

FISHERY ASSESSMENT REPORT

IFFO GLOBAL STANDARD FOR RESPONSIBLE SUPPLY OF FISHMEAL AND FISH OIL



FISHERY:	Chilean Anchovy (<i>Engraulis ringens</i>) Regions XV-IV
LOCATION:	Chile
DATE OF REPORT:	October 2015
ASSESSOR:	Deirdre Hoare

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1. APPLICATION DETAILS AND SUMMARY OF THE ASSESSMENT OUTCOME			
Name:			
Address:			
Country:		Zip:	
Tel. No.		Fax. No.	
Email address:		Applicant Code	
Key Contact:		Title:	
Certification Body Details			
Name of Certification Body:		Global Trust Certification Ltd.	
Assessor Name	Peer Reviewer	Assessment Days	Initial/Surveillance/ Re-certification
Deirdre Hoare	Sam Peacock	5	Re-certification
Assessment Period	2015		
Scope Details			
1. Scope of Assessment		IFFO Global Standard for Responsible Supply – Issue 1	
2. Fishery		Chilean Anchovy (<i>Engraulis ringens</i>) Regions XV-IV	
3. Fishery Location		Chile Regions XV- IV	
4. Fishery Method		Purse Seine	
Outcome of Assessment			
5. Overall Fishery Compliance Rating		medium	
6. Sub Components of Low Compliance		none	
7. Information deficiency		none	
8. Peer Review Evaluation		Maintain approval	
9. Recommendation		Maintain approval	

2. QUALITY OF INFORMATION
Good
3. COMPLIANCE LEVEL ACHEIVED
Medium
Recommendation
Maintain approval
4. GUIDANCE FOR ONSITE ASSESSMENT
Based on HIGH compliance findings
Based on MEDIUM compliance findings
Based on LOW compliance findings
5. ASSESSMENT DETERMINATION
<p>The Chilean anchovy fishery in regions XV-IV has seen no substantial management changes since the time of the initial assessment. Chile has a robust legal and administrative framework for fisheries, where decisions are informed by annual surveys and fishery-dependent data. The available evidence continues to suggest that the fishery is well monitored and enforced. Reference points have been revised by external experts and were recently officially adopted. TAC for 2014 was reduced according with the current stock status. Protective measures for spawning zones have been introduced. The stock is considered overexploited and overfished. However, the reproductive stock was between the limit and the target biomass reference point. Fishing mortality is slightly above the target.</p> <p>As at the time of the initial assessment, limited data are collected on levels of bycatch in the fishery, and there is a lack of transparency in the way that quota recommendations, both initial and mid-year, are calculated. Although a new fisheries law was implemented in February 2013, its contents have not resulted in changes to any of the compliance ratings for the fishery.</p>
HIGH Compliance
A1, A3, D1, D2, E2
MEDIUM Compliance
A2, B1, B2, C1, D3, E1
LOW Compliance

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SUMMARY OF LEVEL OF COMPLIANCE					
	The Management Framework and Procedures	Stock assessment procedures and management advice	Precautionary approach	Management measures	Implementation
legal and administrative basis	A1				
Fisheries management should be concerned with the whole stock unit	A2				
Management actions should be scientifically based	A3				
Research in support of fisheries conservation and management should exist		B1			
Best scientific evidence available should be taken into account when designing conservation and management measures		B2			
The precautionary approach is applied in the formulation of management plans			C1		
The level of fishing permitted should be set according to management advice given by research organisations				D1	
Where excess fishing capacity exist, mechanisms should be in established to reduced capacity				D2	
Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment				D3	
A framework for sanctions of violation of laws and regulations should be efficiently exists					E1
A management system for fisheries control and enforcement should be established					E2

KEY: Low Compliance: Medium Compliance: High Compliance:

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6. RATIONALE OF THE ASSESSMENT OUTCOME

A. THE MANAGEMENT FRAMEWORK AND PROCEDURE

LEVEL OF COMPLIANCE

A1. The management of the fishery must include a legal and administrative basis for the implementation of measures and controls to support the conservation of the fishery.

LOW	An administrative framework that ensures an efficient management of the fishery for its conservation is not established.
MEDIUM	An administrative framework that ensures an efficient management of the fishery for its conservation is somehow established, but there is evidence of not being efficient to ensure the conservation of the stock.
HIGH	A legal and administrative framework that ensures an efficient management of the fishery for its conservation is established and works efficiently toward the conservation of the stock.

Determination: The Chilean fisheries management framework is extensive and robust, and includes specific commitments to ensuring the sustainability of marine stocks. H

Primary institutional framework

The Chilean institutional structure governing the fisheries and aquaculture sector centers around three key organisations, with a number of other institutions providing additional research and enforcement support (such as the Navy). These three organizations have a degree of operational independence while performing a crucial and interlinked function within the broad institutional framework.

- The Subsecretariat de Pesca (Undersecretariat of Fisheries, SUBPESCA or SSP) is positioned within the Chilean Ministry of Economy, Development and Tourism and was created under Law No. 1.626 on the 21st of December 1976. It provides the policy settings and regulatory framework for the domestic management of the sector. It also manages policy direction and provides input into international fisheries issues. Law 20.657 created eight scientific-technical fisheries committees within SUBPESCA, to act as advisory bodies in the formulation of all reference points, quotas, and other technical measures. The law also rendered their technical recommendations mandatory – thus there is a legal requirement for scientific advice to be adopted.
- The Servicio Nacional de Pesca (National Fisheries Service, SERNAPESCA) is also based within the Ministry of Economy, Development and Tourism. It is responsible for executing national fisheries policy, for supervising its enforcement and for ensuring proper application of the legal rules and regulations on fishing. In practice, compliance is checked by Intertek Caleb Brett Chile SA, acting on behalf of SERNAPESCA.
- The Instituto de Fomento Pesquero (Fisheries Development Institute, IFOP) is the research arm of the institutional framework. A non-profit organisation created in 1964 under a joint agreement between the Chilean government, the FAO, and the UN Development Program, it is the primary source of scientific advice to the SSP on fisheries and aquaculture agreement issues. Its work includes stock assessment, advising on total allowable catch levels for the wild fisheries, and the environmental and health aspects of aquaculture production. It draws a proportion of its funding from SUBPESCA but also has to compete for funding from a range of public funding sources.

Fisheries councils

The National Fisheries Council was created by the Fisheries and aquaculture Law 18.892 for the purpose of managing the participation of all stakeholders in the fisheries and aquaculture sector. It is a ruling, advisory

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and consultative body for dealing with Fisheries and Aquaculture plans and Laws as well as for development proposals for small scale fishing. There are also five Zonal Fisheries Councils aimed at contributing to the decentralization of management measures to be taken by authorities, and to enhance regional participation of fisheries and aquaculture stakeholders. They communicate new and amended regulations through regional bulletins and acts published several times a year to fishery stakeholders. Finally, Regional Fisheries Councils are aimed at studying fisheries and aquaculture problems affecting their zones and to propose solutions and management measures to SUBPESCA. Until 2013 the Councils were responsible for approving the SUBPESCA-recommended TAC; however, the introduction of Law 20.657 (the General Law on Fisheries and Aquaculture, LGPA) in February 2013 adjusted this arrangement to render the Council as a purely consultative body for the purposes of TAC-setting.

Legal instruments

Since February 2013, the primary legal instrument for fisheries management in Chile has been Law 20.657 (LGPA). The LGPA is a modification of the previous fisheries legislation, and includes:

- A commitment to the sustainable use and conservation of marine resources.
- A commitment to make key decisions on conservation measures on the basis of scientific information above all other considerations. To this end, the recommendations of SUBPESCA’s scientific-technical committees have been made mandatory.

A commitment to develop management plans for any fishery with restricted access, and the review and updating of these plans every five years.

LEVEL OF COMPLIANCE

A2. Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account fishery removals and the biology of the species.

LOW	Fisheries management is not concerned with the whole stock unit over its entire area of distribution and do not take into account any of the matters listed in ‘A1’.
MEDIUM	Fisheries management is concerned with matters listed in ‘A1’ but not entirely. Fisheries, in relation to ‘A1’ statement, should improve to ensure the long term conservation of the marine resource.
HIGH	Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account: <ul style="list-style-type: none"> • All fishery removals • The biology of the species

Determination: Fisheries management takes into account all fishery removals and the biology of the species however the Southern Peru/Northern Chile Stock is assessed and managed separately by Chile and Peru.

M

Anchoveta has a wide geographical distribution in the South Eastern Pacific Ocean, from Zorritos (4°30’ S) in Northern Peru to Chiloé (42°30’ S) in Southern Chile (Serra *et al.*, 1979). There are three different anchoveta (*Engraulis ringens*) stocks (Cahuin *et al.*, 2015):

1. the Northern-Central Peruvian stock, managed by Peru;
2. the Southern Peru/ Northern Chile stock, managed by both Peru and Chile, and,
3. the “Central-Southern Chile stock”, managed by Chile.

There is some evidence based on reproductive population parameters that two independent populations may exist in Central-Southern Chile (Canales and Leal, 2009), however it is more likely based on genetic and

other studies that there is only one stock (Ferrada *et al.*, 2002; Cahuinet *al.*, 2015). Chilean anchovy fisheries are divided into three management units;

- Regions XV- II
- Regions III and IV
- Regions V – X

This report refers to the Anchoveta Regions XV-II and III-IV.

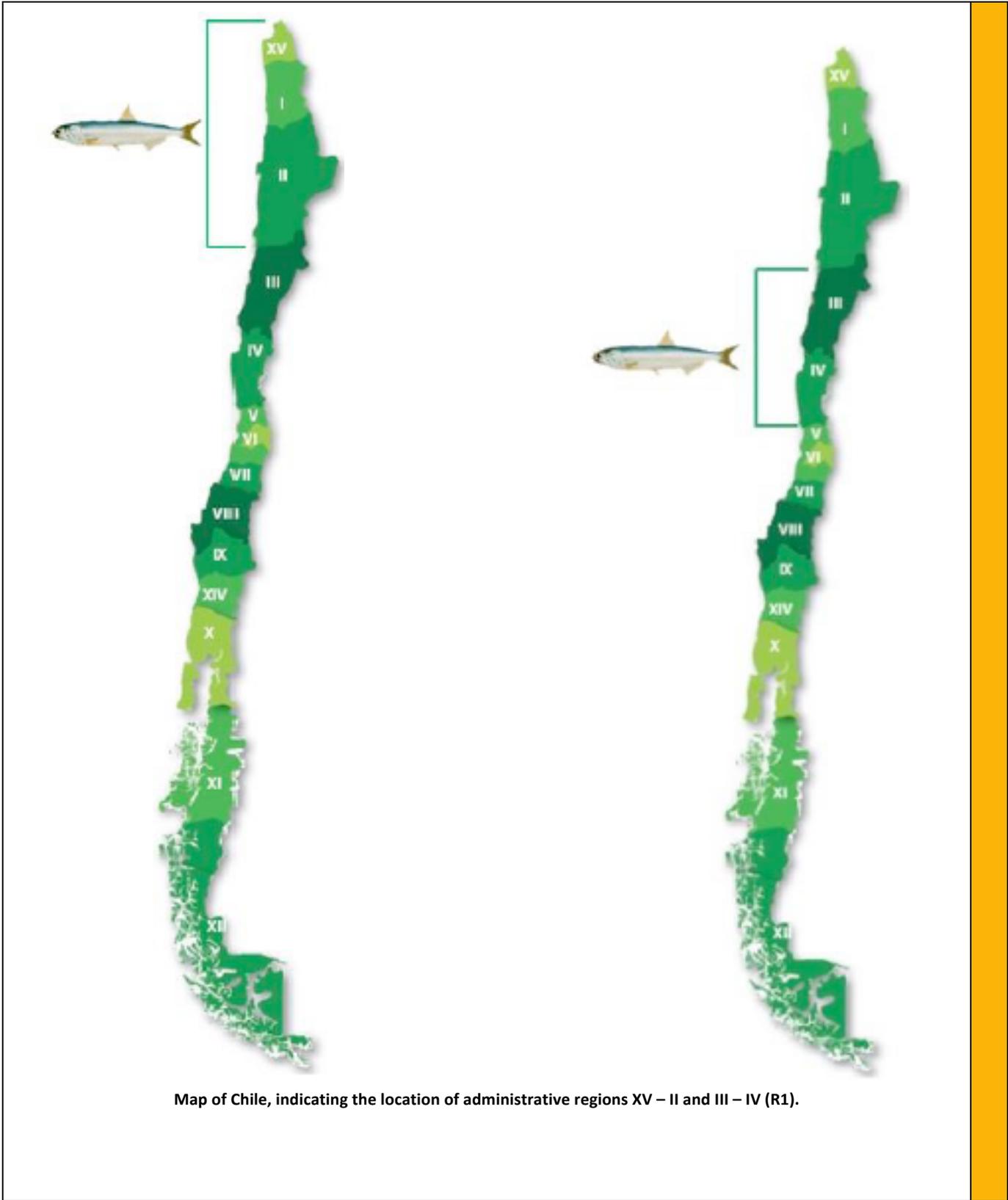
The Southern Peru/ Northern Chile stock which includes Chile regions XV-II is distributed along Chilean and Peruvian waters, but is managed separately by these countries. No specific management plans are known to be in place for this stock, although several management measures are already used in both countries, including TACs, closed season and minimum mesh sizes (CeDePesca, 2010). A joint Peruvian-Chilean assessment workshop bringing together Chile’s Fisheries Development Institute (IFOP) and the Peruvian Institute of the Sea (IMARPE) were held from 1982 to 2011 to evaluate both anchoveta and sardine, but are currently suspended. IFOP has continued to assess the stock, but without the most recent Peruvian survey and sampling data. Anchovy stock assessment is conducted separately for each fishery unit; XV-II Region fishery unit and III-IV Region fishery unit. Quotas are then issued at the Regional level.

There is a no discard policy in place for Chilean fisheries, meaning all by-catch is landed, but only target species appear to be sampled by SERNAPESCA.

There are limits on the percentages of bycatch allowed http://www.subpesca.cl/normativa/605/articles-86767_documento.pdf . Information on the species composition and volume of by-catch is now available for management and research organisations, allowing the ecosystem-wide impacts of fisheries from being factored into management regimes.

IFOP is the main organization that provides the necessary scientific support for the sector. Universities and technological institutions such as the School of Oceanographic and Natural Sciences at Universidad of Concepcion are also engaged independently or participate in public bidding to undertake research work ordered by the State on a case by case basis only. IFOP has a regionalized structure with research stations situated the length of Chile. IFOP also owns and operates an oceanic research vessel (the Abate Molina), and rents others as necessary to carry out basic work on population dynamics, population surveys, etc. Artisanal vessels are utilized in shallower waters closer to coast.

The management of the Regions XV-II and III-IV fishery as a separate population assumes minimal interaction between this and the other anchovy populations.



Map of Chile, indicating the location of administrative regions XV – II and III – IV (R1).

LEVEL OF COMPLIANCE

A3. Management actions should be based on long-term conservation objectives

LOW	Management actions are not based on long term management objectives.
MEDIUM	Management actions are based on long term management objectives. However the actions are not scientifically

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	formulated.	
HIGH	Management actions are based on long term management objectives, and actions are science based.	
<p>Determination: Management actions are based on long term management objectives, and actions are science based.</p> <p>Management actions generally aim at keeping spawning biomass at 60% of unfished levels to sustain the reproductive viability of the stock, according to SUBPESCA technical reports. Under the Chilean General Law for Fisheries and Aquaculture, “the provisions of the Act shall subject the preservation of aquatic resources, and all extractive fishing, aquaculture, research and sport activities, which takes place in inland waters, internal waters, territorial sea or exclusive economic zone of Chile in accordance to Chilean laws and its signed international treaties”. The Fisheries Research Fund under the Ministry of Economy is to finance research projects in aquaculture and fisheries, providing for the adoption of management measures of fisheries and aquaculture activities, which aim at the conservation of aquatic resources, considering both the biological and socio-economic aspects of fisheries.</p> <p>The updated fisheries Law 20.657 states that the purpose of the Act “is to foster the conservation and sustainable use of aquatic resources through the application of a precautionary approach, an ecosystem approach to fisheries regulation and the protection of marine ecosystems in the world those resources”. It also states that MSY is the objective to be taken into account when quotas are established.</p> <p>R1, R2</p>		H
B. STOCK ASSESSMENT PROCEDURES AND MANAGEMENT ADVICE		
LEVEL OF COMPLIANCE		
<i>B1. Research in support of fisheries conservation and management should exist.</i>		
LOW	Research to support the conservation and management of the stock, non-target species and physical environment does not exist	
MEDIUM	Research to support the conservation and the management of the stock, non-target species and physical environment exists, however research programmes could be significantly improved to decrease scientific advice uncertainty.	
HIGH	Research to support the conservation and the management of the stock, non-target species and physical environment exist, and existent research is considered most adequate for the long term conservation of the target, non-target and physical environment	
<p>Determination: Research to support the conservation and the management of the stocks exist, and existent research is considered adequate for long term conservation. However, research on the effects of the fishery on non-target species appears to be lacking. Additionally, greater transparency in the methodology used to calculate quotas and make broader management decisions would allow a more thorough assessment.</p> <p>REGIONS XV-I-II</p> <p>A statistical catch-at-age assessment model was replaced in 2010 by a statistical catch-at-size model, to better handle the uncertainty in age estimation. Differentiation by fleet addresses different size structures of catches. Data inputs to the model include commercial landings data including size sampling from both Chile and Peru, relative estimates of biomass and recruitment obtained from acoustic surveys and estimates from the Daily Egg Production Method (DEPM). Model outputs are provided on a six month scale to better represent the stock’s dynamics with two peak recruitment periods. The model has been improved in recent years but uncertainty remains around the age and growth parameters, which affects the estimates of abundance and reference points. In Chile, the Applied Research Center of the Sea (CIAM), a</p>		M

non-governmental institution, conducts regular surveys of eggs and larvae abundance of anchoveta, in order to identify intra-annual trends on the early life stages of the stock (Alegria and Diez, 2014a; 2014b; 2015a; 2015b).

The Undersecretary of Fisheries annually requests a report from IFOP on the "Status Research and Evaluation Operational Strategies and Spanish Sardine Anchovy XV, I and II Regions". This project utilises the information from several sources, including the above surveys, to make an indirect assessment of the stock in order to establish the resource assessment and recommend a total allowable catch (TAC).

REGIONS III & IV

Indirect stock assessment in 2013 was carried out with ADMB (Automatic Differentiation Model Builder), which input data includes: biological data (length-at-age composition data), CPUE indices (1986-2012), biomass direct indices from acoustic survey, Reclan (2006-2013) and landings data (1985-2013). Natural mortality (M) was defined at 1.3 (IFOP, 2013). Additional data is used, such as: a separate hydroacoustic survey to assess the stock's recruitment within the first 20 nm off the coast, carried out in February of each year since 2006 (IFOP, 2010; Subpesca, 2011) and SSB estimates from 'Daily Egg Production Method' (DEPM). Last survey was conducted between August and September 2014, during the period of greatest reproductive activity (CCT-PP, 2014). Thus, the model utilises estimates of stock biomass (total biomass, spawning stock and recruits), together with the levels of fishing mortality and exploitation rates, among other indicators.

Research visibility

The original IFOP advice to SUBPESCA was not available for review by the assessment team, and so in section D1, comparisons between scientific recommendations and final quotas are based on the SUBPESCA reports. While greater transparency in the process of converting IFOP reports into SUBPESCA reports would be useful, the SUBPESCA reports contain sufficient technical detail to convince the assessment team that they are equivalent to the original conclusions.

R3- R12

LEVEL OF COMPLIANCE	
<i>B2. Best scientific evidence available should be taken into account when designing conservation and management measures.</i>	
LOW	Scientific advice is not taken into account when designing conservation and management measures.
MEDIUM	Scientific advice is taken into account, when designing conservation and management measures. However some areas of discrepancy are identified that could have a significant impact in the long term conservation of the marine environment.
HIGH	Scientific advice is taken into account, when designing conservation and management measures, in a comprehensive manner.

Determination: Since 2013, there has been a legal requirement for SUBPESCA's technical recommendations (including TAC) to be adopted. However, as the original IFOP advice is not available to the assessment team, it is not possible to determine how fully these recommendations reflect the original scientific advice.

The main scientific advice for the fishery is the recommendation for the annual TAC, which is given in three stages each year. A pre-season recommendation is followed by an initial in-season recommendation, which makes use of landings data and a February survey. A third, final recommendation is made after a second survey is conducted in June; the results of the two surveys are also used to produce the pre-season TAC

estimate for the following year. These three TAC recommendations are made by IFOP to SUBPESCA, and do not appear to be made publically available. SUBPESCA then passes on its own recommendations, which are publically available, to the CNP and SERNAPESCA.

The new Fisheries and Aquaculture law (Law N° 20.657, SUBPESCA, 2013b) created Scientific-Technical Committees ('Comités Científicos e Técnicos', CCT) (formed by scientists from several institutions and SUBPESCA's representatives) for the major fisheries groups in Chilean waters. The Scientific Technical Committee for the Small Pelagics Fisheries (Comité Científico Técnico de Pesquerías de Pequeños Pelágicos, CCT-PP) meets regularly and, after analyzing IFOP's update on stock status and catch projections, makes its own recommendations to SUBPESCA, which consists on an advised TAC range with a lower limit of 20% of the actual TAC recommendation. The update to the LGPA made it mandatory for the management recommendations of SUBPESCA's scientific/technical advisory boards to be adopted by fishery managers, including with regards to the setting of quotas. However, examples of the recommendations of the scientific/technical boards were not available to the assessment team and it is not clear whether this component of the law has yet been applied in practice. Although final TACs do reflect the SUBPESCA recommendations, it is not clear the extent to which they reflect the original IFOP advice.

The LGPA also states that quotas should be established using MSY as the primary technical parameter.

Regions III - IV

For 2015, based on IFOP's 2014 stock assessment (which is not publicly available), the CCT-PP has recommended a TAC between 24,000 and 30,000 tons (CCT-PP, 2014), considering a medium level recruitment and a 30% risk not to achieve the management objective.

Regions XV – II

As IFOP's assessment is based on the stock as a whole, it is assumed that these advised catches should be portioned between Chile and Peru. For 2015, IFOP advice is not publicly available. According with CCT-PP report, the range for the quota was calculated between 506,400 and 633,000 tons, but the recommended quota was defined at 633,000 tons (CCT-PP, 2014). This recommendation was based on the projection for the second semester of 2013, considering low level of recruitment and a risk level of 30% of not achieve the management objective. The Technical Scientific Committee also recommends a new re-assessment during 2015 based on new data available (CCT-PP, 2014).

R13

C. THE PRECAUTIONARY APPROACH

LEVEL OF COMPLIANCE

C1. The precautionary approach is applied in the formulation of management plans.

LOW	The precautionary approach is not applied in the formulation of management plans.
MEDIUM	The precautionary approach is applied, however not all uncertainties are taken into account.
HIGH	The precautionary approach is applied, taking into account uncertainties relating to the dynamic of fish population (recruitment, mortality, growth and fecundity), and the impact of the fishing activities, such as discards and by-catch of non-target species as well as on the physical environment (Habitats).

Determination: The precautionary approach is applied in management plans for the target stock; however not all uncertainties are taken into account.

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The biological equilibrium reference point for both stocks has been set to prevent the spawning stock from decreasing to less than 60% of that which would exist in the absence of fishing. In other words, it means

that the stock should be exploited keeping at least 60% of the egg production in the long term (10-year period). In addition, given the different sources of uncertainty and high fluctuations due to environmental conditions, management measures aim to ensure that the risk of failing to reach the resource conservation objective in the long term should not exceed 10%

Regions III-IV

For 2014, the Limit Reference Point for spawning biomass was 73,000 tons (B20% SSB₀) and a precautionary lower limit of 219,000 tons (B60%SSB₀) is also considered. These values were calculated based on 2013 Spawning Stock Biomass (SSB) that represent 67% of the original Spawning Stock Biomass (SSB₀) (SUBPESCA, 2013a), resulting in a SSB₀ of 365,000 tons. The harvest target reference point, F60% was set at 0.52 in 2014.

Regions XV- II

The legal framework (LGPA N°20.657) requires that all stocks be managed to meet MSY. In Chile, two technical workshop recently analyzed and proposed biological reference points for this stock (CCPP, 2012; SUBPESCA, 2012a; CCT-PP, 2014). During the workshop undertaken in 2014, "Revisión de los PBR's en las Pesquerías Nacionales", with the participation of international experts, the biologic reference points were revised. The proxy for BMSY, 50%B₀ (B₀ = unfished spawning stock biomass) is proposed as the target biomass reference point, which correspond to 55%BDR (Spawning Biomass per Recruit). The limit biomass reference point was defined at Blim=25%B₀. The proxy for FMSY (F[~55%] BDR) was estimated as 0.66 (CCT-PP, 2014). In Peruvian waters, a target exploitation rate of 0.25, corresponding to a "moderate" level, is used to project TAC levels (IMARPE, 2013).

In both regions the stock assessment shows that the stocks are overexploited and overfished.

R14, R15

D. MANAGEMENT MEASURES

LEVEL OF COMPLIANCE

D1. The level of fishing permitted should be set according to management advice given by research organisations.

LOW	The level of fishing permitted is not set according to management advice given by research organisations.
MEDIUM	The level of fishing permitted is higher than management advice given by research organisations. However, the difference is not considered to have a significant impact of the sustainability of the stock
HIGH	The level of fishing permitted is set according to management advice given by research organisations.

Determination: The level of fishing in 2015 has been set according to the advice of scientific organisations.

Once SUBPESCA receives IFOP's scientific reports, it writes its own technical report, summarising the status of the fishery and issuing its own TAC recommendation to the National Fisheries Council, along with a recommendation for the distribution of the quota. SUBPESCA's reports, along with economic and social considerations, are discussed by the National Fisheries Council, where a final decision is made regarding the quota level and its distribution. Finally, the Minister of Economy, Development and Reconstruction proceeds to sign the TACs for each fishery unit and its distribution, in accordance with the Fisheries and Aquaculture Law. The TAC for the anchovy fishery is split to accommodate commercial and research purposes, and the commercial share is subdivided to accommodate the industrial and artisanal sectors. TACs are then allocated in several periods throughout the fishing season taking into account the

seasonality of the catch.

The TACs allocated to the two management areas in 2013 were set according to SUBPESCA advice. Along with final landings, TACs were:

- Regions XV, I, II: 800,000t (Landings 714,975t)
- Regions III, IV: 60,000t (Landings 34,653t)

The allocated TACs for 2014 were as follows:

- Regions XV, I, II: 751,000t.
- Regions III, IV: 52,700t.

For 2015:

- Regions III-IV

Based on IFOP’s 2014 stock assessment (which is not publicly available), the CCT-PP has recommended a TAC between 24,000 and 30,000 tons (CCT-PP, 2014), considering a medium level recruitment and a 30% risk not to achieve the management objective. The set TAC is 30,000 tons.

- Regions XV- II

The TAC was set at 620,225 tons below the advice from the CCT-PP (633,000 tons) (SUBPESCA, 2014; CCT-PP,2014)

LEVEL OF COMPLIANCE	
<i>D2. Where excess fishing capacity exist, mechanisms should be in established to reduced capacity to allow for the recovery of the stock to sustainable levels.</i>	
LOW	Mechanisms to allow for recovery of the stock to sustainable levels are not established.
MEDIUM	Mechanisms to allow for recovery of the stock to sustainable levels are somehow established. However there is no evidence of the efficiency of the methods used.
HIGH	Mechanisms are established to reduce capacity to allow for the recovery of the stock to sustainable levels and there are evidences of recovery.

Determination: Mechanisms are established to reduce capacity to allow for the recovery of the stock to sustainable levels and there are evidences of capacity reduction.

In 1985, the high demand for fishing permits to work in pelagic fisheries forced SUBPESCA to regulate access to the fisheries, freeze the size of the fleet and the related fishing power and refuse new permits. All pelagic fisheries were declared to be fully exploited a definition that had not been used before in Chilean fisheries. In 2001 a new management scheme named Maximum Catch Limit per Firm (MCLF) was established, which is applicable to fully exploited fisheries. With the application of the MCLF management system, a high proportion of the most important Chilean fisheries became subject to a form of Individual Transferable Quota (ITQ) system. In this, whenever a firm wants to sell a part of its fishing quota, that share is linked to the corresponding vessels and their respective licenses. The MCLF regime has caused a major reduction in fishing capacity in all regulated fisheries (without State intervention) and has increased the profitability of the industrial sector.

Artisanal fishers are registered on the National Registry for Artisanal Fishermen (NRAF) in the particular area they live. This program serves to control their number per Regional Area. Artisanal fishers are allocated exclusive fishing rights in the first five miles contiguous to the coastline and only under exceptional and regulated conditions can industrial fishing be authorized in these areas.

LEVEL OF COMPLIANCE	
<i>D3. Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species</i>	

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<i>and the physical environment.</i>		
LOW	There are no management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment.	
MEDIUM	There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. However it is not science based.	
HIGH	There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. Measures are based on scientific information.	
<p><i>Determination: Some management measures are in place to minimise the impacts of the fishery on non-target species, but on the whole there is limited available evidence to determine the extent of these impacts. In particular, there is a lack of data on bycatch, including bycatch of PET species.</i></p> <p>Non-target species</p> <p>No recent data on other non-targeted species for this fishery could be found – bycatch information is not systematically collected. Species and maximum limits of bycatch species (by proportion) are defined per target species and gear type for artisanal fleets operating in the different regions (MEFT, 2015b).</p> <p>In the III-IV Regions, the Anchoveta and Pacific sardine <i>Sardinops sagax</i> constitutes a mixed fishery. However, Pacific sardine stock is collapsed for the last 10 years, what is related to environmental and biological adverse conditions for this species. Landings in 2014 for all Chilean regions were only 145 tons.</p> <p>In the I-IV Region industrial pelagic fishery, the 2006 landing composition (770,000 tonnes) showed a higher incidence of anchovy (58%), followed by jack mackerel (<i>Trachurus murphyi</i>; 26%), chub mackerel (<i>Scomber japonicus</i>; 16%) and other incidental resources such as mote sculpin (<i>Normanichthys crockeri</i>), Peruvian silverside (<i>Odontesthes regia</i>) or Pacific sardine (<i>Sardinops sagax</i>). Anchovy-jack mackerel mixed catches may be frequently found in this fishery.</p> <p>In the I-IV Region artisanal pelagic fishery, 2006 landings (240,000 tonnes) showed a greater presence of anchovy (67%), mote sculpin (13%), jack mackerel and chub mackerel (9% each), with a marginal incidence of jumbo flying squid (<i>Dosidicus gigas</i>), Pacific menhaden (<i>Ethmidium maculatum</i>) or palm ruff (<i>Seriolaella violacea</i>).</p> <p>In the III-IV Region, up to 30% of anchovy is allowed per fishing trip in the purse seine industrial fishery targeting Jack mackerel, with a 1000-tonnes maximum limit per year.</p> <p>Ecosystems</p> <p>The availability of sardine and anchoveta as a prey is considered to be one of the major threats to Humboldt Penguin. Chile has implemented five marine reserves, with the objective of conserving natural banks of scallop, oyster and mussel, but also dolphins and penguins. Additionally, the introduction of the five-mile artisanal-exclusive zone near the shoreline has provided significant protection to spawners and other shallow-water organisms from industrial fishing activities.</p> <p>ETP species</p> <p>The incidence of dolphins in catches is considered to be minimal, with the majority of marine mammal interactions involving sea lions (which are not categorised as at risk by the IUCN). Seabirds also interact with the fishery, including the kelp gull, Peruvian pelican and Franklin’s gull (all either Least Concern or Near Threatened). Overall there is limited evidence available on the extent to which these species, and other ETP species, are impacted by the fishery.</p>		M

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Physical environment		
The impact of purse seine nets on the physical and biological environment of the sea floor is considered minimal, as nets are generally used at depths considerably greater than their size.		
R16		
E. IMPLEMENTATION		
LEVEL OF COMPLIANCE		
<i>E1. There should be a framework for sanctions of violation of Laws and regulations.</i>		
LOW	A framework for sanctions of violation of Laws and regulations do not efficiently exist.	
MEDIUM	A framework for sanctions of violation of Laws and regulations do exist but do not work efficiently.	
HIGH	A framework for sanctions of violation of Laws and regulations exists and is proven to be efficient.	
Determination: There is a framework allowing for the application of sanctions ranging from monetary fines to revocation of licence.		H
The LGPA defines a range of sanctions for offences including fishing with an unlicensed vessel, discarding, incorrect logbook use, failure to report landings, fishing in a region or fishery other than the one for which the vessel is licenced, and for industrial vessels which land more fish than they have quota for. Depending on the offence, sanctions can include one or a combination of monetary penalties dependant on tonnage; suspension of fishing licence; and revocation of licence entirely. Punitive proceedings are the responsibility of the regional SERNAPESCA director. In 2005, a national action plan was approved with the aim of preventing, deterring and eliminating IUU fishing. There is no evidence available to determine the level of success this plan enjoyed.		
LEVEL OF COMPLIANCE		
<i>E2. A management system for fisheries control and enforcement should be established.</i>		
LOW	A management system for fisheries control and enforcement is not established.	
MEDIUM	A management system for fisheries control and enforcement is established but do not work efficiently.	
HIGH	A management system for fisheries control and enforcement is established and work efficiently.	
Determination: There is evidence of a fisheries control and enforcement regime in place in Chile, but limited information to determine how effective this regime is.		M
The guiding instrument of fisheries management in Chile is the General Law on Fisheries and Aquaculture (LPGA). No. 18.892 of 1989 Act, as amended (Decree 430) plus other intermediate laws, regulated the activities of fisheries and aquaculture until February 9, 2013 when the new Law on Fisheries and Aquaculture No. 20,657, was published in the Official Journal amending the previous one in the field of sustainability of aquatic resources, access to industrial, craft and regulations for research and monitoring fishing activity.		
Enforcement of fisheries legislation is the responsibility of SERNAPESCA. Industrial vessels operate under mandatory VMS monitoring.		
Sernapesca;		
<ul style="list-style-type: none"> Carry out audits of capture fisheries and implement the surveillance and control of compliance with legal provisions relating to the fisheries. 		

- Health and environmental monitoring of aquaculture, surveillance. Developing strategies and procedures for prevention, surveillance and control of high-risk diseases.
- Information and sectoral statistics. Managing fisheries and aquaculture records.

Within the Exclusive Economic Zone the Chilean Navy also monitors an area covering approximately 4,542,990. Km2 ensuring the prevention of depredation of natural resources in an effort to protect the ecosystem from unauthorized activities.

R17

7. KEY STAKEHOLDERS

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