

MSC PRE-ASSESSMENT REPORT

AOBAC A.G. PATAGONIAN TOOTHFISH FISHERY IN CHILE

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Glossary of Acronyms

ACAP	Agreement of Conservation of Albatross and Petrels
ASI	Accreditation Services International
B_0	Unfished biomass
B_{MSY}	Biomass at maximum sustainable yield
BRP	Biological Reference Point
CAB	Certification Assessment Body
CITES	Convention on International Trade in Endangered Species
CMS	Convention of Migratory Species
CPUE	Catch Per Unit Effort
CR	MSC Certification Requirements
DAT	Default Assessment Tree
DCD	<i>Dissostichus</i> Catch Document
ETP	Endangered, Threatened or Protected
EEZ	Exclusive Economic Zone
F	Fishing mortality rate
FAO	Food and Agriculture Organization [of the United Nations]
F_{LIM}	Fishing mortality rate that will drive the population biomass to the point where recruitment will be impaired
F_{MSY}	Fishing mortality rate at which catch is sustainable and at a maximum
g	Gram (0.001 kg)
GCR	Guidance to the CR
GLFA	General Law of Fisheries and Aquaculture
IFOP	Instituto de Fomento Pesquero
IUCN	International Union for the Conservation of Nature
IWC	International Whaling Commission
LRP	Limit reference point
mm	Millimetre
MSC	Marine Stewardship Council
NGO	Non-Governmental Organization
PAN-AM	The National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries
PI	Performance indicator
SCS	Scientific Certification Systems
SG	Scoring guidepost
STC	Scientific Technical Committee
SI	Scoring issue
SERNAPESCA	Servicio Nacional de Pesca y Acuicultura
SUBPESCA	Subsecretaría de Pesca y Acuicultura
TL	total length
TQ	transferrable quota
TRP	target reference point
US	United States
VME	Vulnerable Marine Ecosystem
WWF	World Wildlife Fund

Executive summary

This report discloses the results of a Marine Stewardship Council pre-assessment of the unit consisting of the AOBAC fishery for the Patagonian Toothfish (*Dissostichus eleginoides*), caught with passive bottom longlines off the coast of Chile, south of latitude 47°S to the southern boundary of the Exclusive Economic Zone in the XII region. The pre-assessment was undertaken by a SCS Global Services expert team via the fishery client, AOBAC A.G., based out of Punta Arenas, Chile. To our knowledge, this is the first time that the Chilean fleet fishing for toothfish has undergone pre-assessment against the MSC standard, although a likely related portion of the stock around the Falkland Islands is already MSC certified. The formal identification for the fishery is the Patagonian Toothfish Fishery in Chile, but for the purposes of this report, the fishery will be referred to as the “Chilean Toothfish Fishery”.

AOBAC A.G. is a commercial fishing operation, landing in Punta Arenas, Chile. There are 6 boats in the fleet included in the proposed unit of certification. The fleet fishes for the Patagonian Toothfish in Chilean waters south of latitude 47°S and all the way to the border with Argentina. The fleet uses a modified longline gear called “cachalotera” or trotline. The fishery’s activities are regulated by two main government entities at the national level: Subsecretaría de Pesca y Acuicultura (SUBPESCA), that deals with planning and policy of fisheries, and Servicio Nacional de Pesca y Acuicultura (SERNAPESCA) which deals with regulation and enforcement. The General Law of Fisheries and Aquaculture (Ley General de Pesca y Acuicultura, 18.892, 1991)¹ and amendments provides the regulatory framework for artisanal and industrial fisheries management in Chile. The last modification of the Law was made in 2013.

SCS has developed a portfolio of experience conducting MSC assessments for wide variety of fisheries. SCS was the first to certify Alaska salmon and the first small scale Native American tribe salmon fishery on Annette Islands. SCS has also completed the MSC assessments of Macquarie Island toothfish and the Heard Island/MacDonald Island toothfish.

The assessment was conducted by SCS Global Services (Dr. Carlos Alvarez Flores and Biol. Sandra Andraha Galán), with a two day onsite visit conducted on the 14th and 15th of April 2015. An additional day was spent consolidating information and discussing potential scores and the main issues identified while onsite. The site visit included meetings with representatives of SUBPESCA, SERNAPESCA, IFOP, CEPES and the Client. During and subsequent to the visit, relevant documentation provided by attendants was collected by SCS. The assessment was carried out using the MSC Certification Requirements v2.0 (Effective April 1, 2015).

In the course of the pre-assessment 3 performance indicators (PI) were identified as having the potential to fall below the SG 60 (pre-conditions for certification), while there were a further 15 performance indicators, that could require one or more conditions in a full assessment. In general, P2 scored well for most aspects related to bycatch and ETPs. The general legal framework is also very strong and scored quite well. Despite that, the PI related to stock status is one of the main weaknesses of the fishery: the team was in agreement with the opinion of the peer review for the fishery’s stock assessment, which was considered to be on the right track but with outstanding work to do. We concluded that IFOP’s work is a robust assessment that has a very constructive critique and that it will lead to the best possible estimate of the status of the stock. Relatively minor weaknesses were identified in relation to the harvest control rules, the compliance and enforcement and the evaluation process of the management system.

¹ http://www.subpesca.cl/normativa/605/articles-516_documento.pdf

It is important to point out that the majority of elements representing pre-conditions in preassessment (or conditions in a full assessment) relate to the need for further or more complete information, rather than clear evidence of non-conformity at the 80 level.

Positive aspects are the solid legal framework, the existence of an institutional system that works towards the goals established in the Law, the solid research program of IFOP and the total reduction of seabirds killed with the use of “cachaloteras”. Of no less importance is the clear commitment that the industrial sector has shown to improve the knowledge about the resource and its interest to comply with international standards and conservation measures.

The most critical problem identified was related to the considerable uncertainty associated with the identity of the harvested stock. Alternative conclusions about this issue lead to significant differences not only in the estimates of stock status, but to radically different management structures, some that could include the need to operate under some form of multi-national agreement.

It is very important to acknowledge that the stock is currently severely depleted. The official stand is that the stock is over-harvested, a view that is in contrast compared to the results of IFOP’s stock assessment which concluded that under both of its alternative conceptual models, the stock is in the area of collapse. The difference between these apparently opposing views, is in reality not very large. If the stock is not already in the area legally established for collapsed fisheries, it is dangerously close and the current fishing mortality rate is much higher than that leading to MSY. Regardless of the outcome of any evaluation towards certification, for any fishery in this situation, it would be advisable to take decisive measures to protect the stock.

Two related issues were identified that represent weaknesses in the management system. The General Fishery and Aquaculture Law establishes that fisheries in a state of overexploitation or collapse must include in the Management Plan a Recovery Program. The establishment of a Management Plan is also a requirement for fisheries under the regime of Incipient Development. At present, the Management Committee has not been constituted and therefore, no Management Plan has been developed. The second issue in the management system as related to the MSC Certification Requirements is that because there is an absence of a Management Plan, there are no clear and explicit Harvest Control Rules to prevent the stock from falling under the Limit Reference Point. Additionally, because there’s no Management Plan, there is no Recovery Program.

It should be noted that in Principle 3, the fishery scored very well in relation to the overall national fisheries legal and management framework. This highlights the importance of having a solid system to work with and a clear understanding of elements that may still be missing. In this Principle, the weaknesses were found in relation to the specific application of regulations to the toothfish fishery. This relates to the same issues mentioned in the previous paragraph. The Team underscores that failing PI 3.2.3 may be related to insufficient information more than an actual lack of a solid compliance and enforcement system; nevertheless this component is key to show full compliance in this fishery. Overall, low scores related to the management system can, for the most part, be improved once the definitions in the Law are implemented and additional information is provided.

The Team calls the client’s attention to the requirement that in order to obtain a Certificate, each one and all of the three Principles must score an average of 80 or higher. Because of this, it is recommended that even though there are no Performance Indicators in P2 that scored under 60, some of them that are in the range of 60 to 79 be addressed to increase their score. It is quite possible that some of those PIs can be improved by simply gathering the information needed to support evidence of compliance.

As it is, SCS considers that the main impediment to proceed to full assessment for MSC Certification is the problem related to the identity of the stock and its current status.

We also advise the client to explore the possibility of evaluating data deficient Performance Indicators that are eligible, using the *MSC Risk Based Framework* which can be used as an alternative to the Default Assessment tree for some Performance Indicators.

We would also suggest that the client work with MSC outreach to follow any changes in the standard, consultation or updated guidance related to harmonization of overlapping fisheries and their scoring, which may have important implications for this fishery.

1 Introduction

This report sets out the results of a Marine Stewardship Council (MSC) pre-assessment of the Patagonian Toothfish in Chilean waters south of 47°S. This assessment refers to the MSC's Principles and Criteria for Sustainable Fishing (the 'MSC standard').

1.1 Labelling

Products originating from MSC certified fisheries are eligible to carry the blue ecolabel of the MSC (fig 1). The blue ecolabel is a symbol that is easily recognized by consumers so that they can be confident that they are purchasing a seafood product that originates from a sustainable source. This pre-assessment will aid in determining whether this fishery may be prepared for an MSC assessment. The report can provide guidance only and the outcome of a full assessment will be the subject of deliberation by the selected assessment team. A full MSC assessment would not necessarily be completely consistent with the results of this pre-assessment, although if conducted with SCS, would build on the document base already received.

In the MSC assessment process, the burden of proof is on the fishery. The assessment team may only consider information that is also available to the public and it is the client's responsibility to assemble an information package for the assessment team. The MSC assessment process is also a public process where the public is invited to engage in contributing to the assessment.

1.2 Aims/scope of pre-assessment

The principal aim of the pre-assessment is to determine, on the basis of information made available by the client, the position of the fishery in relation to the MSC Principles and Criteria. In particular, the pre-assessment will:

- Outline the key components of the fishery and determine the scope of the main certification;
- Identify any obstacles or problems for certification;
- Provide a recommendation on whether or not the fishery may be ready to proceed with MSC certification.



Figure 1. The blue MSC eco-label may be used on products originating from an MSC certified fishery. Consumers recognize the label to mean that the product comes from a sustainable source. The largest markets for MSC products include large supermarkets in Europe, the United States and Japan.

It should be noted that no verification of information or contacting of stakeholders has taken place at this stage. This would be part of a full MSC assessment which is open to public scrutiny and comment.

This report sets out:

- The Unit of Certification in Pre-Assessment;
- Species biology and description of the fishery;
- Geographic range;
- Description of the fishery;
- Other fisheries in the vicinity;
- An overview of the main species and issues of relevance to P2;
- Management system background;
- Stakeholders;
- Preliminary evaluation of the fishery against the MSC Principles and Criteria;
- Obstacles or problems to certification for the fishery in the form of potential Conditions to meet before entering full assessment;
- A recommendation as to whether or not the fishery should move to main assessment at this time.

1.3 Main challenges identified during pre-assessment of the fishery

- The most critical challenge this fishery needs to tackle is the resolution of the identity of the stock and the determination of the role all fisheries (not only the industrial sector, but all fisheries in Chile and abroad) may play in the conservation of this population.
- Depending on the definition of the unit for full assessment, it will be necessary to demonstrate that the stock is above the point where recruitment is impaired. SCS recommends that even if the stock is not quite at that point yet, consideration should be given to the current fishing mortality rate and evaluate the risk to fall soon below the Limit Reference Point.
- Regardless of whether the stock is accepted to be in a state of high risk to fall or be at the point where recruitment is impaired, it is recommended that the provisions in the Law are implemented to get a Recovery Program started as soon as possible.
- Developing the Management Plan is also anticipated to resolve several aspects that appeared as missing during the pre-assessment. Creation and operation of the management committee will address many participation and consultation issues and consequently may improve the responsiveness of the decision-making processes. It will be very positive to include in the Management Plan, strategies to handle potential discards; investigate potential indirect impacts of the fishery on ETPs, including marine mammals; and the overall investigate the impact of removing large amounts of biomass of this species from the ecosystem; and to determine the nature and scope of potential impacts of the gear on the benthic habitat.
- Producing adequate information with sufficient level of detail will be necessary to better understand the ecology and status of primary and secondary species, structure, function and distribution of habitats and ecosystem components and consequently the impact of the fishery on these components. In order to achieve this level of information and data, it will be necessary at least to ensure adequate coverage of the observer program.

1.4 Unit of Assessment and Unit of Certification

The MSC Certification Requirements (CR) define the Unit of Assessment (UoA) as a unit that includes a) *The target stock(s)*; b) *the fishing method or gear type/s, vessel type/s and/or practices* and c) *The fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including other eligible fishers that are outside the unit of certification.*

On the other hand, the CR define the Unit of Certification (UoC) as a unit that includes a) *the target stock(s)*; b) *the fishing method or gear type/s, vessel type/s and/or practices* and c) *the fishing fleets or groups of vessels, or individual fishing operators pursuing that stock, including those client group members initially intended to be covered by the certificate.*

Under these definitions, the basic difference between the UoA and the UoC is the group of vessels or fishing operators that share all features of fishers or vessels in the UoC, but that are initially not covered by the certificate. This group of fishers is known as *other eligible fishers*.

In this fishery, for the purposes of pre-assessment, the UoA will be defined to be the same as the unit of certification. It is possible however that this situation could change in the future due to the current uncertainty in the determination of the boundaries of the biological population around South America (add the interest of the fleets harvesting). If this change takes place, a modification of scope would be necessary. The full evaluation may be different from this pre-assessment with regard of Principle 1 if there are sectors of the stock that were not included in the assessment and possibly the catch of other fisheries (even from other countries) will have to be considered. Under Principle 2, other potentially eligible fishers may have to be evaluated and under Principle 3, it may be possible that an international arrangement would have to be developed to be able to manage a fishery harvesting a *shared stock*.

Stock Identity

During the onsite visit and reviewing the material presented to the team, it was realized that the definition of the UoA was not clear-cut. A recent technical report by the Instituto de Fomento Pesquero (IFOP) concludes that: *results of different studies indicate that separate stocks of toothfish exist in the western region of the Indic Ocean (Prince Edward, Marion, Crozet, Kergulen, Heard and McDonald Islands), the Macquarie Island, the Atlantic sector (South Georgia and South Sandwich Islands) and the Chilean/Patagonian shelf. Fish in Bouvet Island are similar to the population in the South Georgia Islands. The relationship between the Ross Sea and the stock of the Macquarie Island is unknown (Tascheri-Oyaneder 2014).*

The review of different sources of information concluded that movements of the toothfish are limited by the Polar front, the Circumpolar current and the lack of physiological mechanisms to support temperatures below 2°C. A wide range of evidence was included by IFOP to discuss the identity of the stock harvested by the industrial Chilean fleet. These analyses include genetics, reproductive status, physiology, isotopes, spectrometric analysis and tagging. The evidence lead to the proposition that in South America: a) There's a single large spawning area in the Pacific, to the southernmost region of Chile and extending east towards Argentinian waters; b) There's a single toothfish genetic population unit in the coasts of South America, extending from the north of Peru to the southern tip of the continent, and from there to the coasts of *Argentina and the Malvinas Islands*; c) Toothfish harvested by the industrial fishery come from a single spawning population; d) Toothfish move from the slope of the Eastern South Pacific south of latitude 47°S, to the south towards the Western South Atlantic towards the area where the deep water demersal artisanal fishery operates; e) There's connectivity between the spawning grounds extending from the southwest of Cape Horne and the west of Burwood Bank (Tascheri-Oyaneder *et al.* 2014). The report of Galleguillos *et al.* (2008) concludes that based on the evidence pointing to a single discrete

population unit from Peru south to the tip of the South American continent and north to Argentina, including the *Malvinas*, management should be conducted *jointly* for all fishing in the region.

On the basis of a single stock occupying the waters around Chile and Argentina, the IFOP assumed two possible cases that could have relevant consequences for management. In the first case, fish moving away from the spawning grounds to the north of Chile and Peru and to the Falklands or north of Argentina, are in practice “lost” to the breeding population and become irrelevant to replenish the stock. It is obvious from this perspective that the artisanal fishery of Chile and the fisheries in Peru, the Falklands and northern Argentina would be sustainable only from the extent of the emigration rate of the fish. Recruitment would have to be protected by regulating the harvest of the breeding stock on both sides the southern end of the continent. In the second case, fish moving north to the fishing grounds of the artisanal fishery and to Peru (where there is also a toothfish fishery, see Anonymous 2000), would have the ability to return south to spawn. Fish emigrated north on the Argentinian side would not be considered as capable of moving south and even if its origin is the same as the fish on the Chilean side, they would not be contributing to the recruitment.

A peer review on the latest stock assessment states that: *In particular for the fisheries in Chile, the uncertainty about the stock structure, spatial dynamics and the relationship among fish caught in the areas where the Chilean artisanal and industrial fisheries operate and also among the areas where the Argentinean and Falkland Island fisheries occur is of critical importance.* Because of this, the review indicated that other (even more plausible) scenarios exist and that: *Other models would have substantially different implications for the assessment and management advice* (Polacheck 2015).

Gear and Fleet

The main gear used by the UoC is a passive bottom longline that holds small lines with baited hooks at the end. The longline is set to lay near the bottom at depths near 2,000 m. Buoys are attached to the each extreme end of the longline to mark the presence of the gear. Although three different types of longline have been used by this fishery, presently only the trotline called *cachalotera* is used because it prevents fish removal by sperm and killer whales (Fig. 2). The *cachalotera* is a modification of the single main longline that, instead of having a single hook at the end, holds a bunch of 6 to 10 hooks. The main longline can be up to 14 km long and hold near 800 secondary lines or *barandillos*. The *barandillo* is the combination of the secondary line with the bunch of hooks and weight at the end, to which a protective cone made of gillnet is added to protect the fish at retrieval (Fig 2; Tascheri-Oyaneder *et al.* 2014). Within the UoC there are six boats that belong to three different companies associated in AOBAC. These are industrial vessels that are 50 m or longer.

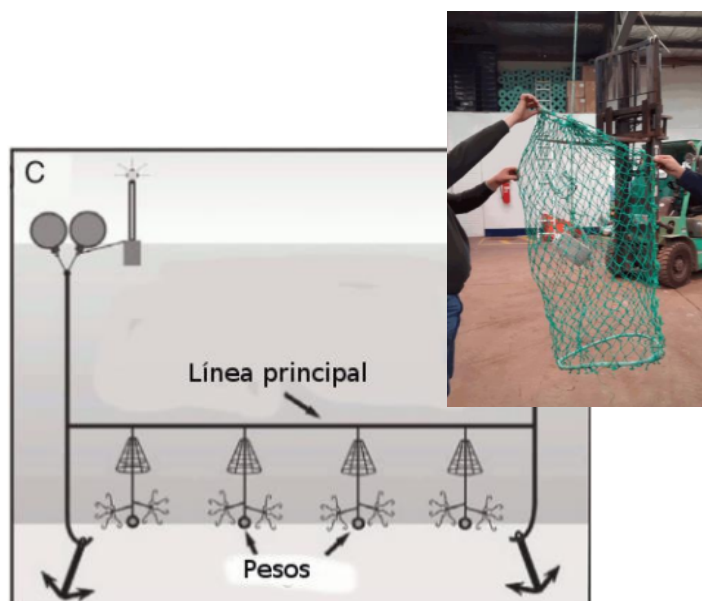


Fig. 2. Diagram of the trotline called *cachalotera* used by the industrial Chilean fleet fishing for Patagonian toothfish south of 47°S. The photo depicts the cone with hooks and weight inside. Reproduced from Tascheri-Oyaneder *et al.* (2014).

Unit of Assessment

For the purpose of MSC evaluation, the harvested population unit under assessment (the stock) will be the toothfish found along the slope and shelf of the coast of Chile south of 47°S and on the coast of Argentina south of 54°S, with a single breeding ground from the southern Tierra del Fuego area east to the west of Burwood Bank (Fig. 3). It is understood that fish spawned in this region may migrate north of Chile and up to Peru in the East Pacific and north the coast of Argentina and northeast to the Falklands. Under Case 1 in the conceptual model of IFOP, emigrated fish would not return to breed and therefore are irrelevant for recruitment. The implication of this assumption is that the Peruvian fishery, the Chilean artisanal fishery, all fishing in Argentina north of 54°S and most of the fishery from the Falklands don't need to be included in the assessment of the stock and that their management actions are irrelevant to the breeding stock in the south, but not vice versa. There may be an undetermined portion of the Falkland fishery that is harvesting portions of the breeder stock. Under this alternative stock structure, at least coordination between Chile and Argentina may be needed. Inclusion of the Falkland Islands should be considered but may not be critical. Under IFOP's Case 2, the fishery from Peru and the artisanal fishery from Chile have to be included in the stock assessment. While other possible scenarios would have to include the fisheries from the Falklands, and perhaps all fishing north of parallel 54°S (predominantly from Argentina, but there may be an additional undetermined fleet working outside the Argentinian EEZ).

Under Case 1, the stock in the UoA is harvested by vessels from Chile and Argentina but only the industrial Chilean fleet is part of the UoA. Vessels from Chile include only bottom longliners that are presently using the trotline system ("cachalotera"). While vessels from Argentina were (until 2011 at least) predominantly longliners as well, there is a portion of the trawl fishery that come south to the Burwood Bank and the southernmost part of the slope next to the border with Chile (Fig. 4) and catch some of the breeder stock. It is however unclear if the longline used by this fleet is the cachalotera type or the so called *autoline*. It is also possible that the Argentinian fleet fishing in the south has shifted to bottom trawling gear (comments by industry members at onsite meeting).

Under Case 2 of the conceptual model of IFOP, fish that moved north along the Pacific coast as larvae or juveniles may return to breed in the spawning grounds in the south. In this case, the Peruvian fleet and the Chilean artisanal fisheries would have to be monitored to be included in assessments and management. An international program would have to be developed and Peru, Chile, and Argentina must be part of it. The fish on the Falklands is still considered part of a sink population and is not included.

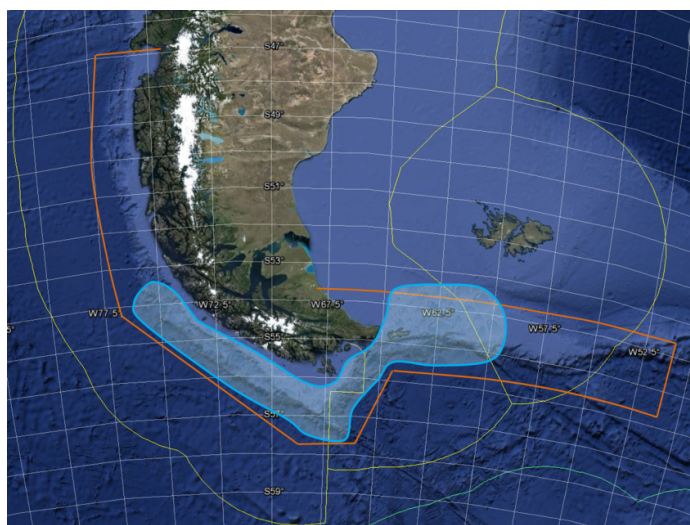
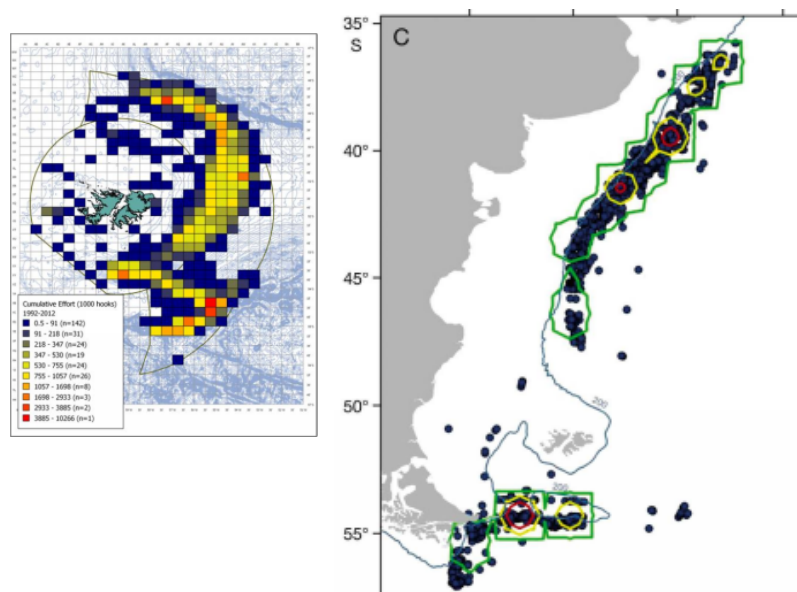


Fig. 3. Approximate area occupied by the stock (orange line) of the Patagonian toothfish that constitutes the Unit of Assessment. The blue area represents the approximate spawning grounds. Yellow lines are the boundaries of the EEZ for Chile, Argentina and the Falkland Islands.

Fig. 4. Distribution of fishing effort of the Argentinian fleet targeting Patagonian toothfish with bottom longlines from 2001 to 2009 (right). Reproduced from Hanchet *et al.* (2014). Notice the cluster of sets around Burwood Bank and south/west to Staten Island and the slope near the border with Chile. The figure on the left is the distribution of effort around the Falkland Islands with red squares higher effort. Reproduced from Andrews *et al.* (2014).



It is important to bring the client’s attention to the recommendation of Polacheck (2015) to consider even more alternative Cases to explain the stock structure and dynamics. Because the alternatives of Polacheck (2015) have not been explored or discussed at all, we are not suggesting what alternative scenarios need to be considered for management or assessment, but they need to be carefully analysed in future assessments and may include the participation of all fisheries, including the substantial catches along the entire Argentinian waters and the Falklands (Fig. 4).

Finally, based on the above discussion, the UoA is comprised exclusively of the fleet of industrial vessels from Chile that use cachalotera type longlines. Although other vessels of similar characteristics may be harvesting the same stock and could be considered eligible and included in the UoA, they are not assessed and are not part of the UoA. If in the future, these vessels become interested in sharing the Certificate, they would need to be evaluated and the Certificate would change in scope. Without detriment to or contradiction of the definition of the UoA, the stock harvested by the fleet in the UoA is also harvested by other fleets (one or more), therefore, the status of the stock under Principle 1 must be assessed as a whole, including all fisheries involved.

Unit of Certification

The UoC which is the same of the UoA is defined by the Chilean industrial fleet of bottom longliners, using cachaloteras, harvesting a single stock of toothfish, south of parallel 47 along the continental slope, all the way to the limits with Argentina. Clearly, under the scenario of Case 1 of IFOP conceptual model, any Argentinian longline vessels that fish from the border with Chile around the slope east, south of the Staten Island and until the Burwood Bank, have the potential to become other eligible fishers, but they would have to be assessed. Also, an overlap with the fishery around the Falkland Islands would have to be analysed further since it would involve an already MSC-certified fishery. In principle, eligibility of other fleets would be possible if they are industrial longliners that are fishing on the breeder stock. Under Case 2 and other scenarios of the conceptual model, there needs to be a broader analysis of the characteristics of other fleets to determine their potential to eligibility.

Harmonization with the certified Falkland Islands Patagonian toothfish fishery

The Certification Report for the toothfish fishery around the Falklands considers that fish in this area constitute a separate stock from all others, including Argentina and Chile (Andrews *et al.* 2014). The report acknowledges that the Falklands stock spawns at Burwood Bank and that the *region spans both Argentine waters and the Falkland Conservation Zone (FCZ), such that recruitment to both*

fisheries is likely to come from this region. Additional recruitment contributions to both fisheries potentially come from southern Chile (Ashford et al 2012). Figure 2 in the Falklands Certification Report (Fig. 4 in the present report) shows also that considerable fishing effort takes place on and around the Bank, which means it is likely that the fishery is partly harvesting the breeding stock and not only the emigrated fish that is not contributing to recruitment; nevertheless, the Certification Report of the Falklands assumes the fishery operates on a discrete separate stock. The Certification Report concludes: *on the basis of the available scientific evidence applied to the MSC definition of “Fish Stock”, the Argentine and Falkland toothfish fish stocks are separate, and that the assessment and management of the Falklands stock as a discrete stock is justified. Note, however, that following an objection to the determination of the Assessment Team, additional research is to be carried out into this aspect.*

A revision of evidence may be necessary to resolve whether these fisheries are harvesting single or discrete different stocks.

Table 1. Description of the fishery Units of Certification.

Species (biologically distinct unit)	Patagonian toothfish or bacalao de fondo (<i>Dissostichus eleginoides</i>: Smitt, 1898)
Method of Capture	Passive bottom longline of type <i>cachalotera</i>
Stock	Single breeder stock spanning from parallel 47°S along the continental slope south to the southern tip of the South American Continent and east to Burwood Bank. It is assumed that fish from outside these bounds may originate from this spawner population but once emigrated to the north, both in the Pacific and the Atlantic, most likely don't contribute to recruitment.
Geographical range of fishing operations	From 47°S along the continental slope south to the border with Argentina.
Management Framework	<p>The Ministry of Economy, Development and Tourism is responsible for the management of the fishing sector in Chile. Three agencies under the Ministry and a Research Institute are in charge of fisheries:</p> <ul style="list-style-type: none"> • <i>Subsecretaría de Pesca y Acuicultura</i> (SUBPESCA) is responsible for policy and planning of fisheries; • <i>Servicio Nacional de Pesca y Acuicultura</i> (SERNAPESCA) is responsible for regulations and enforcement; • <i>Fondo de Investigación Pesquera</i> (FIP) aimed at funding the research for fisheries management. • The <i>Instituto de Fomento Pesquero</i> (IFOP) is a non-profit research organization that generates scientific and technical information usually under contract to SUBPESCA and SERNAPESCA. <p>Chilean fisheries are primarily governed by the General Law of Fisheries and Aquaculture 18.892, 1991 (GLFA) and its amendments. The last modification of the GLFA published in 2013 (Law 20657) defines the creation of a <i>Comité Científico Técnico</i> (Scientific Technical Committee) for demersal fisheries, including toothfish, which advises SUBPESCA and the <i>Comité de Manejo</i> (Management Committee). The latter is in charge of the development of the management plan for the fishery. Other decrees and resolutions and other rules and regulations, for the management of the fishery, are regularly published by SUBPESCA and by SERNAPESCA, respectively.</p>
Client	AOBAC A.G.

1.5 Total Allowable Catch (TAC) and Catch Data

The Chilean Fisheries Subsecretary determines yearly allowable catch quotas for the industrial fishery. The quota for year 2015 has been established as a range between 877 to 1,098 tons, out of which 15 tons are reserved as a research quota. This quota is smaller than the last official recorded catch of 1,348 tons in 2013.

2 Description of the fishery

2.1 Scope of the fishery in relation to the MSC programme

The AOBAC toothfish fishery engages in the capture of native, wild-stock of toothfish off the coast of Chile and does not engage in habitat modification. The Client should be aware that the MSC standard requires any fishery to pass baseline scope eligibility criteria defined under CR 27.2.7.6.

Unilateral exemptions: Conformity Assessment Bodies (CABs) are required to document and retain information on other matters related to scope such as whether a “fishery operates under a controversial unilateral exemption to an international agreement or if destructive fishing practices are used”. Under CR 27.4.4.1 “CABs shall use these definitions to interpret this criterion: i. “Controversial means creating a controversy in the wider international community rather than simply between two states.” Under 27.4.4.1aiv “international agreements are those with a direct mandate for sustainable management of the resources affected by the fishery according to the outcomes expressed by Principle 1 and 2”. SCS does not foresee any obstacles to full assessment based on this scope criterion.

Destructive Fishing: CR 27.4.4.2 subsequently requires that CABs shall verify that the fishery confirms to Principle 3, Criterion B14. Fishing operations shall not use destructive fishing practices such as fishing with poisons or explosives. SCS does not foresee any obstacles to full assessment based on this scope criterion.

Shark finning: It is noted under GCB 3.6.2 that “At its December 2011 meeting held in Berlin, the Marine Stewardship Council (MSC) Board of Trustees resolved that fisheries engaged in shark finning will not be eligible for certification to the MSC standard for sustainable fisheries. The Board’s decision is based upon international norms and consensus, such as that expressed in the FAO’s International Plan of Action for the Conservation and Management of Sharks, as well as scientific and management grounds. Under GCB 3.6.4 it is recognized that “fisheries not engaged in shark finning may find it difficult to comply with fins naturally attached regulations. In those cases where a ratio of shark fins to shark carcass is used by the management system to ensure that shark finning is not occurring, a default of 5% fin: carcass wet weight should be used, unless an alternative can be objectively justified by the management system (e.g. where it is scientifically accepted that the ratio of fins to carcass for a species differs from 5%). SCS does not foresee any obstacles to full assessment based on this scope criterion.

Any evidence of unilateral exemptions, the use of explosives or shark finning have the potential to preclude the fishery from certification on the basis of being out of scope for eligibility.

2.2 Overview of the fishery

History and Management

The Patagonian toothfish fishery in the southern portion of Chile developed in the early 1990s to offer the fishers an alternative resource to reduce pressure to their original targets, the southern hake and the pink cusk-eel. Results from exploratory surveys allowed them to start operating south of 47°S under the regime of an *incipient fishery* which is managed using transferrable quotas (TQs). In 1992 access to the fishery was established through a bid system that provides an *Extraordinary Fishing Permit*. In 1996 a closing season was implemented to stop fishing from June 1st to August 31st in the area between 53° to 57°S. In 2001 the area of regulation for the southern industrial fleet was re-established from parallel 47°S to the southern limit of the EEZ in the XII region. Approximately in 2005, the cachalotera started to be used (Moreno *et al.* 2008; Rubilar *et al.* 2012). Finally, in 2013 a new General Fisheries and Aquaculture Law was published. Some of the most relevant inclusions in the new law are: a) artisanal fishery vessels more than 15 m long, they are now required to carry a satellite VMS; b) the regime of incipient development is modified to allow the artisanal sector to have access to 50% the yearly quota for a period of three years, the proportion of the artisanal quota that is not used in this period can be used to increase the quota bid; c) all vessels with an Extraordinary Fishing Permit must carry also a VMS; d) all fishers are required to present a logbook reporting the catch; e) quotas are established on the basis of keeping the stock at Maximum Sustainable Yield (MSY) or to drive the stock to MSY with consideration of the biological characteristics of the species, the quotas need to be within the range determined by the Technical-Scientific Committee and any modification of the quota must be supported by new scientific information (Tascheri-Oyaneder *et al.* 2014).

The new Law (Anonymous 1991, as amended in 2013) mandates that the status of a stock should be established in accordance with a *Biological Reference Framework* (BRF). This framework requires the estimation of *Biological Reference Points associated to the Maximum Sustainable Yield*. Also, a biomass level must be adopted that corresponds to a *Limit Biological Point*. Reference points can be target or limit and are defined in terms of spawner biomass or fishing mortality rate. The Law specifies that MSY is the fisheries management goal and is defined as the *highest average catch level that can be sustainably obtained from a stock under the prevailing environmental and ecological conditions*. On the basis of such definitions, the BRF considers five possible states of a harvested stock: *under-exploited, fully exploited, over-exploited and collapsed, overfished* (Anonymous 1991, as amended in 2013; Tascheri-Oyaneder *et al.* 2014). The formal definitions of these states are:

Under-exploited = $BD_{act} > BD_{RMS}$

Fully exploited = $(BD_{RMS} - \xi BD_{RMS}) < BD_{act} < (BD_{RMS} + \xi BD_{RMS})$

Over-exploited = $BD_{act} < (BD_{RMS} - \xi BD_{RMS})$

Collapsed = $BD_{act} \leq BD_{LIM}$

Overfished = $F \geq F_{RMS}$

BD_{act} = Spawning biomass estimated through stock assessment

BD_{RMS} and F_{RMS} = Spawning biomass and Fishing mortality rate producing MSY

BS_{LIM} = Limit spawning biomass.

ξ = A proportion of BD_{RMS} adopted by the Scientific Committee to define the range of full exploitation.

These definitions are in turn used to build the Kobe plot shown in Fig. 5.

It is worth mentioning that informal information collected during the onsite meeting revealed that the fishery has a history of irregular behaviour. Two examples were provided; first, the aforementioned peak in 1992 during which hake had a quota that could be filled easily, it was

convenient to report toothfish which didn't have a quota. Fish in that year were probably recorded as toothfish sent to Europe when in fact, no toothfish from Chile has ever been sent to Europe. The second example was catch reported outside the EEZ in mile 201 which was likely caught in Argentine waters. Fishers today have the incentive of exporting to the US which requires accurate and verifiable catch records that comply with CCMALR provisions.

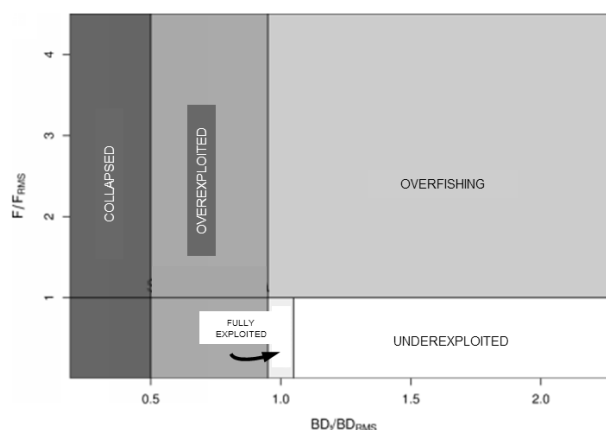


Fig. 5. Diagram representing potential states of a fishery according to definitions in Chilean Law. Reproduced from IFOP Tascheri-Oyaneder *et al.* (2014).

The AOBAC fleet

AOBAC is an organization that aggregates several companies conducting industrial activities related to the fishery for the Patagonian toothfish. Although the web site lists eleven vessels, the UoC includes only six factory ships of more than 50 m long using cachalotera longlines (Table 2). AOBAC fishing presently represents about 90 % of the total bid.

Table 2. Vessel List

Company or Fishing Association	Vessel Name	Port Registration	Vessel Owner	Licensed gear
AOBAC A.G. / Globalpesca SPA	Globalpesca I	Valparaiso	Globalpesca SPA	Longliner
AOBAC A.G. / Globalpesca SPA	Globalpesca II	Valparaiso	Globalpesca SPA	Longliner
AOBAC A.G. / Globalpesca SPA	Globalpesca III	Valparaiso	Globalpesca SPA	Longliner
AOBAC A.G. / Pesca Cisne	Cisne Blanco	Valparaiso	Pesca Cisne S.A.	Longliner
AOBAC A.G. / Pesca Cisne	Cisne Verde	Valparaiso	Pesca Cisne S.A.	Longliner
AOBAC A.G. / Deris S.A	Puerto Toro	Valparaiso	Deris S.A.	Longliner

The main gear used by the UoC is a passive bottom longline that holds small lines with baited hooks at the end. The longline is set to lay near the bottom at depths near 2,000 m. Buoys are attached to the extreme ends of the longline to mark the presence of the gear. Although three different types of longline have been used by this fishery, presently only the trotline called *cachalotera* is used because it prevents fish removal by sperm and killer whales (Fig. 2). The *cachalotera* is a modification of the single main longline that instead of having a single hook at the end, it holds a bunch of 6 to 10 hooks.

The main longline can be up to 14 km long and hold near 800 secondary lines or *barandillos*. The *barandillo* is the combination of the secondary line with the bunch of hooks and weight at the end and to which a protective cone made of gill net is added to protect the fish at retrieval (Fig 2). Within the UoC there are six boats that belong to three different companies associated in AOBAC (Table 2; Tascheri-Oyaneder *et al.* 2014). These are industrial vessels that are 50 m or longer with processing capacity onboard.

The main area of operation of the AOBAC fleet is along the continental slope of Chile from parallel 47°S to the limit of the XII Region at the border with Argentina (Figs. 3 and 6).

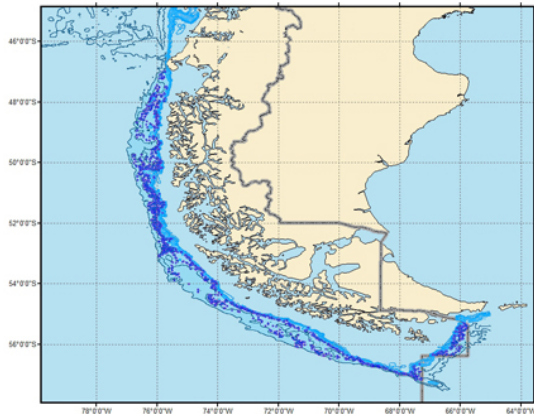


Fig. 6. Distribution of sets by the AOBAC fleet showing the area along the continental slope where the UoC operates. Reproduced from the Globalpesca website.

2.3 Principle One: Target species background

Patagonian toothfish (*Bacalao de profundidad*)

Class: Actinopterygii

Order: Perciformes

Family: Nototheniidae

Genus: *Dissostichus*

Species: *Dissostichus eleginoides*

A wide range of evidence was included by IFOP in a discussion on the identity of the stock harvested by the industrial Chilean fleet (Tascheri-Oyaneder *et al.* 2014). These analyses include genetics, reproductive status, physiology, isotopes, spectrometric analysis and tagging. The evidence lead to the proposition that: a) There's a single large spawning area stretching from the Pacific, to the southernmost region of Chile and extending East towards Argentinian waters; b) There's a single toothfish genetic population unit in the coasts of South America, extending from the north of Peru to the southern tip of the continent, and from there to the coasts of *Argentina and the Malvinas* Islands; c) Toothfish harvested by the industrial fishery come from a single spawning population; d) Toothfish moves from the slope of the Eastern South Pacific south of latitude 47°S, to the south towards the Western South Atlantic and to the north of latitude 47°S towards the area where the demersal artisanal fishery operates; e) There is connectivity between the spawning grounds extending from the southwest of Cape Horne and the west of Burwood Bank. The report of Galleguillos *et al* (2008) concludes that based on the evidence pointing to a single discrete population unit from Peru south to the tip of the South American Continent and north to Argentina, including the *Malvinas*, management should be conducted *jointly* for all fishing in the region.

The Patagonian toothfish is a synchronic spawner with ovaries that develop eggs in batches of two different sizes, with the larger that will be laid in one single event in the immediate spawning season and the smaller ones that will continue developing until the next spawning event. The Chilean stock spawns only in the southern extreme of the continental shelf during the southern winter months of June through September. The spawning grounds in South America extend from the tip of Cape Horne east to the south of Tierra del Fuego, the Strait of Le Maire and the Staten Island, to the Burwood Bank. Length at sexual maturity (L50) in females of the Chilean stock ranges (in different estimates) from is 83.7 cm of total length to 117 cm (Tascheri-Oyaneder *et al.* 2014).

Age has been obtained by tagging, scale and otolith reading, however the most reliable and current approach is the use of the otoliths. Scales were used originally because they are easier to obtain and work with, but a study using radioactive markers led to the conclusion that scales could underestimate true age (Tascheri-Oyaneder *et al.* 2014).

The catch history of the industrial toothfish fishery is represented in Fig. 7. It is worth mentioning that there's a good possibility that the high peak in 1992 includes a large proportion of hake that in those years had a quota and some fishers reported it as toothfish that didn't have quota. Other than that, catches have been historically less than 4,000 tons for the most part. Starting in the late 90s, catches have been 3,000 tons or less. In 1992 a specific denomination for the industrial fishery operating south of 47°S was created, the unit is called *Unidad de Pesquería de Bacalao*. This unit operates with a sort of ITQ under the denomination of *Extraordinary Fishing Permits*.

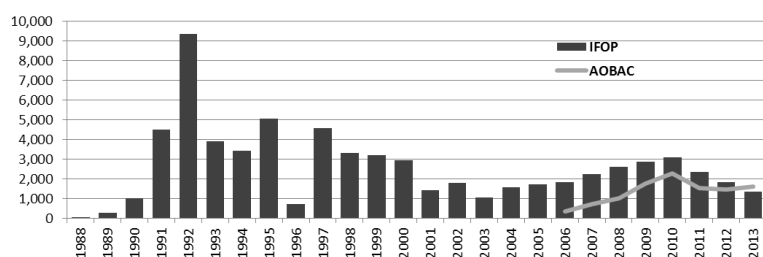


Fig. 7. Catch history of toothfish by the industrial fleet of Chile operating south of the 47°S parallel.

As the industrial fishery south of 47°S developed, interactions with birds, sperm and killer whales also increased, particularly in the southernmost areas of operation (Fig. 8). Interactions were originally more important with sperm whales, which motivated the development of the trotline or chachalotera to reduce the loss of fish to sperm whales. The modification in the gear certainly reduced the damage from sperm whale interactions, but it also eliminated the bird bycatch (Moreno *et al.* 2008) and most likely increased the efficiency of the gear. The chachalotera however didn't help much to reduce the impact from interactions with killer whales, particularly the younger animals that apparently have no problem in accessing the fish from under the hood.

The most recent stock assessment conducted by IFOP considered two Cases regarding stock structure and the role of vagrants or fish that emigrated to the north on both sides of the continent.

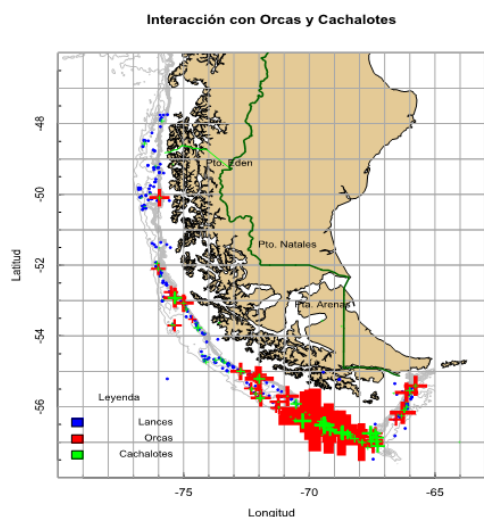


Fig. 8. Distribution of recorded interactions of sperm and killer whales with fishing operations for toothfish by the Chilean industrial fleet between June 2011 and May 2012. Red marks represent killer whales and green markers are sperm whales. Size of the marker represent number of interactions in the area. Reproduced from Rubilar *et al.* (2012).

Assumption 2 implied that the catch of the Chilean artisanal fishery had to be incorporated to account for a reduction in the number of potential spawners. This was possible within Chilean jurisdiction, and the same had to be done with Argentina, but apparently they didn't agree with this possibility (Tascheri-Oyaneder *et al.* 2014). This is an interesting issue because the Public Report of the evaluation of the Argentine fishery against MSC standards acknowledged a single stock for all Argentine waters, although no specific mention was made about the contribution of fish in the north to the recruitment capacity of the stock, it makes reference of *several fish moved over 600 km from the northern fishing grounds at 40°S off Mar del Plata to the southern fishing grounds off Cape Horn* (Hanchet *et al.* 2014).

Total biomass in 2013 was estimated under the assumption of Case 1 at 31,496 tons and the vulnerable biomass at 10,384. If Case 2 applies then total biomass in 2013 was estimated at 93,663 tons and vulnerable biomass at 40,846 (Fig 9).

In any of the two Cases of IFOP conceptual model, the result of the stock assessment is that the stock is depleted down to 10 or 11% of the virgin biomass and therefore, under the Chilean definition, it is below $0.2BD_0$, that is, the stock falls in the category of collapsed (Fig. 10).

From the results of the stock assessment conducted by IFOP, two additional observations are interesting that occur quite similarly regardless of the assumption on stock structure. First, estimated and observed age structure in the catch shows evident temporal variability, but overall there's no trend and modes fluctuate approximately between 10 to 15 years (Fig. 11), although in case two the mode is closer to 10 years and less variable.

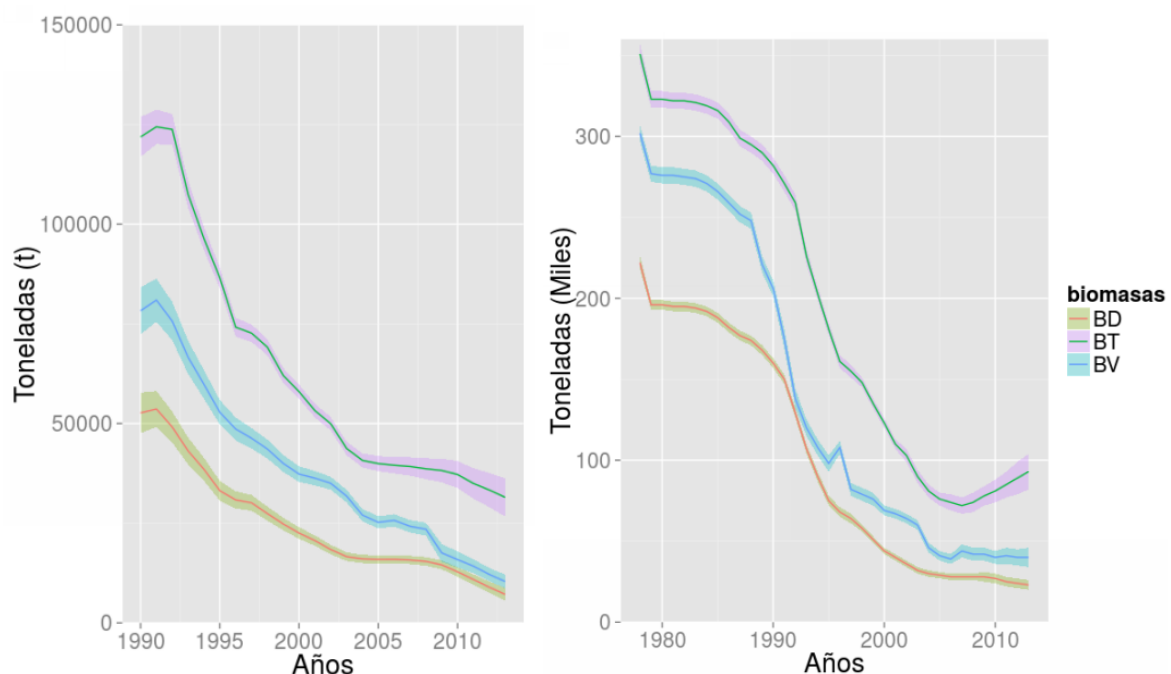


Fig. 9. Model estimated biomass trends of the Patagonian toothfish under Case 1 (left) and Case 2 of the IFOP conceptual model. Case 1 reconstruction is between 1990 and 2013 and Case 2 from 1978 and 2013. BD = Spawning biomass; BT = Total biomass and BV = Vulnerable biomass. Reproduced from Tascheri-Oyaneder *et al.* (2014).

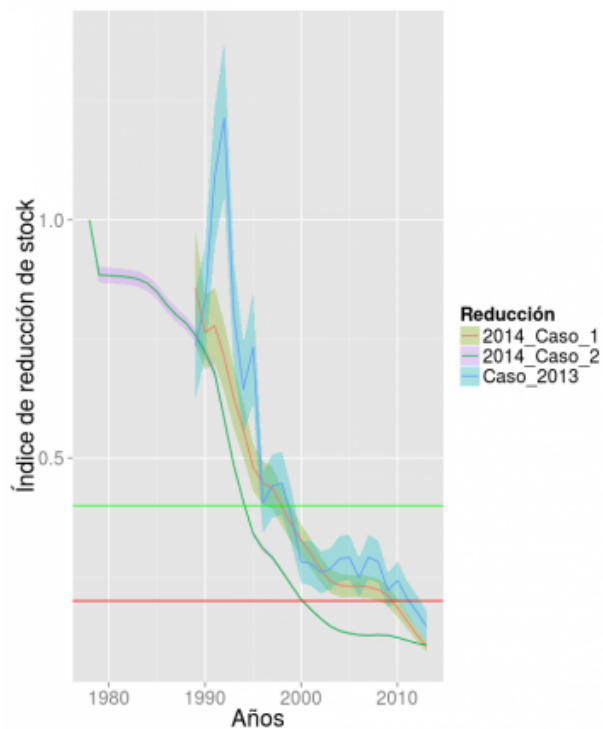


Fig. 10. Temporal trends of the index of depletion of the Patagonian toothfish estimated by IFOP under its two conceptual model cases (Case 1 and Case 2) and using the previous assessment model (Case 2013). The 95% confidence bands are added. Green line is the target management goal and the red line is the limit that determines collapse under Chilean Law. Reproduced from Tascheri-Oyaneder *et al.* (2014).

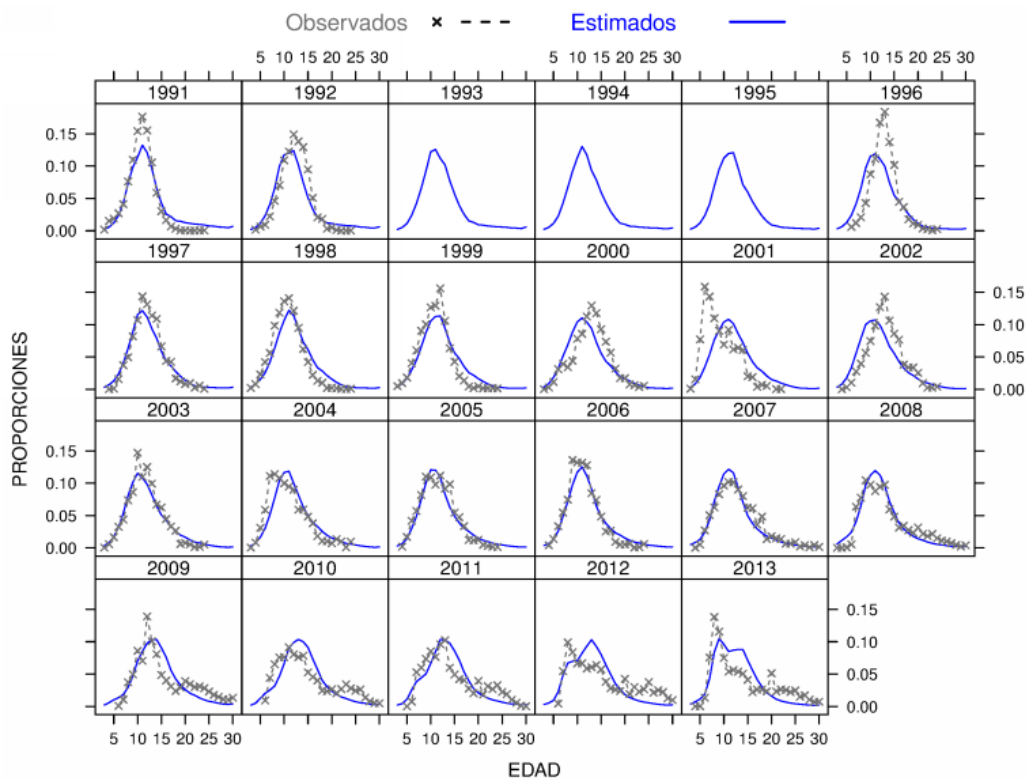


Fig. 11. Observed (x) and model estimated (blue line) age of toothfish in the catch of the longline fishery of the industrial fleet in Chile from 1991 to 2003. Reproduced from Tascheri-Oyaneder *et al.* (2014)..

Secondly and more importantly, estimated recruitment declined from 1990 to the lowest in 2005 and apparently is fluctuating since then. Uncertainty in the most recent years is high, but still the trend does not show signs of continuous decline (Fig. 12). Possible conclusions about this trajectory are to be drawn carefully considering the underlying assumptions and constraints of the model.

However, if this is approximately close to the history and current trajectory of recruitment, it may imply that recruitment is not compromised. Still, given the low estimated biomass, it is clear that a rebuilding strategy needs to be implemented immediately.

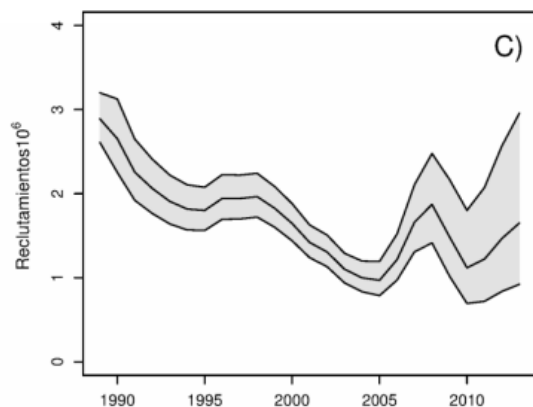


Fig. 12. Estimated recruitment trend and 95% confidence band for the Patagonian toothfish from 1989 to 2013 under IFOP Case 1. Reproduced from Tascheri-Oyaneder *et al.* (2014).

The results of IFOP’s stock assessment are contrasting with the official status presented by the Sub-secretary of Fisheries and Aquaculture (Anonymous 2015) which considers the stock overexploited, but not collapsed. In this report, the level of collapse is located at 22.5% of the virgin biomass. Figure 13 places the status of the stock slightly above the level of collapse, but what appears to be probability contours show that most of the density is located somewhere around 40% below the level of collapse. Also, the fishery is severely overharvesting the stock with $F_{actual} \gg F_{MSY}$. In this situation, even if the stock in 2013 was not collapsed, by the following year most likely will reach the level of collapse. Nevertheless, this is probably the support for the industry stand to accept that the stock is depleted but in disagreement that the stock is collapsed.

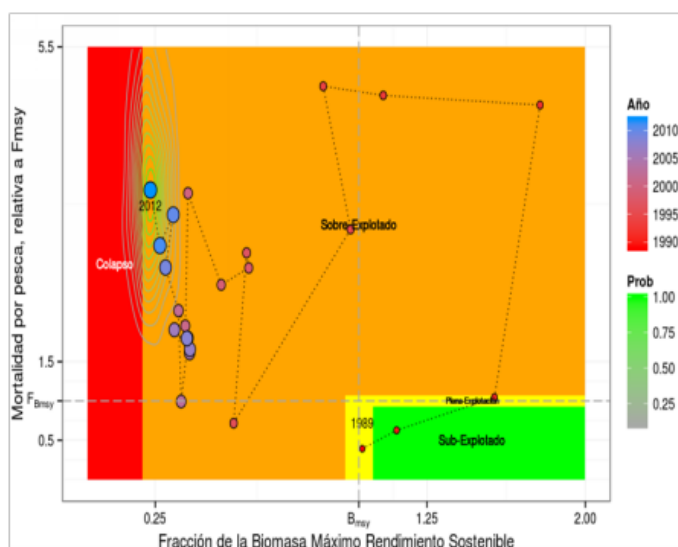


Fig. 13. Phase diagram showing the status of the Patagonian toothfish fishery in Chile. Reproduced from Anonymous (2015).

Based on the results of the assessment, IFOP recommended that the range of allowable catch should be between 545 to 681 tons if Case 1 was adopted. If Case 2 was assumed, the catch could be up to 1,642, but the implications of Case 2 were still unacceptable, then the allowable catch under Case 1 had to be implemented (Tascheri-Oyaneder and Canales-Ramírez 2014). However, given the disagreement between the assessment by IFOP and the Scientific Committee regarding the status of the stock, the authority decided that the catch for 2015 should remain the same as in 2014, which was set to a range of 877 to 1,098 tons (Anonymous 2014).

Finally, it is relevant to mention that the certification report of the toothfish fishery in the Falklands, in section 5.2.1.2 about Status of the Stock, in the Target Species Background as related to Principle 1, referred that: *the stock in 2013 is considered stable at around 51% of the unexploited stock size and well above the biomass trigger point (proxy BMSY). Overall, after a long term decline to the target level, the SSB appears to have now levelled off in recent years and is no longer exhibited a declining trend (Andrews et al. 2014).*

2.4 Principle Two: Ecosystem background

The analysis for P2 is made considering the UoA and the UOC are the same and composed by the Chilean industrial fleet. If this situation changes in the future, any fleet becoming part of the UoA would have to be evaluated for compliance with the requirements of this Principle.

The only certified fishery that can cause cumulative impacts on Principle 2 would be the Falkland Islands, this being dependent on the interpretation given to the population structure as explained in the section describing the UoA. In such case, it would be important for full assessment, to identify the species in the Falkland fisheries that have to be included to evaluate the cumulative impacts.

Ecosystem and habitats

This demersal fish lives preferably on the slope of continental shelves in depths between 50 and 3,800 m. The Chilean Patagonian Toothfish is also associated with deep-water ecosystems (Miethke and Galvez 2009), covering a range from 400 to 2,800 m. It is mainly located between 1,000 and 1,800 m depth, corresponding to an area of the slope with a maximum width of 50 nm. This condition makes of this species a highly vulnerable fishery resource (Young 1998).

The bathymetric range that occupies the Patagonian Toothfish during the life cycle is wide with a typical pattern of stratification by size, which is common in deep-sea fish. In general, larger individuals (adults) occupy waters deeper than 500 m on the continental slope and smaller fish are found in shallower waters (Young *et al.* 1997). Spawning of Toothfish occurs in deep waters in the southern area (Fig. 3).

In deep waters on the continental slope of the southeastern Pacific, seven species of Chondrichthyan (four skates and three sharks) were registered (Reyes and Torres-Florez 2009). All species have been also recorded around or in shallow Patagonian waters (Argentina, Uruguay, Falkland Islands, Chile central).

The waters off Chile are important foraging area for seabirds and overlap with toothfish fishing grounds (Fig. 14b). This region holds some of the most important seabird colonies in the world including globally important populations of black-browed albatross. In the vicinity of the fishing grounds there are important breeding areas for albatross (Fig 14a). Beside this species, the four island groups off southern Chile – Diego Ramírez, Evangelistas, Diego de Almagro, and Ildefonso, are home of colonies of seabird species such as grey-headed albatross (virtually the entire population of grey-headed albatrosses breeds at Diego Ramirez), southern giant petrel, blue petrel, shooty

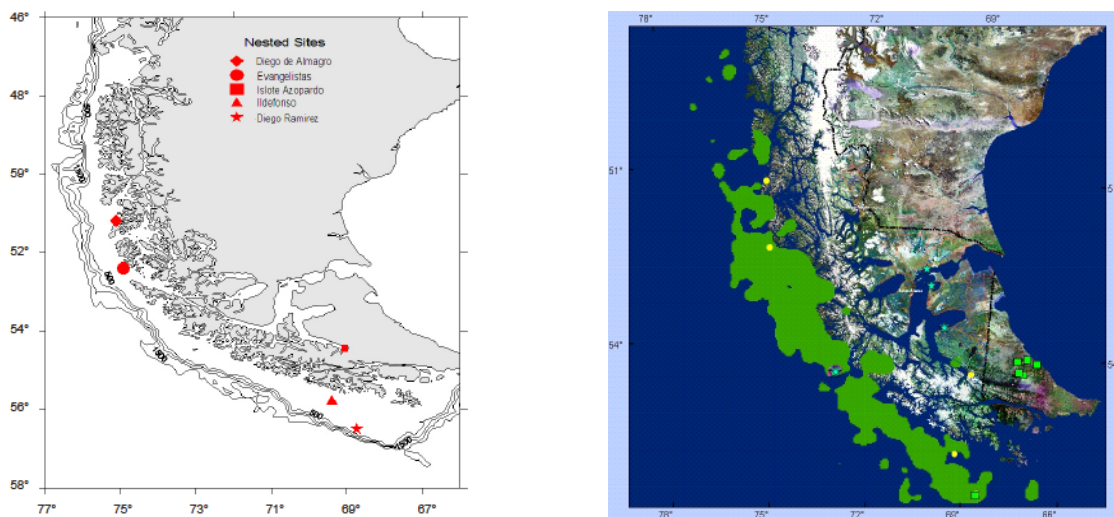


Fig 14. a) Colonies of black-browed and grey-headed albatross. Reproduces from Moreno et al 2008; b) Foraging area of Black Albatross. Reproduced from Miethke, S. y M. Gálvez 2009.

shearwater and several species of diving-petrels, penguins, cormorants, gulls and terns, among others. Two additional populations in southern Chile have been discovered recently on islets in Tierra del Fuego and in the Magallanes región for the black-browed albatros.

Information on population trends and demographic parameters for these species of seabirds is limited for a number of sites, including the colonies in Chile.

Trophic relationships

In the case of ecosystems and habitats, not much information is available. There is no knowledge on the potential impact of fishing on the structure and function of the ecosystem. A research program to determine stomach content has been started with preliminary results but nothing beyond leading to understand ecosystem processes. Qualitative analysis of stomach contents allows to determine the trophic level occupied by the species in the food web in which it participates, whereas with the quantitative analysis, the predation on species that are their food could be estimated, thus deduct their dependence on them. The diet of this species varies according to age, size and depth, at different stages of their life cycle. It is considered that in the adult phase, the Patagonian Toothfish is at high levels of the food chain.

In Austral South Pacific waters between 50-57°S and 67-76°W, López *et al.* (2014) reported that *D. eleginoides* feeds mainly on bony fish, dominating the presence of *Macruronus magellanicus* (Merluza de cola or Patagonian grenadier) and *Antimora rostrata* (Blue Antimora). Fishes make up the larger proportion of the diet (68.7%) mostly represented by the Order Gadiformes. Other two species of abyssal fishes, two grenadiers (*Macrourus holotrachys* and *Coelorinchus fasciatus*) are presented in lower proportion, and are part of the unintended bycatch of the Toothfish longline fishery (Reyes *et al.* 2009). Cephalopods are next in importance with 23.8%, and in minor percentage crustaceans and birds, the latter may be considered accidental or rare. In short, the Patagonian Toothfish is a generalist prone to feed on fish.

On the other hand, little is known about toothfish's predators and it is unknown how the Toothfish biomass extraction could affect ecosystem structure. It is highly likely that the Toothfish is part of the diet of sperm whales (*Physeter macrocephalus*), which are able to dive to the lower depths at

which adult *D. eleginoides* occur. The population status of these whales is unknown so it is difficult to estimate how could be impacted by the extraction of the Toothfish from the ecosystem.

A different situation is the predation during fishing operations, which is described below.

Vulnerable ecosystems

In the fishing area, a group of seamounts are present in the South and South Austral zone. Seamounts are considered Vulnerable Marine Ecosystems (VME) and are extremely fragile to disturbance caused by fishing. In these ecosystems, deep cold water corals and sponges waters are found, and fish species living in total darkness and generate their own light and other species that have not yet been described by scientists. In Chile, several high seas fisheries have been developed based on fish species that form large aggregations that are associated to the mountains, among which is the Patagonian Toothfish, but the impact on this ecosystem is yet unknown.

In June 2015, a new regulation was published by SUBPESCA prohibiting bottom-trawling fishing on seamounts.

Potential direct and indirect impacts on habitats and ecosystems

In general, little information is available about the habitat and structure of marine habitat in a significant scale for the fishery. Little emphasis has been applied to studies on the impact of the fishery on habitat because it is presumed that this is not an important factor given the characteristics of the fishing gear. In MSC assessments conducted in longline fisheries for Patagonian Toothfish in Falkland Islands, it has been difficult to determine the effect of longlines on benthic habitat. It is noted that evaluations undertaken in other fisheries have concluded a low level of risk of impacting habitat, ecosystem function and structure habitats, which is consistent with other MSC evaluations of toothfish longline fisheries.

Furthermore, it is presumed that the use of "cachalotera" prevents interaction with benthic habitat because fishing occurs in the water column and not in the benthic habitat.

Indirect impact of the reduction of availability of Toothfish as a prey for predator species, as consequence of the removal of this species, is totally unknown.

The Primary, Secondary and Endangered, Threatened or Protected (ETP) species

For the purposes of a MSC evaluation, *Primary* species are those in the catch within scope of the MSC program (e.g. fishes) and that not covered under Principle 1 (target species) because they are not included in the UoA. These species however are harvested under some management regime, measures are in place intended to achieve management objectives, and these are reflected in either limit or target reference points. In this fishery, four species were identified as primary, the Patagonian grenadier (*Macruronus magellanicus*), southern hake (*Merluccius australis*), a skate (*Raja chilensis*) and jumbo squid (*Dosidicus gigas*). Most other species present in the catch were found in the *Unmanaged* category and therefore assigned as *Secondary* species (Table 3 and 4).

Table 3. Catch (t) of primary and secondary species in the Chilean Patagonian Toothfish fishery 2009-2013 (IFOP data)

Latin name	International common name	Local common name	2009	2010	2011	2012	2013
<i>Coelorinchus chilensis</i>	Chilean grenadier	Granadero chileno/pejerrata	7,916	33,933	43,849.1	77,021	24,902.4
<i>Coelorinchus</i>	Banded	Granadero/	10,994	37,038	33,278	7,903	7,197.2

<i>fasciatus</i>	whiptail/rattail	pejerrata					
<i>Macrourus carinatus</i>	Grenadier	Granadero escamoso	14,577	20,217.6	15,963.7	0	60
<i>Macrourus holotrachys</i> ²	Bigeye Grenadier	Granadero grande	0	7,440	0	0	0
<i>Raja chilensis</i>	Yelownose stake	Raya volantín	4,108	7	0	0	0
<i>Salilota australis</i>	Patagonian cod	Brotula	0	0	636	0	72
<i>Helicolenus lengerichi</i>		Chancharro	0	0	102	0	36
<i>Merluccius gayi gayi</i>	South Pacific hake	Merluza común	0	0	60	72	0
<i>Isurus oxyrinchus</i>	Shortfin mako	Marrajo	0	0	108	0	0
<i>Lampris sp.</i>	Opah	Pez sol	0	0	88	0	0
<i>Coelorhynchus patagoniae</i>	Whiptail	Pejerrata	0	0	0	0	72
<i>Macruronus magellanicus</i>	Patagonian grenadier	Merluza de cola	0	0	64	0	0
<i>Breviraja sp.</i>	Skate	Raya	0	0	39	0	0
<i>Centroscymnus crepidater</i>	Dogfish	Tiburón negro	0	0	30	0	0
<i>Raja sp.</i>		Raya	0	0	30	0	0

The catch of all the species is far below 5% by weight of the total catch, so they fall in the MSC category of *Minor species*. The fisheries of these minor primary species are considered overexploited by SUBPESCA in the 2014 report on the status of the main Chilean fisheries, with the exception of squid, which is considered *fully exploited* and whose capture as target species began to develop from 2011.

The TAC established for the Patagonian grenadier in 2015 is 40,321 t for the trawlers. 16,068 t are allocated for the XI-XII Region, where the toothfish fishery operates. Regarding *R. chilensis*, the fishery is also considered overexploited and a ban is established for this fishery between 41°28,6' LS and southern border of XII Region until December 31, 2015. For Southern hake, TAC established for 2015 is equivalent to 12,120 t.

Table 4. Catch (t) of primary and secondary species in the Chilean Patagonian Toothfish fishery 2010-2014 (AOBAC data)

Latin name	International common name	Local common name	2010	2011	2012	2013	2014
<i>Coelorinchus fasciatus</i>	Banded whiptail/rattail	Granadero/pejerrata	21,440	795	0	0	0
Sp.	Grenadier	Granadero	0	0	6,469.4	13,214.3	810
<i>Stromateus stellatus</i>	Butterfish		1,711	0	0	0	0
<i>Micromesistius australis</i>			0	1,569	0	0	0
<i>Dosidicus gigas</i>	Jumbo Flying Squid	Jibia	0	0	0	725.4	0
<i>Helicolenus lengerichi</i>		Chancharro	0	0	0	436	0

<i>Macruronus magellanicus</i>	Patagonian grenadier	Merluza de cola	0	0	0	268.2	0
<i>Merluccius australis</i>	Southern hake	Merluza austral	0	0	0	65.2	0

Secondary species, as unintended bycatch, mainly include a number of species of the Order Gadiformes, dominated by Macrouridae Family, and other species in much lower percentages. Catch data provided by IFOP (observer data from 2009 to 2013) and AOBAC (data from 2010 to 2014) show that the largest catch by weight is representing by the Patagonian grenadier (*C. fasciatus*) and the Chilean grenadier (*C. chilensis*). It is worth mentioning that both species and data differ between the two lists provided. Furthermore, it is presumed that precise species identification is difficult to make onboard, so many individuals are just included in the overall group of grenadiers. In any case, neither of the grenadier species reach a significant proportion of the total catch (any one of them is below 2% of the total catch), and as a whole, unintended grenadier bycatch is less than 5% of the total catch per year (Table 5 and 6). Species considered less resilient, such as sharks, are caught very occasionally. In summary, there is not a single species in the unintended bycatch that classifies as a *Main* species under the MSC criterion (>5% of the total catch by weight). Thus, all secondary species are considered *Minor* species.

The report of Rubilar *et al.* (2014) concludes that diversity of unintended bycatch is low. The species most frequently caught are two grenadiers or rattails: *Macrourus holotrachys* and *M. carinatus*, which together make up 98% of the incidental catch. Part of these grenadiers catch is processed and used on board. Studies on the biological parameters of these species are not available neither the fishing effect on them. According to information provided by the client the incidental catch of grenadier is allowed without restriction. Other species caught and discarded include a deepsea cod, *Antimora rostrata*, two elasmobranchs, a skate (*Bathyraja macloviana*) and a shark (*Somniosus pacificus*), and two crabs of the genus *Lithodes* (Fig.15 and Table 3).

Table 5. Proportion of primary and secondary species in the total catch of Chilean Patagonian Toothfish fishery 2009-2013 (IFOP data)

Latin name	International common name	Local common name	2009	2010	2011	2012	2013
<i>Coelorinchus chilensis</i> ²	Chilean grenadier	Granadero chileno/pejerrata	0.004	0.012	0.014	0.004	0.005
<i>Coelorinchus fasciatus</i>	Banded whiptail/rattail	Granadero /pejerrata	0.004	0.012	0.014	0.004	0.005
<i>Macrourus carinatus</i>	Grenadier	Granadero escamoso	0.005	0.006	0.007	0.000	0.000
<i>Macrourus holotrachys</i>	Bigeye Grenadier	Granadero grande	0.000	0.002	0.000	0.000	0.000
<i>Raja chilensis</i>	Yelownose stake	Raya volantín	0.001	0.000	0.000	0.000	0.000
<i>Salilota australis</i>	Patagonian cod	Brotula	0.000	0.000	0.000	0.000	0.000
<i>Helicolenus lengerichi</i>		Chancharro	0.000	0.000	0.000	0.000	0.000
<i>Merluccius gayi gayi</i>	South Pacific hake	Merluza común	0.000	0.000	0.000	0.000	0.000
<i>Isurus oxyrinchus</i>	Shortfin mako	Marrajo	0.000	0.000	0.000	0.000	0.000
<i>Lampris sp.</i>	Opah	Pez sol	0.000	0.000	0.000	0.000	0.000

<i>Coelorrhynchus patagoniae</i>	Whiptail	Pejerrata	0.000	0.000	0.000	0.000	0.000
<i>Macruronus magellanicus</i>	Patagonian grenadier	Merluza de cola	0.000	0.000	0.000	0.000	0.000
<i>Breviraja sp.</i>	Skate	Raya	0.000	0.000	0.000	0.000	0.000
<i>Centroscymnus crepidater</i>	Dogfish	Tiburón negro	0.000	0.000	0.000	0.000	0.000
<i>Raja sp.</i>		Raya	0.000	0.000	0.000	0.000	0.000

Table 6. Proportion of primary and secondary species in the total catch of Chilean Patagonian Toothfish fishery 2010-2014 (AOBAC data)

Latin name	International common name	Local common name	2010	2011	2012	2013	2014
<i>Coelorrhinchus fasciatus</i>	Banded whiptail/rattail	Granadero / pejerrata	0.009	0.001	0.000	0.000	0.000
Sp.	Grenadier	Granadero	0.000	0.000	0.004	0.008	0.004
<i>Stromateus stellatus</i>	Butterfish		0.001	0.000	0.000	0.000	0.000
<i>Micromesistius australis</i>			0.000	0.001	0.000	0.000	0.000
<i>Dosidicus gigas</i>	Jumbo Flying Squid	Jibia	0.000	0.000	0.000	0.000	0.000
<i>Helicolenus lengerichi</i>		Chancharro	0.000	0.000	0.000	0.000	0.000
<i>Macruronus magellanicus</i>	Patagonian grenadier	Merluza de cola	0.000	0.000	0.000	0.000	0.000
<i>Merluccius australis</i>	Southern hake	Merluza austral	0.000	0.000	0.000	0.000	0.000

The study of Reyes and Torres-Florez (2009) reported 7 species of deepsea chondrichthyans (sharks and rays) in fishing operations in the area of south-eastern Pacific Ocean (52°43'S-57°05'S). The species are the skates *Amblyraja amblyraja frerichsi*, *Bathyraja cousseauae*, *Bathyraja meridionalis* and *Bathyraja macloviana* and the sharks *Somniosus pacificus*, *Squalus acanthias* and *Lamna nasus*. IFOP data provided includes records of the skates *Raja chilensis* and *Breviraja sp.* and the sharks *Isurus oxyrinchus* and *Centroscymnus crepidater* as well.

Generally, little is known about the status of the non-target species. None of sharks and rays species are included in CITES, CMS or national red lists, although some are in the Vulnerable category as the IUCN Red List. During the visit, and with the information provided, it was not possible to determine the extent of shark bycatch. According to information from the meetings, this catch is restricted to a few individuals. However, according a three-month study on toothfish fishing grounds, a longline vessel catches 5,346 kg of chondrichthyans biomass. Reyes and Torres-Florez (2009) conclude that this theoretical catch is considered high by the vulnerability of deep-sea chondrichthyan, so they recommend further studies to determine the impact and better understand the biology of these species and status of the populations.

Discards are not allowed but the new GLFA requires quantifying them (art. 7). At the time of the visit, there was not a program of discards in place but the industry showed interest in cooperating to describe and measure discarding rigorously. It is planned to start a discard research program during this year, as has already begun in other fisheries such as the hake fishery. Although, in this incipient fishery the observers also record uninended catch, the information concerning "fate" of these species is not currently registered, thus level of discards is unknown. During the meetings,

anecdotally was mentioned that only species with no commercial value are discarded at a very low rate. Some species are used as bait but an important part of the bait is imported, mainly from Spain.

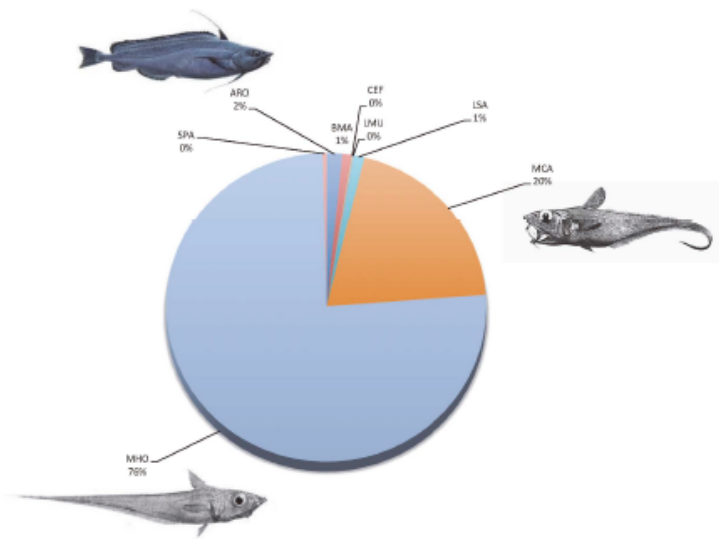


Figure 15. Composition of unintended bycatch of Toothfish fishery 2013. MHO: *Macrourus holotrachys*; MCA: *Macrourus carinatus*; ARO: *Antimora rostrata*; BMA: *Bathyraja macloviana*; SPA: *Somniosus pacificus*; LMU: *Lithodes murrayi*; LSA: *Lithodes santolla*. Reproduced from Rubilar et al. (2014).

Endangered, threatened or protected (ETP) species including their status and relevant management history

The MSC define Endangered Threatened and Protected (ETP) species as those that are recognized by Chilean legislation and/or binding international agreements to which the jurisdictions controlling the fishery under assessment are party. Species listed under Appendix I of CITES shall be considered ETP species for the purposes of the MSC assessment, unless it can be shown that the particular stock of the CITES listed species impacted by the fishery under assessment is not endangered, and species classified as ‘out-of MSC scope’ that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

Chile is a signatory to CITES and the Convention on the Conservation of Migratory Species. The trade and impacts of all species under these treaties are regulated by SERNAPESCA (Decree no. 179). The General Law on Fisheries and Aquaculture includes the development or bycatch mitigation measures for seabirds, marine mammals and reptiles, to minimize mortality, and requires statistics on bycatch and monitoring programs in place.

Interaction with seabirds.

Seabird mortality associated with fisheries is one of the major threats leading to population decreases of certain species, particularly albatrosses and petrels. Some of the seabirds species present in the Toothfish fishing grounds that interact with the fishery are listed under the Agreement of Conservation of Albatross and Petrels (ACAP). The National Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (PAN-AM), jointly developed by scientists, SUBPESCA, SERNAPESCA and industry (some AOBAC member companies were actively involved in its preparation), establish a number of measures and techniques for seabirds bycatch mitigation and proposes voluntary on board codes of conduct. The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) also requires conservation measures for seabird, and Chile has

decided to adopt domestic regulations that replicate those of the Convention.

Originally, the implementation of the "cachaloterías" sought to avoid Toothfish predation by marine mammals but proved to be effective in avoiding seabird bycatch. Based on the results of the project "Monitoring the National Plan of Action for Seabirds" (2006-30 FIP), the replacement of the traditional Spanish longline is proposed by the gear called "cachalotera" or trotline. Moreno *et al.* (2009) conclude that with the use of the "cachaloterías", the total number of seabirds killed was zero. After proving its effectiveness, the recommendation of the use of cachaloterías was added as an appendix to the PAN-AM in Chile (Supreme Decree No. 136 of 17 April 2007). From 2008 all hooks of Toothfish longline fleet have been set with the trotline system. In addition, the LGFA has regulations and mitigation measures for bycatch including birds (Art. 4 and 7).

The more frequent species caught in the toothfish longline fishery was black-browed albatross, because this fishery is one of the most important in terms of the number of vessels, hooking effort and proximity of the fishery to albatross breeding islands. Robertson *et al.* (2013) conclude that there has been an increase in the number of albatrosses in breeding sites that correlates with the transition from 2006 to the use of cachaloterías and full adoption from 2008.

During the onsite visit, the AOBAC members anecdotally mentioned that the industry has adopted voluntary code of conduct of best practices (e.g. avoiding throwing hooks overboard; captains paid for the hooks recovered and identified with the name of a vessel; use of educational posters). It is worth mentioning that there are still some interaction with seabirds at the time of throwing the offal and waste into the water with hooks, but they are taking steps to change this behavior including penalties and rewards.

In 2011, SUBPESCA created a National Scientific Committee for Biodiversity Seabirds (Comité Científico Nacional de Biodiversidad–Aves Marinas; CCNB-AM) to track progress of the implementation of the PAN-AM and to formulate scientifically supported recommendations on the population status, conservation, and fisheries interactions of seabirds.

Table 5. Species considered ETP in the pre-assessment

Common name	Latin name	IUCN RedList status	Population Trend	International listing	National regulation
Seabirds					
Black-browed Albatross (albatros ceja negra)	<i>Thalassarche melanophris</i>	NT	Decreasing	ACAP Annex I CMS App. II CCMALR	PAN-AM
Grey-headed Albatross (albatros cabeza gris)	<i>Thalassarche chrysostoma</i>	EN	Decreasing	ACAP Annex I CMS App. II CCMALR	PAN-AM
White-chinned Petrel (fardela negra gigante)	<i>Procellaria aequinoctialis</i>	VU	Decreasing	ACAP Annex I CMS App. II CCMALR	PAN-AM
Southern Giant Petrel (petrel gigante del sur)	<i>Macronectes giganteus</i>	LC	Increasing	ACAP Annex I CMS App. II CCMALR	PAN-AM
Blue Petrel	<i>Halobaena caerulea</i>	LC	Stable		
Shooty Shearwater (fardela negra)	<i>Puffinus griseus/ Ardena grisea</i>	NT	Decreasing		PAN-AM
Marine mammals					

Sperm whale (cachalote)	<i>Physeter macrocephalus</i>	VU	Unknown	CITES Ap I CMS Ap I IWC CCMALR	Protected species
Killer whale (orca)	<i>Orcinus orca</i>	DD	Unknown	CITES Ap II CMS Ap II IWC CCMALR	Protected species

DD: Data Deficient; LC: Least Concern; NT: Near Threatened; VU: Vulnerable
Source: Albatross and Petrel Species to which the ACAP Agreement applies

Although there are no records of marine mammals killed as a consequence of toothfish fishing operations, it is worth mentioning that all cetaceans are protected in different ways in Chile. Chile is member state of the International Whaling Commission (IWC) and an amendment to the GLFA (Law no. 20.293) (October 2008) protects cetaceans in Chilean waters. Furthermore, all are declared “national monument” in Chilean waters and there are regulations to prohibit capture, trade or processing these species (Decreto Supremo Nº 225, November 9, 1995; Decreto Supremo Nº 179, June 2, 2008; Decreto Supremo Nº 230, June 20, 2008). Law Nº 20.293, October 14, 2008, “declares maritime areas of sovereignty and national jurisdiction, hunting free zone for cetaceans”.

Predation by marine mammals

Killer whales (*Orcinus orca*) and sperm whales (*Physeter macrocephalus*) have been observed to remove toothfish from commercial fishery longlines on the Patagonian shelf and other toothfish fisheries (Hucke-Gaete *et al.* 2004; Goetz *et al.* 2011; Rubilar *et al.* 2014; SCS 2012; Passadore *et al.* 2015). Distribution and foraging areas of these two species coincide with the fishing grounds. In the area there are two ecotypes of killer whales, which are most frequently observed around the fishing boats, from August to November (ecotype A), and from September to December (ecotype D). These ecotypes have never been observed together at once, which may be a sign that they tend to avoid each other. Sperm whales have a peak in November. There has been an increase and a change in the composition of killer whales and sperm whales in the area of Tierra del Fuego. It seems to be that sperm whales used to be greater in number, but currently, killer whales are more abundant. It is observed that killer whales distribution may have adjusted to the Toothfish fishery operation area. The highest frequency of sightings and abundance of killer whales and sperm whales around fishing vessels occurred in the area south of the 55 S°. North of this latitude, abundances of both species decrease and sperm whales tend to predominate (Rubilar *et al.* 2014).

The “cachaloterías” have had an important effect to mitigate predation, especially in the presence of sperm whales. However, killer whales are able to adapt their behaviour to the modification of the gear and continue capturing Toothfish. Given the success of killer whales to feed on toothfish directly from the gear, it is suggested that these mammals tend to associate more strongly than sperm whales with fishing operations. Instead, it is assumed that the sperm whales prey on this species naturally due to their diving capacity (Rubilar *et al.* 2014).

Using “cachaloterías” has reduced the rate of predation by marine mammals. As a result of such interaction, the predation rate of fish estimated by Hucke-Gaete *et al.* (2004) ranged between a maximum of 5% to less than 1.5%, with an average of 3%. Moreno *et al.* (2009) estimated that the depredation rate fell to a maximum of 0.36%. Studies conducted by CEPES have estimated that the rate of predation was 1.5%. Skippers constantly adapt their fishing strategies to avoid this predation. Additionally to the use of different gear, they have also changed soaking time, hauling and other techniques. It seems that predation by marine mammals is still a matter to be resolved. In addition, predation losses can not be entirely attributed to mammals and has been detected fish probably bitten by sharks.

With regards of the interaction between the toothfish fishery with marine mammals, and in particular with killer whales (since it is likely that the interaction with the sperm whale is now negligible), two aspects may need to be considered in a full assessment. First, fish already caught by the gear and lost during haul out because it is consumed by the mammals, it is effectively killed and is a removal associated to the fishery. Consumption of toothfish by marine mammals must be added to assessments as if they were a type of unintended “unreported discard”. Until formal estimates of this catch are obtained with associated uncertainty, alternative scenarios have to be considered. Secondly, if marine mammals are shifting behaviour, distribution and feeding preferences, an investigation of potential ecosystem impacts should be considered and evaluated.

2.5 Principle Three: Management system background

Area of operation of the fishery and the jurisdiction under which it falls

Chile is divided into 15 administrative regions. As noted above, the Patagonian Toothfish industrial fishery in Chile is located south of latitude 47°S around the slope to the southern boundary of the Chilean EEZ in the XII region. Under the definition of MSC, the toothfish stock is considered a *shared stock, stocks that migrate across the boundaries of adjacent Exclusive Economic Zones (EEZs) of two or more coastal States*.

Legal Framework

Chilean fisheries are primarily governed by the GLFA (Law 18.892) and its amendments, and several other legal bodies and administrative procedures. In general terms, GLFA subjects to regulation the preservation of the hydrobiological resources, extractive fisheries, aquaculture, research and sports activities, as well as processing, transformation, storage, transportation and marketing activities related to hydrobiological resources, carried out either in continental waters as well as in the territorial sea or exclusive economic zone and adjacent areas with national jurisdiction. Law 20657 (31 January 2013) modified the 1991 GLFA. This last modification ensures that the legal framework is consistent with the MSC standards and the delivery of sustainable fisheries.

The objective of the Law is the conservation and sustainable use of fishery resources through the application of precautionary and ecosystem approaches in the fisheries regulation and safeguarding the marine ecosystems in which those resources exist.

It requires that national fishery policy take account of a number of issues: (a) long-term objectives for the conservation and management of fisheries and protection of ecosystems and periodic evaluation of the effectiveness of adopted measures (every five years); (b) the application of the precautionary principle with greater caution in the management and conservation of resources when scientific information is uncertain, unreliable or incomplete with any lack of scientific information not delaying the introduction of conservation and management measures; (iii) the ecosystem approach to the conservation and management of fishery resources and the protection of ecosystems; (iv) the management of fisheries resources in a transparent, accountable and inclusive manner; (v) the collection, verification, reporting and sharing of timely and accurate data; (vi) the consideration of the impacts of fishing on associated or dependent species; (vii) the prevention or elimination of overfishing and excess fishing capacity; (viii) the effective implementation of conservation and management measures and (ix) the minimization of discards both target species and bycatch.

The GLFA (2013) establishes MSY as the fisheries management target. By the end of year 2014 the BRP for the Chilean fisheries must be established by law. The BRP must be scientifically determined by scientific and technical committees as noted above.

Summary of management measures related to current and historical management of the Patagonian toothfish industrial fishery in Chile, southern 47° LS, may be found on SUBPESCA and SERNAPESCA websites. SUBPESCA legislation includes decrees and resolutions on the value of sanctions, establishment of TAC, bycatch mitigation, establishing under development fishery for toothfish, associated species associated to the fishery, research, close season, nominations Management Committee members, among others (<http://www.subpesca.cl/institucional/602/w3-article-826.html>). SERNAPESCA registers the landings and accordingly emits resolutions communicating opening and closing fishing period according to quotas. (https://www.sernapesca.cl/index.php?option=com_remository&Itemid=246&func=search).

Management system

Summary of national Agencies

The Ministry of Economy, Development and Tourism (www.minecon.cl) is responsible for the management of the fishing sector in Chile. The Chilean institutional structure governing the fisheries and aquaculture sector centers around three key organizations under the Ministry of Economy, with a number of other institutions providing additional research and enforcement support:

- SUBPESCA (www.subpesca.cl) is in charge of fisheries management and of the development of fisheries and aquaculture policies. The institution provides the policy settings and regulatory framework for the domestic management of the sector, as well as providing policy direction and inputs into international fisheries issues. The department in charge of administration of Toothfish is the Unit of Demersal Fisheries (*Unidad de pesquerías demersales*) (Fig. 16).
- SERNAPESCA (www.sernapesca.cl) is in charge of enforcement of all the fisheries and aquaculture-related laws, regulations and international agreements. Production statistics compilation is also its responsibility.
- The Fisheries Research Fund (FIP) is a governmental agency aimed at funding the research necessary to support the adoption of fisheries management measures by the state. The FIP is chaired by the Fisheries Research Council, which is headed by SUBPESCA and constituted by representatives of the National Oceanographic Committee and by specialists from the fishing sector. FIP is funded by the budget allocated in the Budget Law of the Nation and other inputs corresponding to prepayments of fisheries and aquaculture licenses.

The Fisheries Development Institute (IFOP) is a non-profit agency in charge of generating the scientific and technical information required to develop sound management upon which laws and regulations are based. It generally works under contract to SUBPESCA and SERNAPESCA. It is the primary source of scientific advice to SUBPESCA on fisheries management issues, including the stock assessment.

International cooperation and management system

CCAMLR was established by international convention in 1982 with the objective of conserving Antarctic marine life. This was in response to increasing commercial interest in Antarctic krill resources, a keystone component of the Antarctic ecosystem and a history of over-exploitation of several other marine resources in the Southern Ocean. CCAMLR practices an ecosystem-based management approach. Based on the best available scientific information, the Commission agrees a set of conservation measures that determine the use of marine living resources in the Antarctic.

CCAMLR implements a comprehensive set of measures in order to support the conservation of

Antarctic marine living resources and the management of fisheries in the Southern Ocean. These measures, which are known as “conservation measures”, are reviewed and developed at each annual meeting of the Commission, and subsequently implemented by Members during the ensuing inter-sessional period and fishing season. The measures are published in the annual Schedule of Conservation Measures in Force (<http://www.ccamlr.org/en/conservation-andmanagement/browse-conservation-measures>).

The Conservation Measures are binding on all Members and apply in CCAMLR’s Convention Area. Some measures apply to a specific time period (e.g. a fishing season) while other measures remain in force at all times. Measures which are no longer applicable are removed from the schedule and archived by the Secretariat.

The Patagonian Toothfish Fishery under this pre-assessment is outside the CCAMLR, however, CCAMLR members, such as Chile have an obligation, under Resolution 10/XII1 to “ensure that their flag vessels conduct harvesting of such stocks areas adjacent to the Convention Area responsibly and with due respect for the conservation measures it has adopted under the Convention”. As a result, Chile chooses to apply CCAMLR’s conservation measures to this toothfish longline fishery. So while CCAMLR is not part of the formal management system for the fishery, relevant conservation measures are applied by SERNAPESCA. This joint approach is generalized by the Chilean government, which seeks to harmonize the regulations of RFMOs and other fisheries agencies with national regulations.

Concerned that Illegal, unreported and unregulated (IUU) fishing for Toothfish in the Convention Area threatens to deplete toothfish populations and to ensure vessels flagged to Members fishing for toothfish in the Convention Area comply with conservation measures, CCAMLR implements a **Catch Documentation Scheme (CDS)** for toothfish species (*Dissostichus spp.*). Chile has fully adopted this Scheme for Toothfish domestic fisheries and uses the same CCAMLR web-system (e-CDS) that tracks toothfish from the point of landing throughout the trade cycle. For all Members, the CDS is required to be used for the landing and/or trade of all toothfish whether caught inside or outside the Convention Area.

International cooperation with other countries will be defined depending on the definition of the identity of the Toothfish stock as noted above.

Management plan

Article 8 of the GLFA provides that fisheries under the regimes of incipient development or in recovery (overexploited or collapsed), must establish a management plan. SUBPESCA will establish a Management Committee for the elaboration, implementation, evaluation and adjustment of the management plan. Once the management plan is elaborated, the Scientific Technical Committee (SCT) will have two months to review it, comment and provide advice. The Management Committee will establish the time for the evaluation of the plan, which cannot exceed five years.

The toothfish fishery operates under the regime of incipient development, and although it isn’t considered to be in the recovery regime, it is overexploited or depleted. However, the Management Committee for the Toothfish fishery has not yet been established and consequently the management plan has not been developed.

Decision-making process

The GLFA, published in 2013, defines the roles of main bodies involved in the fishery that undertake research and inform decision making. The new Law provides greater authority to the STC, while reducing the part played by the National Fisheries Council (NFC) with the aim of placing the scientific criteria over the economic and political considerations. STCs were originally established in 2007

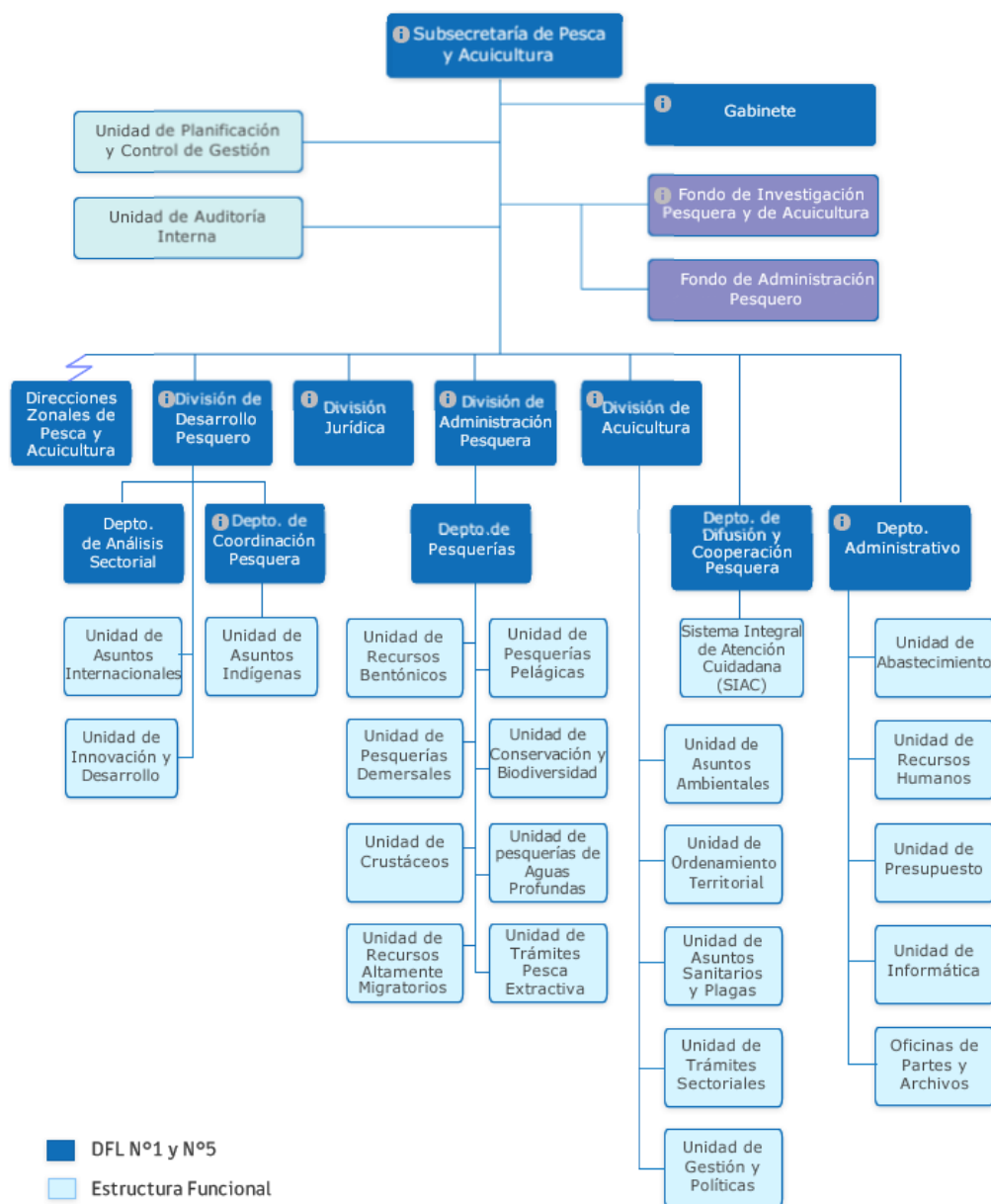


Figure 16. Organigram of SUBPESCA

(Resolution no. 997) for each of the main species groups (demersal for the toothfish fishery) to inform the fisheries councils. Each of the eight established STCs has associated task groups that undertake detailed analyses. NFC's role is to ensure the effective involvement of stakeholders in the fisheries sector at the national level on matters related to fishing activity and aquaculture. NFC obtains inputs on policies and regulations from Zonal Fisheries Councils.

The new law defines institutional changes in the decision-making process. It defines the creation of SCT and CM:

- The Scientific Technical Committee (STC) is a body responsible for providing scientific and technical advice for management. They are advisory bodies and advisers of the fishing authority, composed of five voting members, two non-voting, four institutional (SUBPESCA and IFOP). Its functions are: a) propose the Biological Reference Points (BRP); b) determine

the status of the fishery; c) TAC recommended range; d) propose the research program of the fishery; and e) advise the Fisheries Authority. The Toothfish fishery has a STC for deep sea demersal resources. All documents, technical reports and meeting notes are public.²

- The Management Committee is an advisory / consultative body of fisheries management. They are advisory bodies and advisers of the fishing authority, composed of not less than two nor more than seven representatives of registered artisanal sector involved in the fishery; three representatives of the ship owners sector; one representative of processing plants sector; one official of SERNAPESCA; one official nominated by the Undersecretary of Fisheries and Aquaculture (Chairman of the Management Committee). Its functions are: a) propose the Management Plan (binding); b) advise the Fisheries Authority in matters of fisheries management, including recommendations for quotas (Art. 3 c). The toothfish fishery does not have a Management Committee established.

In the current situation of transition, the SCT provides direct advice to the Minister of Economy, who makes decisions. During the onsite visit discussions, it was brought to our attention, the perception that in the absence of a Management Committee the STC is making the decisions directly.

SUBPESCA commissioned IFOP to produce the “Status and sustainable exploitation of Patagonian Toothfish”. The GLFA requires that IFOP research must be subject to peer review to ensure quality of the results. The stock assessment of the Toothfish fishery was subjected to an external review made by Tom Polachek and whose results are discussed throughout this report.

Quota allocation

Industrial fisheries can either be under regimes of *full exploitation*, of *incipient development* or in *recovery*. The regime of incipient development applies to demersal and benthic fisheries only. In fisheries under incipient development, such as the Patagonian Toothfish fishery, individual transferable catch quotas are allocated through a public bidding process, granting an *Extraordinary Fishing Permit* lasting a period of 10 years and allowing fishers to operate on a yearly basis. By Law, the industrial fishery has access to 50% of the *Global Catch Quota*. A person in the toothfish industrial sector, can get access to an individual quota and obtain an Extraordinary Fishing Permit, which allows the holder to harvest up to 10% of the fraction of the Global Catch Quota assigned to the industrial sector. The fraction of the global quota assigned in 2015 has been established as a range between 877 to 1,098 tons. In practice, the quota is the upper limit of the range, 1,098 t.

Monitoring, control, surveillance and enforcement.

The fisheries surveillance and control system in Chile is based on four pillars: 1) legislation; 2) judiciary and court structure allows for more efficient process (including the system of sanctions); 3) field implementation of the vigilance system; 4) the attitude of the industry to comply with the regulatory framework and collaborate with authorities (private sector creates its own sanctions).

The tools used by the surveillance and control system include, but are not limited to, use of VMS, logbooks, port inspections with certified scales, certified statements of landing, accreditation of origin, catch and export certification. The new law streamlines reporting requirements by SERNAPESCA (logbooks, VMS, etc.). The law regarding VMS is very complete and includes strong enough sanctions to remove the incentive to break the law (art. 64 defines the use and conditions of VMS for industrial and artisanal fisheries). A screen snapshot can be used as evidence in court accuracy.

² <http://www.subpesca.cl/institucional/602/w3-propertyvalue-51146.html>

A fishing VMS is a cost-effective tool for the successful monitoring, control and surveillance (MCS) of fisheries activities. VMS provides SERNAPESCA with accurate and timely information about the location and activity of regulated vessels in the fishing area. Their VMS system records locations every 30 min and if it stops transmitting a vessel has 6 hrs. to fix any problem. Inspections at port at the landings verify VMS equipment onboard.

All exports to the United States require *Dissostichus* Catch Document (DCD) to both industrials (since 2001) and artisanals (since 2014). The certificate requires the VMS tracking forcing the artisanal to also carry onboard VMS equipment.

SERNAPESCA has to certify landings for each fishing trip through auditing agencies duly certified for these purposes. An auditing company authorized by SERNAPESCA conducts the certification of landing information in order to verify landing information declared by ship owners and fishing permit holders. Certified scales are using by the authority on landings. Control of legal origin accreditation (*acreditacion de origen local*) has been in place since long ago.

During onsite visit, SERNAPESCA Officer noted that Toothfish is probably the most strongly regulated fishery in Chile and this is most likely due to the need to abide to CCAMLR requirements. Conservation measure 10-05 (2014) defines the Catch Documentation Scheme for *Dissostichus spp.*

A web-based application implemented by CCAMLR (e-CDS)³ generates both DCD (Fig. 17) and *Dissostichus* Export Document (DED) that are issuing and validated by a SERNAPESCA officer.

Sanctions

The GLFA defines the infractions, sanctions and procedures for fishing activities that contravene existing legislation. Among the infractions defined for fisheries under the regime of incipient development are: exceed the tonnage allowable catch for a calendar year; not reporting catches; discards in contravention of the law; fishing in a unit other than the fishery is registered (*Unidad de Pesquería de Bacalao*); or do not meet the conservation measures, management and compliance with international treaties to which Chile is a party.

Sanctions that can be imposed on this fishery include fines and suspension or revocation of the title of skipper and of the Extraordinary Fishing Permits (*permiso extraordinario de pesca*), and confiscation of fishing gear. Fines may apply to the following infractions, among other: capture during closure; reporting higher or lower catches than the real; irregularities in the use of VMS; capture protected species; capture below minimum size; hinder the work of scientific observers. The value of the sanction is set annually by decree in *Unidades Tributarias Mensuales* (UTM), and based on SUBPESCA technical reports. The unit established for the period 2013-2014 was 224.9 UTM / tonne for the group of cods (including Patagonian Toothfish) (Decree 1197 of November 18, 2013, SUBPESCA). This sanction has one of the greater value, surpassed virtually only by lobster and mammals, birds and marine reptiles.

Ship owners and skippers are responsible for the infractions concerning catch, landings and fishing operations. Should the infraction be considering a crime, penalties for imprisonment may be applied.

Enforcement is carried out by SERNAPESCA officers and the Chilean Navy and they are also responsible for the complaint in the competent court where a judge gives judgment as appropriate. An Appellate Courts exits where sentences may be revoked.

³ (<http://ecds.ccamlr.org>),

DISSOSTICHUS CATCH DOCUMENT						V 1.7
Document Number:			Flag State Confirmation Number:			
1. Issuing Authority of Document						
		Address:		Telephone:		Fax:
2. Fishing Vessel						
Name:		Home Port:		Registration Number:	Call Sign:	IMO/Lloyd's Number (if issued):
3. Licence Number (if issued)			Fishing dates for catch under this document			
			4. From:		5. To:	
6. Description of fish (Landed/Transhipped)						7. Description of Fish Sold
Species	Type	E E Z	Area Caught*	Estimated Weight to be Landed (kg)	Verified Weight Landed (kg)	Net Weight Sold (kg)
Species: TOP (<i>Dissostichus eleginoides</i>), TOA (<i>Dissostichus mawsoni</i>)						
Type: WHO Whole, HAG Headed and gutted, HAT Headed and tailed, FLT Fillet, HGT Headed, gutted, tailed, OTH Other (specify)						
7. Description of Fish Sold						
Name of Recipient:				Signature:		
Address:		Telephone:		Fax:		
8. Landing/Transhipment information: I certify that the above information is complete, true and correct, and that for any <i>Dissostichus</i> spp. taken in the Convention Area, I certify that it was taken in a manner which is consistent with CCAMLR conservation measures.						
Master of Fishing Vessel or Authorised Representative: (print in block letters)			Date:	Signature:	Landing/Transhipment Port and Country /Area:	Landing/Transhipment Date:
9A1. Certificate of Transhipment: I certify that the above information is complete, true and correct to the best of my knowledge.						
Master of Receiving Vessel:		Signature:	Vessel Name:		Call Sign:	IMO/Lloyd's Number:
9B1. Transhipment within a Port Area (countersignature by Port Authority if appropriate)						
Name:		Authority:		Signature:	Date:	
9A2. Certificate of Transhipment: I certify that the above information is complete, true and correct to the best of my knowledge.						
Master of Receiving Vessel:		Signature:	Vessel Name:		Call Sign:	IMO/Lloyd's Number:
9B2. Transhipment within a Port Area (countersignature by Port Authority if appropriate)						
Name:		Authority:		Signature:	Date:	
10. Certificate of Landing: I certify that the above information is complete, true and correct to the best of my knowledge.						
Name:		Signature:		Authority:		

* Report the statistical area/subarea/division where the catch was taken and indicate whether the catch was taken on the high seas or within an EEZ.

3 Evaluation Procedure

3.1 Assessment methodologies used

This assessment utilized version 2.0 (April 2015) of the Certification Requirements and version 2.0 of the reporting template.

3.2 Pre-Assessment Team

Dr. Carlos Alvarez-Flores. Team Leader

Dr. Carlos Alvarez-Flores research interests are focused on the management and conservation of wildlife and fisheries. This includes abundance estimation; assessment of population status; estimation of population parameters; the effect of human intervention; direct harvest; bycatch and associated environmental effects; projections based on biological potential; population viability; risk assessment; design of alternative management strategies. His background comes from work dealing with large, pelagic, data rich fisheries, but his current assignments are related to small-scale, coastal, data poor fisheries. Therefore, his present challenge is to combine ideas, techniques, knowledge and experience to improve the performance of these problematic activities in developing countries. Most of his experience has been centered in practical investigations applied to population assessment and management as a consultant for governments, NGOs and the private sector of different countries. To the present, he has worked for SCS for over two years in pre-assessments, assessments and surveillance audits of different types of fisheries.

Biol. Sandra Andraka. Consulting Team Member

Sandra has over 10-year experience working on marine conservation and fisheries management and 15 years in conservation projects in Latin America. She has built a relationship of trust with a wide range of stakeholders, including fishers and decision makers, private and public fishing sector, through her work as Manager of the WWF's Eastern Pacific Bycatch Program, a 9-country initiative with a bottom-up collaborative working approach to build solutions. As independent consultant, she has been commissioned to provide orientation and advice for artisanal and small-scale fisheries management in the Eastern Tropical Pacific, Marine Spatial Planning, assessment of the capacity needs towards implementation of the FAO Port State Measures Agreement, development of a public-private sustainable marine commodities platform to mainstream sustainability in the large pelagic value chain in Costa Rica, development of onboard observer programs, and mitigation measures for bycatch in Central America, among others. Her varied background also includes policy work and advocacy both nationally and internationally for adoption of conservation measures for better practices in long-line fisheries, managing projects linking between marine turtles conservation and livelihood in nesting beaches in Central America, marine protected areas planning, learning organization process and planning and implementation of result-based management projects. Sandra is member of the Joint Tuna RFMO Bycatch Working Group and the International Sea Turtle Society. She is the President of EcoPacific+ Consulting. She holds a degree in biology from the Complutense University of Madrid, Spain, and a Higher Postgraduate Specialisation on Rural Planning in accordance with the Environment from International Centre for Mediterranean Studies (CIHEAM), in Spain.

3.3 Summary of site visits and meetings held during pre-assessment

SCS Team conducted an onsite visit to meet with AOBAC, fishery authorities and researchers in Valparaiso, Chile, from 14 to 16 April 2015. A summary of activities may be found in Table 6 and a list of attendees to the meetings in Table 7.

Table 6. Summary of onsite meetings, 14 and 16 April 2015.

Tuesday April 14th				
From	to	Attending	Location	Topics & Comments
09:00	10:00	AOBAC Staff SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Introductions. Preliminary conversations and organization of the meeting
10:00	11:30	AOBAC Staff IFOP Staff Renzo Taschieri Liu Chong Rento Céspedes SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Principle 1. Status of stocks reference points, harvest strategy, control rules, monitoring and stock assessment. IFOP conducts the Stock Evaluation Studies. Renzo is the biologist in charge of the species.
11:30	11:45	Coffee Break		
11:45	13:30	AOBAC Staff IFOP Staff Renzo Taschieri Liu Chong Rento Céspedes SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Principle 1. Status of stocks reference points, harvest strategy, control rules, monitoring and stock assessment.
13:30	16:00	Lunch		
16:00	18:30	AOBAC Staff Subsecretaría de Pesca Staff Darío Rivas SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Principle 3. General governance, Fishery specific management Subsecretaria de Pesca manages the fisheries in Chile Dario Rivas, biologist, is in charge of the seabass

Wednesday April 15th				
From	to	Attending	Location	Topics
09:00	10:45	AOBAC Staff Subsecretaría de Pesca Francisco Ponce Jorge Iguerra SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Principle 2. Environmental interactions. Retained species and discards, ETPs, habitat and ecosystem. Francisco Ponce is expert in the field of environmental issues and ecosystems.
10:45	11:00	Coffee Break		
11:00	14:00	AOBAC Staff Servicio Nacional de Pesca. Alejandro Covarrubias SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Principle 2. Environmental interactions. Retained species and discards, ETPs, habitat and ecosystem. Sernapesca is the law enforcement body. Alejandro Covarrubias is in charge of international issues
14:00	16:00	Lunch		

16:00	18:30	AOBAC Staff CEPES Alejandro Zuleta Andrés Franco SCS Assessment Team	Salón Reñaca Hotel Diego de Almagro	Open to general questions or SCS staff review or consolidate information. CEPES is the private sector Alejandro is a well-known biologist with long experience in seabass.
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Thursday April 16th				
From	to	Attending	Location	Topics
09:00	TBD	SCS Assessment Team	TBD	Preliminary Scoring AOBAC Team will be available for any assistance that may be needed.
Evening	End of visit			

Table 7. List of meeting attendees.

Name	Role	Affiliation
Mr. Eduardo Infante	Chairman	AOBAC A.G / Globalpesca SpA
Mr. Enrique Gutiérrez	CEO	Deris S.A. (Former Pesca Chile)
Mr. Roberto Jirón	CEO	Pesca Cisne S.A.
Mr. Manuel Uriarte	Advisor	AOBAC A.G.
Dr. Renzo Taschieri	Fisheries specialist	IFOP
Biol. Liu Chong	Artisanal Fisheries specialist	IFOP
Biol. Renato Céspedes	Demersal Fisheries specialist	IFOP
Biol. Darío Rivas	Sectorialista in charge of the Patagonian toothfish fishery	SUBPESCA
Biol. Francisco Ponce	Expert, ecosystem and environment	SUBPESCA
Biol. Jorge Iguerra	Expert, marine mammals	SUBPESCA
Mr. Alejandro Covarrubias	International affairs	SERNAPESCA
Biol. Alejandro Zuleta	Toothfish fisheries expert	CEPES
Biol. Andres Franco	Fisheries expert	CEPES

3.4 Stakeholders to be consulted during a full assessment

Stakeholder consultation is extensive in MSC assessments. There are several areas of the assessment where stakeholders have to opportunity to provide comments. The assessment team leader, assessment team and Conformity Assessment Body (CAB) must explicitly respond to stakeholder comments. These are documented in different versions of the report.

The MSC certification process requires that the evaluation team meets with stakeholders of the fishery and allows them to provide input regarding the certification of the fishery. Stakeholder consultation is necessary for two reasons:

1. It allows the stakeholders to voice opinions so they are engaged in the process, and
2. It provides the evaluation team with the widest possible views of the fishery so that the team can successfully cover all aspects of the fishery in the evaluation process.

The stakeholder consultation is not designed to be an open-ended process, nor one of casting aspersions. Stakeholders will be asked to submit issues in writing and to provide supporting documentation.

The duration and arrangement of stakeholder public comment periods are stipulated by the MSC requirements: these fall between particular steps in the process and range from 10 to 30 days. Stakeholders have the opportunity to comment on:

- the suitability of the assessment team (10 day consultation)
- the suitability of the assessment methodology specified by the assessment team (Default Assessment Tree) (30 day consultation)
- the suitability of peer reviewers for the client draft report (10 day consultation)
- Public Comment Draft Report and specific scores assigned in the report (30 day consultation)
- Certification decision announcement (15 day consultation for any objections to be mounted)

The MSC process is open and transparent with involvement and comments taken from international organizations as well as local organizations. Communication with stakeholders in the MSC process includes invitation to onsite meetings held in the vicinity of the fishery, email alerts for milestones in the MSC assessment process and online posting of announcements on the MSC website. All parties would be kept informed if the fishery were to proceed with a full MSC assessment.

Stakeholders that have engaged in the assessment process by attending onsite meetings or providing written comments may also object to the final certification decision. Stakeholders are required to provide evidence for their objection which an independent adjudicator may hear and make a decision on whether to uphold or not the objection. Stakeholders who have not been active in submission of comments or procedural steps in the full assessment are not allowed to file objections at the final stage of the process. Objections examine whether the process has been followed with due diligence (have requirements and guidance been interpreted accurately), and do not generally question expert judgement used to assign scores for performance indicators.

In the Patagonian toothfish fishery of Chile, the list of stakeholders includes but is not limited to:

1. Agreement on the Conservation of Albatrosses and Petrels (ACAP) <http://www.acap.org/en>
2. International NGOs:
 - Birdlife International, Marine Program in Americas and BirdLife's Albatross Task Force in the Americas <http://www.birdlife.org/americas/programmes/marine-americas>
 - Oceana;
 - WWF;
3. Local NGOs: CODDEFF,
4. Universities and Research Centres:
 - Universidad Austral de Chile <https://www.uach.cl>;
 - Universidad de Concepción <https://www.udec.cl/pexterno/>;
 - Instituto Austral Chileno <http://www.inach.cl>
5. Other users in the fishery: artisanal fishermen

Depending on identification of the stock of Toothfish, it may be necessary to consider other stakeholders in Argentina, Falkland Islands, and potentially Peru.

3.5 Harmonization with any overlapping MSC certified fisheries

MSC requires that an effort be made by the certifiers and clients to harmonize MSC fishery assessments with similar units of certification (species, management regime, area). This means applying certification conditions to the fishery that are similar to the other assessments. Version 2 of the CR requires that CABs have to assure consistency in the evaluation of overlapping fisheries to avoid undermining the integrity of the assessments. It may be possible in the case of overlapping fisheries that CABs would have to coordinate their assessments to harmonise products and outcomes. CABs will need to explain and justify differences in scores and rationales that may take place in a fishery in assessment compared to an already certified fishery.

Currently there is one MSC certified toothfish fishery around the Falkland Islands that may actually be harvesting part of the same biological stock as the Chilean industrial fishery. The certification of that fishery was conducted under the conclusion that: *on the basis of the available scientific evidence applied to the MSC definition of "Fish Stock", the Argentine and Falkland toothfish fish stocks are separate, and that the assessment and management of the Falklands stock as a discrete stock is justified. Note, however, that following an objection to the determination of the Assessment Team, additional research is to be carried out into this aspect.* However, the Chilean IFOP has assembled a larger body of evidence that suggests all toothfish from Chile, Argentina and the Falklands most likely are part of a single stock and separate from that in the South Georgia Islands. It's been suggested as well that management should be conducted jointly for all fishing in the region. This suggests that a revision of this UoA may be appropriate.

Along the same problematic, a *Public comment draft report*, assessing the Argentine Patagonian toothfish fishery against MSC standards (possibly a pre-assessment made public) concluded that all toothfish harvested by the Argentine fleet have shown enough genetic differences with the fish from South Georgia, but it is unclear whether the fish in Argentina, Chile and the Falklands are found in small adult populations with shared spawning and juvenile grounds, but with little mixing of adults once they have formed the discrete populations. The alternative would be the existence of a single large metapopulation as apparently occurs on the Kerguelen Plateau (Hanchet *at al.* 2014).

The SCS team recommends that a full assessment of the Patagonian toothfish fishery in Chile, should tackle the stock identity problematic and bring it up to MSC. This issue has direct impact on Performance Indicators related to stock status, stock assessment and management. It would also be convenient to bring the Argentinian client to the process and to discuss the possibilities to build a consensus to address the problem.

4 Traceability (issues relevant to Chain of Custody certification)

4.1 Eligibility of fishery products to enter further Chains of Custody

Any export of fisheries products must be authorized by SERNAPESCA prior to shipment and uses the Catch Documentation Scheme (CDS) as required by CCAMLR that follows all movement of Patagonian toothfish through catch, trans-shipment, landing, trade and market. This is a requirement to export all toothfish products to the US. All national industrial and artisanal ship owners must complete a DCD (Fig. 18) and get a DED.

5 Preliminary evaluation of the fishery

5.1 Applicability of the default assessment tree

The default assessment tree was developed by the MSC in consultation with stakeholders and published in 2009. With the application of the default assessment tree, fishery assessments have become more standardized across fisheries. The certification and accreditation requirements for the MSC standard allow teams to modify the default assessment tree where it is necessary or does not allow suitable evaluation of a specific fishery/system. Any such modification (or the decision to use the Default Assessment Tree) is posted for public consultation. The team does not anticipate the need to modify the DAT to work on the assessment of the Patagonian toothfish fishery in Chile.

5.1.1 Expectations regarding use of the Risk-Based Framework (RBF)

The risk based framework may be used for some performance indicators in the absence of information or documentation. Due to the economic importance of the toothfish fishery in Chile, as well as the strong science support provided by IFOP, it is not anticipated that it will be necessary to use the RBF for P1 in the evaluation of this unit of assessment. However, if the issue about the identity of the stock still prevents the production of robust and reliable stock assessments, the use of the RBF is a viable alternative that can be considered to evaluate performance of PI 1.1.1. Similarly, PI 2.4.1 and PI 2.5.1 may use the RBF to determine a score as well. The client may wish to read through the MSC Certification Requirements related to the RBF and become clear which performance indicators can and cannot be assessed using RBF methods. In a full assessment, the assessment team will review all available data and determine whether use of the RBF for scoring is appropriate. In order for the RBF to be used, at least one member of the assessment team must be trained in its use. Stakeholder consultation is integral for this to be completed successfully as stakeholders can provide expert judgment, sector knowledge, hands-on experience, fishery-specific and ecological knowledge as well as raise additional issues that may not otherwise be apparent to the assessment team.

5.2 Summary of likely PI scoring levels

Key to likely scoring level in Table 6.3

Definition of scoring ranges for PI outcome estimates	Shading to be used
Information suggests fishery is not likely to meet the SG60 scoring issues.	Fail (<60)
Information suggests fishery will reach SG60 but may not meet all of the scoring issues at SG80. A condition may therefore be needed.	Pass with Condition (60-79)
Information suggests fishery is likely to exceed SG80 resulting in an unconditional pass for this PI. Fishery may meet one or more scoring issues at SG100 level.	Pass (≥80)

Table 6.3 Simplified Scoring sheet

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level
1	Outcome	1.1.1	Stock status	Y	
		1.1.2	Stock rebuilding		
	Management	1.2.1	Harvest Strategy		
		1.2.2	Harvest control rules and tools		
		1.2.3	Information and monitoring		
		1.2.4	Assessment of stock status		
	Number of PIs less than 60: 2				
2	Primary Species	2.1.1	Outcome		
		2.1.2	Management		
		2.1.3	Information		
	Secondary species	2.2.1	Outcome		
		2.2.2	Management		
		2.2.3	Information		
	ETP species	2.3.1	Outcome		
		2.3.2	Management		
		2.3.3	Information		
	Habitats	2.4.1	Outcome	Y	
		2.4.2	Management		
		2.4.3	Information		
	Ecosystem	2.5.1	Outcome	Y	
		2.5.2	Management		
		2.5.3	Information		
Number of PIs less than 60: 0					

Principle	Component	PI	Performance Indicator	RBF required? (y/n)	Likely scoring level
3	Governance & policy	3.1.1	Legal and customary framework		Green
		3.1.2	Consultation, roles and responsibilities		Green
		3.1.3	Long term objectives		Green
	Fishery specific management system	3.2.1	Fishery specific objectives		Yellow
		3.2.2	Decision making processes		Yellow
		3.2.3	Compliance and enforcement		Red
		3.2.4	Management performance evaluation		Yellow
	Number of PIs less than 60: 1				

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7.1 Principle 1

Component	Outcome		
PI 1.1.1- Stock status	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring issues	SG60	SG80	SG100
a. Stock status relative to recruitment impairment	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
b. Stock status in relation to achievement of Maximum Sustainable Yield (MSY)		The stock is at or fluctuating around a level consistent with MSY.	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.
Justification/Rationale			
<p>The score of this PI can be very contentious. Current estimates of stock status indicate it is collapsed, however, the industry agrees that the status is depleted but insist that it is above the point of collapse.</p> <p>The high level of uncertainty regarding the stock structure and dynamics determines alternative scenarios that affect the perception about recruitment and future biomass. However, the degree of depletion is a highly robust statistic that can only separate from the current results under extreme circumstances (e.g. very high recruitment variability). The most recent stock assessment produced three alternative estimates of the state of the stock depending on whether the previous last model was used or the two cases of stock structure that have been discussed in the background sections. The estimates of depletion are 15, 11 and 10% of the estimated virgin biomass respectively for each of these scenarios. Under the definitions of the Law and the management system in Chile, these numbers put the stock far from the target and well in the status of collapse regardless of what scenario is adopted. A biomass of less than 20% of B_0 or less than $0.5B_{MSY}$, is also under the default definition in the MSC CR for a state of the stock where the biomass is not likely to be above the level where recruitment would be impaired. The likelihood is even worsened when consideration is made about issues that need to be resolved in the stock assessment and pointed out in the peer review (Polacheck 2015). Although it is encouraging that the estimated trend in recruitment appears to be fluctuating and not exclusively declining, the trends are not fully reliable given the limitations of the assessment as described by Polacheck (2015). It also needs to be considered that until 2013 the stock was being overfished and that current catches although low are under a lot of pressure because they apparently do not allow the fishery to survive for long.</p> <p>A clear cut decision based exclusively on definitions is not possible because the large uncertainties in the assessment results and the disputed conclusions about the status of the stock relative to the limit reference point. Careful consideration of the evidence and claims leads to a precautionary decision that is directed to protect the stock as a biological component of the natural system, but also to</p>			

protect the foundation of the economic system supporting the fishery. The team decided to fail this Performance Indicator in the pre-assessment to indicate that the fishery may be walking on the fine line and that the risk of compromising the recruitment is too large. Even if the representatives of the industry are right and the stock is above the formal point of collapse, it would be more likely that the population is closer to this point than to the target. In this case, it is in the best interest of the industry and of everyone else to develop a rebuilding strategy and agree to a catch limit that is the maximum possible that assures rebuilding goals in terms of time and probability. It should be understood that if the fishery entered full assessment, the CAB would have to re-evaluate the status of the stock based on an updated assessment that had addressed to the extent of possible, the concerns and comments presented in the peer review of the last assessment. It's worth mentioning that it will be critical that at the time of full assessment the fishing mortality rate (F) is demonstrably at F_{MSY} or less. This doesn't assure a pass for the PI but puts the stock on the path of recovery. See below at the rationale in PI 1.1.2.

RBF Required? (✓/✗/)	✓ RBF could be used	Likely Scoring Level (pass/pass with condition/fail)	Under 60. Fail.
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Component	Outcome		
PI 1.1.2 Stock Rebuilding	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe.		
Scoring issues	SG60	SG80	SG100
a. Rebuilding timeframes	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time . For cases where 5 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the depleted stock.

b. Rebuilding evaluation	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	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 .	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 .
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Justification/Rationale

There is no formal rebuilding strategy coded in any official document in Chile, however the Fisheries Law requires that for stocks that are depleted or collapsed, a management plan would have to develop a recovery plan that evaluates objectives, efficiency of administrative and conservation measures, evaluate the efficiency of the control system, conduct research, incorporate economic and social effects, consider mitigation measures, and where stocks are collapsed evaluate and propose the alternate use of fishing grounds and the temporal limitation in the use of certain gear. The fishery is officially listed as *overexploited*, but as previously discussed, There is a considerable possibility that the stock is either depleted or very close to the level of depletion. Under these conditions, the Law is clear in that the management system must have triggered the reclassification of the stock to a regime of recovery that requires a management plan with the strategy for recovery embedded. This has not happened because the Law first requires the creation of a Management Committee that has not yet been formed.

The analyses of Tascheri-Oyaneder and Canales-Ramírez (2014) included a risk assessment to evaluate the consequences of alternative management actions based on the initial state of the stock in 2014. Performance was evaluated in terms of change in biomass, including the abundance relative to B_{MSY} which is the management target and brings the stock out of the status of overexploitation. The performance is measured as a probability to achieve the goal in 15 years. This approach is considered satisfactory as a rebuilding strategy if the results of the analysis can be effectively implemented. The team also considers that there is sufficient monitoring through reliable catch records and research effort to evaluate if such a strategy would be effective in rebuilding the stock.

The situation of this PI is very marginal in that the team acknowledges that elements required to the development of a strategy for the recovery of the stock are already present in the Law, however the management system has not been efficient in implementing these actions promptly as required by the officially recognized status of the stock. The team has agreed that the fishery can reach a score of 60 with conditions that will require immediate action in the establishment of the Management Committee, development of the Management Plan and an explicit determination of necessary actions to recovery and the reclassification of the regime under which the fishery operates.

Because any applicable strategy would have to start operating in the present, and the response of the stock may be slow enough to prevent detection of its response to the strategy, some conditions associated to this PI would have difficulties to present realistic timelines to comply with the any Action Plan, and to present evidence that the strategy is actually working to rebuild the stock. For this reason the commentary in the PI 1.1.1 is relevant regarding reduction of F to F_{MSY} . Certification requirements specify in SA 2.3.4. that in fisheries where fishing mortality rates are available for the UoA, *current F shall be “likely” to be less than F_{MSY} to justify an 80 score.*

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60. Pass with condition.
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Component	Harvest strategy (management)		
PI 1.2.1 Harvest strategy	There is a robust and precautionary harvest strategy in place		
Scoring issues	SG60	SG80	SG100
a. Harvest strategy design	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in the target and limit reference points.
b. Harvest strategy evaluation	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels.
c. Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
d. Harvest strategy review			The harvest strategy is periodically reviewed and improved as necessary.
e. Shark finning	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.

f. Review of alternative measures	There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA related mortality of unwanted catch of the target stock.	There is a 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.	There is a biannual 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.
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Justification/Rationale

Under the Chilean Fisheries Law, fisheries of closed access, as well as those that are declared under regimes of recovery or incipient development must have management plans. The industrial toothfish fishery operates under the regime of incipient development and because it is overexploited, should be declared in recovery, however, there's no management plan or species specific harvest strategy for the toothfish fishery. The elements of a general harvest strategy are presented in the Chilean Fisheries Law and describe the principles to the way fisheries are to be managed under the Law. These principles include the management goal, definition of fishing regimes, status of stocks, applicable sanctions and institutional responsibilities. Because these definitions are not species specific, no control rules are defined. There are broad definitions in the Law that can be the foundation of control rules, such as the transition from full exploitation to overexploitation that should trigger the redefinition of the regime to establish a recovery strategy. Overall these legal definitions are expected to help achieving the goal of keeping stocks at the level producing MSY.

In the specific case of the toothfish, the elements of the strategy embedded in the Law are not working properly together towards the achievement of the management goal. The stock is officially declared as overexploited (Anonymous 2014) but no Management Committee has been established and consequently, no Management Plan has been created. Because of this, no recovery plan has been established and the stock has not been reclassified from Incipient Development to a state of Recovery.

The team considered that the fishery may pass this PI but strict conditions would have to be applied so that measures are taken to make the elements of the strategy that are not working properly come together to function towards achievement of the management goals.

No shark finning takes place in this fishery

There is a fraction of the catch that is lost predominantly to killer whales. Losses to sperm whales have been mostly eliminated by means of using the cachalotera trotline. Such loss of the target stock catch can be considered under CR *unwanted catch* because it reduces the biomass abundance, and requires an evaluation of whether there are alternative measures to minimize such catch. It is clear in this fishery that losses to marine mammals represent more than fish lost, it's an economic loss they want to minimize. This is the main reason why the cachalotera was developed and worked for sperm whales. The fishery is still in search of gear improvements to minimize the loss to killer whales. Actions that have been already been attempted include variations in gear deployment, soaking time and recovery, shifting headings and other.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.
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Component	Harvest strategy		
PI 1.2.2 Harvest control rules and tools	There are well defined and effective harvest control rules (HCRs) in place		
Scoring issues	SG60	SG80	SG100
a. HCRs design and application	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.	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, or for key LTL species a level consistent with ecosystem needs.	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, most of the time.
b. HCRs robustness to uncertainty		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.
c. HCRs evaluation	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.
Justification/Rationale			
<p>There are no specific control rules that are set explicitly to work on the toothfish fishery to reduce exploitation rates. When evaluating the harvest strategy it was recognized that the Fisheries Law includes a general procedure designed to trigger actions to promote the recovery of species that have dropped below the level producing MSY and therefore are considered overexploited. This is expected to prevent as well dropping further under the point of collapse. However, such strategy has not been implemented in the toothfish fishery in Chile and no explicit control rules exist yet. Consequently, the stock is in high risk to drop to the state of collapse or is probably already there. If there is a disconnect from the intent of the Law and the final result and therefore, such tools described in the law are not being efficient in controlling the exploitation of the stock, this PI cannot get a passing score.</p>			

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	Under 60. Fail.
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Component	Harvest strategy		
PI 1.2.3 Information / monitoring	Relevant information is collected to support the harvest strategy		
Scoring issues	SG60	SG80	SG100
a. Range of information	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly relevant to the current harvest strategy, is available.
b. Monitoring	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 the inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
c. Comprehensiveness of information		There is good information on all other fishery removals from the stock.	

Justification/Rationale			
<p>All fisheries harvesting this stock of toothfish gather basic catch and effort data. Some fisheries collect biological information and the Chilean management allows for a portion of the catch quota to be allocated for use with scientific purposes. However, it is clear that this fishery requires a dedicated program to tackle the uncertainties around the identity of the stock. This is probably the greatest challenge for the management system of this fishery not only in Chile but in all countries involved in the exploitation of this species in South America. Until this happens, no sufficient information will be available about stock structure and abundance cannot be monitored with the accuracy that is consistent with the most basic control rule.</p> <p>As for other removals, some portions of the fishery (such as the Chilean industrial sector) appear to have good records of their total catch (target and bycatch), but other sectors have had difficulties in accommodating observers in their vessels and their total catch has not been verified to the satisfaction of the managers. Until a broad long term observer program is not operational, uncertainties in the catch and overall behaviour of the fishery will be a relevant impediment to improve in critical areas of performance.</p> <p>This PI can pass with the minimum score of 60 and will have conditions associated to the resolution of the stock identity problem. This necessarily requires the development of a monitoring program that is designed to satisfy the different elements of the requirements at SG80, but in particular the aspects related to stock identity, catch and abundance.</p>			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60. Pass with conditions.

Component	Harvest Strategy		
PI 1.2.4 Assessment of stock status	There is an adequate assessment of the stock status.		
Scoring issues	SG60	SG80	SG100
a. Appropriateness of assessment to stock under consideration		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
b. Assessment approach	The assessment estimates stock status relative to generic reference points appropriate to species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	

c. Uncertainty in the assessment	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.
d. Evaluation of assessment			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
e. Peer review of assessment		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.

Justification/Rationale

The stock assessment conducted by IFOP has evolved rapidly in the last couple of years. Significant improvements include the creation of a flexible platform of analysis that is accommodating critical issues such as changes in age determination, composition of the fleet, alternative recruitment models, and other. The conceptual model of the assessment is not limited to the operation of a specific fleet but is searching for the best approach to assure that any sector can optimize its catch and avoid the collapse of the fishery. The team therefore considers that the assessment is designed to determine stock status in a broad sense and is closely connected to the reference points that are coded in the Law. The assessment also has identified and addressed some of the most important sources of uncertainty, although some other highly critical issues still need to be investigated thoroughly.

We recognize the extensive critique that resulted from the internal and international peer review process and is not oblivious of the reviewer's opinion that *the current assessment could not be considered as an adequate and robust basis for the determination of stock status and provision of management advice* (Polacheck 2015). The SCS team is not in disagreement of such strong conclusion, however, the reviewer also acknowledges the virtues of the assessment and our team considers that although incomplete and in need of substantial improvements, this is the best available view of the status of the stock and the fishery.

Despite the fact that this model still has a long and complex road ahead, the SCS team considers that this fishery is relying on the right approach to the investigations to determine the best ways to manage the fishery. The team concluded that this PI has the potential to score at the SG80 level. But points to the need to increase this score given that other PI in this Principle may score under 80. It is therefore strongly recommended that all efforts are made to advance in accounting for as much as possible in the critique from the peer review process.

RBF Required? (✓/×/)	✓ default score is assigned for this performance indicator if the RBF is used in PI 1.1.1	Likely Scoring Level (pass/pass with condition/fail)	≥80
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7.2 Principle 2

Component	Primary species (outcome)		
PI 2.1.1 Outcome Status	The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI.		
Scoring issues	SG60	SG80	SG100
(a) Main primary species stock status	Main primary species are likely to be above the PRI OR If the species is below the PRI. the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding	Main primary species are highly likely to be above the PRI OR If the species is below the PRI, there is either evidence of recovery or a demonstrably effective strategy in place between all MSC UoAs which categorise this species as main , to ensure that they collectively do not hinder recovery and rebuilding.	There is a high degree of certainty that main primary species are above PRI and are fluctuating around a level consistent with MSY.
(b) Minor primary species stock status			For minor species that are below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
Justification/Rationale			
<p>Four species were identified as minor primary species in the toothfish fishery in the UoA: <i>Macruronus magellanicus</i>, <i>Merluccius australis</i>, <i>Raja chilensis</i> and <i>Dosidicus gigas</i> The catch of these species are not included in the UoA. Three out of the four species are considered overfished according to the document "Status of Main Chilean Fisheries, 2014" (SUBPESCA 2015); the hoki fishery is near collapse and the skate fishery has a ban until the end of 2015. Although there is no clear evidence whether or not the fishery hinders the recovery and rebuilding of these minor primary species, the proportions of capture of the total catch are very low according to data provided by IFOP and AOBAC,</p> <p>If the fishery enters full assessment, and it is able to demonstrate the necessary evidence for this indicator at the level of the UoA, this could compensate other low scores on this principle.</p>			
RBF Required? (✓/✗/)	RBF not necessary	Likely Scoring Level (pass/pass with condition/fail)	≥80

Component	Primary species (management)		
PI 2.1.2 Primary species management strategy	There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring issues	SG60	SG80	SG100
(a) Management strategy in place	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 be above the point where recruitment would be impaired.	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.	There is a strategy in place for the UoA for managing main and minor primary species.
(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	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.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved.
(c) Management strategy implementation		There is some evidence that the measures/partial strategy is being implemented successfully .	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).
(d) Shark finning	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
(e) Review of alternative measures	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species.	There is a 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.	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.

Justification/Rationale			
<p>The law provides that bycatch and discards must be minimized and plans to reduce discards must be elaborated (Article 7). Management plans should have the following elements: a) management and conservation measures and technological means to reduce discarding both target and bycatch species; b) a monitoring program; c) an evaluation of the measures taken to reduce discarding both target and bycatch species. Furthermore, the reduction plan should consider a code of good practice in fishing operations, as a further mitigation measure.</p> <p>It can be considered that there is a partial strategy in place to collect data by observers and quantify unintended or bycatch species catches, but the data collected do not record the disposition (discarded or exploited), therefore there is no certainty on the use of the primary species. The industry has also conducted research surveys to quantify this capture but these investigations are no longer continued.</p> <p>Furthermore, at present, the toothfish fishery has neither a management plan nor a discards plan, as required by law for fisheries operating under the regime of incipient development. This is because the Management Committee, which is responsible for developing the plan, has not yet been established. In the specific case of the toothfish, the elements of the strategy embedded in the Law are not working properly together towards the achievement of the management goal.</p> <p>The team considered that the fishery may pass this PI, but strict conditions would have to be applied so that measures are taken to make the elements of the strategy that are not working properly come together to function towards achievement of the management goals.</p> <p>Shark species caught as unwanted catch were not identified as primary species; thus scoring issue d) has not been scored.</p>			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.

Component	Primary species (information)		
PI 2.1.3 Primary species information	Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring issues	SG60	SG80	SG100

<p>(a) Information adequacy for assessment of impact on main species</p>	<p>Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.</p>	<p>Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.</p>	<p>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.</p>
<p>(b) Information adequacy for assessment of impact on minor species</p>			<p>Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.</p>
<p>(c) Information adequacy for management strategy</p>	<p>Information is adequate to support measures to manage main primary species.</p>	<p>Information is adequate to support a partial strategy to manage main Primary species.</p>	<p>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.</p>
<p>Justification/Rationale</p>			
<p>Two main sources of information are available in this fishery for minor primary species: an observer program conducted by IFOP collects data in this fishery, including catches at species level; and information from vessel logbooks. A research plan of discards is foreseen to start this year. Some quantitative information is collected, but more comprehensive and detailed analysis of the data is required to support a strategy to manage all primary species and as noted above, there is no strategy in place at the moment. If the fishery enters full assessment, quantitative adequate information at the level of the UoA may compensate other low scores on this principle.</p>			
<p>RBF Required? (✓/×/)</p>	<p>× RBF can't be used</p>	<p>Likely Scoring Level (pass/pass with condition/fail)</p>	<p>≥80</p>

Component	Secondary species (outcome)		
PI 2.2.1 Secondary species outcome	The UoA aims to maintain secondary species above a biological based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring issues	SG60	SG80	SG100
(a) Main secondary species stock status	<p>Main Secondary species are likely to be within biologically based limits.</p> <p>OR</p> <p>If below biologically based limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main secondary species are highly likely to be above biologically based limits</p> <p>OR</p> <p>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.</p> <p>AND</p> <p>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that also have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding.</p>	<p>There is a high degree of certainty that main secondary species are within biologically based limits.</p>
(b) Minor secondary species stock status			<p>For minor species that are below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species</p>

Justification/Rationale			
<p>Similar to the primary species, there are virtually no instances where the bycatch of any one species is of sufficient quantity to be classified as a “main” secondary species under the MSC criterion of it being >5% of the total catch by weight or to have value to the fisher or particular vulnerability. All secondary species are considered “minor”. At least six species of sharks have been registered by IFOP data from 2009 to 2013 and other studies in this fishery (Reyes and Torres-Florez 2009). Status of some of these species is Vulnerable according to IUCN Red List. If the fishery enters full assessment, evidence at the level of the UoA may compensate other low scores on this principle.</p>			
RBF Required? (✓/×/)	RBF not necessary	Likely Scoring Level (pass/pass with condition/fail)	≥80

Component	Secondary species (management)		
PI 2.2.2 Secondary species management strategy	There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring issues	SG60	SG80	SG100
(a) Management strategy in place	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.	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.	There is a strategy in place for the UoA for managing main and minor secondary species.
(b) 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 some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
(c) Management strategy implementation		There is some evidence that the measures/partial strategy is being implemented successfully .	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).

(d) Shark finning	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.
(e) Review of alternative measures	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.
Justification/Rationale			
<p>The situation of this PI is basically the same as for the primary species PI 2.1.2. The team considered that the fishery may pass this PI, but strict conditions would have to be applied so that measures are taken to make the elements of the strategy that are not working properly come together to function towards achievement of the management goals.</p> <p>Levels of shark bycatch are low. Shark finning is banned in Chile. There is a high degree of certainty that shark finning is not taking place in the fishery.</p>			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.

Component	Secondary species (information)		
PI 2.2.3 Secondary species information	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 issues	SG60	SG80	SG100

<p>(a) Information adequacy for assessment of impact on main species</p>	<p>Qualitative information is adequate to estimate the impact of the UoA on the main secondary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.2.1 for the UoA:</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.</p>	<p>Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.</p> <p>OR</p> <p>If RBF is used to score PI 2.2.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.</p>	<p>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.</p>
<p>(b) Information adequacy for assessment of impact on minor secondary species</p>			<p>Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status</p>
<p>(c) Information adequacy for management strategy</p>	<p>Information is adequate to support measures to manage main secondary species.</p>	<p>Information is adequate to support a partial strategy to manage main secondary species.</p>	<p>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.</p>
<p>Justification/Rationale</p>			
<p>The situation of this PI is basically the same as for the primary species. PI 2.1.3. An observer program conducted by IFOP collect data in this fishery, including unwanted catches at species level, and information is also available from vessel logbooks. A research plan of discards is foreseen to start this year. Some quantitative information is collected but more comprehensive and detailed analysis of the data is required to support a strategy to manage all primary species. There is no strategy in place at the moment. If the fishery enters full assessment, adequate information at the level of the UoA may compensate other lower scores on this principle.</p>			
<p>RBF Required? (✓/×/)</p>	<p>× RBF can't be used</p>	<p>Likely Scoring Level (pass/pass with condition/fail)</p>	<p>≥80</p>

Component	ETP species (outcome)		
PI 2.3.1 ETP species outcome	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring issues	SG60	SG80	SG100
(a) Effects of the UoA on population/stock within national or international limits, where applicable	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.
(b) Direct effects	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.
(c) Indirect effects		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.
Justification/Rationale			
<p>Two groups of species are considered ETP species in the fishery for Patagonian toothfish, seabirds and marine mammals, and their interaction with the fishery varies. Seabirds are subject to the direct impact of the fishery, while marine mammals feed on toothfish during fishing operations. The industry meets all measures of PAN-AM Chile and ACAP; moreover Chile has adopted CCAMLR measures for seabirds. In addition, the use of "cachaloteras" has reduced seabird mortality to zero. Therefore, there is a high degree of certainty that the effects of the fishery are within limits of national and international requirements for protection of ETP species, and also there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP seabird species. A direct effect of fishery on sperm whales is that occasionally they get entangled with the line and destroy the fishing gear; however, further information is not available.</p> <p>It is highly unlikely that indirect effects create unacceptable impacts on seabirds. The indirect effects on marine mammals are unknown or undetermined. This last issue would be enough to prevent the fishery to perform at SG80 and a related condition should be added.</p>			
RBF Required? (✓/×/)	✓ RBF could be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions

Component	ETP species (management)		
PI 2.3.2 ETP species management strategy	<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> • meet national and international requirements; • ensure the UoA does not hinder recovery of ETP species. <p>Also, the UoA regularly reviews and implements</p>		
Scoring issues	SG60	SG80	SG100
(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 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.
(d) Management strategy implementati on		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 minimize 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 biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
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Justification/Rationale

There is a comprehensive strategy in place for managing the UoA's impact on ETP seabird species, including measures to minimise mortality, which is designed to exceed national and international requirements for the protection of ETP species. Responding to the international call for the voluntary adoption of a plan to reduce the impacts of fisheries on seabirds, Chile generated a National Plan of Action (PAN-AM/Chile) to monitor seabird bycatch, and to mitigate threats to seabirds with emphasis on industrial longline fisheries, including the toothfish fishery. Other actions related to the creation of a national scientific committee for biodiversity, and new collaborative research platforms under the auspices of SUBPESCA support the implementation of the strategy. Chile is member of ACAP and provides information required by the Agreement on the status of listed species.

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). 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 Meeting of the Parties (MOP) of ACAP has held ordinary sessions at intervals of not more than three years, and biannually more recently.

Although the use of cachaloteras has reduced predation by marine mammals as part of a strategy, it is unknown whether there are comprehensive strategies for managing these species in place and to ensure the UoA does not hinder the recovery of these species.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	≥80
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Component	ETP species (information)		
PI 2.3.3 ETP species information	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <ul style="list-style-type: none"> • Information for the development of the management strategy; • Information to assess the effectiveness of the management strategy; and <p>Information to determine the outcome status of ETP species</p>		
Scoring issues	SG60	SG80	SG100

<p>(a) Information adequacy for assessment of impacts</p>	<p>Qualitative information is adequate to estimate the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA:</p> <p>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</p>
<p>(b) Information adequacy for management strategy</p>	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and support a strategy to manage impacts on ETP species.</p>	<p>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.</p>
<p>Justification/Rationale</p>			
<p>Research studies and peer-reviewed papers were provided discussing the impacts from fishing and solutions that have proved to be effective. Quantitative information is available to assess with a high degree of certainty the magnitude of impacts, mortalities and injuries and the consequences for the status of seabird species. Likewise, information is adequate to support the PAN-AM and achieving its objectives.</p> <p>However, available information refers mainly to the reduction in the number of birds killed by the use of "cachaloteras". Other interactions with the fishery have been identified, such as mortality associated with the disposal of offal and waste with hooks and during hauling. Anecdotal evidence from discussions with industry during the onsite visit indicates that creative solutions and measures are being applied to reduce this impact. Industry and fishery authorities agreed that all CCAMLR measures concerning seabird bycatch mitigation have been adopted by Chile. Nevertheless, this team was not provided with documented information on it. If the fishery enters full assessment, all available documented materials will better support the scoring of this PI to meet the requirements of scoring issues a) and b) of SG100, not only for seabirds but also for marine mammal interactions.</p>			
<p>RBF Required? (✓/×/)</p>	<p>If RBF used, then RBF alternative within scoring issue (a).</p>	<p>Likely Scoring Level (pass/pass with condition/fail)</p>	<p>≥80</p>

Component	Habitats outcome		
PI 2.4.1 Outcome status	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area(s) covered by the governance body(s) responsible for fisheries management.		
Scoring issues	SG60	SG80	SG100
(a) Commonly encountered habitat status	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.
(b) VME habitat status	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.
(c) Minor habitat status			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.
Justification/Rationale			
<p>Deep-sea habitats in southern Chile have not been much studied. A specific study of the possible effect on habitats of longlines was not available; thus the scoring of this principle is difficult. However, due to the type of fishery and according to other MSC assessments in similar toothfish fisheries, it is considered that this fishery is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.</p> <p>A group of seamounts was identified as VME in the fishing area of this fishery. It is considered that this fishery is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm, but no evidence was provided.</p> <p>The fishery meets all the elements of the SG 60 but does not score SG 80 for this component because further fine scale information is required on the habitats that exist within the area of the fishery. This PI is considered to be data deficient. If the fishery moves to full assessment, the RBF may be considered for use for this PI.</p>			
RBF Required? (✓/✗/)	✓ The team did not have enough information. RBF (CSA) may be used in the full assessment	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.

Component	Habitats management strategy		
PI 2. 4.2 Management strategy	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.		
Scoring issues	SG60	SG80	SG100
(a) Management strategy in place	There are measures in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance.	There is a partial strategy in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above.	There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats.
(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats).	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.	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or habitats involved.
(c) Management strategy implementation		There is some quantitative evidence that the measures/partial strategy is being implemented successfully.	There is clear quantitative evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a).
(d) Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs	There is qualitative evidence that the UoA complies with its management requirements to protect VMEs.	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.	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.
Justification/Rationale			

As mentioned above, because little is known about the benthic habitats in the fishing area, and it is considered that these fisheries have a low level of risk of impacting habitat, specific measures have not been developed to reduce serious or irreversible harms to habitat structure and function.

However, it may be considered that there are measures in place that contribute to reducing this impact. The measure in place to reduce the impact of the fishery consists of using the gear "Cachalotera", which is presumed to prevent interaction with benthic habitat because fishing occurs in the water column and not in the benthic habitat. An additional measure includes the ban during the spawning season.

The recent regulation banning bottom trawling on seamounts, including the group present in the fishing area prevents the impact of non-MSA fisheries on this VME.

The impacts of gear loss on habitats has not been considered, but if the fishery enters full assessment, in order for a fishery to score a 100, a management strategy should be in place even for gears that do not regularly contact benthic habitats since gear loss or unexpected seafloor impacts could occur.

All these considerations together, based on plausible argument, would pass the SG60. But, as mentioned in P1.2.1, the management plan of the toothfish fishery has not yet been developed, thus a strategy to manage the impact and achieve the Habitat Outcome 80 level of performance does not formally exist at the moment as part of this plan.

The team considered that the fishery may pass this PI but strict conditions would have to be applied so that measures are taken to make the elements of the strategy that are not working properly come together to function towards achievement of the management goals.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.
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Component	Habitats information		
PI 2.4.3 Information monitoring	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring issues	SG60	SG80	SG100

(a) Information quality	<p>The types and distribution of the main habitats are broadly understood.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Qualitative information is adequate to estimate the types and distribution of the main habitats.</p>	<p>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.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats</p>	<p>The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.</p>
(b) Information adequacy for assessment of impacts	<p>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.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.</p>	<p>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.</p> <p>OR</p> <p>If CSA is used to score PI 2.4.1 for the UoA:</p> <p>Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats</p>	<p>The physical impacts of the gear on all habitats have been quantified fully.</p>
(c) Monitoring		<p>Adequate information continues to be collected to detect any increase in risk to the main habitats.</p>	<p>Changes in habitat distributions over time are measured.</p>
Justification/Rationale			

As mentioned above, although there is little information and studies on habitat, it is considered that there may be a broadly understood of the main habitat, including seamounts, if bathymetric data and basic information captured some species present in these habitats is interpreted.

Thus, 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. However, it is unknown whether adequate information continues to be collected to detect any increase in risk to the main habitats. Same as above, use RBF would provide more information, if fishery moves to full assessment.

RBF Required? (✓/✗/)	If RBF used, then RBF alternative within scoring issues (a) and (b).	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions
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Component	Ecosystem outcome		
PI 2.5.1 Outcome status	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function..		
Scoring issues	SG60	SG80	SG100
(a) Ecosystem status	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.
Justification/Rationale			
<p>The situation on the knowledge of the structure and function of ecosystem is similar to the understanding of the habitat. To our knowledge, there are not enough studies conducted in this regard. A single study of the diet of toothfish was available; therefore, it is difficult to estimate the state of other components of the ecosystem. However, due to the nature of the fishery, as mentioned above, it is unlikely to disrupt the key elements underlying the structure and function of ecosystems to a point where there would be a serious or irreversible damage.</p> <p>The fishery meets SG 60 but to score SG80 for this component, further fine scale information on the different elements of the ecosystem is required. This PI is considered to be data deficient. If the fishery moves to full assessment, the RBF may be considered for use for this PI.</p>			
RBF Required? (✓/✗/)	✓ The team does not have enough information to assess the IP. RBF (SICA) may be used in the full assessment	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.

Component	Ecosystem management strategy		
PI 2. 5.2 Management strategy	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 issues	SG60	SG80	SG100
(a) Management strategy in place	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.
(b) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/ ecosystems).	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	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA and/or ecosystem involved
(c) Management strategy implementation		There is some evidence that the measures/partial strategy is being implemented successfully.	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).
Justification/Rationale			

As mentioned above, because little is known about the ecosystem in the fishing area, and it is considered that these fisheries have a low level of risk of impacting key elements of ecosystem structure and function, specific measures have not been developed to reduce serious or irreversible harms to habitat structure and function.

However, it may be considered that there are measures and strategies in place to manage the impact of the fishery on the target species, seabirds and sperm whales predation on toothfish, but yet is not well understood the functional relationships between the fishery and the components and elements of the ecosystem. Because of this lack of knowledge, it cannot determine if the existing measures are sufficient to address specific ecosystem impacts effectively enough to meet the appropriate standard. Moreover, a management plan of the fishery has not yet been developed.

All these considerations together, based on plausible argument, would pass the SG60. But, as mentioned in P1.2.1, the management plan of the Toothfish fishery has not yet been developed, thus a strategy to manage the impact and achieve the Ecosystem Outcome 80 level of performance does not formally exist at the moment as part of this plan.

The team considered that the fishery may pass this PI but strict conditions would have to be applied so that measures are taken to make the elements of the strategy that are not working properly come together to function towards achievement of the management goals.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.
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Component	Ecosystem information		
PI 2.5.3 Information monitoring	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring issues	SG60	SG80	SG100
(a) Information quality	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
(b) Investigation of UoA impacts	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.

(c) Understanding of component functions		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are understood.
(d) Information relevance		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.
(e) Monitoring		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.
Justification/Rationale			
As mentioned above, although there is little information and studies on ecosystem function and structure, information is adequate to identify the key elements of the ecosystem but although main impacts of the UoA on these key ecosystem elements can be inferred from existing information, have not been investigated in detail.			
Same as above, use RBF would provide more information, if fishery moves to full assessment.			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions

7.3 Principle 3

Component	Governance and Policy		
PI 3.1.1 Legal and/or customary framework	<p>The management system exists within an appropriate legal and/or customary framework which ensures that it:</p> <ul style="list-style-type: none"> • Is capable of delivering sustainability in the UoA(s); and • Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and • Incorporates an appropriate dispute resolution framework. 		
Scoring issues	SG60	SG80	SG100

(a) Compatibility of laws or standards with effective management	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	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.	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.
(b) Resolution of disputes	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 .
(c) Respect for rights	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 manner consistent with the objectives of MSC Principles 1 and 2.	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 objectives of MSC Principles 1 and 2.	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.
Justification/Rationale			

The Chilean Fishery Legal framework as described above is an effective national legal system and organised and effective cooperation with other parties capable of delivering sustainable fisheries. Depending on the definition of the identity of the stock in the future, it will be necessary to review the existence of management systems for international cooperation, according to the number of participating countries. The system must ensure compliance, decision-making and mechanisms of transparency of data to make decisions. During the last stock assessment conducted by IFOP, there was a positive exchange of information with scientists from authorities in Argentina, but a formal mechanism in place to share scientific data was not identify in this pre-assessment.

The new law provides the creation of STC and Management Committee in order to make science-based management decisions. Fishery authority considers that the relationship with the industry is proactive and there is an on-going dialogue.

Although the national legal framework is clearly established and meet SG60 and SG80, the problem of the stock identity may have to be re-evaluated in the future to consider international cooperation for management of a shared stock which currently does not exist.

The Chilean fishery management system has shown a formal commitment to the legal rights of people dependent on fishing for food and livelihood through the creation of a reserve for artisanal fisheries, allocations for artisanal fishers in fishery quotas and the incorporation of representatives of the artisanal fishers in the various levels of Council and other forms of stakeholder consultation. It is worth mentioning that the rights of citizens are explicitly defined. They have the right to access non-classified documents (Law 20,285 Access to Information), know the identity of the authorities and officials involved in fisheries administration and management procedures, receive clarification on rules and decisions, request corrective actions if there have been mistakes, make claims; and report any officer who they consider to have been negligent. If stakeholders do not agree with a policy or a sanction, they may appeal to the Minister.

The Chilean legal framework to manage fisheries meets the requirements at SG80.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	≥80
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Component	Governance and Policy		
PI 3.1.2 Consultation, roles and responsibilities	<p>The management system has effective consultation processes that are open to interested and affected parties.</p> <p>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties</p>		
Scoring issues	SG60	SG80	SG100

(a) Roles and responsibilities	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.
(b) Consultation processes	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 .
(c) Participation		The consultation process provides opportunity for all interested and affected parties to be involved.	The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement.
Justification/Rationale			

Chilean fisheries are primarily governed by the General Law of Fisheries and Aquaculture 18.892, 1991 (GLFA) and its amendments. The roles of the main organizations and individuals are well defined in the GLFA. The Ministry of Economy, Development and Tourism is responsible for the management of the fishing sector in Chile. Three agencies under the Ministry and a Research Institute are in charge of fisheries: 1) *Subsecretaría de Pesca y Acuicultura* (SUBPESCA) is responsible for policy and planning of fisheries; 2) *Servicio Nacional de Pesca y Acuicultura* (SERNAPESCA) is responsible for regulations and enforcement; 3) *Fondo de Investigación Pesquera* (FIP) aimed at funding the research for fisheries management. Additionally, the *Instituto de Fomento Pesquero* (IFOP) is a non-profit research organization that generates scientific and technical information usually under contract to SUBPESCA and SERNAPESCA.

The last modification of the GLFA published in 2013 (Law 20657) defines the creation of a *Comité Científico Técnico* (Scientific Technical Committee) for demersal fisheries, including toothfish, which advises SUBPESCA and the *Comité de Manejo* (Management Committee). The latter is in charge of the development of the management plan for the fishery. Other decrees and resolutions and other rules and regulations, for the management of the fishery, are regularly published by SUBPESCA and by SERNAPESCA, respectively.

The GLFA establishes the creation of various figures which provide opportunity for all interested and affected parties to be involved at different levels: the National Fishery Council, the Regional Fishery Councils, the Scientific Technical Committee and the Management Committee. Different sectors, such as artisanal and industrial organizations, are represented in these bodies, which meet periodically to review and discuss issues concerning the fisheries. The minutes and other relevant documents shared during the meetings are available on the website of SUBPESCA and are considered for the consultation process.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	≥80
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Component	Governance and Policy		
PI 3.1.3 Long term objectives	The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring issues	SG60	SG80	SG100
(a) Objectives	Long-term objectives to guide decision-making, consistent with the MSC fisheries standard and the precautionary approach, are implicit within management policy.	Clear long-term objectives that guide decision-making, consistent with MSC fisheries standard and the precautionary approach are explicit within management policy.	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.

Justification/Rationale			
In the new GLFA (2013) are explicit and required long-term objectives and the application of the precautionary principle in articles 1b y 1c.			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	≥80

Component	Fishery Specific Management System		
PI 3.2.1 Fishery-specific objectives	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring issues	SG60	SG80	SG100
(a) Objectives	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.	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.	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.
Justification/Rationale			
<p>The Management Committee for the Toothfish fishery has not yet been established and consequently the management plan has not been developed. However, specific objectives are implicit in the management system: TAC is set annually; allocation of quotas (auction system); observer program in place; bycatch mitigation measures including PAN-AM for longline fisheries; associated fauna list for toothfish fishery, among others.</p> <p>The creation of the Management Committee will allow developing a management plan with short and long-term objectives. As it is, this PI barely reaches the SG60 level and needs to be developed to better detail to increase its score.</p>			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60. Pass with conditions.

Component	Fishery Specific Management System		
PI 3.2.2 Decision-making processes	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 issues	SG60	SG80	SG100
(a) Decision-making processes	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.	
(b) Responsiveness of decision-making processes	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.
(c) Use of precautionary approach		Decision-making processes use the precautionary approach and are based on best available information.	
(d) Accountability and transparency of management system and decision-making process	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.

(e) Approach to disputes	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.
Justification/Rationale			
<p>SUBPESCA receives advice from the STC and CM. The Management Committee will make decisions according to scientific advice from the STC. Research programs are established with FIP support and annually stock assessment is conducted in order to provide scientific advice for making decisions.</p> <p>All reports and meeting minutes of the STC are published on SUBPESCA website. Advisory and decision making processes are established and linked to the application of the precautionary approach.</p> <p>Issues in this PI are meet at the SG60 level and some may pass at the SG80 level. However, it is clear that considerable improvement can be achieved with the implementation of the Management Committee and the development of the Management Plan</p>			
RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.

Component	Fishery Specific Management System		
PI 3.2.3 Compliance and enforcement	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring issues	SG60	SG80	SG100
(a) MCS implementation	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.

(b) Sanctions	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.
(c) Compliance	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.	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.	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.
(d) Systematic non-compliance process		There is no evidence of systematic non-compliance.	

Justification/Rationale

During the discussion it was mentioned that extensive illegal, unreported and unregulated (IUU) fishing occurred in the past in toothfish fisheries. While it appears there were many instances of non-compliance, the fishery is presently well regulated and some monitoring, control and surveillance measures have been implemented. Adoption of CCAMLR Conservation Measures has strengthened enforcement mechanisms. The requirement of completing DCD and DED improves compliance. Some evidence exists to demonstrate fishers comply with the management system. The sanctions are codified in the GLFA and applied by the SERNAPESCA office. Strong sanctions prevent the incentive to break the law. Industry actively cooperates where necessary in the collection of data. Discussions with fishery managers during the site visit did not provide any evidence of systematic non-compliance of fishers with the regulations. A system for recording catch in real time enables timely decisions regarding closure of the fishing season each year. However it is unclear, how this reporting system truly reflects the actual catch. There appears to be a gap in the surveillance system to ensure the behaviour of the fleet at sea is compliant with all elements of the management structure. Whether this gap exists or not, it should be carefully addressed at the time of a full assessment. Because of this, and with the purpose of elevating the relevance of this gap to a critical and strategic status, the team decided to assign to Soring Issue (a) of this PI a score under 60.

RBF Required? (✓/×/)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	Under 60. Fail.
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Component	Fishery Specific Management System		
PI 3.2.4 Monitoring and management performance evaluation	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives.</p> <p>There is effective and timely review of the fishery-specific management system.</p>		
Scoring issues	SG60	SG80	SG100
(a) Evaluation coverage	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.
(b) Internal and/or external review	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.
Justification/Rationale			

Some parts of the fishery-specific management system have their own mechanisms of evaluation in place:

- Research plan and scientific research: a research plan is established each year including priority studies for the fishery. The law requires an external evaluation of the research to ensure the quality of results.
- Monitoring system: research programs for the direct evaluation of biomass and abundance of resources, and stock assessment, are established, among others.
- Decision-making process: at least one of the two specific systems that are required for decision-making, consultation and participation of stakeholders at specific-fishery level, is operating, the STC. This committee may be consulted by SUBPESCA on management and conservation measure design, which contribute to internal review of the management system.
- MCS: there is a national control and surveillance plan, which also considered actions for this fishery. Plan's compliance is evaluated and adjustments are made regularly.

Two key parts of the fishery-specific system are not in place: the management plan (including discards plan and criteria for the evaluation of the compliance of the objectives and strategies), and the Management Committee. Systematic monitoring of this fishery, and the evaluations of the management plan, at least every five years, will have to be conducted in the framework of the Management Committee, which still absence.

The GLFA includes specific provisions for fisheries in incipient development, thus the review of the law will contribute to the evaluation of the toothfish fishery management system. In this sense, it is considered that regular modifications are made to the GLFA as issues arise, including aspects of fishery management. In addition, law states that SUBPESCA may ask the NFC for advice on fisheries policy, the law itself and the national development plan, which contributes to internal reviews of the management system.

The mechanisms to evaluate parts of the fishery-specific management system exist and It can be considered that meetings between industry and SUBPESCA, SERNAPESCA provide a forum and the opportunity for decision-makers to receive feedback on the management system for SUBPESCA occasional internal review. The team considered that this PI meets SG60.

RBF Required? (✓/×/ /)	× RBF can't be used	Likely Scoring Level (pass/pass with condition/fail)	60 to 79. Pass with conditions.
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