 S/S - Approx Breaking Load 300 kg |
| 17083812 | 360 mm Dia x 1,200m Dbl Lug Trawl Float - Weight 8.7 kg |
| 17566170 | 450 mm - Road Cone - Fluoro Orange |
| 17060245 | 170 mm Dia Centre Hole Trawl Float (Inside Road Cone) |

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FAD, TORI LINES, MARKERS

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## 9.7.4. Independent Adjudicator - Consultation schedule

**MARINE STEWARDSHIP COUNCIL**

**IN THE MATTER OF AN OBJECTION TO THE FINAL REPORT ON THE PROPOSED CERTIFICATION OF THE CHILE AUSTRAL HAKE INDUSTRIAL TRAWL AND LONGLINE FISHERY UNDER THE MSC PRINCIPLES AND CRITERIA FOR SUSTAINABLE FISHING**

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**CONSULTATION SCHEDULE**

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1. Based upon the teleconference of the parties held on August 22, 2019, the following is the schedule for my individual consultations under PD 2.5.3 of the Objections Procedure:

    a. Tuesday, August 27, 2019, 10:30 am Eastern Daylight Time (3:30 pm British Summer Time) – Consultation with the objector, BirdLife International;

    b. Tuesday, August 27, 2019, 2:00 pm Eastern Daylight Time (7:00 pm British Summer Time) – Consultation with the CAB, SAI Global; and

    c. Wednesday, August 28, 2019, 10:30 am Eastern Daylight Time (10:30 am Chile Standard Time) – Consultation with the fishery client, Federacion de Industrias Pesqueras del Sur Austral (FIPES).

2. A teleconference of all the parties is tentatively scheduled for Monday, September 2, 2019, at 10:30 am Eastern Daylight Time.

3. Dates and times are subject to modification if they prove inconvenient. If there is a need to adjust the dates and times, the parties are requested to notify me via the dedicated email address for this objection.

Eldon V.C. Greenberg
MSC Independent Adjudicator

Dated: August 23, 2019

  

### 9.7.5. Independent Adjudicator - Notice regarding consultation schedule and extension of consultation period

## MARINE STEWARDSHIP COUNCIL

**IN THE MATTER OF AN OBJECTION TO THE FINAL REPORT ON THE PROPOSED CERTIFICATION OF THE CHILE AUSTRAL HAKE INDUSTRIAL TRAWL AND LONGLINE FISHERY UNDER THE MSC PRINCIPLES AND CRITERIA FOR SUSTAINABLE FISHING**

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**NOTICE REGARDING CONSULTATION SCHEDULE AND EXTENSION OF CONSULTATION PERIOD**

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1. Based upon the teleconference of the parties held on Monday, September 2, 2019, I believe that there is the prospect of substantial progress being made toward possible resolution of the objection, and all parties are making good faith efforts to this end. However, it is also apparent that more time is necessary to complete the consultation process than the ten days allotted under PD 2.5.3.1 of the Objections Procedure. In accordance with PD 2.5.3.1, I find that "there is a real and imminent prospect of a solution that is acceptable to all relevant parties," and that an extension of the consultation period is therefore appropriate. In the circumstances, the consultation period is hereby extended for five (5) working days, to and including Wednesday, September 11, 2019. I note that all parties have agreed to this extension. During the extended consultation period, the parties are encouraged to make such exchanges among themselves, in writing or by telephone, as may be necessary to bring the negotiations to a successful conclusion.

2. The next teleconference of the parties has been scheduled for Wednesday, September 11, 2019, at 10:00 am Eastern Daylight Time (3:00 pm British Summer Time; 10:00 am Chile Standard Time). In the interim, if any party believes that my direct intervention would be of assistance, please do not hesitate to contact me.

Eldon V.C. Greenberg
MSC Independent Adjudicator

Dated: September 4, 2019

## 9.7.6. SAI Global's letter of proposal agreement during the consultation period.

**SAI Global**
Quayside Business Park
Mill Street, Dundalk,
Co. Louth, Ireland.
www.saiglobal.com

**Date:** 06th September 2019
**Email:** ChileAustralHakeObjection@msc.org

**By email:**
**To:** Mr. Rory Crawford, Birdlife International
**CC:** Mr. Eldon Greenberg, Independent Adjudicator

**Re: Objections to the certification of Chile Austral hake (*Merluccius australis*) industrial trawl and longline**

Dear Rory,

In response to our recent consultations, we would like to propose the following compromises which we feel may be acceptable compromise to all parties. It is important to re-iterate that these suggestions are made voluntarily and, as subsequent articulated in our responses to this Notice of Objection to date, we remain confident in the findings outlined in the Final Report. With all that being said, we and the Fishery Client are prepared to make certain amendments to the Final Report which we feel, when considered in conjunction with recent developments 'on the ground' in this fishery, should satisfactorily address your major concerns.

This document is intended to provide a set of proposals that we might agree in principle before moving forwards. Should the proposed amendments be agreeable, we will make the changes and circulate a revised draft of the Final Report to all parties for review so that might examine the changes in detail; these proposed amendments are:

1. **Addition of previously agreed clarifying changes to the Final Report**
   The clarifying changes we had previously made to the Final Report in a bid to avoid an objection will be made on a permanent basis; these included one change in score (PI 2.3.2 from 85 to 80) and amendments to the way in which PIs 3.2.1 and 3.2.3 were scored.

2. **Addition of a Recommendation on PI 2.3.2.**
   While, for the reasons outlined previously, a Condition on this PI is not appropriate, we will instead recommend that the fishery implements "best practice" measures for the mitigation of seabird bycatch. This Recommendation will be formally included into the report.

   The Recommendation will be accompanied by a clarifying note to state that, while the Team couldn't formally consider the information, we are aware of the very recent implementation of new legislation mandating the implementation of additional migration measures. The note will also state that the implementation of these measures will be specifically examined at subsequent surveillance audits and that should the fishery fail to comply with any new regulations then a condition in the area of compliance under P3 may be appropriate.

**3. Addition of detailed narrative around Objections process and recent developments**

Technically we can't consider information that post-dates the publication of the PCDR in the assessment. However, we are required to include in the Public Certification Report, as a minimum, any Notices of Objection and related findings from the Independent Adjudicator. Therefore, we feel it would be permissible to also include in this Appendix additional information related to the objections process including information which became available after the publication of the PCDR.

Therefore, if agreeable, we will add a detailed narrative explaining how the Objections Process has played out including recent changes 'on the ground' and how these have influenced things. The intention here would be to provide detailed information so that readers of the report would be able to fully understand the reasons behind a settlement (if this were to occur).

We would appreciate your feedback on these proposals. If there are additional wants on your behalf, we will try to accommodate them within the confines of what is permissible under MSC requirements. Therefore, if you have additional request we would appreciate if you might consider, given the constraints of the MSC requirements, whether they are in fact within our gift.

If anything in the above is unclear, please let us know.

Yours sincerely,

Sam Dignan

**Sam Dignan**
Fisheries and Aquaculture Scheme Manager
**SAI Global/Global Trust Certification**

**On behalf of:**

**Dr. Ivan Mateo**
Fisheries Assessment Officer
SAI Global/Global Trust Certification

### 9.7.7. Regulation released during the consultation period

**Note.** This is a translated version of an original regulation written in Spanish (Res. Ex. No 2941). It is provided for information ONLY and any discrepancies should be resolved by reference to the definitive Spanish version.

***FREE TRANSLATION***

MINISTRY OF ECONOMY, DEVELOPMENT AND TOURISM
UNDERSECRETARIAT FOR FISHERIES AND AQUACULTURE

ESTABLISH MANAGEMENT MEASURES TO REDUCE INCIDENTAL CATCHES OF SEABIRDS IN THE TRAWL FISHERIES THAT ARE INDICATED

VALPARAISO, 28 AUGUST 2019

RES. EX. N° 2941

**VISTO:** As reported by the Fisheries Management Division of this Undersecretariat for Fisheries and Aquaculture through the Technical Report 175-2018 contained in Technical Memorandum (R. PESQ.) N° 175/2018 dated July 26, 2018, complemented by the Technical Memorandum (R. PESQ.) N° 189/2019, dated August 22, 2019; the letters (D.D.P.) CIR. ORD. N° 09 dated August 7, 2018 and N° 001 dated January 4, 2019, both of this Undersecretariat for Fisheries and Aquaculture; by the presidents of the Zonal Fisheries Councils of Atacama and Coquimbo through the letter Ord./Z2/N° 049/2018 dated August 13, 2018; from Valparaíso, the Libertador Bernardo O'Higgins and the Maule and Oceanic Islands by letter (C.Z.P.) N° 006/2018, dated August 23, 2018; of the Aysén Region of General Carlos Ibáñez del Campo by letter (D.Z.P. XI) ORD. N° 005/2019; of Magallanes and Antártica Chilena through Ord. CZ.V./03/2018 dated August 13, 2018; by the Zonal Fisheries Councils of the Regions of Arica and Parinacota, Tarapacá and Antofagasta by Ord./ZI/N°003 dated January 18, 2019; of Ñuble and Biobío ORD. (CZP3) N°002/2019, dated January 21, 2018; of La Araucanía and Los Ríos through Letter (D.Z.P.) ORD. N°02 dated February 1, 2019; of Los Lagos through Ord./DZP/X/N°100 dated September 25, 2018; the provisions of the D.F.L. N°5 of 1983; the General Law of Fisheries and Aquaculture N° 18.892 and its amendments whose consolidated text was fixed by the D.S. N° 430 of 1991 of the Ministry of Economy, Development and Reconstruction; Laws N° 19.880, N° 20.597 and N° 20.657; the D.S. N° 136 of 2007, of the current Ministry of Economy, Development and Tourism; the Resolution Ex. N° 1857 of 2018, of this Undersecretariat for Fisheries and Aquaculture; the previous communications to the Scientific Technical Committees of Fisheries of Highly Migratory Resources, Condrichtian species and Biodiversity; of Demersal Resources Southern Austral Zone; of Demersal Crustaceans; Demersal Central South Zone and Deepwater Demersal Resources, by Circular Letter (DDP) CIR. N° 106 dated August 16, 2019, of this Undersecretariat; the Discard and Incidental Catch Research Programs for Demersal crustacean, Chilean common hake, Hoki, Chile Austral Hake, Pink cusk eel and Southern blue whiting fisheries, according to Resolutions Ex. N° 882 of 2013, N°1416 of 2013, N°2571 of 2013 and N°1046 of 2014 and the Plans for Reduction of Discards and Incidental Catch for Demersal crustacean, Chilean common hake, Hoki, Chile Austral Hake, Pink cusk eel and Southern blue whiting fisheries, according to Resolutions N° 1106, N° 1840, N° 3067, N° 4479 and N° 4480, respectively, all of 2017 and Decree Ex. N° 258 of 2008 of the Ministry of Foreign Affairs that promulgated Annex V of the International Convention MARPOL 73/78 .

*FREE TRANSLATION*

**CONSIDERING:**

1.- That Chile is part or member of various international treaties or organizations that have established conservation and management measures aimed at minimize the adverse impacts of fishing on the capture of unwanted species, bycatch and incidental catch, including seabirds, and must comply with these measures in accordance with the provisions of article 7° E of the General Law of Fisheries and Aquaculture.

2.- That through D.S. N°136 of 2001 of the current Ministry of Economy, Development and Tourism, was approved the National Action Plan to reduce the incidental catches of seabirds in the longline fisheries (PAN-AM/Chile) and its addenda.

3.- That besides the reduction of the incidental mortality in longline fisheries, that Plan includes among its goals, to detect other fisheries in national waters where could be mortal interactions with seabirds, applying mitigation measures to reduce mortalities to a minimum, according to the techniques alternatives available.

4.- That the Discard and Incidental Catch Research Program in the trawl fisheries of Demersal crustacean; Chilean common hake, Hoki, Chile Austral Hake, Pink cusk eel and Southern blue whiting, carried in accordance with the article 7°A of the General Law of Fisheries and Aquaculture, demonstrates that there are seabird's mortalities resulting from the interaction with fishing activities that require the adoption of the mitigation measures.

5.- That consequently, plans to reduce discards and incidental catches were established in the aforementioned fisheries, which, in terms of incidental catch of seabirds, included conservation and management measures, technological means, a monitoring and follow-up program of the measures and a best practices code, among others.

6.- That in order to achieve an adequate implementation and enforcement of the plans for the reduction of discards and the incidental catch in trawl fisheries, the Fisheries Management Division of this Undersecretariat for Fisheries has recommended, through a Technical Memorandum (R. PESQ.) N°175/2018, cited in *VISTO*, the establishment of management measures to minimize incidental mortality of seabirds.

7.- That the article 4° letters c) and e) of the General Law of Fisheries and Aquaculture, provides the procedure to implement the utilization and carrying on of devices or tools on board to minimize incidental catch, enabling to make the fishing activity more selective, as well as the implementation of best fishing practices to avoid, minimize or mitigate incidental catch.

8.- That the provisions of this resolution are without prejudice to compliance with the provisions established in Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), cited in *VISTO*, which in particular in Rule 3 prohibits the dumping of all plastic materials into the sea, including, ropes and fishing nets of synthetic fibers and plastic bags, as a threat to marine species, including seabirds and their ecosystem.

***FREE TRANSLATION***

9.- That this management measure has been consulted with the Zonal Fisheries and Aquaculture Councils of the Regions of Arica and Parinacota, Tarapacá and Antofagasta; Ñuble and Biobío; La Araucanía and Los Ríos; and of Los Lagos, whose pronouncements are in letters mentioned in *VISTO.*

10.- That due to the lack of quorum necessary to issue its pronouncement , the Zonal Fisheries and Aquaculture Councils of the Atacama and Coquimbo Regions; Valparaíso, the Libertador Bernardo O'Higgins and the Maule and Islas Oceánicas; of the Aysén of General Carlos Ibáñez del Campo Region; and of the Magallanes and Antártica Chilena Region, lack of a quorum to hold a meeting, so it has been resolved to dispense of their pronouncements in accordance with the provisions of article N°151 of the General Law of Fisheries and Aquaculture.

11.- That this management measure has been previously communicated to the respective Technical Scientific Committees.

**RESOLVE:**

1. Approve the following management measures aimed at avoid or minimize incidental catch of seabirds in trawl fisheries carried on in waters under national jurisdiction or on the high seas, by vessels flying the Chilean flag, through the mandatory use of equipment or devices and the compliance of applying the best fishing practices indicated in this resolution.

Notwithstanding the foregoing, in the case of transboundary or highly migratory fisheries, regulated by an international treaty of which Chile is a party or member, it will be applicable to trawl fisheries the management measures intended to avoid or reduce incidental catches of seabirds that have been adopted accordingly with those treaties and that are published, in accordance with the provisions of article 7°E of the General Law of Fisheries and Aquaculture.

2. The management measures include in this resolution will be applicable to the following trawl fisheries:

a) **Freezer Trawler of deep water shrimp, squat lobster and Chilean yellow shrimp:** industrial and artisanal vessels
b) **Freezer Trawler of Chilean common hake and Hoki (central-south zone):** industrial vessels
c) **Freezer Trawler of Chile Austral Hake, Pink Cusk eel, Hake and Southern Pomfret (south austral zone):** industrial vessels
d) **Factory Trawler or Surimi Trawler of Chile Austral Hake, Pink Cusk eel, Hake and Southern blue whiting (south austral zone):** industrial vessels

3. The industrial and artisanal vessels referred in the previous paragraph, must comply to the following mitigation measures:

**a) Freezer Trawler of Deep water shrimp, Squat lobster and Chilean yellow shrimp:**

1. **Mitigation measures:**
   **Use of Bird Scaring Lines (BSL)**
   - During the trawling the two main lines of the BSL must cover at least 10 meters after the point of contact of the warp cable with the water (**Figure 1**). These lines must be made with a polypropylene rope with a minimum length of 30 meters and a diameter between 8 to 12 millimeters.
   - In those vessels where the height of the pulley[1] of the warp cable is greater than 6 meters with respect to the waterline, the total length of the main lines of the BSL must have a ratio of 1:5 with respect to that height (**Figure 1**).
   - The colors of the secondary lines must be colorful or striking, preferably red, orange or yellow.
   - The BSLs must be placed 2 meters above the pulley of the warp cable and at a distance of 2 meters at the side of these pulleys in each band (port side and starboard), it may be necessary to fix arms that extend the distance of the pulleys.
   - Secondary lines (streamers), flags, streamers or strips, must be double and joined to 1 meter from the stern and then at regular intervals of 2.5 meters throughout the entire BSL's air extension to the entrance of the warp cable into the water. The rest of the BSLs will not have secondary lines (**Figure 1**).

   **Use of Bird bafflers**
   - In this fisheries (e.g Freezer Trawler of Deep water shrimp, Squat lobster and Chilean yellow shrimp), these devices can be used instead of using the BSL.
   - In the bird bafflers the materials and colors of the secondary lines are the same than those used in the BSL

2. **Best fishing practices:**
   - **Clean nets before shooting.** Prior to shooting, remove from the nets all fish and other materials that have been adhered (stickers).
   - **Night shooting (full nautical darkness)**. Fishing operations carried out during the night and with low artificial luminosity will be excluded from the use of BSL or Bird bafflers.
   - **Discard management.** Discards authorized in accordance with the plan to reduce the discard of these fisheries and organic waste from evisceration or the processing of catches must be disposed between fishing sets and by batch or crushed and discharged after the entry of the warp cable to the water, or discharged crushed in a submerged way.

[1] **Pulley** is the translate of "Pasteca" or "Roldana". In the Figure 1 is called "Block"

*FREE TRANSLATION*

**b) Freezer Trawler of Chilean common hake and Hoki (central-south zone)**

**1. Mitigation measures:**

**Use of Bird Scaring Lines (BSL)**

- During the trawling the two main lines of the BSL must cover at least 10 meters after the point of contact of the warp cable with the water (**Figure 1**). These lines must be made with a polypropylene rope with a minimum length of 30 meters and a diameter between 8 to 12 millimeters.
- In those vessels where the height of the pulley of the warp cable is greater than 6 meters with respect to the waterline, the total length of the main lines of the BSL must have a ratio of 1:5 with respect to that height (**Figure 1**).
- The colors of the secondary lines must be colorful or striking, preferably red, orange or yellow.
- The BSLs must be placed 2 meters above the pulley of warp cable and at a distance of 2 meters at the side of these pulleys in each band (port side and starboard), it may be necessary to fix arms that extend the distance.
- Secondary lines (streamers), flags, streamers or strips, must be double and joined to 1 meter from the stern and then at regular intervals of 3 meters until cover at least 10 meters behind the entry of the warp cable into the water. The rest of the BSLs will not have secondary lines (**Figure 1**).

**Use of Bird bafflers**

- These devices can be used instead of the BSL, but only in the vessels with a main engine power equal to or less than 400 hp. The vessels with a main engine power of more than 400 hp must use BSL.
- In this device the materials and colors of the secondary lines are the same than those used in the BSL.

**Use of Snatch block**

- A Snatch block must be installed on the stern of the vessel to approximate the third cable to the surface of the water, *i.e.* below the height of the warp cables, thus reducing its aerial extension and the risks of collision of seabirds as outlined in **Figure 1.**

  Vessels that use a wireless netsonde and consequently have removed the third cable will be exempted from the previous obligation.

2. **Best fishing practices:**
   - **Clean trawl nets before shooting.** Prior to shooting, remove from the nets all fish and other materials that have been adhered (stickers).
   - **Night shooting (full nautical darkness)**. Fishing operations carried out during the night and with low artificial luminosity will be excluded from the use of BSL or Bird bafflers.
   - **Discard management**. Discards authorized in accordance with the plan to reduce the discard of these fisheries and organic waste from evisceration or processing of catches must be disposed between fishing sets and by batch or crushed and discharged after the entry of the warp cable to the water, or discharged crushed in a submerged way.

**c) Freezer Trawler of Chile Austral Hake, Pink Cusk eel, Hake and Southern Pomfret (austral zone):**

1. **Mitigation measures:**

   **Use of Bird Scary Lines (BSL)**
   - During the trawling the two main lines of the BSL must cover at least 10 meters after the point of contact of the warp cable with the water (**Figure 1**). These lines must be made with a polypropylene rope with a minimum length of 30 meters and a diameter between 8 to 12 millimeters.
   - In those vessels where the height of the pulley of the warp cable is greater than 6 meters with respect to the waterline, the total length of the main lines of the BSL must have a ratio of 1:5 with respect to that height (**Figure 1**).
   - The colors of the secondary lines must be colorful or striking, preferably red, orange or yellow.
   - The BSLs must be placed 2 meters above the pulley of warp cable and at a distance of 2 meters at the side of these pulleys in each band (port side and starboard), it may be necessary to fix arms that extend the distance.
   - Secondary lines (streamers), flags, streamers or strips, must be double and joined to 1 meter from the stern and then at regular intervals of 3 meters until cover at least 10 meters behind the entry of the warp cable into the water. The rest of the BSLs will not have secondary lines (**Figure 1**).

   **Use of Snatch block**
   - A Snatch block must be installed on the stern of the vessel to approximate the third cable to the surface of the water, *i.e.* below the height of the warp cables, thus reducing its aerial extension and the risks of collision of seabirds as outlined in **Figure 1.**

     Vessels that use a wireless netsonde and consequently have removed the third cable will be exempted from the previous obligation.

2. **Best fishing practices:**
   - **Clean trawl nets before shooting.** Prior to shooting, remove from the nets all fish and other materials that have been adhered (stickers).
   - **Night shooting (full nautical darkness)**. Fishing operations carried out during the night and with low artificial luminosity will be excluded from the use of BSL or Bird bafflers.
   - **Net binding.** The purpose of this measure is to minimize the time the net is on the surface, increasing it sink rate and diminish the time of exposition to interaction with seabirds.
   - **Discard management**. Discards authorized in accordance with the plan to reduce the discard of these fisheries and organic waste from evisceration or processing of catches must be disposed between fishing sets and by batches or crushed and discharged after the entry of the warp cable to the water, or discharged crushed in a submerged way.

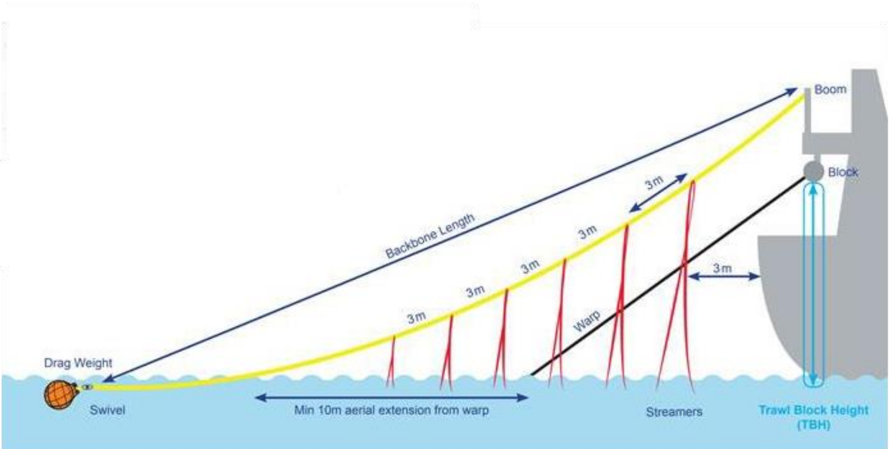
**d) Factory Trawler or Surimi Trawler of Chile Austral Hake, Pink Cusk eel, Hake and Southern blue whiting (austral zone):**

1. **Mitigation measures:**
   **Use of Bird Scaring Lines (BSL)**
   - The two main lines of the BSL must have a minimum length equivalent to 5 times the distance in meters from the pulley of the warp cable to the sea surface (**Figure 1**). These lines must be made with a polypropylene rope with a minimum length of 30 meters and a diameter between 8 to 12 millimeters.
   - The colors of the secondary lines must be colorful or striking, preferably red, orange or yellow.
   - The BSLs must be placed 2 meters above the pulley of the warp cable and at a distance of 2 meters at the side of these pulley in each band (port side and starboard), it may be necessary to fix arms that extend the distance.
   - Secondary lines (streamers), flags, streamers or strips, must be double and joined to 1 meter from the stern and then at regular intervals of 3 meters until cover at least 10 meters behind the entry of the warp cable into the water. The rest of the BSLs will not have secondary lines (**Figure 1**).

   **Use of Snatch block**
   - A Snatch block must be installed on the stern of the vessel to approximate the third cable to the surface of the water, *i.e.* below the height of the warp cables, thus reducing its aerial extension and the risks of collision of seabirds as outlined in **Figure 1.** Vessels that use wireless netsonde and consequently have removed the third cable will be exempted from the previous obligation.

2. **Best fishing practices:**
    - **Clean trawl nets before shooting.** Prior to shooting, remove from the nets all fish and other materials that have been adhered (stickers).
    - **Night shooting (full nautical darkness)**. Fishing operations carried out during the night and with low artificial luminosity will be excluded from the use of BSL or Bird bafflers.
    - **Net binding.** The purpose of this measure is to minimize the time the net is on the surface, increasing it sink rate and diminish the time of exposition to interaction with seabirds.
    - **Limit trawling period.** From south of parallel 55° LS, limit the maximum effort to 4 hours of trawling during the third quarter of each year.
    - **Discard management**. Discards authorized in accordance with the plan to reduce the discard of these fisheries and organic waste from evisceration or processing of catches must be disposed between fishing sets and by batches or crushed and discharged after the entry of the warp cable to the water, or discharged crushed in a submerged way.

**Figure 1.** Bird Scaring Line (BSL) scheme for trawlers in Chile, dimensions and reference concepts.




**4.** The provisions of this resolution are without prejudice to the compliance with the provisions established in Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), cited in *VISTO,* which in particular in Rule 3 prohibits the dumping of all plastic materials into the sea, including, without being exhaustive, ropes and fishing nets of synthetic fibers and plastic bags.

Other types of garbage, such as food remains and waste resulting from domestic operations and routine work of the vessels (excluding fresh fish and any portion thereof), must be treated and disposed of in accordance with the provisions of Annex V of the aforementioned Convention.

5. The industrial and artisanal vessels that use trawl nets must carry on board and use the devices and equipment implemented in this resolution as well as to comply with best fishing practices to avoid or minimize the incidental catch of seabirds.

6. The carrying out of fishing activities in contravention to the provisions of this resolution as well as the conservation and management measures that have been adopted in the framework of international treaties or organizations to which Chile is a party or member and that have been accepted in accordance with the procedure established in article 7°E of the General Law of Fisheries and Aquaculture is prohibited.

7. Violation of the provisions of this resolution shall be sanctioned in accordance with the procedures and penalties contemplated in the General Law of Fisheries and Aquaculture, in particular in the provisions of articles 40 D, 110 letters h) and l), 110 ter letters c) and e), 114 and paragraph 4 of Title IX, of the General Law of Fisheries and Aquaculture.

8. The National Fisheries and Aquaculture Service must adopt the measures and carry out the necessary controls to achieve effective enforcement and compliance with the provisions of this resolution.

9. This resolution shall enter into force within three months from the date of its publication in an extract in the Newsletter “Diario Oficial”.

10. Transcribe a copy of this Resolution to the National Fisheries and Aquaculture Service and the General Directorate of the Maritime Territory and Merchant Marine.

**REGISTER, COMMUNICATE AND PUBLISH IN EXTRACT IN THE OFFICIAL NEWSLETTER “DIARIO OFICIAL” AND ON FULL TEXT ON THE ELECTRONIC DOMAIN WEBSITES OF THE UNDERSECRETARIAT FOR FISHERIES AND THE NATIONAL FISHERIES AND AQUACULTURE SERVICE.**

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**This translation to English language of the Resolution RES.EX. N°2941 of the Undersecretariat for Fisheries, was made by Fipes and should be taken as unofficial translation.**

### 9.7.8. Independent Adjudicator – Notice regarding futher extension of consultation period

# MARINE STEWARDSHIP COUNCIL

## IN THE MATTER OF AN OBJECTION TO THE FINAL REPORT ON THE PROPOSED CERTIFICATION OF THE CHILE AUSTRAL HAKE INDUSTRIAL TRAWL AND LONGLINE FISHERY UNDER THE MSC PRINCIPLES AND CRITERIA FOR SUSTAINABLE FISHING

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## NOTICE REGARDING FURTHER EXTENSION OF CONSULTATION PERIOD

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1. Based upon the teleconference of the parties held on Wednesday, September 11, 2019, I believe that substantial progress has been made toward possible resolution of the objection and that the parties are on the verge of an agreed settlement. Some additional time, however, is necessary to complete the process. Accordingly, pursuant to PD 2.5.3.1 of the Objections Procedure, I find that "there is a real and imminent prospect of a solution that is acceptable to all relevant parties," and that a further extension of the consultation period is therefore appropriate. In the circumstances, the consultation period is hereby extended for five (5) working days, to and including Wednesday, September 18, 2019.

2. During the extended consultation period, the CAB shall submit its final proposals to the objector and the fishery client by 5:00 pm British Summer Time on Thursday, September 12, 2019. The objector and the fishery client shall have until 5:00 pm British Summer Time on Monday, September 16, 2019, to respond to these proposals. If they concur and an agreement is reached, the CAB shall submit to me, not later than 5:00 pm British Summer Time on Wednesday, September 18, 2019, the final terms of the agreement, including in accordance with PD 2.5.4 "such changes and revisions to the Final Report and determination as . . . [have been] agreed." Once I have had the opportunity to review the changes, I will advise the CAB that it may proceed to prepare a Public Certification Report in accordance with FCR 7.19.1 and will formally dismiss the objection.

Eldon V.C. Greenberg
MSC Independent Adjudicator

Dated: September 12, 2019

## 9.7.9. Objector – Acceptance of proposed changes to the Final Report and Determination

RC Rory Crawford <[redacted] | Ivan Mateo; ChileAustralHakeObjection@msc.org; Valeria Carvajal [redacted] [redacted] Samuel Dignan; Virginia Polonio; Géraldine Criquet

RE: second draft of the Public Consultation Report of the Chile Austral hake Industrial trawl and longline MSC evaluation

You replied to this message on 16/09/2019 15:20.

Dear all,

Many thanks for this – we are able to drop our objection on the basis of this updated report.

One additional note (and obviously not make-or-break), but the reference to the Albatross Task Force on p81 makes reference to longline initiatives, then discusses their nomination for a Latin American Green Award for purse seine bycatch mitigation. This doesn't appear relevant to this fishery and I'd suggest deleting. No need to re-circulate the report.

All the best,

Rory

## 9.7.10. Independent Adjudicator - Acknowledgement of agreed resolution and dismissal of objection

# MARINE STEWARDSHIP COUNCIL

### IN THE MATTER OF AN OBJECTION TO THE FINAL REPORT ON THE PROPOSED CERTIFICATION OF THE CHILE AUSTRAL HAKE INDUSTRIAL TRAWL AND LONGLINE FISHERY UNDER THE MSC PRINCIPLES AND CRITERIA FOR SUSTAINABLE FISHING

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### ACKNOWLEDGMENT OF AGREED RESOLUTION AND DISMISSAL OF OBJECTION

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1. During the consultation period on this objection, the parties were able successfully to conclude negotiations resulting in a mutually agreeable resolution of the issues raised by the objector. In a submission of September 18, 2019, the CAB advised that the objector was willing to drop its objection in light of the following agreed changes to the Final Report: (a) changing the score for PI 2.3.2 (from 85 to 80), amending the way in which PIs 2.3.1 and 2.3.3 were scored and including additional background information; (b) adding a recommendation on PI 2.3.2 recommending that 'best practice" in mitigating the industrial trawl fishery's impacts on seabirds (*e.g.,* as recommended by ACAP) be implemented "as soon as practicable" and that studies be undertaken to assess the effectiveness of any new measures; and (c) adding a detailed narrative explaining the objections process and recent changes "on the ground." Accordingly, I find that a satisfactory resolution of this matter has been reached. The CAB may now proceed to finalize the Public Certification Report in accordance with FCR 7.19.1, and the objection is hereby dismissed.

Eldon V.C. Greenberg
MSC Independent Adjudicator

Dated: September 19, 2019