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# Public Certification Report

**Assessment against MSC Principles and Criteria for:  
PATAGONIAN SCALLOP BOTTOM OTTER TRAWL FISHERY  
IN ARGENTINE SEA  
(*Zygochlamys patagonica*)**

Certificate code: F-OIA-P-0101

**28<sup>th</sup> August, 2017**

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**CLIENTS:** *Glaciar Pesquera S.A. and Wanchese Argentina S.R.L.*



## PUBLIC CERTIFICATION REPORT (PCR)

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28<sup>th</sup> August 2017

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## Glossary.

CAB	Conformity Assessment Body
CAPECA	Cámara de Armadores de Pesqueros y Congeladores de la Argentina
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
CF	Conversion Factor
CFP	Consejo Federal Pesquero
CoC	Chain of Custody
CONICET	Consejo Nacional de Investigaciones Científicas y Técnicas
DNCP	Dirección Nacional de Coordinación Pesquera
ETP	Endangered, Threatened or Protected
FAO	Food and Agriculture Organization
FCRv2.0	Fisheries Certification Requirements v2.0
IIMyC	Instituto de Investigaciones Marinas y Costeras
INIDEP	Instituto Nacional de Investigación y Desarrollo Pesquero
IPI	Inseparable Practically Inseparable
ISBF	Introduced Species Based Fisheries
ITQs	Individual Transferable Quotas
NGO	Non-Governmental Organizations
OBOs	On Board Observers
PNA	Prefectura Naval Argentina
PSA	Productivity Susceptibility Analysis
RBF	Risk Based Framework
SAGPyA	Secretaría de Agricultura, Ganadería, Pesca y Alimentación
SENASA	Servicio Nacional de Sanidad y Calidad Agroalimentaria
SICA	Scale Intensity Consequence Analysis
SSPyA	Sub Secretaría de Pesca y Acuicultura
TAC	Total Allowable Catch
UoA	Unit of Assessment
UoC	Unit of Certification
VMS	Vessel Monitoring System

## 1. Executive summary.

This report provides an integrated view of the Patagonian scallop (*Zygochlamys patagonica*) bottom otter trawl fishery as a result from the Second Re-Certification Assessment, for the period 2017-2022.

The assessment addresses the following topics: target stock pursued (as nature, distribution and status of the stock, according management units); harvest strategy; by-catch and retained species considerations (as primary or secondary species), ETP species, habitats and ecosystems (environmental impact of fishing); management system of the UoA; and, many other variables which affect the sustainability of a fishery. These aspects are assessed against MSC Principles and Criteria for Sustainable Fishing.

In the Southwest Atlantic, the Patagonian scallop stock is distributed along the isobaths 100 m from Cabo de Hornos (56° S) to estuary of Río de la Plata (36°15' S), coinciding with the Front Slope, area characterised for its high productivity (Campodónico *et al.*, 2015a). The scallop fishery is divided in areas denominated "Management Units (MUs)". The fleet is composed by four vessels that have fishing permit and are included in the General System of Individual Transferable Quotas (ITQs) (CFP Resolution N° 8/2016).

In 1999, Secretaría de Agricultura, Ganadería, Pesca y Alimentación (SAGPyA) established a fishery management plan. Since 2001, this plan has been adjusted and includes: specific objectives for the fishery, harvest strategy and harvest control rules (CFP Resolution N° 4/2008 and N° 9/2016). The Total Allowable Catch (TAC) is set annually by Management Units.

The Patagonian scallop fishery has been certified two times as sustainable (against the MSC Principles and Criteria for Sustainable Fishing) in December 2006 and April 2012, and since then, four annual surveillance audits were conducted (periods 2007-2011 and 2013-2016), where new available information was reviewed and all conditions and milestones were met.

Based on the performance of this fishery during those periods, the client group requested to go ahead with a second re-certification assessment process.

Taking into account the last Public Certification Report, all surveillance reports, outcomes and evaluate progress against certification conditions, OIA decided to proceed with the second re-assessment, which started on April 2016. A series of announcements were posted on the MSC website, reporting all stages being undertaken.

For this process, the assessment team proposed is composed by: Dr. Enrique Morsan (Team Leader and expert on Principles 1 and 2) and Lic. Gabriel Sesar (expert on Principle 3). Additionally, Eng. Carolina Medina Foucher and María Laura Laco have provided technical support in regards to MSC Fisheries Certification Requirements. All assessment steps were followed, as the proper 'Stakeholder Notification: Fishery enters full assessments' and the 'Assessment Timeline' were released at the beginning –including the site visit information–, followed by the proposal and subsequent confirmation of the assessment team, proposal and subsequent confirmation of the assessment tree –the use of RBF was not required–; proposal and subsequent confirmation of peer reviewers as required in MSC Fisheries Certification Requirements v2.0.

One of the main steps when assessing a fishery against MSC Principles and Criteria for Sustainable Fishing is stakeholder consultation and information collection, in order for the assessment team to gather all relevant information and become aware of any potential issues. The site visit was performed on May 26<sup>th</sup> and 27<sup>th</sup>, 2016, and all stakeholders with experience and knowledge about the fishery were invited and encouraged to participate in the meetings.

After the site visit, the team discussed and analyzed all data, as well as the technical, written and anecdotal resources collected during the visit; and according to their judgment and expertise, agreed on a final score in line with the MSC Requirements. As the period from the assessment announcement to the receipt of the Public Comment Draft Report by MSC has been exceeded 9 months, OIA invited stakeholders to provide during 30 days any new information relating the fishery that the team should consider in the assessment.

The re-assessment has considered all available information, including relevant scientific and technical literature about scallops and other relating species and fisheries, relevant Federal and Provincial legislation and regulations pertinent to this fishery and all information provided by stakeholders, according to the requirements of MSC Principles and Criteria for Sustainable Fisheries. Based on the analysis of such information, suiting the parameters of the assessment tree, the assessment team scored performance indicators using the default assessment methodology.

Since the first re-certification process, there are no other companies identified catching scallops in the management units. Two companies are part of Unit of Certification (the same Unit of Assessment): Glaciar Pesquera S.A. and Wanchese Argentina S.R.L. The strengths and weaknesses of the fishery, in relation to the Principles and Criteria of the MSC are presented, key stakeholders identified, assessment process discussed, and appendices relevant to material, are all presented on this report and all literature consulted by the assessment team listed.

As this fishery is certified since 2006, several assessment processes have been carried out and information provided by client group and stakeholders has strengthened the performance indicators due action plans performed. As consequence, in this second re-certification, the assessment team does not suggest any conditions.

On the other hand, the main weakness is the limited accessibility of catch information per management unit. Data collected is processed and analyzed by different entities (*i.e.* INIDEP, SSPyA and CFP) to obtain information related to their specific objectives. If there is a difficulty in understanding the operation of the fishery, due TACs are established by management units and landing catches are provided as total, unifying all fishing areas, the results do not harm the management system, due management authorities constantly monitor the MUs to control the achievement of TAC established.

As a result, the general scores for each Principle are:

Principle	Score	Result
P1 – Target species	<b>85.8</b>	<b>Pass</b>
P2 – Ecosystem	<b>87.0</b>	<b>Pass</b>
P3 – Management system	<b>93.8</b>	<b>Pass</b>

The minimal pass mark is 80 in each principle. Therefore, the assessment team recommends that the fishery should be certified according to the MSC Principles and Criteria for Sustainable Fisheries.

There are no performance indicators that do not reach 80, so no condition has been raised that will require achievement within specified time periods in line with MSC requirements.

This Public Certification Report includes scores and weightings, stakeholder submissions, peer review and objection processes and determination.

The fishery achieved a score of 80 or more in all MSC Principles and did not score less than 60 in any performance indicator. Following the recommendation of assessment team and reviewing stakeholder and peer reviewer comments, OIA's decision making entity concluded that the fishery has passed the re-assessment and determined its intention to re-certify without condition as sustainable against the MSC standard.

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## 2. Authorship and peer reviewers.

### a. Names, qualifications and affiliations of team members

#### **Dr. Enrique Morsan – Team Leader and responsible for Principle 1 and 2**

Dr. Morsan is professor of Fishery Biology, Oceanography and professional researcher member of Directive Council in Instituto de Biología Marina y Pesquera “Almirante Storni” of Universidad Nacional del Comahue. He has 28 years of experience in marine biology, populations dynamics of marine invertebrates, assessment and managements of fishery resources. Dr. Morsan has participated in various MSC assessment processes of fisheries as Southern Red King Crab (*Lithodes santolla*), Mullet (*Mugil platanus*), Patagonian scallop (*Zygochlamys patagonica*) and Argentine Patagonian toothfish (*Dissostichus eleginoides*), and has had training in the use of the Risk Based Framework (RBF).

OIA has verified that Dr. Morsan meets the fishery team leader qualifications and competency criteria specified in Annex PC1 of FCRv2.0, in particular:

- has a university degree (Ph. D.) in biology;
- has over 5 years’ experience in the fisheries sector related to the tasks under his responsibility;
- has passed MSC team leader training, meets the competencies specified in section 2 of Table PC1;
- has undertaken 2 MSC fishery assessment or surveillance visits as a team member in the last 5 years; has the experience in applying knowledge of auditing techniques in the gathering of information, the scoring of the fishery and the rationales of the score given.
- has the experience in applying different types of interviewing and facilitation techniques; and the ability to effectively communicate with the client and other stakeholders.

Furthermore, Dr. Morsan has the qualifications and competencies required for serving as an expert on: fishery stock assessment, fish stock biology/ecology, fishing impacts on aquatic ecosystems, current knowledge of the country, language and local fishery context, understanding of the CoC Standard and Certification Requirements.

Dr. Morsan has no conflicts of interest in relation to the Patagonian scallop fishery.

#### **Lic. Gabriel Sesar - Responsible for Principle 3**

Lic. Sesar has a degree in economics sciences and has been a Consultant in many Argentinean fishery management projects. He has 29 years in fishery managements and operations. He has served as team member in Argentine anchovy (*Engraulis anchoita*), Bonaerense stock, and Argentine hoki (*Macruronus magellanicus*) surveillance processes against Principles and Criteria of the MSC.

OIA has verified that Lic. Sesar meets the fishery team member qualifications and competency criteria specified in Annex PC2 of FCRv2.0, in particular:

- has a university degree in economic science;
- has over 5 years’ experience in the fisheries sector related to the tasks under his responsibility;
- has passed MSC fishery team member training, meets the competencies specified in section 2 of Table PC2;
- has undertaken more than 2 MSC surveillance visits as a team member in the last 5 years;



Furthermore, Lic. Sesar has the qualifications and competencies required for serving as an expert on: fishery management and operations, current knowledge of the country, language and local fishery context, and understanding of the CoC Standard and CoC Certification Requirements.

Lic. Sesar has no conflicts of interest in relation to the Patagonian scallop fishery.

**b. Names of peer reviewers**

**Mr. Ian Scott**

Mr. Scott is an independent fisheries consultant specialized in project management, project planning and evaluation, sustainability certification, fisheries policy and management, including market, economic and financial appraisals, with over 30 years of experience. In recent years, he has advised Mexico and Morocco fisheries and has been team member in many MSC fishery assessments such as Lake Waterhen, NFDL snowcrab, Louisiana blue crab and Chilean crustacean fisheries. Ian has participated as lead auditor and P3 specialist on assessments of Portuguese sardine, Canadian sablefish, Scotia Fund y haddock, BC dogfish, Mexican skipjack and yellowfin, U.S. dogfish, Maldives skipjack, Maldives Yellowfin, Chilean hake, Lake Waterhen Walleye and Northern Pike, Lake Erie Commercial Fisheries. He has completed a large number of pre-assessments in Ecuador, Mexico, the USA, Canada, Portugal, Greenland and Spain. He is an MSC certified Lead Auditor and Chain of Custody Auditor, and is trained in the use of RBF. He was a key member of the MSC field trial RBF evaluation team for Peruvian and Ecuadorian mahi mahi. He used the RBF in the BC dogfish assessment, the Maldives assessments, Lake Waterhen and Lake Erie.

OIA verified that Mr. Scott meets the fishery member qualifications and competency criteria specified in Annex PC2 of FCRv2.0, in particular:

- has a university degree (BA and MA) in economic sciences and has over 5 years' experience in the fisheries sector related to the tasks under his responsibility;

- has knowledge of a common language spoken by clients and stakeholders, and more than two assignments in the region (Peru, Ecuador, Chile and Argentina) in which fishery under assessment is based in the last 10 years.

- Mr. Scott complies with fisheries management and operation qualifications.

- has knowledge on the different steps in the fisheries assessment process; scoring the assessment tree for each Performance Indicator; and, how conditions are set and monitored.

Ian has no conflicts of interest in relation to the Patagonian scallop fishery.

For more information, it is available Scott' CV in the MSC website.

**Mr. Italo Campodónico**

Mr. Campodónico is a marine biologist graduated from the Universidad de Chile with over 40 years of experience in marine resources and fisheries management. For 20 years, he has worked as a full-time researcher at Instituto de la Patagonia and Universidad de Magallanes. Former head of Chile's Departamento de Pesquerías de Subpesca. For many years, he was Chile's representative to the oceans and fisheries related Working Group of APEC as well as the head of the Chilean scientific delegation to the South Pacific Regional Fisheries Management Organization. He is the author of many scientific (crustacean and fish biology, phytoplankton and toxic red tides, oil pollution) as well as technical reports in the field of marine commercial fisheries. Currently he is an independent fisheries consultant working in fisheries certification under MSC Standard. In this position, Mr. Campodónico has served as team member in Chilean anchovy (northern stock) and Antarctic krill pre-assessments; as peer reviewer of the Argentine anchovy (northern stock) and Chilean squat lobsters; as well as team member in the fourth annual audit of the Argentine hoki.

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OIA verified that Mr. Campodónico meets the fishery member qualifications and competency criteria specified in Annex PC2 of FCRv2.0, in particular:

- has a university degree in marine biology and has over 5 years' experience in the fisheries sector related to the tacks under his responsibility;

- has knowledge of a common language spoken by clients and stakeholders, and more than two assignments in the region (Peru, Chile and Argentina) in which fishery under assessment is based in the last 10 years.

- Campodónico complies with fish stock assessment, fish stock biology/ecology and fishing impacts on aquatics ecosystems qualifications.

- has knowledge on the different steps in the fisheries assessment process; scoring the assessment tree for each Performance Indicator; and, how conditions are set and monitored.

Italo has no conflicts of interest in relation to the Patagonian scallop fishery.

For more information, it is available Campodónico' CV in the MSC website.

### 3. Description of the fishery.

#### 3.1 Unit(s) of Assessment (UoA) and scope of certification sought

The Patagonian scallop bottom otter trawl fishery in Argentine Sea under Re-Assessment Process meets the scope requirements (FCR 7.4) for MSC fishery assessment (FCR 7.8.3.1), and so, is eligible for certification through the following determination:

- The Patagonian scallop bottom otter trawl fishery does not target amphibians, birds, reptiles or mammals.
- The Patagonian scallop bottom otter trawl fishery does not use poison neither explosives, nor any other destructive fishing practices.
- The Patagonian scallop bottom otter trawl fishery does not operate under a controversial unilateral exemption to an international agreement.
- The Patagonian scallop bottom otter trawl fishery is not overwhelmed by dispute, and there is a mechanism for resolving disputes.
- The Patagonian scallop bottom otter trawl fishery is wild capture, and is not based on any introduced species or enhancement.
- No IPI stocks are caught in the Patagonian scallop bottom otter trawl fishery.
- At the moment, there is no overlap with other MSC Certified or applicant fishery.
- The Patagonian scallop bottom otter trawl fishery does not include an entity that has been successfully prosecuted for violation against forced labour laws.

The Patagonian scallop bottom otter trawl fishery in Argentine Sea has been assessed as sustainable (against MSC Principles and Criteria for Sustainable Fishing) in December 2006 and re-certified in April 2012.

Four annual surveillances were conducted (from 2013 to 2016), where new available information was reviewed in order to assess if all conditions and milestones were met.

Taking into account the previous Public Certification Report, all surveillance reports, outcomes and evaluating progress against certification conditions, it was decided to proceed with the second re-assessment process.

#### 3.1.1 UoA and proposed Unit of Certification (UoC)

The Unit of Assessment (UoA) is defined as the specific aspect of the fishery, OIA and its expert team assesses during the MSC fishery assessment. The UoA is set at the beginning of the assessment; anything outside this unit is not eligible to enter the certification at a later date, unless a certificate expansion is completed at that time.

The UoA was chosen as encompass with the client's assessment requirements. As it stands, only 4 bottom otter trawl vessels have permission to catch scallop and are covered by the certificate. As it was mentioned before, there are no other companies fishing scallops in the established management units by CFP. All vessels are relatively homogenous insofar as their technical characteristics are concerned. This fishery is based on ITQ system, where only vessels that are under this management measure can access to harvest scallops in Management Units.

For this fishery the UoC is equal to UoA, due there are no other eligible fishers in the ITQ system for scallop fishery. So, the fishery is completely certified as MSC Sustainable Fishing.

The CAB reviewed the data available and concluded that the UoA is adapted and consistent with MSC Principles. The UoA for the Patagonian scallop bottom otter trawl fishery is defined below:

- Target species: Patagonian scallop (*Zygochlamys patagonica*)
- Stock: Argentinean stock. From Tierra del Fuego to Bahía Samborombón (Buenos Aires Province). Banks are mainly concentrated between 39°30' S and 42°30' S at depths of 80 to 120 m, influenced by the front of the slope, continental platform and Malvinas Current.
- Fishing area: The fishery occurs in the Management Units (Figure 1), established by CFP Resolution N° 5/2014.
- Fishing method: Bottom otter trawl.
- Fleet: Argentine bottom otter trawlers.
- Management system: The Patagonian scallop fishery is managed by Consejo Federal Pesquero. The management system is based by resolutions published in enforcement authority website.
- Client group: It is composed by the following companies: Glaciar Pesquera S.A. and Wanchese Argentina S.R.L.
- Other eligible fishers: By resolution, there are no other vessels harvesting Patagonian scallop:

Vessel	Fleet	Company
(MN 2030) Atlantic Surf III	Bottom otter trawler	Glaciar Pesquera S.A.
(MN 2929) Capesante	Bottom otter trawler	
(MN 0537) Erin Bruce	Bottom otter trawler	Wanchese Argentina S.R.L.
(MN 2439) Miss Tide	Bottom otter trawler	

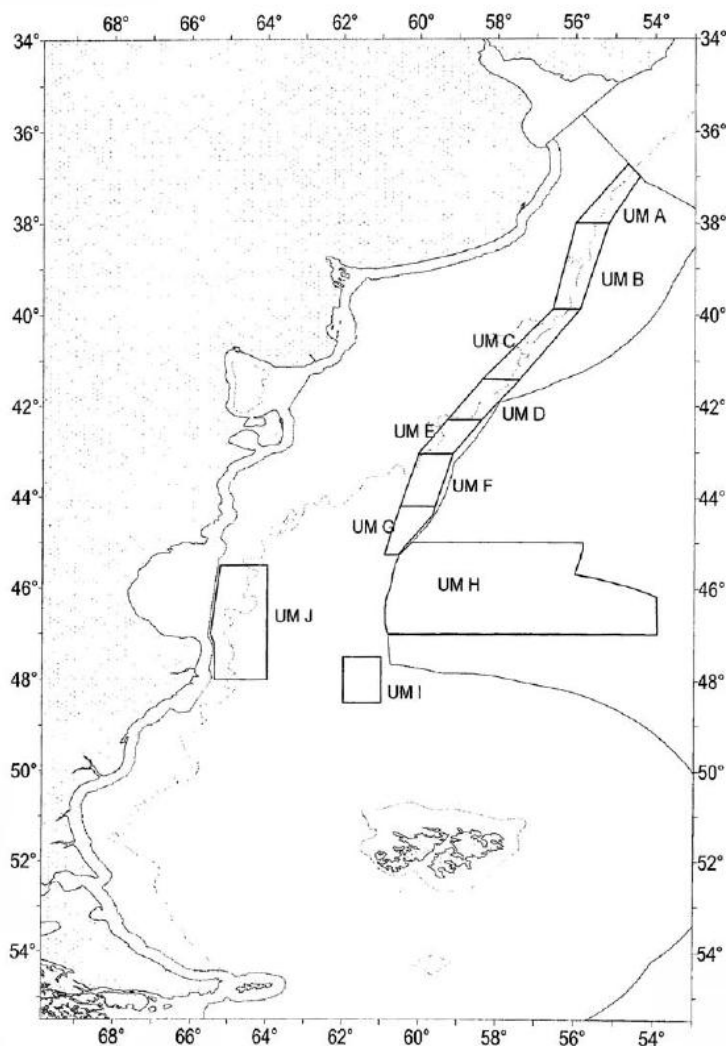


Fig. 1. Management Units (MUs) areas for Patagonian scallop fishery (Source: CFP Resolution N° 5/2014).

Table 1. Location of Management Units areas for 2016.

Management Unit (MU)	Latitude	Longitude
A	36°43'00	54°42'00
	36°59'00	54°23'00
	38°00'00	55°10'00
	38°00'00	56°00'00
B	38°00'00	56°00'00
	38°00'00	55°10'00
	39°53'00	55°54'00
	39°53'00	56°35'00
C	39°53'00	56°35'00
	39°53'00	55°54'00
	41°25'00	57°26'00
	41°25'00	58°23'00
D	41°25'00	58°23'00
	41°25'00	57°26'00
	42°18'00	58°24'00

	42°18'00	59°18'00
E	42°18'00	59°18'00
	42°18'00	58°24'00
	43°02'00	59°09'00
	43°02'00	60°03'00
	43°02'00	60°03'00
F	43°02'00	59°09'00
	44°12'00	59°36'00
	44°12'00	60°31'00
	44°12'00	60°31'00
G	44°12'00	59°36'00
	44°23'00	59°39'00
	44°54'00	60°11'00
	45°15'00	60°34'00
	45°15'00	60°55'00
H	East of line 200 mn counted from the baseline to the outside edge of continental margin between 45° and 47° S	
I	47°30'00	61°00'00
	48°30'00	61°00'00
	48°30'00	62°00'00
	47°30'00	62°00'00
J	48°00'00	64°00'00
	48°00'00	65°23'00
	47°15'00	65°23'00
	47°00'00	65°29'00
	45°30'00	65°14'00
	45°30'00	64°00'00

### 3.1.2 Final UoC(s)

<b>Species:</b>	Patagonian scallop <i>Zygochlamys patagonica</i>
<b>Stock:</b>	Argentinean stock
<b>Geographical area:</b>	Argentine Sea – FAO 41 (Figure 1)
<b>Harvest method:</b>	Bottom otter trawl net
<b>Client group:</b>	Glaciar Pesquera S.A. Wanchese Argentina S.A. At the moment, these companies are allowed to use the fishery certificate issued. Only scallop caught by those vessels linked with these companies identified by reference on a valid fishery certificate by OIA shall be eligible for chain of custody certification and subsequent use of the MSC ecolabel.
<b>Other eligible fishers:</b>	At the moment, there are no other eligible fishers identified that catch scallop in Argentine Sea.

### 3.1.3 Total allowable catch (TAC) and catch data

The following table represents the TAC and catch data of certified vessels which are currently covered by the Fishery Certificate (F-OIA-P-0101). Catch/TACs in t present the total scallop catches before processed on board.

Table 2. TAC and catch data of Patagonian scallop

TAC	Year	Amount (per management unit)	MU A : 2,500 t MU B : 19,753 t <sup>1*</sup> MU C : N/D <sup>3*</sup> MU D : 0 <sup>2*</sup>
	2016	(TACs were estimated by CFP in the following Resolutions: N° 10/2015; N° 14/2015; and N°	

		03/2016)		MU E: 6,239 t <sup>1*</sup> MU F: 24,573 t MU G: 2,648 t MU H: 2,500 t MU I: 1,000 t MU J: 1,000 t <b>TOTAL: 60,213 t</b>
UoA share of TAC	Year	2015	Amount	31,626.63 t
UoC share of total TAC	Year	2015	Amount	31,626.63 t
Total green weight catch by UoC	Year (most recent)	2016 (to 26/12/2016)	Amount	32,282.08 t
	Year (second most recent)	2015	Amount	31,626.63 t

<sup>1\*</sup> but closures are implemented for certain sub-areas of the MU (see CFP Resolution N° 10/2015)

<sup>2\*</sup> a full closure is suggested for the whole year 2016

<sup>3\*</sup> TAC for 2016 has not been defined for this area yet (and it was 3,000 t for 2015)

### 3.1.4 Scope of assessment in relation to enhanced fisheries

The assessed fishery is a wild catch fishery and does not correspond to the definition described by the MSC FCRv2.0. The Patagonian scallop bottom otter trawl fishery is not considered enhanced fishery.

### 3.1.5 Scope of assessment in relation to introduced species based Fisheries (ISBF)

The assessed fishery does not correspond to the definition described in the MSC FCRv2.0, so the Patagonian scallop bottom otter trawl fishery is not considered an introduced species based fisheries (ISBF).

## 3.2 Overview of the fishery

### 3.2.1 Background of the fishery

The Patagonian scallop is a bivalve mollusk that lives in depths of 40 and 20 m, whose distribution area includes from southern of Uruguay to Tierra del Fuego. While this sector is extended, the main concentrations ("banks") and more productive are located between 39°30' S and 42°30' S (from Buenos Aires Province to northern of Golfo San Jorge) at depths between 80 and 120 m).

In 1991, an exploratory fishing trip off Uruguay developed protocols for handling, processing and packaging the catch, and collecting data to assess stock status. The spatial distribution and composition of scallop stock off Uruguay were assessed during 1993 and 1994. In 1995, the Argentine government authorized F/V Erin Bruce to explore resource availability in the Argentine shelf. Data collected by onboard observers in the course of 15 trips confirmed the existence of dense grounds over a wide geographic area. By the end of 1995, the Argentine fisheries authority approved two fishery projects for the exploitation of Patagonian scallop by a fleet composed of four vessels, which have operated continuously since then (except between 1997 and 2001, when one vessel was removed from the fishery) (Soria *et al.*, 2016).

Landing volumes have varied greatly over the time series, derived from management measures and natural conditions (*e.g.* closed areas and peak of spawning biomass). Since 2009, landings have decreased. The volume of scallop landings in the Argentine Sea has been on a downward trend from over 11,000 t in 2009 to 4,400 t in 2015 (Figure 2). Landings correspond to weight of frozen scallop meat. Currently, whole scallop catches are estimated from the muscle (meat) production using a conversion coefficient of 7.14. The relation with the stock status is explained in section 3.3.c.

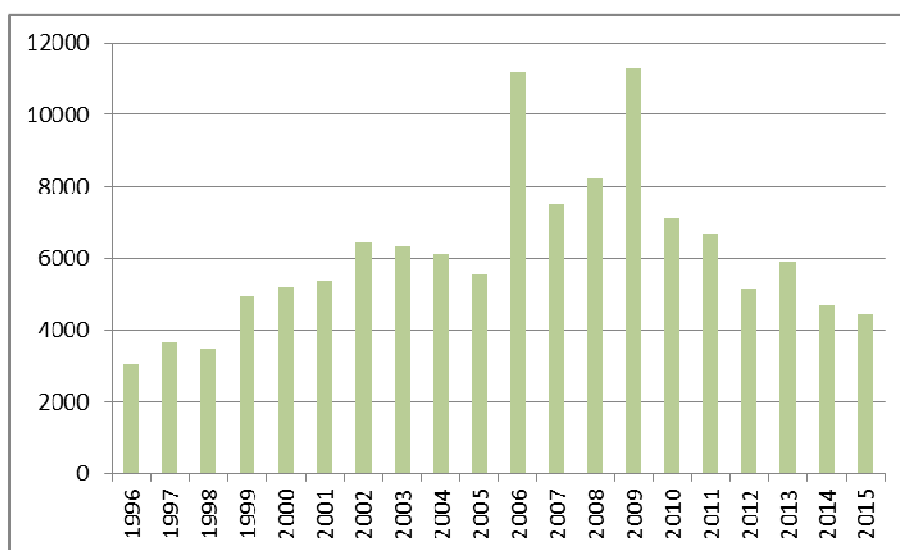


Fig. 2. Scallop meat landings (t) in the Argentine Sea from 1996 – 2015 (Source: Information provided by SSPyA).

In 1999, a fishery management plan was proposed (SAGPyA Disposition N° 17/99), recognizing two management units (MUs) that integrate different banks (Reclutas, MdQ, San Blas, SAO, SWSAO, Tango B and SW-Tango B). Both MUs are delimited by northern or southern of 39°30' S. Actually, according to CFP Resolution N° 15/2012, MUs are identified individually (from A to J, Table 1), including sub-areas where it is forbidden to catch using bottom otter trawl net (see Annex II of CFP Resolution N° 15/2012).

The fishing period is annual and CFP may establish temporary closed areas or subareas, according to INIDEP technical reports. Also, it was established a monitoring committee conformed by INIDEP staff, a representative of Dirección Nacional de Pesca y Acuicultura and companies. The purpose of the committee is to assess the stock status, catches, propose actions and identify measures that may arise in relation to stock exploitation by vessels.

The total allowable catch (TAC) is determined annually per management unit by CFP in accordance with INIDEP technical reports (Table 3). Each vessel has a fishing permit and must have available 20 days per year for research studies. Also, every one shall have an observer on board appointed by INIDEP at least in 50% of the total fishing trips. In case violating SAGPyA Disposition N° 17/99, sanctions shall be imparted in accordance with Federal Fishing Law N° 24.922.

Table 3. Annual TACs for Patagonian scallop and total catch of fleet (Source: Data provided by CFP and SSPyA).

Year	Total TAC (t) for MUs	CFP Resolutions N°	Catch (t)
2013	75,056	24/2012; 27/2012 and 15/2013	42,265.94
2014	57,309	17/2013; 01/2014; 02/2014 and 06/2014	33,583.70
2015	63,659	17/2014 and 19/2014	31,626.63
2016	60,213	10/2015; 14/2015; 01/2016 and 03/2016	32,282.08*

\*Data provided until 26/12/2016



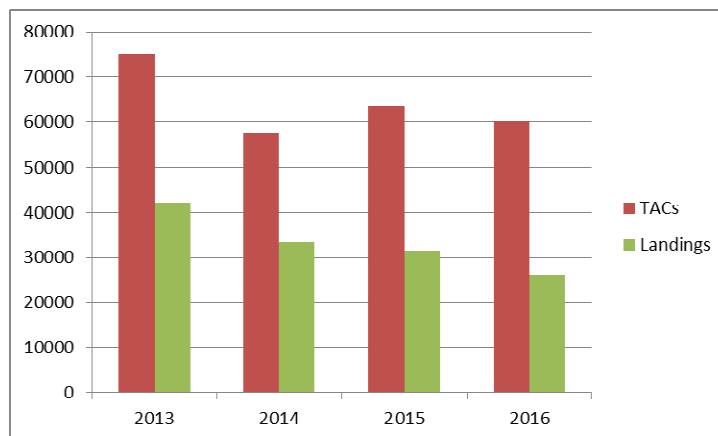


Fig. 3. Total TAC assigned versus scallop landings (Source: Information provided by SSPyA).

### 3.2.2 Fishing gear and method of the fishery

In the Argentine Sea, scallop is harvested using bottom otter trawl net (under assessment).

A bottom otter trawl is a cone-shaped net consisting of a body made from four panels of Euroline, closed by one cod-ends (mesh sizes: 50/52/55 mm bar) and with lateral wings extending forward from the opening. A bottom trawl is kept open horizontally by two otter boards (Figure 4). Nets (two, one per side) are 13 m long, with a mesh size of 10 cm and 15 m long head and foot rope. Estimated gear efficiency is 21-31% (Soria *et al.*, 2016).

Vessels tow a single trawl from the stern. Bottom trawls usually have an extended top panel (square) to prevent scallops from escaping upwards over the top of the net. The mouth of the trawl is framed by a headline with floats to open the trawl vertically and a ground gear, which is designed according to the bottom condition on the fishing ground so as to maximize the capture of targets living close to the bottom and at the same time protect the gear from damage and to facilitate movements across uneven bottom.

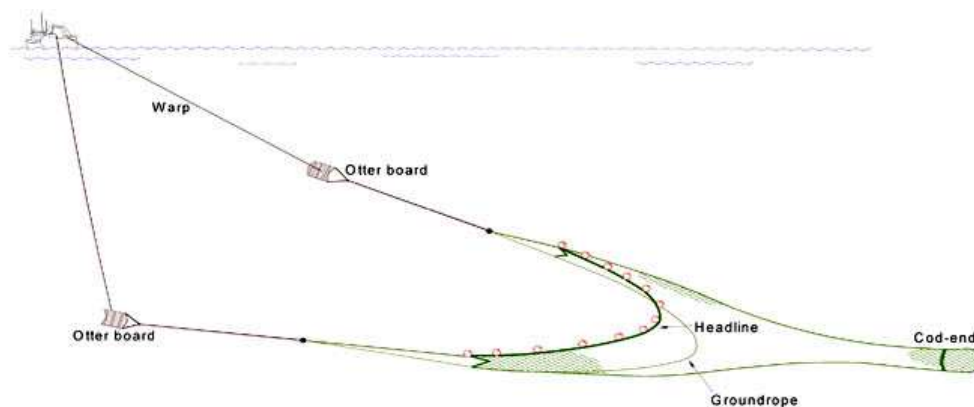


Fig. 4. Schematic representation of the deployment of bottom trawl net.

The trawl is designed and rigged to have bottom contact during fishing and is, depending on the bottom substrate, equipped with different kind of groundrope with the purpose of shielding lower leading margin of the trawl from ground damage whilst maintaining ground contact and easy move on the bottom.

### 3.2.3 Fishing area

As it is mentioned above, the Patagonian scallop bottom otter trawl fishery is carried out in the management units established by CFP from 39°30' S to 42°30' S at depths of 80 to 120 m (Figure 5). In the last year (2015), the fleet has been concentrated in the MUs D, E and F (Figure 6).

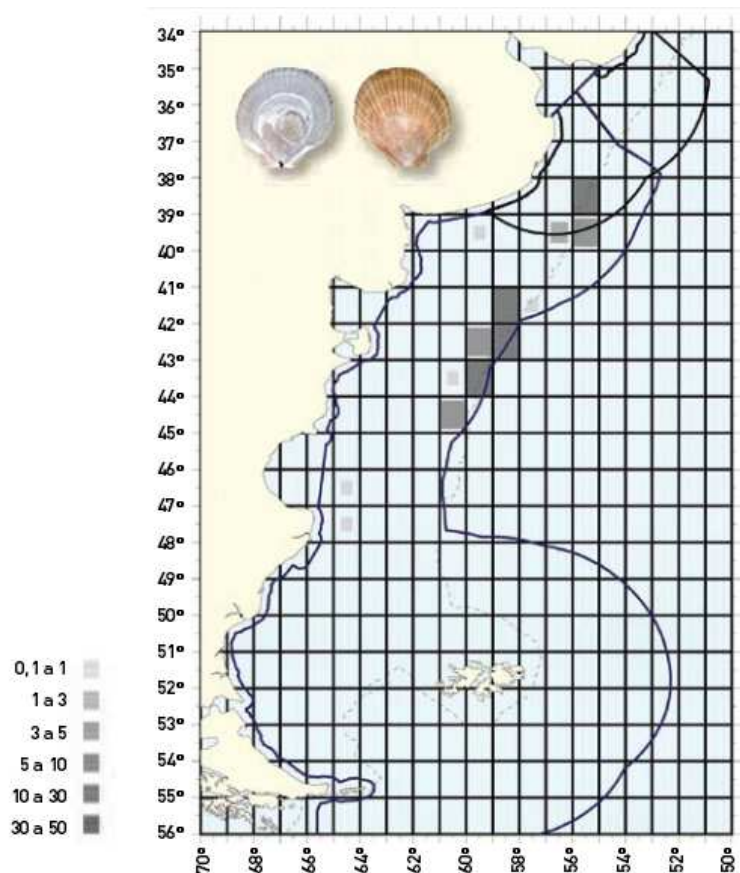


Fig. 5. Percentage incidence of each statistical rectangle on the total catch in the period 2000-2010.

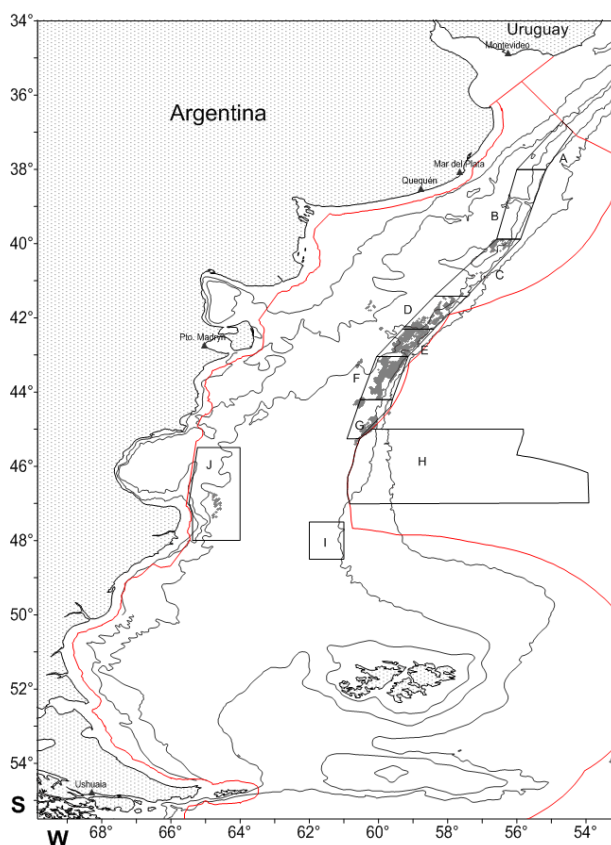


Fig. 6. In black is detailed the fishing effort by Patagonian scallop fleet in 2015 into unit of managements (Source: INIDEP).

### 3.2.4 Fleet

The scallop fishery is managed by catch allocation, so only 4 factory vessels (two fishing companies) are authorized to harvest scallops. The catch, composed of scallops, other benthic invertebrates, and shell hash, is mechanically processed on board. Bycatch and under-sized scallops are separated by drums and discarded, while commercial size scallop are processed, separated the adductor muscle, which is frozen, graded in plates and packed (Soria *et al.*, 2016).

Vessels work during 24 h per day throughout the year, completing 40-60 hauls per day, of an average duration of 13.95 min. Trawling velocity is 7.2 km/h. The entire fleet completes, on average 36 trips per year, of 20-50 days each, depending on fuel availability and storage capacity. Boats are equipped with non-selective bottom otter trawls directly attached to the doors (otter board).

Scallop meat is landed in Mar del Plata and Ushuaia Ports.

### 3.3 Principle one: target species background

#### a. Biology and ecology

The Patagonian scallop (*Zygochlamys patagonica*) is endemic to the Magellanic Biogeographic Province. It is distributed around southern South America, reaching 42° S on the Pacific and 35°50' S on the Atlantic. Recorded maximum shell height is around 90 mm and maximum estimated age is between 13 and 25 years depending on the site. Legal commercial size (55 mm) is reached at ages varying from 5 to 10 years over much of the latitudinal range, but in some areas scallops hardly

reach legal size. Generally, throughout the SW Atlantic shelf break the maximum age and size vary between beds.

Sex are separated, and sex ratio is 1:1 (Campodónico *et al.*, 2008). Sexual maturity is reached at about 36-45 mm (2-3 years). Across a broad latitudinal range (39°47' to 54°30' S) on the Atlantic, spawning takes place mainly during the spring, although a second pulse may occur in between late summer and early autumn.

Larval stages have a plankthrophic developmental mode (Schejter *et al.*, 2010); however, the duration of the larval period has not been documented yet. Size for settlement is around 0.2 mm (Waloszek, 1984). The main structure or settlement is one species of hydroid, which occurs around 100 m depth.

Patagonian scallop diet is composed of diatoms. Food contents is maximum during spring, followed by the bloom of phytoplankton (Schejter *et al.*, 2012).

The population structure corresponds to a metapopulation. A spraed population composed by disjunct components (grounds) with an asymmetric degree of larval connectivity. The location of scallop grounds is related to major and very different frontal systems (Bogazzi *et al.*, 2005; Mauna *et al.*, 2008).

Fronts are highly productive zones that may facilitate the retention of pelagic larvae. Therefore, contribute to the persistence of scallop populations and other benthic organisms, and increase food availability (Franco, 2013).

The front starts forming in early spring as a seasonal thermocline develops, and persists through autumn, when the water column becomes vertically homogeneous (Sabatini & Martos, 2002; Bogazzi *et al.*, 2005; Rivas & Pisoni, 2010). Explorations with a coupled biophysical model suggested that benthic-pelagic coupling between the front and the scallop ground is unlikely. Scallop larvae and food supply may be advected, instead, from regions to the southwest, favoured by the general N-NE residual flow over the shelf (Franco, 2013). Larval retention in the region appears to be related to an area of gentle topographical elevation of the intermediate shelf.

Based on simulations with a coupled biophysical model, strong unidirectional connectivity is expected along shelf-break between 45 and 35° S, with southern scallop beds being the larval sources for northern beds (Franco, 2013). Furthermore, given the path of the Malvinas Current (Matano *et al.*, 2010; Piola *et al.*, 2013), it is plausible that southern scallop beds are the ultimate larval sources for scallop beds located downstream along the shelf break.

By comparing 12 beds of the Argentine shelf, low levels of genetic differentiation were observed, suggesting a high gene flow. Subtle genetic structure was detected between scallop beds of the intermediate shelf associated to the Southern Patagonian Frontal System and beds located along the Shelf Break Front (Trucco & Lasta, 2009).

#### **b. Stock assessment**

Two management areas were established initially: 'North' (between 36°45' and 39°30' S) and 'South' (between 39°30' and 43°30' S). In 2007, 14 smaller MUs were defined, 4 of which were established south of the former Management Areas. In 2009, a new MU was created beyond 200 nm. MUs were redefined again in 2012, and their number settled at 10 (Figures 1 and 6).

A survey is conducted annually in each MU in order to estimate the absolute biomass, and to collect information on size structure, reproductive conditions and composition of the benthic community. Survey design consists in a regular grid with an average spacing of 9.3 km between stations; the geographical extension of the scallop beds inside each MU is based on annual effort allocation by the fleet. Between 1999 and 2008, surveys were conducted by research vessels and samples were

collected with a dredge of 2.5 m wide. Since then, commercial vessels are being used and samples taken with commercial otter nets.

Analysis of the spatial structure and size of the stock involves geostatistical methods and is conducted independently for each MU. Areas with a proportion of individuals of commercial size ( $Z$ ) larger than 0.5, and a density of more than 10 t/km<sup>2</sup> may be opened to harvest (Figure 7).

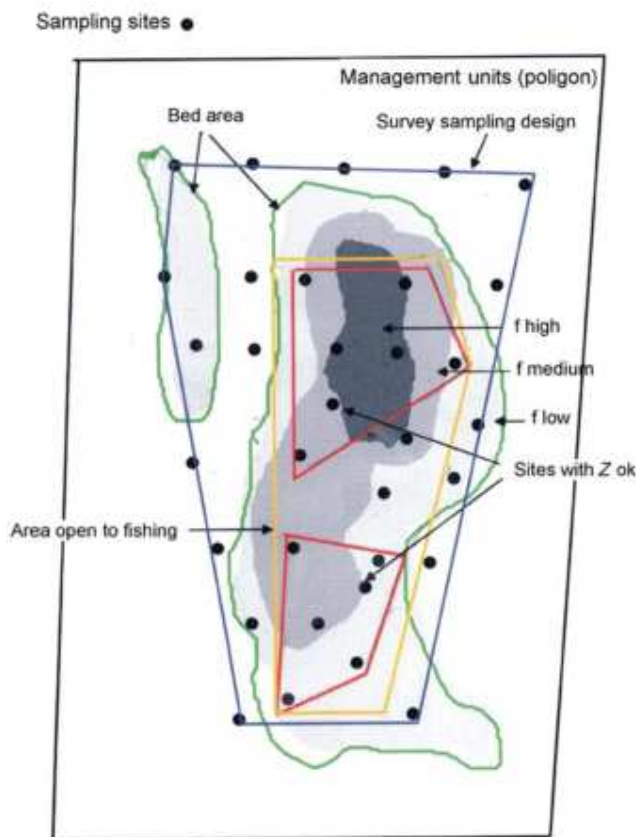


Fig. 7. Example of the survey-based decision rule. The black polygon represents the limits of the Management Unit and the green contour the limits of the scallop bed defined by effort allocation. The blue polygon is the area covered by the survey and the dots indicate the sampling stations. The red polygon includes sampling stations with a proportion of legal-sized scallops  $Z > 0.5$ . The yellow polygon is the area opened to fishing (Source: INIDEP Research Group).

Fishery-dependent information is collected at a very fine scale, allowing analysis of CPUE and total catch for each bed. CPUE data is used as an index of abundance to track changes in biomass in each bed and to provide information to adjust the survey design.

A TAC is calculated for each bed as 40% of the lowest confidence limit of the estimated commercial biomass ( $Z > 0.5$ ; biomass of individuals over 55 mm). The area opened to fishing either (i) a polygon that includes all areas with  $Z > 0.5$ ; if fishery-dependent information provides an adequate definition of bed limits or (ii) the entire MU if there is not enough information, or there are few recruits in the surveyed area.

*Management unit B according INIDEP Technical Report N° 25/2015*

In the MU B, the abundance of total biomass was 360,338 t ( $\pm 76,247$  t) and the commercial biomass (scallop with  $\geq 55$  mm) was 227,733 t ( $\pm 45,182$  t). As there is no evidence about significant

recruitments in some areas, it is recommended the closure to fishing for two sub-areas in the MU B for a period of one year from January 1<sup>st</sup>, 2016.

The fishing area is defined by incorporation of fishing stock cohorts 2007-2008, 2008-2009 and 2009 and 2010. The estimation of commercial biomass, considering the 40% of average absolute biomass, was 35,936 t. In the abundance estimated considering the 40% of lower limit of confidence interval of average absolute biomass was 22,977 t. Projecting estimates above biomass at 1<sup>st</sup> January 2016 and considering the mortality rate, it is observed that the same amount 30,892 t in the first case or 19,753 t in the second case.

#### *Management unit D and E according INIDEP Technical Report N° 26/2015*

A survey was carried out between September and October 2015 for MUs D and E with the objective to establish the Total Allowable Catch (TAC) and to study the size composition. "Atlantic Surf III" was used as survey vessel and was equipped with dredge. Efficiency of the gear was assumed 0.5. Analysis of Z index (proportion of commercial sized scallop in relation with total scallop) revealed prevalence of places with Z index less than 50%, and analysis of catch per haul revealed low densities of commercial sized scallop were recorded in the majority of the sampling stations. Both aspects suggest the closure of the MU D during one year stating from 1<sup>st</sup> January 2016.

Moreover, scallop beds of MU E were characterized by individuals of commercial size with densities of 10 t/km<sup>2</sup>. Considering the two options to take decisions: a) 40% mean absolute biomass and; b) 40% of lower of confidence limit mean absolute biomass, the TAC suggested for the MU E was estimated in 8,436 t ("a" alternative) and 6,239 t ("b" alternative), applicable to year 2016. Low records of juveniles (scallop 0+) suggest failure of recruitment of the 2014-2015 cohorts in the MUs D and E.

#### *Management units F and G according INIDEP Technical Report N° 08/2016*

In the mentioned management units, the estimation of commercial biomass, considering the 40% of average absolute biomass, was 31,699 t and 3,843 t, respectively. In the estimation, considering the 40% of the lower limit of confidence interval of average absolute biomass was 24,573 t and 2,648 t for MU F and G, respectively.

However, it was observed that there were registered few sets with presence of individuals of age 0+. It highlights the failure of massive recruitment at the bottom of the cohort form 2014-2015 in these MU. This raises the need to continue implementing a highly precautionary measure regarding the management of scallops in these areas.

The following table describes the total and commercial biomass estimation by MUs:

MU	Total Biomass (t)	Commercial Biomass (t)
B	360,338	227,733
D	51,382	31,252
E	60,177	39,749
F	143,127	115,058
G	23,023	16,370

#### *Fishery records*

##### *Period 2015 according INIDEP Technical Report N° 16/2016*

During 2015, total scallop landings (meat) was 4,404 t and the estimated catch of whole scallop was 31,455 t. Fleet worked 1,157 days (79.3 % of days at the sea) with 815 days of effective fishing, in 27 trips. Fishing effort was allocated in MUs of the shelf-break front with 75,543 sets and swept area was 1,933 km<sup>2</sup>, assuming non-overlapping hauls. Both values were lesser than the previous year

(84,851 sets and 2,357 km<sup>2</sup>). During the last years, the explored areas outside the MUs and other MUs were not visited.

### c. Stock status

Mean biomass estimation is being maintained around a stable level during the last 10 years (Figure 8). However, between 2006 and 2008 when robust year-classes recruited (cohort 2002-2003), both estimation of biomass, TAC and mean annual CPUE (whole scallop/swept area) were increased. During the following years, the mean annual CPUE for main beds has shown a slowly declining trend, as consequence of the depletion of such year classes. Bogazzi (2008) showed that the non-random allocation effort and in turn the CPUE, reflects the movement of each vessel among patches of different density within a bed, which are sequentially fished. The declining trend of CPUE can be associated to several factors such as the non-random allocation of effort, and the spatial distribution of abundance. If the spatial arrangement is composed by scattered patches within a bed, the area considered in the biomass estimation can be large and the estimated biomass of whole scallop remains stable. However, the detection of dense patches by the fleet could be difficult and can spend effort searching them. It affects the fleet economical trade off. In other cases, where the capacity of patch detection is optimal, the fleet moves between closed patches depleting them sequentially and CPUE may be hyperstable, not reflecting the true rate of abundance reduction.

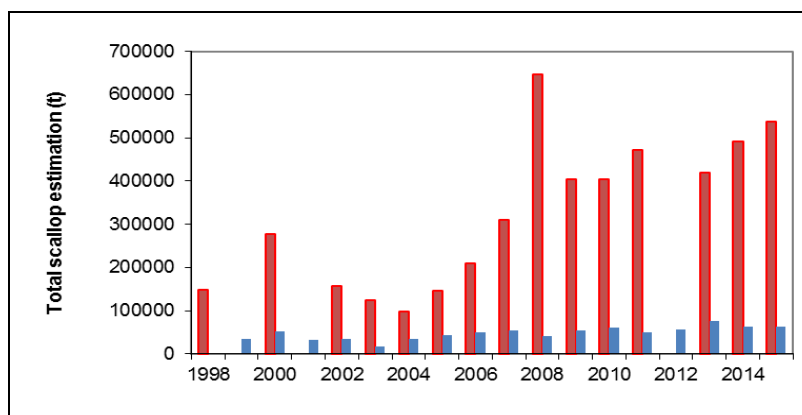


Fig. 8. Total scallop biomass estimated (red bars) and TAC (blue bars). (Source: INIDEP Research Group)

The harvest rate considered as TAC / biomass commercial scallop, decreased after the strong cohort were vanished. During the last 10 years, it was lesser than 20% (Figures 9 and 10). However, during 2013 – 2015 the TAC was twice of landings.

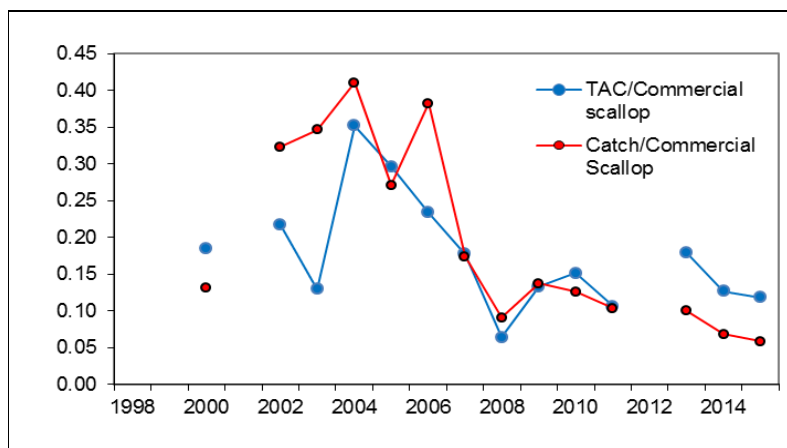


Fig. 9. Relation of annual catch and TAC with Commercial scallop estimation. (Source: INIDEP Research Group)



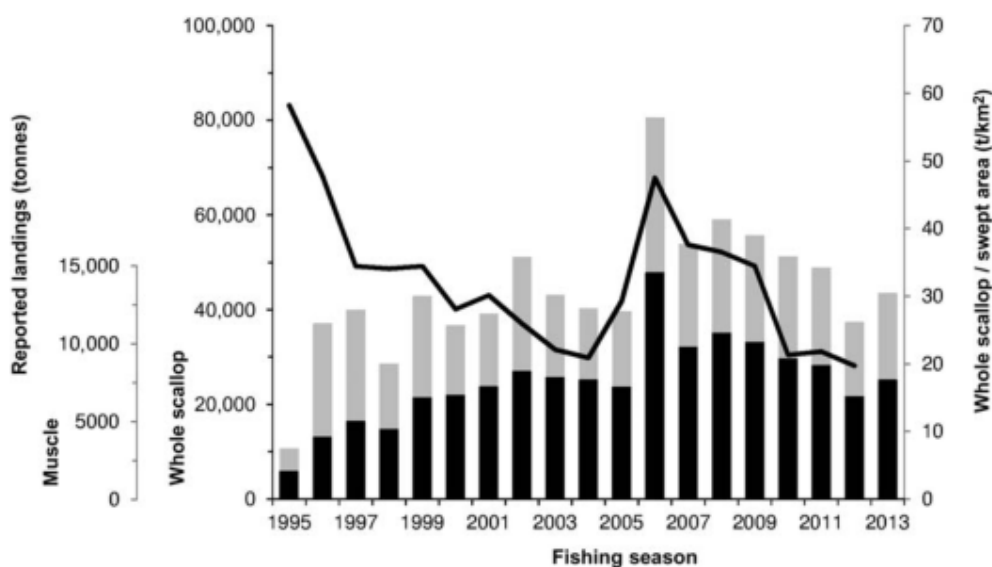


Fig. 10. Argentine sea, reported landings of muscle (black bars) whole scallop catches (grey bars) and captures of whole scallop per swept area (solid line) by year, 1995-2013. (Source: Soria et al., 2016).

#### d. Management

The fishery policy is established by Consejo Federal Pesquero (CFP) in the framework of the Federal Fishing Law N° 24.922. INIDEP conducts research and assessment of fisheries resources, including the On Board Observer Program. Subsecretaría de Pesca y Acuicultura (SSPyA) implements the management plans proposed by INIDEP.

The management plan established by CFP includes:

- a minimum legal size of 55 mm total height;
- no-take zones established in each bed for protection of the parental stock;
- no-take zones established in each bed for research purposes;
- opening of beds only when the ratio of juvenile to commercial sized scallops is at least 1:1;
- a no fishing season imposed;
- limited entry (four vessels);
- TAC for each MU is calculated as 40% of lower limit of estimated commercial biomass;
- immediate return to the sea of sub-legal size scallops; and
- creation of a technical commission with representatives from the fisheries authority and the fishing companies to monitor the fishery.

In addition, short-term management measures based on results of the annual surveys include spatial openings-closures and TACs.

#### e. Key Low Trophic MSC Criteria

Scallop is not considered according to the MSC criteria as a key low trophic species (FCRv2.0 – Table SA1). Fishes as *Callorhynchus callorhynchus*, *Pseudoperis semifasciata* and *Congiopodus peruvianus* may prey upon the Patagonian scallop. The main invertebrate predators are the gastropods *Fusitriton magellanicus magellanicus*, *Odontocymbiola magellanica*, *Adelomelon ancilla*, the sea stars *Labidiaster radius*, and *Ctenodiscus australis*, and the echinoid *Sterechinus agassizii*.



### 3.4 Principle two: ecosystem background

This section of the report describes the potential impacts of the fishery on the ecosystem. Five key components are considered to describe the complete range of elements in the ecosystem likely to be affected by the UoA. These are:

- Primary species: species where management tools and measures are in place, intended to achieve stock management objectives reflected in either limit or target reference points.
- Secondary species: large variety of species including fish and shellfish that are not managed according to reference points and out-of scope species (amphibians, reptiles, birds and mammals) that are not ETP species.
- ETP species: endangered, threatened or protected species by national ETP legislation or listed in binding international agreements.
- Habitat: habitats within which the fishery operates.
- Ecosystem: ecosystem elements such as trophic structure and activity, composition of the community, biodiversity.

For each of these components, the assessment team assesses 3 topics:

- Outcome: current status of each component and whether the fishery is posing a risk of serious or irreversible harm to the component or hindering its recovery.
- Management: arrangements in place to manage the impact that the UoA has on the P2 species.
- Information: tracking and data available in terms of information adequacy.

#### 3.4.1 Ecosystem

##### The aquatic ecosystem

The Ecosystem Component considers the broad ecological community and ecosystem in which the fishery operates.

The Argentine Sea biogeographic scheme has been characterised by Balech & Elrich (2008) and two major biogeographic provinces – Argentine and Magellan – were identified. The former extends from 30° S - 32° S to 41° S - 44° S; and from the coast to the 82-95 m isobaths, between 35° S - 39° S; to 70 m depth in the North of Patagonia (Figure 11). The different physiologic characteristics allow distinguishing movable sandy bottoms in the Argentine Province and gravelling bottoms (where algae grow) in the Magellan. Climatic differences explain the prevalence of northern winds in the first, where warm and temperate-cold coastal waters alternate. The detailed analysis of faunal composition of both Provinces; the Argentinean is characterised by a marked heterogeneity of this components and the Magellan by its own homogeneity and own taxa.

The detailed analysis of the faunal composition of both Provinces performed using benthonic organisms (echinoderms, crustaceans and molluscs) and nektonic (fishes) resulted in subdivisions that correspond to: Uruguayan area (down to 38° - 39° S) and Rio Negro area (south of said latitude) in the Argentine Province; and the Chubutian and South Patagonian districts (north and south 47° S, respectively) in the Magellan.

The Patagonian scallop fishery mainly occurs in the transition between the Argentine Province and the Chubutian District of the Magellanic Province, where scallop beds are associated with very different frontal systems and transient zone waters.

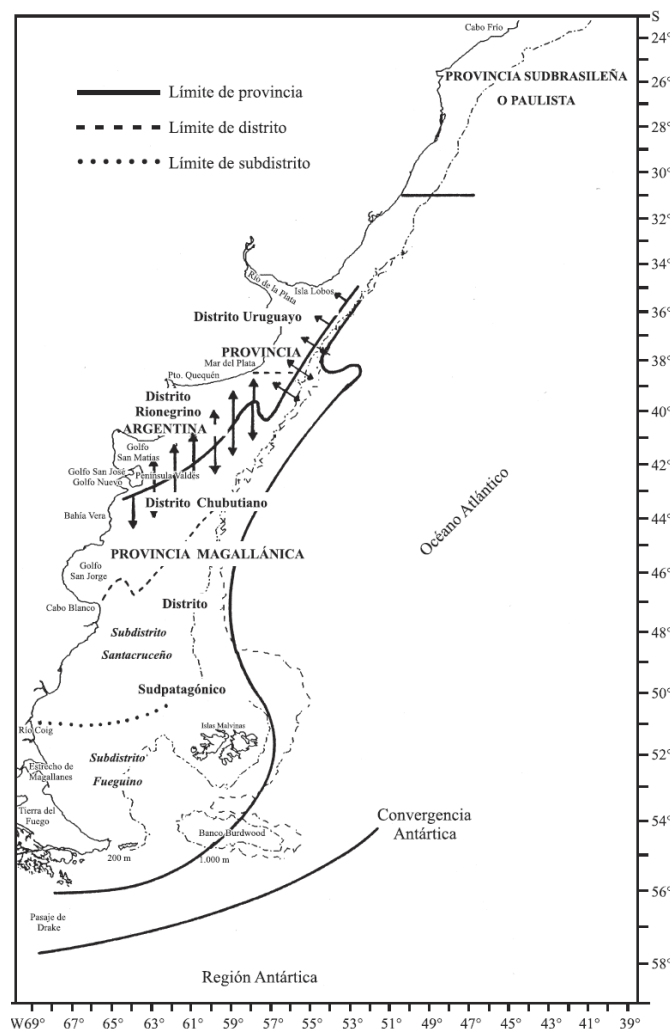


Fig. 11. Biogeographic divisions of the Argentine littoral. The arrows allow to state that a considerable number of species from the south reach 41° S and even 40° S, and others from warm waters 44° S – 45° S (Source: Balech & Elrich, 2008).

Margaleff (1977) (cited in Balech & Elrich, 2008) noticed that there are many factors that may influence the distribution, activities and biomass of organisms, and these influences are in fact, a combination of different factors. However, there are some factors which have a preponderant importance, such as water temperature, particularly minimum average temperatures (Dana, 1853; cited in Balech & Elrich, 2008) and maximum average temperatures (Levinton, 1995; cited in Balech & Elrich, 2008). These last seem to be more important in the delimitation or the area where many species live in the Argentina Biogeographic Province. Moreover, significant quantitative changes in forage organisms may induce, frequently, trophic behavioural changes in predators (Kinne, 1970; cited in Balech & Elrich, 2008).

#### The “Argentine biogeographic province” scheme

It is located on the continental shelf, between a northern fluctuating boundary between 30° and 32° S (in front of the Brazilian state of Rio Grande do Sul) – a limit of a highly thermophiles biological whole-; and a southern border located in northern Patagonia, which is actually a wide strip that extends between 41° S and 44° S.

### Environmental features

Several major physiographic characters shall be noted in this province. First, a marked change in the general direction of the coast on the southern of the central part, with a strong deviation to the west. Further south, the typical moving bottoms (predominantly sandy) that characterize almost all this province, are replaced by resting bottoms which prevail in the rest of the Argentine coast. All these features strongly influence the biology, because only this second kind of bottom allows the entrenchment of large algae.

Moreover, also to the south, there is a marked climate change: the winds, which in almost all the coast of Buenos Aires Province coast are predominantly northern; in Patagonia, they have absolute western predominance, with a great increase of its average speed. In addition, to the south rainfall decreases; and so is the contribution of inland water to the sea.

From the hydrological point of view, the Argentina province is characterized by alternating predominance during the year, of warm-coastal waters and temperate-cold waters (with sub-Antarctic characteristics).

Given the movement of the Malvinas Current, and the eurytemia of many species, there is evidence to suggest that the boundary between the two provinces is north of 43° S is around the isobath of 82 to 95 m between latitudes 35° S to 39° S; and the isobaths of 70 m in north of Patagonia. This limit is quite diffuse, and valid primarily for benthic organisms. Planktonic organisms may vary greatly seasonally -following changes in the hydrological room-; and nektonic not only follow those changes but may transgress those limits, such as anchovy and squid.

### Biota

The Argentina province is the most explored by naturalists, and therefore, its fauna is known quite well. It is also the most exploited, from the fishing point of view, by coastal fishing boats and some greater autonomy boats of medium height. The main organisms of this province are in Figure 12.

Biologically, it is characterized by a marked heterogeneity, as a result of a mix between subtropical and sub-Antarctic elements. This result also determines a very low endemism. It is mainly neritic and since it ends, on average, in the east before reaching the edge of the platform, it is limited by Malvinas Current, which leads to the north not only sub-Antarctic waters but an own biome.

Celenterados	Equinodermos	Crustáceos	Moluscos	Peces
<i>Renilla reniformis</i>	<i>Astropecten cingulatum</i>	<i>Artemesia longinaris</i>	<i>Mytilus edulis platensis</i>	<i>Micropogonias furnieri</i>
<i>Bumodactis marplatensis</i>	<i>Enoplopatiria marginata</i>	<i>Pleoticus muelleri</i>	<i>Glycimeris longior</i>	<i>Cynoscion guatucupa</i>
<i>Phymactis clematis</i>	<i>Luidia</i> spp.	<i>Neohelice granulata</i>	<i>Adrana electa</i>	<i>Macrodon ancylodon</i>
<i>Corynactis carnea</i>	<i>Poraniopsis mira</i>	<i>Cyrtograpsus angulatus</i>	<i>Macra janeiroensis</i>	<i>Umbrina canosai</i>
	<i>Arbacia dufruesnei</i>	<i>Platyxanthus crenulatus</i>	<i>Aequipecten tehuelchus</i>	<i>Pagrus pagrus</i>
	<i>Encope emarginata</i>	<i>Ovalipes trimaculatus</i>	<i>Amiantis purpuratus</i>	<i>Nemadactylus bergi</i>
	<i>Mellita platensis</i>		<i>Pitar rostratus</i>	<i>Acanthistius patachomicus</i>
	<i>Amphiodia planispina</i>		<i>Calliostoma coppingeri</i>	<i>Percophis brasiliensis</i>
	<i>Ophioplocus januari</i>		<i>Buccinanops monilifer</i>	<i>Parona signata</i>
			<i>Diodora patagonica</i>	<i>Pseudopercis semifasciata</i>
			<i>Brachidontes rodriguezi</i>	<i>Mustelus schmitti</i>
			<i>Macra patagonica</i>	<i>Engraulis anchoita</i>
			<i>Mesodesma mactroides</i>	<i>Scomber japonicus</i>
			<i>Tagelus plebeius</i>	<i>Seriola lalandei</i>
			<i>Notocochlis isabelleana</i>	
			<i>Urosalpinx ruxshii</i>	
			<i>Muricopsis necocheanus</i>	
			<i>Adelomelon brasiliensis</i>	
			<i>Macoma uruguayensis</i>	

Fig. 12. Organisms of the Argentine province (Source: Balech & Elrich, 2008).

### Biogeographic districts

There are arguments for a subdivision of the Argentine province, not only for reasons of distribution of species, but also because of the relative abundance of each species. Balech (1954b) (cited in Balech & Elrich, 2008) proposed a Rio Negro district at the south, and a Uruguayan one to the north. The boundary between these two is rather diffuse and it would be situated at about 39° S, while some authors proposed to locate it near the Rio de la Plata. The first proposal is supported by the northern dominance (for more than 6 months a year) of water temperatures above 14° C, which represent what the author called "coastal drift"; while the southern district is dominated by cold water. There are not just a few Magellan species that reach this latitude (39° S), but also this latitude is the approximate limit of some species arriving from the north. Although the available information does not allow further details, it is noticed that Magellan species tend to remain most in the eastern part of the province.

### **The "Magellan biogeographic province" scheme**

The Magellan biogeographic province is located all along the Argentine coast, from Peninsula Valdes to Southern Patagonia, including a South Brazilian and Uruguayan portion in deeper waters. It is far more extensive than the Argentine Province, but above all, has a much wider continental shelf. It is also more homogeneous by net dominance of cold water sub-Antarctic province.

### Biota

As own and differential physiographic features of this province there are noticed: a predominance of biotope sandbar in the coastal zone, with beaches of sand and gravel; development of mud at the mouth of rivers; very large tides that generate strong currents; and strong westerly winds. Consolidated bottoms allow the "roots" of large algae that give this coastline a very special physiognomy.

Among the animals associated with these large algae we can include: anemones, barnacles, clams, hydroids, bryozoans, amphipods, isopods and some fish. Although perhaps one of the most remarkable faunal features in this province is the presence of several species of Gadiformes (such as *Macruronus magellanicus*, *Merluccius australis*, *Micromesistius australis* and *Salilota australis* as indicators of the whole province), with high biomass and subjected to an intense commercial fishing, and the development of two fish families: Nototheniidae and Zoarcidae.

When observing their respective areas of distribution (Cousseau, 1993; cited in Balech & Elrich, 2008), it is shown that this species which occur in the entire platform in the south Patagonian district, are away from the coast when going north (at about 46° S and even to 38° S in winter), occupying a narrow strip by the east of the Argentine province, in the Malvinas Current. *Merluccius hubsi*, the commonest euryoic hake, and main demersal fishing resources in the Argentine Sea occupy not only the entire Magellan province but also part of Argentine province.

### Biogeographic districts

Despite this relative homogeneity of conditions, fairly net faunal boundaries were noted (although they may not be clear in offshore waters offshore); and three biogeographic districts were identified: (1) "Fueguino", from the southern limit of the Tierra del Fuego province to 51° S, which integrates with the waters surrounding this province and nearby islands; The "Santacrucean" district, that extends from there until Cabo Blanco; and the "Chubutian" district, from this point to the north, up to the border with the Argentine province.

The fauna from the northern prolongation of this province, going from south to north the eastern limit of the Argentine province, has more components of the Sudpatagonic district than of the Chubutian. This fact is not only limited to fishes but also to other benthic organisms.

## The Patagonian shelf

The Patagonian Shelf Large Marine Ecosystem extends from Uruguay to the Strait of Magellan. It has a total area of about 2.7 million km<sup>2</sup> and it is relatively narrow in the north but widens progressively to the south, where it reaches a width of 850 km. All this system has distinctive bathymetry and hydrography features. The location of Atlantic Patagonian scallop grounds is related to major and very different frontal systems and transient zone waters. Complex hidrogeographic mechanisms can enhance benthic-pelagic coupling, thus increasing food availability for benthonic populations.

The Northern Patagonian Frontal System (NPFS) (also called Peninsula Valdes tidal Front) (Figure 11), is an intermediate shelf-tidal front located near Peninsula Valdes and extending southward off the Patagonian coast from ~42° S to 45° S, although its position varies considerably between years. The turbulence generated by strong tidal currents keeps the well-mixed shallow waters separated from the deeper stratified water. This front starts forming in early spring, as a seasonal thermocline develops; the steepness of the gradient is maximal during the summer (and so is the chlorophyll-*a* concentration); and persists through autumn, when the water column becomes vertically homogeneous (stratification declines). The average position of the system estimated over this period shows an overall NE-SW alignment following closely the bathymetry and isoclinic contours (75-80 m). It is located on average 50 km offshore in the south, and ~80 km offshore in the northern zone.

The Southern Patagonia Frontal System (SPFS), on the other hand, is a thermohaline front developed on the south coast of South America. Seawater masses from the northern of Pasaje de Drake age are diluted due to the excess of rainfall on the Pacific and the continental discharge along the west coast of the Atlantic. This flow towards the Argentinian coast contributes to the low salinity waters south of Estrecho de Magallanes and is affected by the strong west dominant winds. The diluted plume is vertically mixed by the tides, and the wind is traced 200 km off-shore and 800 km norward, reaching Golf San Jorge (Acha *et al.*, 2004).

A Shelf Break Frontal System (SBFS), coincidental with the 90-200- depth range marks the transition between continental shelf waters and the Malvinas Current (Figure 11 and 13). It is characterised by high chlorophyll-*a* concentrations, attributable to nutrients inputs from upwelling along the shelf break. Large scallop aggregations are associated with this productive frontal system. It is influenced by two major wind-driven currents, the northward flowing Malvinas Current and the southward flowing Brazil Current; which provide a distinctive ecological boundary to the east, and a high productivity. While the southward flowing Brazil Current is warm and saline, the northward flowing Malvinas Current carries cool, less saline, nutrient-rich sub-antarctic water towards the equator.

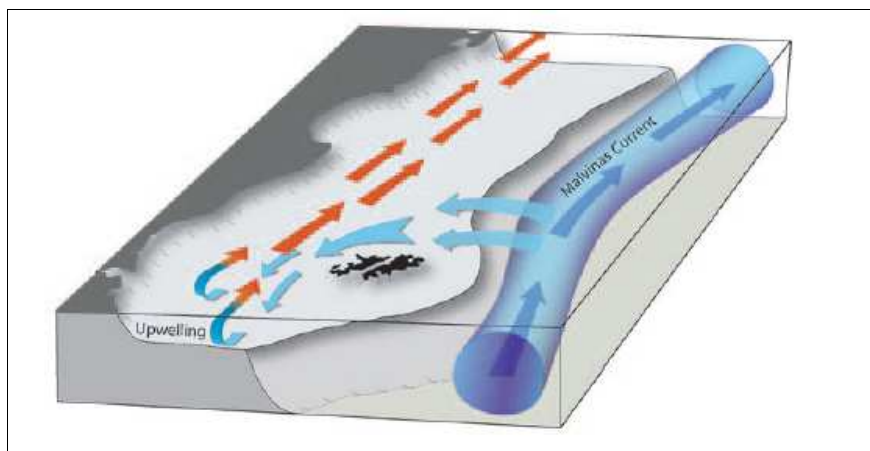


Fig. 13. Scheme of the cross-shelf exchange along the shelf-break front in Patagonia Argentina (Source: Matano *et al.*, 2010)

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The two currents mix their waters at a Confluence Zone (CZ). The Confluence Zone is a wide area characterized by intense horizontal and vertical mixing. It is located at about 39° S, but displaced to the north during winter. The exchange of water masses of different temperatures and salinity affects biological productivity.

There are significant coastal tidal fronts in this Large Marine Ecosystem that divide the coastal domain (which comprises areas where large quantities of fresh water and sediments are discharged from the main inland rivers) from the outer shelf domain. It is also known that frontal zones are areas of high productivity especially along the extensive shelf break front, but no comprehensive study has yet been made of this Large Marine Ecosystem.

Although the Shelf Break Front has a very complex structure and exhibits multiple thermal fronts (Franco *et al.*, 2008), its position remains remarkable stable (Saraceno *et al.*, 2004), and is closely locked in position by the topography that steers the Malvinas Current which, nevertheless, still penetrates the Patagonian Shelf and influences the regional ecosystems (Piola *et al.*, 2010). The most obvious evidence of this nutrient input is the high level of biological activity that is found in the Patagonian Shelf Large Marine Ecosystem, which is considered a Class I marine ecosystem with a productivity rate larger than 300 grC/m<sup>2</sup> yr<sup>-1</sup> (Csirke, 1987; Brandhorst & Castelo, 1971; Lutz & Carreto, 1991; Sabatini *et al.*, 2004).



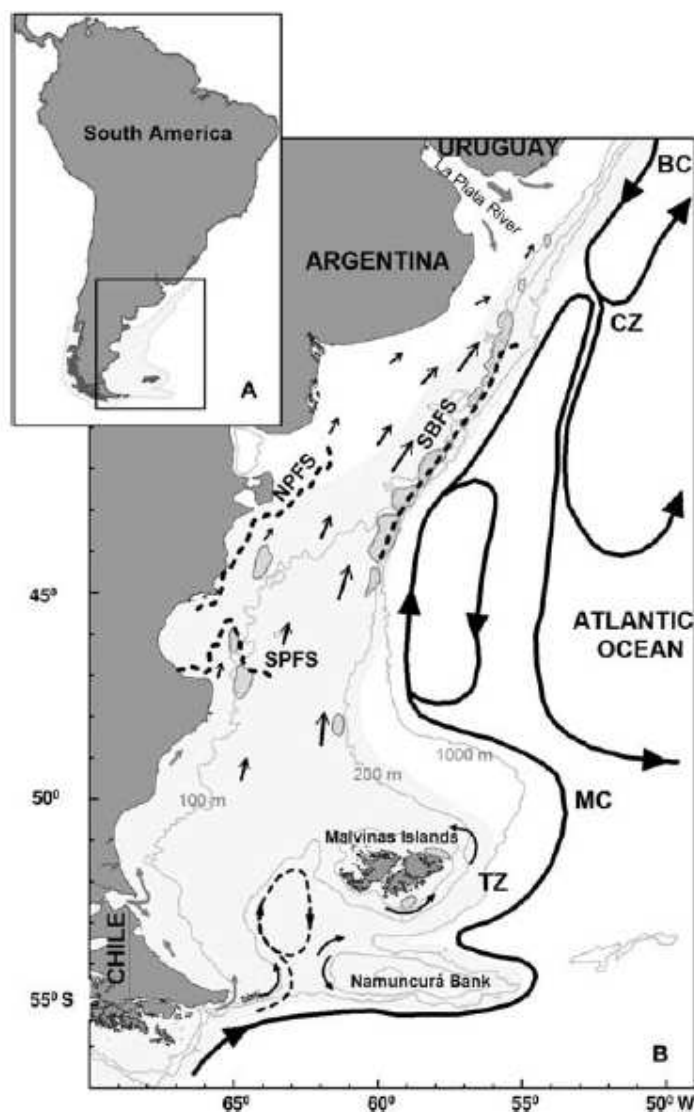


Fig. 14. *Zygochlamys patagonica* geographic distribution (A); and representation of the depth-averaged circulation in the southern Atlantic region, showing the Malvinas Current (MC), Brazil Current (BC), the Confluence Zone (CZ) and Transient Zone (TZ). Schematic representation of several frontal systems based on hydrogeographic data are: Northern Patagonia Frontal System (NPFS); Southern Patagonia Frontal System (SPFS); and the Shelf Break Frontal System (SBFS). Gray areas represent main scallop grounds (Source: extracted from “Scallops Biology, Fishery and Management in Argentina”, 3rd Ed.).

#### Scallop beds and frontal systems of Patagonian Shelf Large Marine Ecosystem

The Argentine Sea integrates a big oceanic ecosystem comprising a part of the continental margin of south-western Atlantic exposed to the ecological effects of fronts generated by currents of Brazil and Malvinas. This environment has as main components: an extensive geological continental shelf, slope and abyssal plain.

Argentinean continental shelf has an exceptional environment. It has an underwater plateau of 1,000,000 km<sup>2</sup>, which makes it the largest in the southern hemisphere. The platform gradually extends from north to south, reaching 850 km wide south of 50° S and forms a large ecosystem that is distinguished from other similar by its bathymetric features and hydrography.

Patagonian scallop Stocks are widely distributed over the Patagonian Shelf Large Marine Ecosystem at low densities. Commercially exploitable beds however occur in discontinuous concentrations across the shelf. The geographic location of these scallop beds has been constant over the 30 year period since known. Since 1995, they have become the focus of the important Patagonian scallop fishery (Lasta & Bremec, 1998).

Bogazzi *et al.* (2005) analysed the historical survey data documenting the geographic distribution of the Patagonian scallop beds, geographic and catch and effort data from the commercial fishery, oceanographic data on the frontal systems, and remote sensing imagery; and found out that the geographical location of large-scale aggregations of scallops on the Patagonian Shelf Large Marine Ecosystem match exactly the location of the three major and very different frontal systems of the Patagonian Shelf. However, the fishery for Patagonian scallop on the Northern and Southern Fronts (where scallop meat condition was often very poor) has not resulted to be as productive as the one on the Patagonian Shelf Break Front.

### **3.4.2 Exploitation of the Patagonia scallop fishery**

The exploitation of the Patagonia scallop (*Zygochlamys patagonica*) fishery takes place in the Southern Patagonia Frontal System, and mainly at about the limits of the Shelf-Break Frontal System.

As mentioned before, there are three different productive systems in the Patagonia region, based on hydrogeographic data: the Northern Patagonia Frontal System (NPFT); the Southern Patagonia Frontal System (SPFS) and the Shelf Break Frontal System (SBFS).

The Northern Patagonian Frontal System (NPFS) located near Peninsula Valdes and extending southward off the Patagonian coast varies its position considerably between years; and the turbulence generated by strong tidal currents keeps the well-mixed shallow waters separated from the deeper stratified water, resulting in a marked seasonal stratification. This front starts forming in early spring, as a seasonal thermocline develops; the steepness of the gradient is maximal during the summer (and so is the chlorophyll-a concentration); and persists through autumn, when the water column become vertically homogeneous (stratification declines).

The Southern Patagonia Frontal System (SPFS), on the other hand, is permanently marking the transition between tidally mixed low-salinity of the Patagonian Current waters and seasonally stratified more saline waters of the continental shelf. The nutrients carried by these waters of different temperature and salinity added to the nutrient flux produced by re-suspension and tidal mixing, and cause additional chlorophyll blooms along the inner and middle shelf of Patagonia (Matano *et al.*, 2010). The position of the Southern Patagonia Frontal System varies only slightly between years; and phytoplankton productivity peaks once during spring and once in autumn (Mann & Lazier, 1991; Cucchi Coleoni & Carreto, 2001).

While the coastal system has depths generally less than 50 m, it is characterized by vertically homogeneous waters during all the year (due to the combined effect of winds and tides) and is recorded minimal concentrations of nitrate and chlorophyll. On the other hand, Sub-Antarctic waters of the platform show seasonal stratification of column water and two maximum concentrations of chlorophyll recorded in spring and autumn (Figure 15).



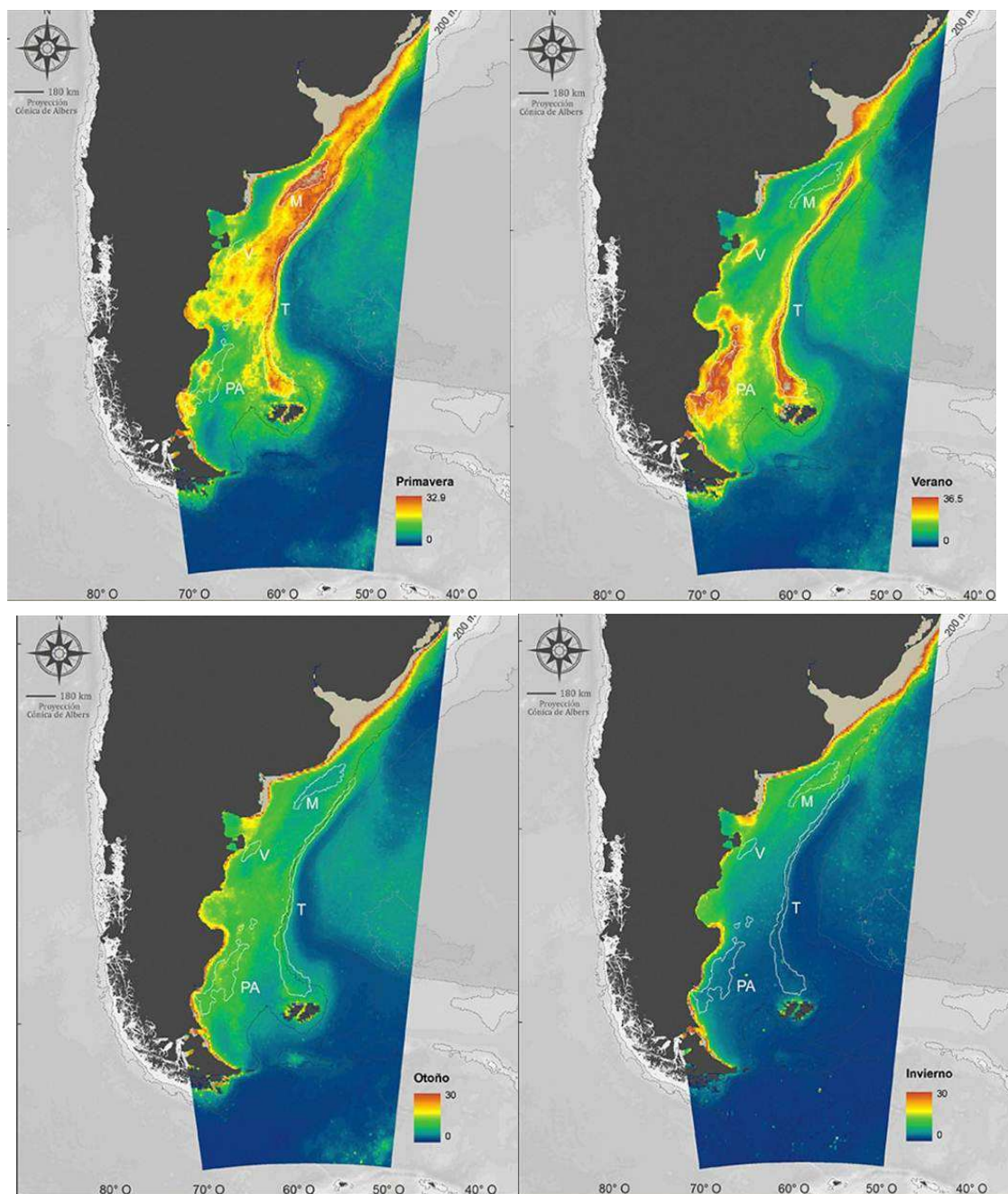


Fig. 15. Chlorophyll concentration in spring, summer, autumn, winter (Source: [www.alestuariodelplata.com.ar](http://www.alestuariodelplata.com.ar)).

The Northern Patagonian Frontal System is highly productive in spring and summer, which appears to be associated with enhanced phytoplankton biomass and high chlorophyll-a concentrations. Growth of phytoplankton populations can possibly be explained by at least two mechanisms of transport across the front, moving either cells or nutrients: the spring-neap cycle and baroclinic eddies (Pingree *et al.*, 1975; Mann & Lazier, 1991).

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### *Fishing gear impact and selectivity*

According to the fishing gear, both companies have carried out experiences addressed to improve the fishing gear with two objectives: better efficiency and selectivity of undersized scallop and bycatch. All trials have been documented and discussed in a workshop in 2012.

The conclusion was that there is not still improved a fishing gear alternative of them used currently. The improvement in the system is the result of successive changes that have increased the efficiency and fundamentally improve selectivity. This improvement in selectivity is observed in the lower catch of scallop non-commercial size and by-catch.

A Report “Evolution of gear about selectivity and reduce the impact on the seafloor by Patagonian Scallop Fishery”, prepared in 2014, is a detailed narrative of the fishing gear used in the fishery. Given characteristics of the Argentine continental shelf and the spatial distribution of scallop into the bottom of it, consisting primarily of sands of different grain size, it was established that the main fishing gear was bottom trawls.

From the ecosystem point of view, Pesquerías de Moluscos Bentónicos Program has a unique opportunity to study the impact of Patagonian scallop fishery (*Zygochlamys patagonica*) in the Southwest Atlantic, both the target species and throughout the benthic community associated. It has information from the previous community at the beginning of fishing operations (baseline).

Since the beginning of the activity in 1996, patterns very comprehensive management including collection of all activities by the commercial fleet, campaigns annual assessment, sampling of benthic fauna by observers on board and establishment of areas of closures were implemented permanent (Lasta, 2000; Bremec & Lasta, 2002; CFP Resolutions N° 4/2008, N° 5/2009 and N° 15/2012).

Worldwide has been applied two methodologies to study the impact of fisheries on benthic communities. The first, through dimensional experimental designs in time and in certain places, which compared before and after the disturbance caused during the same experience. With this methodology, disturbance can be achieving accurate information. The second method is to compare areas subject to different levels of fishing effort from historical information. The difficulty of this methodology is that, generally, fishing efforts do not have good spatial definition. Thus, the disturbance that is assigned to a sample may not be correct.

Pesquerías de Moluscos Bentónicos Program has detailed information of all activities of the scallop fleet and the benthic community associated with the fishery, so that the advantages of the two above-described methods were meet: there are disturbance accurate information and features fishing exclusion areas for use as a control site and the disturbance assigned to each sample represents the actual effect of the fishery on the benthic community.

In the research work carried out by Escolar *et al.* (2015), the structure and composition of the benthic invertebrate community that make up the catch of Patagonian scallop fishery through a gradient of fishing effort, using a historical database is analyzed. While there are reports that involve a time series (Bremec *et al.*, 2006; Escolar *et al.*, 2009 and Schejter *et al.*, 2014), this is the first to also consider the fishing effort.

While there are other factors that shape the distribution and structure of the benthic community, this work shows how the fishing effort influences biomass and distribution of many species of the community: the area subject to greater fishing effort presented the lowest values of biomass throughout the period analyzed. While the same species are recorded throughout the area and throughout the study period, these have different biomasses for effort fishing.

This is also observed by Escolar *et al.* (2011) and Schejter *et al.* (2014). Throughout the study period, it was also observed as distribution rates of species varied. During the period 1998-2009, decreased

the distribution of Patagonian scallop, *Porifera*, *Ophiacantha vivipara* and *Fusitriton magellanicus*, among the most notorious; and increased the density of polychaete, *Chaetopterus antarcticus*.

First, it demonstrated the importance of spatial closures and temporary fishery for benthic community, registering a biomass recovery after implementing the successive fishery closures. The benthic community recovers more quickly in the exclusion area fishery.

The importance of the exclusion area is noteworthy since the beginning of the fishery, this area control or baseline, can distinguish between natural changes those caused by trawling.

This study extends the knowledge of the benthic community, and allows a better understanding of the functioning of marine ecosystems and identifies which groups of organisms are necessary to preserve of fishing activity. INIDEP research group plans to continue developing this line of research studies similar to other management units to analyze the variation of the benthic community regarding closures both time and space (Escolar *et al.*, 2015).

### 3.4.3 Scallop beds: distribution and benthic habitats

Patagonian scallop is found in South America, from 42° S to 35° S, both in the Pacific and in the Atlantic Ocean. The Argentina stock is located between the northern boundary with Uruguay and Tierra del Fuego, all along the Continental shelf and adjacent waters. Habitat is marine benthonic, at depths of 40-200 m and inhabit soft bottom, mainly muddy-sandy substrates. Biggest concentrations are mainly located between 39°30' S and 42°30' S, at depths from 80 to 120 m, with the influence of the facing slope composed by the platform regime and the Malvinas Current. Scallops on all beds but especially those along the Shelf Break Front have always been related to a rich associated fauna of suspension and deposit feeders, and predators.

Since 1995, prior to the beginning of the commercial exploitation of the Patagonian scallop, studies have been developed to know and monitor the qualitative and quantitative composition of the community associated with this fishery resource (Bremec & Lasta, 2002; Schejter *et al.*, 2013a, 2013b and 2014). Most of the information comes from the study of the bycatch of the fishery during the Patagonia scallop biomass assessments, which have been carried out, in general terms, on an annual basis. During the exploration campaigns in 1995 (and in other scientific campaigns developed over the next three years on board of commercial vessels), the fishing gear used was bottom trawling nets (Bremec *et al.*, 1998; Bremec *et al.*, 2000; Bremec & Lasta, 2002). During the period 1998-2007, both the evaluation of the resource and the monitoring of accompanying fauna were carried out aboard the Fishing Research Ship "BIP Captain Cánepa" (INIDEP), using a scallop dredge, 2.5 m mouth opening (Campodónico *et al.*, 2014a). From 2008 and up to 2012, and within the framework of the Management Plan in force, the evaluation campaigns were carried out on the various commercial vessels that make up the scallop fleet, using the bottom trawls characteristic of each vessel. In 2013, after the Workshop "Evaluation of the fishing force and catching strategies for the Patagonian scallop fishery *Zygochlamys patagonica*", the use of the trawler as fishing gear for the biomass and companion fauna evaluations was resumed.

Table 4 summarizes the information on the specific richness (range by season), number of samples studied, vessel and fishing gear used for MU B in the study period. In the richness values presented, the species within the large Bryozoa, Porifera and Hidrozoa taxa have not been discriminated, nor have been counted the exclusively epibiont organisms, so the estimated value of the specific richness range presented is less than the real. From this information, it was observed that the samples of catches collected with dredge had, in general, higher values in the range of species richness per season. The decrease in the number of species detected per season was attributed to the absence of small size species in the samples, which could not be retained in the trawl, because the mesh size of this net is larger than the dredge's one.

Table 4. Specific richness (range by season), number of samples studies, vessel and fishing gear used for MU B (Source: INIDEP Technical Report N° 84/2015).

Year	95	97	01	02	03	04	05	06	07	08	09	10	11	12	13
Specific richness (range)	5-24	12-23	9-22	14-29	13-39	13-39	11-34	15-38	14-32	12-26	20-36	10-26	19-31	8-25	23-45
N° samples	19	85	80	68	67	62	83	81	91	36	45	34	11	24	35
Fishing Gear*	net	net	dre	Dre	dre	dre	dre	dre	dre	net	dre	net	dre	net	dre

\*net = otter trawl net; dre=scallop dredge

The narrow extent of the Patagonian Shelf Break Front, ~40 km at the surface, and the strongly developed community under it, where recruitment and abundance of scallops are highest (Mauna *et al.*, 2008, 2010), provides a unique situation to investigate the coupling of pelagic algal production on benthic community composition and species abundance. Mauna *et al.* (2011) investigated these effects on the benthic communities along the Shelf Break Front; and the biomass and diversity of the benthic community in Marginal and Frontal areas were not significantly different. Spatial gradients in productivity, influence spatial variability in species diversity and richness in many ways and vary with specific systems and scales. Productivity itself does not explain diversity patterns, as increased faunal density or taxon richness can also be driven by tight benthic-pelagic coupling; as well as annual resource stability that reflects timing of organic carbon flux and mode of sedimentation.

As mentioned in Schejter *et al.* (2014a), benthic invertebrate associations in the different MUs of Patagonian scallops have been maintained over time, and the differences recorded between years were mainly due to variations in the biomass of the highest contribution taxa and not to a disappearance or change in species composition. However, the results showed significant differences between the years in which the evaluation was registered with trawls nets and those carried out using scallop dredge net.

According to INIDEP's Research Report N° 84/2015, which analysed the effect of the trawling on the diversity, structure and composition of the benthic community in the long term in the management unit B (using the historical benthic fauna database obtained through the evaluation campaigns of the resource), a greater specific richness was recorded in areas of fishing exclusion and/or areas without activity of the Patagonian scallop fleet.

Redundancy analysis indicated that the "filtering" trophic group is inversely correlated with the relative effort and the "predator" trophic group. On the other hand, Patagonian scallop, Asteroidea and Gasteropoda (these last predators), had a positive correlation with the effort. Porifera and Cnidaria, sessile and filtering groups, showed an inverse relationship. Above all, depth resulted to be the most important factor in modelling the distribution and structure of the benthic community.

This report shows how fishing effort influences the biomass and distribution of many species in the community. As a result, although the same species were recorded throughout the area and throughout the study period, the area subject to greater fishing effort showed lower values of biomass throughout the analysed period. It was also demonstrated, for the first time, the importance of the spatial and temporal closures of the fishery for the benthic community, registering a recovery of the biomass after the implementation of the successive closures to the fishery.

Species *Zygochlamys patagonica*, Porifera, *Diplasterias brandti*, *Ctenodiscus australis*, *Fusitriton magellanicus*, *Ophiacanta vivipara*, *Austrocidaris canaliculata*, *Sterechinus agassizii*, Pterasteridae, *Actinostola crassicornis*, *Sympagurus dimomorphus*, Actiniaria and Ascidiacea were part of the most conspicuous species association during the period 1998-2009. Table 5 shows the results of similarity analysis between years, with the species that contributed the most in biomass to the association.

Thirty-four species belonging to Gasteropoda, Asteroidea, Ophiuroidea, Echinoidea, Polychaeta, Holothuroidea, Crustacea, Cnidaria, Porifera, Chordata and Mollusca (represented exclusively by the Patagonian scallop) groups formed the most conspicuous association of species in the MU B during 1998-2009.

The association of species varied significantly between years and the greatest differences were recorded between the years 1998-2007 and 1998-2009.

Table 5. Number of species that contributed to 90% of the total biomass of the community and the most important species (with a higher percentage contribution of 5% or more) (Source: INIDEP Technical Report N° 84/2015).

Year	Similarity between years	Sample N	Species N°	Main species (in decreasing order according to % contribution)
1998	52,87	87	13	<i>Zygochlamys patagonica</i> , Porifera, <i>Diplasterias brandti</i> , <i>Fusitriton magellanicus</i> , <i>Austrocidaris canaliculata</i> , <i>Sterechinus agassizii</i> , <i>Ophiacantha vivipara</i> , <i>Ctenodiscus australis</i> .
2002	54,14	75	20	<i>Zygochlamys patagonica</i> , <i>Diplasterias brandti</i> , <i>Austrocidaris canaliculata</i> , Actiniaria, <i>Fusitriton magellanicus</i> , <i>Ctenodiscus australis</i> , Porifera, <i>Ophiactis asperula</i> .
2003	52,25	69	23	<i>Zygochlamys patagonica</i> , Porifera, <i>Ctenodiscus australis</i> , <i>Fusitriton magellanicus</i> , <i>Ophiactis asperula</i> .
2004	51,6	70	22	<i>Zygochlamys patagonica</i> , Porifera, <i>Diplasterias brandti</i> , <i>Ctenodiscus australis</i> , Pterasteridae, <i>Austrocidaris canaliculata</i> , <i>Ophiactis asperula</i> .
2005	49,59	88	21	<i>Zygochlamys patagonica</i> , <i>Ctenodiscus australis</i> , Porifera, <i>Ophiactis asperula</i> , Pterasteridae, <i>Diplasterias brandti</i> .
2006	52,09	86	23	<i>Zygochlamys patagonica</i> , <i>Ctenodiscus australis</i> , Porifera, <i>Diplasterias brandti</i> , <i>Ophiactis asperula</i> .
2007	54,76	91	24	<i>Zygochlamys patagonica</i> , <i>Ctenodiscus australis</i> , <i>Chaetopterus antarcticus</i> , Porifera, <i>Austrocidaris canaliculata</i> , <i>Gorgonocephalus chilensis</i> .
2009	55,25	45	21	<i>Zygochlamys patagonica</i> , <i>Chaetopterus antarcticus</i> , Porifera, Pterasteridae, <i>Gorgonocephalus chilensis</i> .

#### 3.4.4 Primary, secondary and endangered, threatened or protected (ETP) species

No bycatch (as Primary, Secondary or ETP species according to the designation of P2 species components - GSA3 of FCRv2.0) is considered to be significantly bycaught or retained. The scallop fishery is pursued outside the distribution of commercially important finfish. Trawl gear is rigged and operated in such a way that demersal fish are not caught. The 100% observer coverage provides quantitative information showing that no such species are caught or retained meeting both qualitative and quantitative conditions. Should any commercial species (other than the target species) be retained, the quantitative information from the observer coverage would allow estimation of the outcome status with respect to biologically based limits.

Although the ecosystem in the area of the fishery does not support any fisheries, it does provide habitat for juveniles of a number of fishes, and some of them are caught in small numbers but not retained. Therefore, incidental catches of fish species (such as some rays and even any sharks) are insignificantly in the fishery, and this is reinforced with weight of the total catch of all species by the UoA.

From the fish caught as bycatch in the Patagonia scallop fishery, the majority correspond to the group of cartilaginous fish, commonly known as "rays" (Schejter *et al.*, 2011), which includes the genera *Bathyraja* (main composition, at about 70% of the total composition, Villalba & Colonello,



2015), *Dipturus*, *Psammobatis* and *Amblyraja* as the most frequent (Colonello & Massa, 2014). The number and composition of specimens captured is highly variable, between and within each commercial tide (Colonello & Massa, 2014).

So, Pesquerías de Moluscos Bentónicos and Pesquerías de Condrictios Programs have been making joint efforts since 2010 to obtain information on chondrichthyes in the fishery, and on board observers were boarded and assigned to specifically obtain information about the bycatch of these groups, and to perform an experience about the survival of the species after being captured in commercial fishing trips.

In 2015, Pesquerías de Moluscos Bentónicos and Pesquerías de Condrictios programs worked with observers on board in commercial fleet, with the aim to increase the frequency of the estimated catch of sharks and perform a preliminary experience of survival of these species using drags. Results indicate that, in general, the greater presence of rays was observed in catches in the first sets to reach the fishing area or after a change of zone. This was verified in the second fishing trip, where the catch was categorized according to whether the sets corresponded to operations or intensive fishing. In exploration hauls (few sets per area) catching rays is higher, while in sets of intensive fishing (several consecutive sets in the same area) capture is low, being able to be zero. This would relate to the effect of "disturbance" or suspension of sediments, which occurs during the drag on the bottom (Colonello & Massa, 2014).

Studies of rays' estimation were carried out in two commercial tides aiming Patagonian scallop and results were presented in INIDEP Technical Report N° 88/2015. Estimations of post-trawling survival of these species were performed comparing the survival of "specimens obtained on the ship deck" vs "specimens obtained after crossing the wells". It was observed that the catch of rays varies considerably along each tide; and that in the exploration hauls (few hauls per zone) the catch of rays is higher, whereas in the intensive fishing sets (several hauls in the same zone), the catch is low, and may even be null. On the other hand, the percentage of survival was higher for the individuals collected on deck, this being particularly noticeable after the first 24 h.

The Argentinean National Action Plan – Sharks, identifies a number of at risk species and juveniles of one of these species (a ray, *Dipterus chilensis*) which are occasionally captured by the fishery. The numbers and species of fish caught are recorded by observers on board in every tow and returned to sea immediately.

Seabirds are common inshore along the coastal fronts where there is major production of pelagic fish. Scallops are no longer fished along these fronts because of their poor meat quality. Seabirds are rare along the Shelf Break Front where diatoms dominate algal production resulting in being no pelagic fish there. The strong benthic-pelagic coupling along the Shelf Break Front results in major benthic production of suspension feeding invertebrates alone. The Argentinean National Action Plan from Seabirds identifies species that are at risk. All seabirds encountered during fishing are recorded by observers.

#### 3.4.5 Unwanted catch

There is not considered to be undesirable bycatch species. All non-target species are considered important parts of the benthic habitat and are returned to the seafloor as soon as possible.

The main unwanted catch species in the Patagonia Scallop fishery is the Patagonian scallop itself, but this species is considered under Principle 1. However, even though the rest of the unwanted catch is not considered to be 'significantly bycaught or retained' (as Primary or Secondary species according to the designation of P2 species components - GSA3 of FCRv2.0); procedures were instituted from inception of the fishery, to ameliorate damage to the organisms, returning them to the sea expeditiously to mitigate subsequent mortality.

Invertebrate bycatch is sorted alive from the scallop catch in a slowly revolving drum in which the bycatch is cushioned in water and it is returned to the sea in that water flow within 30 minutes of caught.

Schwartz *et al.* (2015) carried out a study with the objective to estimate the survival of the benthic invertebrates bycatch discarded back at the sea after trawling by commercial vessels. Individuals of the most frequent species were collected in the discarding point of the vessel, classified into different size classes and level of damage, and conserved in aquarium for 6 days. The experience showed that the survivorship of the species is variable. Species with exoskeleton, like gastropods, are more resistant to the fishing impact. Among echinoderms, ophiuroids showed the lowest percentages of survivorship. The relationship between degree of damage and body size depends of the species. Morphology and structure are key aspects determining the survivorship.

The on board experience with the most frequent and abundant discards and their classification according to species level of damage was done. The highest values of survival were found in the gastropod *Fusitriton magellanicus* and star *Diplasterias brandti* (96.7 and 86.7%, respectively). A positive relationship was found between the level of damage and height in the hedgehog *Austrocidaris canaliculata* and a negative one was recorded in the brittle star *Ophiacantha vivipara*. It was observed that the survival rate decreased with increasing brittleness and rigidity of the structure of the species, indicating that the effect of the selection process on the benthic community associated with the Patagonian scallop fishery varies with the species, size within species and is related to its structure and morphology (Schwartz *et al.*, 2016).

Escolar *et al.* (2014) estimated the harm to invertebrates, distinguishing between damage caused by trawling and damage caused by mechanical process on board, from a research carried out during 2012. The experiment was designed to take samples at three parts of the on board processes: immediately after the catch arrived on deck (trawling damage), after selection (damage by process) and hopper (damage by process of individuals bigger than 55 mm). In the experience, in other vessels, 3 samples were taken in the screw conveyor ("worm"). They concluded that i) the main affected species is the sea urchin *Sterechinus agassizii*; ii) the presence of one additional point of selection in the F/V Atlantic Surf III reduced the number of taxa present in the hopper. If this selection point would be implemented in the entire fleet the harm of individuals at moment to return of the sea, would be similar to the harm on deck; iii) on board selection affects scallop and other component of the fauna. Some of the last are retained in the selection and pass throughout the entire processing. Survivorship of this species is assumed to be loss or null; and iv) there are no trend in the harm level due to it depending on the species composition and its characteristics (size, hardness and morphology).

The survival of these bycatch organisms and their resilience has been estimated and indicated in Table 6. Echinoderms form the major group returned to the sea in this fishery and although they were not exposed to the air or sunlight for any length of time, resilience was mainly estimated to be medium.

Table 6. List of the 34 species that contributed to the 90% of the species association in Management Unit B, during the period 1998-2009. Trophic group, taxonomic class and resilience are also listed. (Source: INIDEP Technical Report 84/2015)

Species	Trophic group	Class	Resilience
Actiniaria	Filter feeder	Cnidaria	Low
<i>Actinostola crassicornis</i>	Filter feeder	Cnidaria	Low
<i>Adelomelon achates</i>	Predator	Gasteropoda	Medium
<i>Antholoba achates</i>	Filter feeder	Cnidaria	Low
Ascidacea 1	Filter feeder	Chordata	Low

Ascidacea 2	Filter feeder	Chordata	Low
<i>Austrocidaris canaliculata</i>	Grazer or detritivore	Echinoidea	Low
<i>Chaetopterus antarcticus</i>	Filter feeder	Polychaeta	High
<i>Ctenodiscus australis</i>	Grazer or detritivore	Asteroidea	Medium
<i>Diplasterias brandti</i>	Predator	Asteroidea	Medium
<i>Eurypodius latreillei</i>	Predator	Crustacea	Medium
<i>Flabellum cf. Curvatum</i>	Filter feeder	Cnidaria	Low
<i>Fusitriton magellanicus</i>	Predator	Gasteropoda	High
<i>Gorgonocephalus chilensis</i>	Filter feeder	Ophiuroidea	Medium
Hydrozoa	Filter feeder	Cnidaria	Low
<i>Idanthyrus macropalea</i>	Filter feeder	Polychaeta	High
<i>Isotealia antártica</i>	Filter feeder	Cnidaria	Low
<i>Labidiaster radiosus</i>	Predator	Asteroidea	Medium
<i>Libidoclea granaria</i>	Predator	Crustacea	Medium
<i>Ophiacantha vivipara</i>	Grazer or detritivore	Ophiuroidea	Medium
<i>Ophiactis asperula</i>	Grazer or detritivore	Ophiuroidea	Medium
<i>Ophiura lymani</i>	Grazer or detritivore	Ophiuroidea	Medium
<i>Paramolgula gregaria</i>	Filter feeder	Chordata	Low
Picnogonida	Grazer or detritivore	Crustacea	High
Porifera	Filter feeder	Porifera	Low
<i>Pseudodechinus magellanicus</i>	Grazer or detritivore	Echinoidea	Low
<i>Pseudocnus dubiosus leoninus</i>	Grazer or detritivore	Holothuroidea	High
<i>Psolus patagonicus</i>	Filter feeder	Holothuroidea	High
Pterasteridae	Predator	Asteroidea	Medium
<i>Sterechinus agassizii</i>	Grazer or detritivore	Echinoidea	Low
<i>Sympagurus dimorphus</i>	Grazer or detritivore	Crustacea	Medium
<i>Trochita pileolus</i>	Filter feeder	Gasteropoda	High
<i>Volvarina warrenii</i>	Predator	Gasteropoda	High

Echinoderms were the dominant group in the community, followed by Cnidarians, Gasteropods, Crustaceans and Ascidians with resiliencies estimated to be mainly medium (62% of the species listed), low (46%), high (23%) and low (23%), respectively. The biomass of scallops and bycatch as well as the relative abundance of epibionts on scallops differed between areas.

One of the management measures adopted from the inception of the scallop fishery was the setting aside of reserve areas in every management unit as a way to maintain reproductive aggregations (Lasta & Bremec, 1998). These reserves also maintain areas free of disturbance from fishing providing control areas to monitor changes due to fishing in the same unit.

Protocol used by observers on board is very complete in order to protect main by-catch species, and has been detailed in previous reports. During 2015 coverage of OBOs was 85%, with only four trips without observer (Campódonico & Herrera, 2015). No visits in the reserve zone were recorded. Invertebrate survivorship incidentally caught in the fishery was analyzed by Schwartz *et al.* (2016).

Schejter *et al.* (2008) analysed the bycatch in 1998, 2001 and 2002 from 94 tows from the fished area of recruitment bed compared with 23 tows from the unfished reserve area on this bed. Benthic assemblages and species richness in both areas were similar. Comparison of taxa richness, scallop biomass, bycatch biomass, multivariate analyses, and Brey-Curtis similarity index between fished



and unfished areas failed to establish any significance in differences (Schejter *et al.*, 2008). Similar sampling on recruitment bed in 2007 does show a significance decrease in bycatch biomass in fished areas between 1995 and 2007 as well as significant differences in species composition with higher biomasses of fragile sessile organisms, in the unfished area compared to the fished area (Escolar *et al.*, 2011).

In order to provide information of the main bycatch species affected by the fishery, a study conducted to evaluate the effect of the trawling on the benthic community associated to Patagonian scallop, was carried out between 1998-2009, analysing 616 subsamples of the surveys (Escolar *et al.*, 2015). All diversity indexes analysed presented variation between years and areas, but the between-areas observed variation is the same independently of the year considered in the analysis. Samples of the areas with high fishing effort showed low values of diversity indexes. The highest values of species richness and high diversity index (Shannon-Wieber index, SW) were those corresponding to exclusion areas and with low fishing effort. On the other hand, areas with high fishing effort showed low value of the SW index.

This study, released on INIDEP Technical Report N° 84/2015, analysed the effects of fishing trawl on the diversity, structure and composition of the benthic community in the long term in the Management Unit B (using the historical benthic fauna database obtained through the evaluation campaigns of the resource), a greater specific richness was recorded in areas of fishing exclusion and/or areas without activity of the Patagonian scallop fleet.

While fishing effort resulted to be both direct and inversed correlated depending on the taxa, above all, depth resulted to be the most important factor in modelling the distribution and structure of the benthic community.

This report shows how fishing effort influences the biomass and distribution of many species in the community. As a result, although the same species were recorded throughout the area and throughout the study period, the area subject to greater fishing effort showed lower values of biomass throughout the analysed period; and here it was demonstrated, for the first time, the importance of the spatial and temporal closures of the fishery for the benthic community, registering a recovery of the biomass after the implementation of the successive closures to the fishery.

The other source of information on the state of the benthic habitat is gathered and recorded by the INIDEP Observers On Board Program, following strict own protocols. Observers have estimated and weighed major groups of the bycatch in every tow landed by the fishery since its inception. In 2003, INIDEP developed an identification guide illustrating the most commonly caught species to help observers in this task (Bremec *et al.*, 2003). Since the beginning of the fishery, observers have also taken a 10 L sample of bycatch from one tow randomly each day and frozen it for later identification at INIDEP. All these data awaits comprehensive analysis and testing to reveal trends in the bycatch of the fishery. These data have the advantage of measuring change more directly and consistently but will require the development of statistical methods for their analyses.

#### **3.4.6 Details of any critical environments or sources of concern and actions required to address them.**

There are no sensitive environments in the area of the fishery.

Moreover, Argentine fishing management has established some closed systems to protect living resources and vulnerable marine ecosystems (Figure 16) if needed, according to the life cycles of some “main concern” species:

- An extensive system of closed permanent and temporal areas for the protection of reproductive process and breeding areas (hake, coastal demersal species).
- An area of permanent close area in high seas for the protection of vulnerable marine ecosystem

(e.g. cold water corals).

-A system of opening and closing of areas using an adaptive management approach for squid, shrimp, scallops and red king crabs.

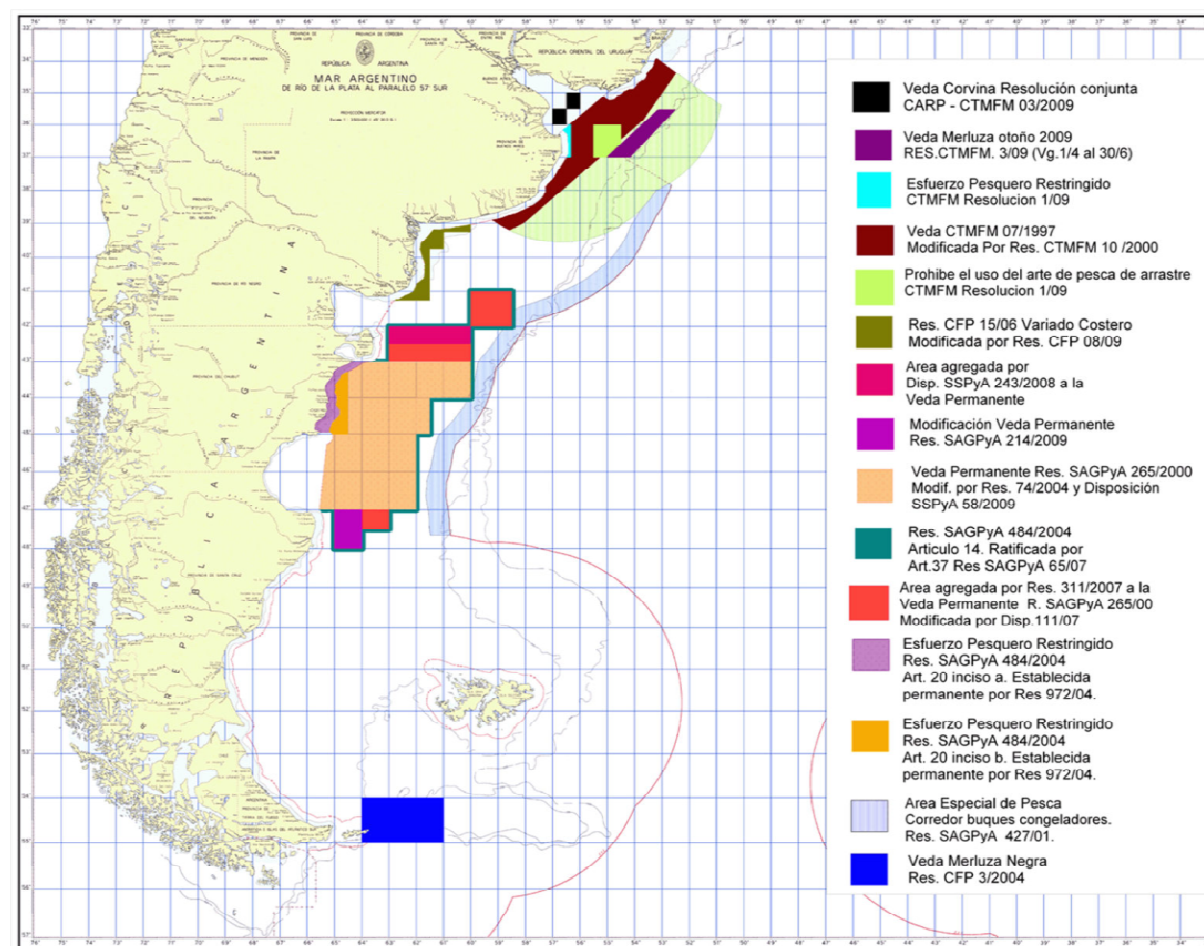


Fig. 16. Closed system areas in the Argentine Sea (Source: [http://obio.ambiente.gob.ar/multimedia/files/GTRA\\_Marino.pdf](http://obio.ambiente.gob.ar/multimedia/files/GTRA_Marino.pdf))

### 3.4.7 Cumulative impacts

No cumulative impacts need to be considered in this assessment. There are no "Primary, Secondary or ETP" species in this fishery, not other MSC UoAs fisheries in the same habitat.

## 3.5 Principle three: management system background

### 3.5.1 Fishery area of operation

The fishery area of operation is from 36°50' to 45°30' S in the Argentina managed waters (AEEZ). There is a Management Unit (MU H) located in international waters (east of line 200 mn counted from the baseline to the outside edge of continental margin between 45° and 47° S).

As it is described by FAO (<http://www.fao.org/docrep/003/t3740e/T3740E03.htm#ch3.10>), UNCLOS does not use the term "straddling stocks", but Article 63, clause 2 refers to: "the same stock or stocks of associated species [which] occur both within the exclusive economic zone and in an area beyond and adjacent to the zone", and this will be taken as a working definition of the

concept of straddling stock in this document. The Fish Stock Agreement, while using the term extensively, does not specifically define it although the above definition ("stocks occurring both within and beyond the exclusive economic zone") is used in explaining the meaning of straddling stocks when using some of the other official languages of the Organization.

The concept of straddling fish stock can cover a continuum from most of the fish being inside the areas of the EEZs under national jurisdiction to most of the fish being in an area beyond and adjacent to it, that is outside EEZs (in the high seas). No minimum portion outside or inside has been defined, but usage seems to indicate that as long as there is some directed fishing effort at catching the stock on either side of the EEZ line, it is considered to be straddling.

As most of Management Units are located in AEEZ, the Patagonian scallop fishery is not shared and there is a single jurisdiction. The management of MU H could be defined as straddling stock.

The Ministerio de Agroindustria through Consejo Federal Pesquero is responsible for managing fishing activity in Argentina. The last one is responsible for carrying out this task.

#### a. National management in Argentine Sea

The Ministerio de Agroindustria organization chart is shown below:



Fig. 17. Updated of organizational chart of Ministerio de Agroindustria (Source: [www.agroindustria.gob.ar](http://www.agroindustria.gob.ar))

#### Ministerio de Agroindustria (MA)

Ministerio de Agroindustria (MA) is the national fishing agency of the Argentine Government and is responsible for the implementation of the national fishing legislation and resolutions emitted by Consejo Federal Pesquero (CFP). Some of its responsibilities are specified in the Law N° 24.922 and those are:

- Conduct and execute the national fishing policy, regulating exploitation, control and research;
- Conduct and execute objectives respecting technical and scientific investigation of fishing resources;
- Control the maximum licensed catch established by CFP and issue annual quotas of catch per vessel, species, fishing zone and fleet;
- Issue fishing licenses, prior approval of CFP;
- Calculate the available surplus and establish, prior approval of CFP, restrictions for closed areas or seasons;
- Establish, prior approval of CFP, requirements or conditions that vessels and fishing companies must fulfil in order to conduct the fishing activity;
- Establish catch methods and techniques, and specification of prohibited equipment and nets, etc., with the advice of INIDEP and in concordance by CFP policies;
- Impose sanctions in conformance of rules, record them and inform to CFP;

- Develop statistical systems for the fishing activity;
- Intervene in bilateral or multilateral international negotiations related to the fishing activity in conformance with the national fishing policy;
- Establish regulations of the fishing record;
- Coordinate payment of catch fees established by CFP;
- Intervene in benefit grantings for fishing sector;
- Intervene in investment plans that require or count on specific international/national financing entities;
- Establish and implement necessary and sufficient control systems to monitor the catch in the territorial sea and EEZ and check the fulfilment and truthfulness of the affidavits of catching.

*Secretaría de Agricultura, Ganadería y Pesca (SAGyP)*

SAGyP, through its Subsecretaría de Pesca y Acuicultura (SSPyA), is responsible for conducting and executing national fisheries policy established by CFP. SAGyP conducts and executes scientific and technical research objectives and needs, control total allowable catches (TAC) by species, issue quotas according to the guidelines set by the Council, collect royalties, establish and implement control systems to determine catches in the territorial sea (AEEZ), monitor landings in authorized ports, carry out sanction regime, check the accuracy of fishing reports and promote the consumption of national seafood products both domestically and internationally.

*Subsecretaría de Pesca y Acuicultura (SSPyA)*

Main objectives of SSPyA are:

- Propose and implement, within the Law N° 24.922 frameworks, its amendments and supplementary national policies for the effective protection of national interests related to wild capture and fishing sustainability against the rational use of living marine resources.
- Propose and implement policies to manage continental fisheries.
- Coordinate management actions for protection and cultivation of living aquatic resources, aimed at their conservation in the long term with national and provincial authorities.
- Assist in benefit provisions from sectorial promotion or grant awarded to fisheries and aquaculture.
- Intervene in all fish health matters.
- Participate in negotiations on setting the tax and customs policies and foreign trade linked to the fisheries sector, in coordination with relevant agencies.
- Coordinate work relating to fishery records.
- Attend in granting fishery allocation prior approval of CFP and assist in approval transferring licenses for fishing vessels.
- Provide, as appropriate, the immediately suspension of fishing permits when vessel arrives to port and any other needed action, when there is a serious violation and penalty, resulting from infringement of current regulations.
- Propose closed areas, fishing seasons and/or reservations and delimitation of fishing areas based on specific technical reports, prior approval of CFP.
- Propose requirements and conditions to develop marine fisheries, including capture methods and forbidden and permitted techniques with the advice of INIDEP.

- To control TACs and the issuing of annual catch quotas per vessels, prior approval of CFP.
- Attend to SAGyP in international negotiations, working on efforts related to the expansion of activity areas for the national fishing fleet and improved management of species.
- Propose measures to regulate the exploitation activities, culture, monitoring and research in areas under national jurisdiction and in adjacent waters to EEZ.
- Review industrial development in accordance with environment.
- Propose and implement measures to regulate transport of fish products.
- Review the policy requirements on fisheries and aquaculture.
- Approve scientific and technical information dissemination through means deemed appropriate.
- To support relationships between Ministerio de Agroindustria, INIDEP and federal administration.

#### *Dirección Nacional de Coordinación Pesquera*

Its main responsibility is to understand the control and management of fishing activities within the framework of current legislation.

#### *Dirección Nacional de Planificación Pesquera*

Its responsibility is to integrate scientific and technical information to facilitate decision-making for management measures, management and expansion of the sector, to implement in the short, medium and long term, developing permanent fishing statistical systems.

#### *Consejo Federal Pesquero (CFP)*

CFP is composed of representatives of the Nation and Provinces seaboard. Its main functions are: national fisheries development plan and establish its national fisheries policy and research; set the Total Allowable Catch (TAC) by species; approve fishing permits; establish mining rights; set fees for the exercise of fishing as well as to regulate and set the rules for the system of resource management by catch quotas. CFP minutes and its decisions (through resolutions and proceedings) are published on its website ([www.cfp.gob.ar](http://www.cfp.gob.ar)).

Responsibilities are described in the Law N° 24.922 – Article 9°:

- Establish national fishing policies and fishery research.
- Set TACs by species, taking into account maximum sustainable yield according data provided by INIDEP. Also, establish annual catch quotas per vessel and species, fishing area and fleet, empowering in Article 27°, CFP regulates and dictates the necessary rules to establish the regime of administration by quotas of catch.
- To approve permits to carry out experimental and commercial fishing.
- Advise to the Application Authority in international negotiations.
- To plan national fisheries development.
- Establish guidelines of co-participation in Fondo Nacional Pesquero (FO.NA.PE).
- To develop rules on experimental fishing.
- Establish exploitation rights and set fees for fishing activities.
- To regulate artisanal fishing activities, establishing a reserve fishing quota for species.
- Establish issues considered by CFP requiring qualified voting of members.

- Establish own operational rules with approval of members.

#### *INIDEP*

Its missions and functions are to formulate, implement and monitor research projects in exploration, assessment and development of fisheries, aquaculture technologies, fishing gears, processes and economy, according guidelines and priorities established by enforcement authority.

Is the scientific institution, that advises CFP in determining TACs per species, experimental fishing, stock status, plan design or application of management measures and coordinate scientific and technical activities in the assessment and conservation of national marine living resources. Institutional activity and technical documentation produced serve as a basis for decisions of the enforcement authority. Technical reports are provided in the website ([www.inidep.edu.ar](http://www.inidep.edu.ar)).

It is implemented the Observers On Board Program, whose general objective is the coverage of fishing activities on board vessels in order to obtain scientific data to assess for ecological system in operation to assist the development of sustainable fishing.

According SSPyA Regulation N° 9/2008, INIDEP provides technical accreditation to individuals who meet the qualification and training necessary to perform the following tasks:

- Monitoring and measurement of fishing gears.
- Collect sample data and observations during fishing operations.
- Any additional task that INIDEP can determine to improve fishing activities.

#### *Ministerio de Relaciones Exteriores y Culto*

It is responsible of foreign policy aspects in fisheries and environmental issues related with this activity and represents Argentina in international forums. It also understands the negotiation, interpretation and implementation of international instruments regulating fishing activities and those related to environmental issues. Moreover, promotes in international trade of fish products and exportations linked to national fisheries.

#### *Secretaría de Ambiente y Desarrollo Sustentable (SAyDS)*

In relation with environmental issues, Secretaría de Ambiente y Desarrollo Sustentable (SAyDS) de la Nación is the enforcement authority of the General Environmental Law N° 25.675, whose objectives are: to ensure the preservation, conservation, recovery and improvement of the quality natural and cultural of environmental resources; promote balance and dynamics of ecological systems; ensure the conservation of biological diversity; and establish a federal system of interjurisdictional coordination for the implementation of environmental policies at national and regional level. This law provides a framework for the preservation and conservation of natural resources and involves society in activities of prevention of deterioration, preservation and restoration of the environment.

#### *Servicio Nacional de Sanidad y Calidad Agroalimenticia (SENASA)*

SENASA is a health agency whose main objective is the inspection and certification of products and by-products of animal and vegetable origin. Also, performs tasks of prevention, control and eradication of animal diseases, including those transmissible to humans. Develops standards and compliance controls, ensuring the implementation of the Argentine Food Code, within the international standards required. SENASA carries out the monitoring of factory vessels and processing plants and packaging, transport and marketing of fishery and aquaculture products, in addition to controlling the federal traffic, imports and exports of products, by-products and derivatives fishing origin or culture. Regulation of product, by-product and derivative of animal origin products are approved by Federal Decree N° 4238/68



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#### *Prefectura Naval Argentina (PNA)*

The national fishing authority coordinates with Prefectura Naval Argentina (PNA), under Ministerio del Interior, the adoption of all needed measures to ensure control and surveillance of fisheries. In line with current legislation, PNA exerts patrol tasks related to fishing activity as auxiliary police. It is also the agency responsible for granting of number of registration assigned to fishing vessels that have national flag and controls technical aspects related to the safety of human life at sea, safety and pollution prevention caused by the activity.

#### **3.5.2 Consultation and decision-making processes**

The management system includes consultation process to obtain decision-making and regularly seeks and accepts relevant information, from the main affected parties, including local knowledge, to inform the management system by Comisión de Análisis y Seguimiento de la Pesquería de Vieira patagónica (*Zygochlamys patagonica*) created in August 2005 through the CFP Resolution N° 5/2005, after replaced by CFP Resolutions N° 9/2006 and N° 4/2008. The management system demonstrates consideration of the information and explains how it is used or not used.

Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica (*Zygochlamys patagonica*) is integrated by two representatives of the application authority, two of INIDEP, and one representative of each of the companies that have authorized the capture of the species. This Commission shall be an advisory body and shall meet at least twice a year (CFP Resolution N° 21/2014). In addition, it shall submit to CFP its summary meetings with the issues and respective conclusions.

The consultation process provides opportunity for all interested and affected parties to be involved, and facilitates their effective engagement. The opinions and proposals of Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica, are often taken into account by Consejo Federal Pesquero prior to take any decision on the fishery. Any stakeholder may request a hearing with the administration bodies and is heard prior the decision is taken.

Explanations are provided for any action (or lack of actions) associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. These are released in INIDEP Technical Reports. These reports are referred to CFP and its reception published in its meetings' records.

CFP has defined geographic units of management of the Patagonian scallop species (*Zygochlamys patagonica*). The maximum allowable catch (TAC) is determined annually by Consejo Federal Pesquero, according to the reference values suggested by INIDEP. Likewise, capture controls will be performed by each Management Unit. Once the TAC is reached, the Management Unit will be closed to fishing.

The capture of whole scallop of commercial size shall be estimated as a function of the callus obtained by multiplying it by a conversion factor which relates the weight of the product (callus) to the weight of the entire scallop. The conversion factor is set to a value of 7.14.

CFP establishes a minimum valve height of 55 mm, for the scallop to be considered of commercial size and can enter the productive process.

Small scallops must be returned immediately to the sea including by-catch, being able to retain the smaller sizes up to a maximum limit of 20% of the total catch per throw (CFP Resolution N° 9/2016). Specimens caught beyond this tolerance range must be returned to the sea immediately together with the accompanying benthic fauna.

Catches shall be made with both trawls and dredges. In the latter case, the fishing gear must have been previously authorized for research purposes.

Furthermore, CFP establishes penalties for non-compliance, according to Law N° 24.922.

### 3.5.3 Objectives for the fishery

The Federal Fishing Law N° 24.922 (Article 1°) establishes that Argentina will foment the practice of maritime fishing in function of a maximum development compatible with the rational exploitation of living marine resources, will promote the effective protection of national interests related to fishing and the sustainability of fishing activities, the long-term conservation of the resources, the development of industrial processes environmentally appropriate to reach the maximum added value and the maximum Argentinean employment. These minimal premises must be complied by all fisheries in Argentine waters, due mandatory statement for the whole fishery system, and particularly, for the administration system, whose task is to design management policies in order to achieve the Law objectives.

The concept of Maximum Sustainable Yield (MSY) included in the mentioned Law is expressed in its Article 8° of its Regulatory Federal Decree N° 748/99: 'It must be understood as Maximum Sustainable Yield (MSY) of a desired species, the maximum biomass that can be captured annually without affecting its conservation'.

Additionally, other sections of the Federal Fisheries are related with preventing excesses on exploitation and the sustainable utilization of fishery resources:

-Article 17°, by prescribing that fishing in the Argentine maritime jurisdiction will be subjected to restrictions, established with the objective of avoiding exploitation excesses.

-Article 21°, by banning every method, technique, equipment and fishing gear that may cause damage on the aquatic resources.

-Article 22°, by referring to the organization and maintenance of a fishing regulation within the Economic Exclusive Zone, establishing measures for organization and conservation directed to the rationalization of the exploitation and insurance the conservation of resources.

-Article 37°, related to the access to fishing activity in the maritime areas under Argentine jurisdiction of fishing vessels with foreign flag. This article indicates that determination of the capture fishing capacity by the Argentine fleet in order to estimate the available biomass for foreign fleets, could only be done considering biologic features of the exploited resource, and not considering normal cyclic reductions on fleet common in fishing activity nor due to specific situations or extraordinary events that could have affected the operation of a particular fleet.

Incorporating an adaptive criterion, both operational and long-term measures were implemented in the AEEZ. In 2006, it was established the Management Plan for Patagonian scallop fishery (CFP Resolution N° 9/2006) and then, it was modified (CFP Resolution N° 4/2008):

-Article 2°, scallop catches will carry out throughout the year. CFP could set prohibitions, which may be fixed or mobile (temporarily or spatially), based on scientific reports, for research purposes or conservation of juvenile or reproductive fraction of the population.

-Article 3°, catches must be made with trawl nets and dredges. In the last one, the use of dredges must be authorized by CFP to minimize impact with seabeds.

*Note by assessment team: the use of dredges is only for INIDEP's research purposes. The commercial fleet not uses this fishing gear.*

-Articles 4°, 5° and 6°, TACs (tons of entire scallop, including shell and meat) will be established annually by CFP, according to INIDEP's recommendations or precautionary approach. TAC will be set by Management Unit (MU).

-Article 7°, in case that TAC is reached, the MU will be closed.



-Article 8°, the total catch will be estimated using a conversion rate (7.14), relating entire scallop and product (scallop meat) processed on board.

-Article 9°, vessels with national fishing permit and authorization will operate within MUs that have a TAC established, and also outside these areas. In the latter case, catches outside MUs will not be counted to reach the respective TAC.

-Article 10°, vessels must report daily production to Dirección Nacional de Coordinación Pesquera (DNCP), including total quantities and MU harvested. As precautionary approach, DNCP will report to INIDEP when TAC reached 90% in each area.

-Articles 11° and 12°, in case of discovering a new management unit, it is mandatory to inform to DNCP and INIDEP within 5 days. CFP may require studies to estimate abundance and establish operating guidelines. During this lapse, vessels could continue to harvest for 60 calendar days in the new area until CFP establishes the measures.

-Article 13° (replaced by Article 1° of CFP Resolution N° 9/2016), the minimum legal size was set at 55 mm of shell total length. Small scallops must be returned immediately to the sea including bycatch (being able to retain the smaller sizes up to a maximum limit of 20% of the total catch per throw. Specimens caught beyond this tolerance range must be returned to the sea immediately together with the accompanying benthic fauna).

-Article 14° (replaced by Article 2° of CFP Resolution N° 9/2016), it is forbidden to catch in areas that contain  $\geq 50\%$  of juvenile scallop ( $< 55$  mm). If in two days, the vessel catches no-commercial scallops, it is mandatory to change the harvesting area and CFP could establish it a closed area to ensure sustainability. The ship's permanence in the area where more than 50% of juveniles were captured, was reduced from two days to one. It was added the prohibition to revisit the area until it is completed a research campaign aimed at evaluating the size structure in the area.

-Article 15°, the Follow-up Commission ('Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica') will be comprised by two INIDEP's representative, two members of management authority and a representative of each company. The Commission shall be considered an advisory body and shall meet at least once every three months, having to produce a record of the issues covered in its meetings and submit them to CFP. The meetings frequency was modified to a minimum of two per year for all monitoring commissions by CFP Resolution N° 21/2014 of 18<sup>th</sup> December 2014.

-Article 16°, each vessel with license shall allocate 20 days in the year for research issues carried out by INIDEP. Costs related will be provided by fishing companies.

Long-term political objective on rational exploitation, stocks productivity protection, social and inter generation equity and species conservation, are explicit referenced in all relevant legislation and same precautionary approach is included in technical recommendations.

The precautionary approach is established by the Argentine fisheries legislation by means of the prescriptions present in Article 17° of the Federal Fisheries Law N° 24.922, which establishes that "Fishing activity throughout all maritime areas under Argentine jurisdiction, will be subjected to restrictions set by CFP for the conservation of resources, in order to avoid excesses of exploitation and prevent damages over the environment and the ecological system unit". Issues related with the conservation of fisheries resources can also be found in Articles 1°, 21° and 27° of the Federal Fisheries Law 24.922 and in Articles 1° and 12° of its Regulatory Decree N° 748/99.

The precautionary approach is also present in the stock assessment models and in the technical recommendations of biologically acceptable capture, as a result of the uncertainty surrounding recruitment of new individuals. TACs are established considering biomass and reproductive biomass recovery in the long term.

CFP Resolution N° 20/2014 determines the entry of the exploitation of the Patagonian scallop to the Individual Transferable Quota System (ITQ's) and sanctioned the specific regime of administration.

-Article 2°, it is assigned Individual Transferable Quotas (ITQ) for the Patagonian Scallop (*Zygochlamys patagonica*) for a period of 15 years per each Management Unit (MU).

-Article 4°, it is set the maximum percentage of CITC (ITQ) per fishing company of 45% of Total Allowable Catch (TAC).

-Article 5°, it is established a Management Reserve of 5% of TAC.

-Article 6°, it is assigned an ITQ Re-allocation Fund (FRC) of 5% of TAC.

-Article 9°, It is empowered the Enforcement Authority, through the Dirección Nacional de Coordinación Pesquera (DNCP), to calculate annually, based on the TAC, the volume in tons of each Individual Transferable Quotas (ITQ) allocated to each vessel per Management Unit.

-Article 11°, it is established the extinction of Patagonian scallop ITQ in the case of a reduction of the occupied labor force taken as the basis for the initial ITQ allocation or for FRC allocations.

-Article 12°, it is established that the recipient of the initial allocation or the ITQ Reassignment Fund, or of the annual allocation of the Administration Reserve, shall pay a fee for the allocation.

-Article 15°, it is fixed a monetary transfer right per tonne.

ITQs were established as following criteria:

Vessel	Registration	Fishing company	ITQ per each MU ( % del TAC)
ATLANTIC SURF I	0350	GLACIAR PESQUERA S.A.	22.20
ATLANTIC SURF II	2030	GLACIAR PESQUERA S.A.	22.80
ERIN BRUCE	0537	WANCHESE ARGENTINA S.R.L.	20.70
MISS TIDE	2439	WANCHESE ARGENTINA S.R.L.	24.30

Data collection of environmental aspects of the fishery during fishing operations is in charge of on board observers program. The data analysis and conclusions are on charge of the INIDEP Marine Environment Program, which estates the objectives and associated species research objectives.

Objectives for marine bird's protection are established in the National Action Plan for birds (CFP Resolution N° 15/2010). According CFP Resolution N° 3/2017, the following specific management measures were established:

-All freezer vessels with bottom trawl net shall implement two streamer lines (*i.e.* one in port and other one in starboard).

-Streamer lines (LEPs) shall be used when otter boards are submerged until the beginning of the overtuning of the net in each fishing hauls.

-Technical specifications are described in Annex I, II and III of CFP Resolution N° 3/2017.

This resolution will come effective on May 1<sup>st</sup>, 2017, and will be applied voluntarily until April 30<sup>th</sup>, 2018, and mandatory from this date.

Objectives for chondrichthyes protection are established in the National Action Plan for chondrichthyes (CFP Resolution N° 6/2009 and N° 4/2013). Since 2003, the following specific management measures were established by CFP (CFP Resolutions N° 13/2003, N° 13/2009 and N° 4/2013 and N° 7/2013):

-It is forbidden the chondrichthyan fishery as target species.

-It is forbidden the shark finning practice.

-It is mandatory to return individuals alive exceeding a size of 160 cm.

- It is forbidden the use of '*bicheros*' or hooks in discarding process.
  - All individuals dead by fishing process shall be recorded.
  - In case that an individual dead exceeds the size of 160 cm, it shall be frozen on board and provided to scientific authorities, except the following species: *Galeorhinus galeus*, *Mustelus schmitti*, *Squatina spp.*, *Squalus spp.* and *Schroederichthys bivius*.
  - It is established a 50% as total landing catch of skates, sharks and *Callorhynchus callorhynchus* per fishing trip.
  - It is established a 30% as maximum limit of landing for both skates and sharks per fishing trip.
  - In case detecting that fishing haul exceeds the limits mentioned above, the vessel shall change fishing operation area.
  - Skates caught in Bonaerense coasts are considered as "coastal skates".
  - An observer on board shall be provided by INIDEP to monitor thus vessels that register frequent catches of chondrichthyans (skates, shark and elephant fish).
- Objectives for marine mammal and sea turtles protection are established in the National Action Plan for mammals (CFP Resolution N° 11/2015) and in the National Action Plan sea turtles (CFP Act N° 37/2016), respectively.
- The Federal Law N° 25.577 protects cetaceans from any kind of intentional catch. Federal Law N° 25.052 and its complementary Decree N° 598/2003 prohibits catch and commercialization of killer whale (*Orcinus orca*).
- CFP also regulates by means of its Resolution N° 3/2001, the data collection and analysis of birds, reptiles and mammals bycatch during fishing activities.

#### **3.5.4 Monitoring, control and surveillance and enforcement**

Regarding to the control of the operation on the fleet, SSPyA has implemented the Sistema Integrado de Control de Actividades Pesqueras (SICAP), consisting of: a) Satellite Positioning System of the National Fishing Fleet; b) satellite information of the whole area where foreign fishing vessels outside the AEEZ by Comisión Nacional de Actividades Espaciales; and c) activity monitoring and surveillance by PNA, Navy and Air Force which have surface units (coast guard and corvettes) and air units (aircraft and helicopters) to control illegal fishing. This information is supplemented with controls from downloads and on board information. It also features the incorporation of electronic fish and control of activity by cameras on board, not still being implemented yet.



Fig. 18. Sistema Integrado de Control de Actividades Pesqueras (Source: PAN-Tiburones)

The organizations responsible for the control and monitoring of international trade in food products in Argentina are SENASA and Dirección General de Aduanas (DGA).

SENASA is responsible for the inspection and certification of products and by-products of animal and plant health agency, monitoring, control processors vessels, processing plants, on land conditioning, transport and marketing of fishery products and aquaculture, besides controlling the federal traffic as well as imports and exports of products, fisheries products and derivatives of origin or culture.

DGA is an organ that is part of Administración Federal de Ingresos Públicos (AFIP) and is responsible for implementing the legislation on the import and export of goods, as well as the traffic control goods entering or leaving in the customs territory. Its main function is to assess, classify, monitor and control the entry and exit of goods, as well as media that are transported, ensuring compliance with regulations.

This institutional framework and tools generated, allows to set the following control in relation to the extracting and marketing of fishery products:

a) Prior to leaving boat:

1. Release for fishing: control of the leaving boat by PNA, through the document entitled “Declaración de Salida”, which contains date and time the vessel is leaving, certificates validity, the crew’s role, whether the vessel does not count with impediments to set sail, has the corresponding fishing permit and target species, the satellite monitoring equipment is in good working order and the inspector is enabled to meet this function by the competent authority.

b) During the fishing trip:

2. Satellite monitoring during trip: as set out in the SSPyA Regulation N° 2/2003, all fishing vessels (commercial fleet of more than 13 m length, operating in national waters) must have satellite monitoring equipment on board in perfect working order. This makes a total of 570 fishing vessels with equipment on board, with an average daily operation of between 225 and 300 ships in about navigation. The system must inform the ship’s position every hour. In the event the ship stops emitting its signal for more than two hours space, it is immediately ordered to return to port.

Regardless, SSPyA's office control can perform special individual queries ("polling") at any time regarding to the position of the vessel. Twice a day the information system in the SAGyP's website is updated.

3. On board inspections: the inspector prepares the "Informe de Control de Marea" and "Actas", if applicable.

4. Fishing acts: the system consists of several affidavits of catches by species and fishing area signed by the master of the vessel. Moreover, the captain prepares a statement with the summary information ("Parte Final de Marea"), in which the catch is declared by fishing zone across the tide. This portion is scanned by accessing the database and this information is taken into account for the control of tariffs and quotas. In addition, the captain makes a statement with the information for each set ("Parte Lance por Lance"). All documents are delivered to the delegation of DNCP, operating in the port where the landing process is carried out.

c) During the trip:

5. Declaration input: control of port entrance documented by PNA.

6. Monitoring and verification act of discharge: made by dock inspectors in permission by SSPyA.

7. Audit of books plant: each plant recorded in "libros foliados" income and expenses of goods to be processed. Plant books are audited by SENASA or Municipality veterinarian, as appropriate.

8. Exit control plant: for plant outflow of goods should prepare a "Guía de Tránsito", which according to the destination will have restricted or federal character. It should also be authorized by SENASA drawing up a detailed guide to the origin and destination of goods between authorized institutions ("Permiso de Tránsito Restringido").

9. Export control: the goods for export must be accompanied by "Certificado Sanitario de Exportación" issued by SENASA and a "Manifiesto de Exportación (Permiso de Embarque)" issued by AFIP. By providing SSPyA Disposition N° 174/2015, Sistema de Control de Carga was implemented, also known as Legal Capture Certificate, which is mandatory before DNCP request, prior to export requirement, the issuance of a certificate for a large number of species (hake, toothfish, hoki, Southern blue whiting, scallops, haddock and rays) as a requirement for export. The lack of demand for issuance of Load Control Certificate is conditional on the legality of the entire catch of each fishing trip linked to the export check.

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## 4. Evaluation procedure.

### 4.1 Harmonised fishery assessment

At the moment, harmonisation process is not required for this UoA.

### 4.2 Previous assessments

#### **a. A summary of any previous assessments of the client operations and conclusions reached from those previous assessments**

The Patagonian scallop fishery in Argentine Sea was certified for the first time in December 2006 and re-certified in April 2012 against Principles and Criteria of MSC by Organización Internacional Agropecuaria (OIA), therefore it is a well managed and sustainable fishery.

The re-assessment was conducted following MSC Certification Requirements v1.0 and Fisheries Certification Methodology v6.1. The re-assessment process used the Fisheries Assessment Methodology v2.1 using the Default Assessment Tree without adjustments. Risk Based Framework methodology was undertaken for Performance Indicators: 2.2.1 (Bycatch Outcome) and 2.4.1 (Habitat Outcome). PIs were scored using Scale Intensity Consequence Analysis (SICA) and Productivity Susceptibility Analysis (PSA), when applicable.

The assessment team set out 6 conditions. The client group elaborated an Action Plan to address satisfactorily the conditions for a period of 4 years during each surveillance process. This plan was appended to the Final Report.

Actions were examined as part of the four surveillances that were completed in May 2013, May 2014, July 2015 and July 2016, respectively.

In the first surveillance audit, progress of milestones related to PIs 2.2.1, 2.2.2, 2.2.3, 2.4.1 and 2.4.3 were identified by the assessment team as BEHIND TARGET. In the second surveillance audit, all conditions maintained its status as ON TARGET. However, in the third surveillance audit, the condition related to PI 2.4.1 was detected as BEHIND TARGET and condition related to PI 2.2.1 was re-classified as RECOMMENDATION. The other conditions maintained their status; ON TARGET. In the last surveillance, the progress of all conditions established in the re-certification process was sufficient to comply with the action plan proposed. In consequence, the assessment team classified these progresses as adequate and concluded that all conditions are CLOSED. No non-conformities were found.

It is concluded that the Patagonian scallop fishery in Argentine Sea remain meeting the standards of MSC and complies with the requirements to continue with its certification. Therefore, it is recommended certificate holders maintain the certification to MSC Standard and the fishery may apply for a second re-certification process.

Since the fourth surveillance, there are no other fishers/companies eligible to share the MSC Sustainable Fishery Certificate. The client group agrees to continue with the MSC certification.



**b. Details of any conditions/recommendations that were closed at or between the previous surveillance audits**

Condition/Recommendation	PI(s)	Year closed	Justification
Condition 1: the client group must provide evidence that the assessment of stock status is subject to peer review.	1.2.4	Year 4 (2016)	<p><u>The assessment of stock status is subject to peer review.</u></p> <p>INIDEP sent OIA a note where is explained that the report about assessment methodology of Patagonian scallop (<i>Zygochlamys patagonica</i>) biomass from survey research data, which will be released in “Revista de Investigación y Desarrollo Pesquero”, is in peer review process.</p> <p>The peer review process is regular in order to improve when taking decisions, but it was carried out by internal mechanism. It is notified that the document containing the assessment methodology was submitted to be evaluated by anonymous referees.</p>
Recommendation 1: the client group must provide evidence that:  -main bycatch species are highly likely to be within biologically based limits  -if main bycatch species are outside biologically based limits there is a partial strategy of demonstrably effective mitigation measures in place such that the fishery does not hinder recovery and rebuilding	2.2.1	Year 4 (2016)	<p>The main by catch species are highly likely to be within biologically based limits.</p> <p>If main bycatch species are outside biologically based limits, there is a partial strategy of demonstrably effective mitigation measures in place that the fishery does not hinder recovery and rebuilding.</p> <p>The impact assessment on chondrichthyan species in Patagonian scallop fishery was initiated, in order to identify genera and species, size ranges and eggs present. Catches of sharks (<i>Schoederichthys biviatus</i>), batoides (<i>Discopyge tschudii</i>) and rays (<i>Rajidae</i>) were recorded. The most frequent incidental catches were rays (<i>Bathyraja</i>) and others considered “off shore” species (Colonello &amp; Massa, 2014).</p> <p>In 2015, Pesquerías de Moluscos Bentónicos and Pesquerías de Condriktios Programs agreed to work with observers on board in commercial fleet, with the aim to increase the frequency of the estimated catch of sharks and perform a preliminary experience of survival of these species using drags. Results indicate that, in general, the greater presence of rays was observed in catches in the first sets to reach the fishing area or after a change of zone. This was verified in the second fishing trip, where the catch was categorized according to whether the sets corresponded to operations or intensive fishing. In hauls exploration (few sets per area) catching rays is higher, while in sets of intensive fishing (several consecutive sets in the same area), capture is low, being able to be zero. This would relate to the effect of “disturbance” or suspension of sediments, which occurs during the drag on the bottom (Colonello &amp; Massa, 2014).</p> <p>Catching was estimated from retained rays on deck when the entire catch is deposited as “bulk” before to descent in the hold. Due to this stage, it can be underestimated catching rays, as some individuals directly fall in the hold and can not be quantified on deck. Therefore, the results should be corrected from a retention rate calculation and the relationship between the number of individuals retained on deck and individuals reaching wells or processing line. According to preliminary observations in the analysed fishing trips, the retention rate varies between 40 and</p>





			<p>50%.</p> <p>For the second fishing trip, the separation distance in the mesh strainer where the catch falls to holds, decreased. This increased the percentage of retention and immediately discards the rays on deck. The species retained on deck were ruled mostly by applying “best practices”, meaning that the individuals are discarded quickly, without using hooks or “gaffs” (CFP Resolution N° 4/2013). Observations indicate that survival rate was higher in specimens collected on deck. The species collected during the production process crossed the wells and washing machines where water pressure is applied. It is likely that this latter process significantly decreases the survival rate. The experiences should be continued to increase the guarantees on the survival of rays (Villalba &amp; Colonello, 2015).</p>
Condition 3: the client group must provide some evidence that the partial strategy is being implemented successfully for bycatch species.	2.2.2	Year 4 (2016)	<p><u>The partial strategy is being implemented successfully for bycatch species.</u></p> <p>From the ecosystem point of view, Pesquerías de Moluscos Bentónicos Program has a unique opportunity to study the impact of Patagonian scallop fishery (<i>Zygochlamys patagonica</i>) in the Southwest Atlantic, both the target species and throughout the benthic community associated. It has information from the previous community at the beginning of fishing operations (baseline). Since the beginning of the activity in 1996, patterns very comprehensive management including collection of all activity by the commercial fleet, annual assessment campaigns, sampling of benthic fauna by observers on board and establishment of areas of closures were implemented permanent (Lasta, 2000; Bremec &amp; Lasta, 2002; CFP Resolutions N° 4/2008, N° 5/2009 and N° 15/2012).</p> <p>Worldwide has been applied two methodologies to study the impact of fisheries on benthic communities. The first, through dimensional experimental designs in time and in certain places, which compares before and after the disturbance caused during the same experience. With this methodology, disturbance can be achieving accurate information. The second method is to compare areas subject to different levels of fishing efforts from historical information. The difficulty of this methodology is that, generally, fishing effort does not have good spatial definition. Thus, the disturbance assigned to a sample may not be correct. Pesquerías de Moluscos Bentónicos Program has detailed information of all activities of the scallop fleet and the benthic community associated with the fishery. For the advantages of the two methods described above to be met, there are disturbance accurate information and features fishing exclusion areas to be used as a control site and the disturbance assigned to each sample represents the actual effect of the fishery on the benthic community.</p> <p>In the research work carried out by Escolar <i>et al.</i> (2015), the structure and composition of the benthic invertebrate community that makes up the catch of Patagonian scallop fishery though a gradient of fishing effort, using a historical database is analysed. While there are reports that involve a time series (Bremec <i>et al.</i>, 2006; Escolar <i>et al.</i>, 2009 and Schejter <i>et al.</i>, 2014b), this is the first to also consider the fishing effort.</p> <p>Throughout the study period, it was also observed how varied distribution rates of the species. During the period 1998-2009, the distribution of Patagonian scallop, <i>Porifera</i>, <i>Ophiacantha vivipara</i> and <i>Fusitriton magellanicus</i>,</p>





			<p>decreased, among the most notorious; and increased the density of polychaete, <i>Chaetopterus antarcticus</i>.</p> <p>First, it demonstrates the importance of spatial closures and temporary fishery for benthic community, registering a biomass recovery after implementing the successive fishery closures.</p> <p>The benthic community recovers more quickly in the exclusion area fishery. The importance of the exclusion area is noteworthy since the beginning of the fishery, this area control or baseline, can distinguish between natural changes and those caused by trawling.</p> <p>This study extends the knowledge of the benthic community, and allows better understanding on the functioning of marine ecosystems and identifies which groups of organisms are necessary to preserve from fishing activity. INIDEP research group plans to continue developing this line of research studies similar to other management units to analyse the variation of the benthic community regarding both time and space closures (Escolar <i>et al.</i>, 2015).</p> <p>The period comprised between 2005 and 2008 was identified as the highest density for the fishing seabed (MU B), recording a value of 0.28 kg/m<sup>2</sup>; registered during 2006 (Bogazzi <i>et al.</i>, 2013 and Bogazzi, 2015a). During 2006 and 2008, the fishing activity carried out after survey was directed to those areas containing commercial size scallop density and areas with restriction implemented during those years.</p> <p>Observations in different fishing areas have several implications on the analysis of depletion. Bogazzi (2008) showed that a reduction of CPUE is not proportional to the abundance at F rate, but it rather reflects movements of vessel in areas of different probability in the F. The assessment of depletion trends should be made in view of the differences in the spatial pattern distribution and the visiting pattern (frequency of visits).</p> <p>The extent and frequency of impacts on the seabed at small scales, the scale of F and the fishing bed have been evaluated. Additional analyses at large spatial scales, over several fishing beds, should be integrated in order to characterize temporal trends in extension and frequency of trawling in the Patagonian scallop fishery. The results will provide useful information to elaborate criteria of 'best practices' for trawling and determine the consequences of adopting different best practices on population and ecosystem (Bogazzi, 2015b).</p>
Condition 4: the client group must provide evidence that the information is adequate to support a partial strategy to manage main bycatch species.	2.2.3	Year 4 (2016)	<p><u>Information is adequate to support a partial strategy to manage main bycatch species.</u></p> <p>Two reports produced during 2015 were provided. Schejter &amp; Escolar (2015) analysed the Species Richness in the MU B during the period 1995-2013. The first assessment was considered as a baseline to evaluate changes detected throughout the time using survey data. Assessment was done using multivariate methods of ordination. Authors explained the scope of the bias emerged from the use of different sampling gears. The differences detected could be produced by the presence of new species and not by the influence of fishing, due to the MU B remained closed during several years. The results were consistent with those reported by Schejter <i>et al.</i> (2014a) and the biological association of invertebrates has been persistent over time. The recorded differences between years were due to the</p>



			<p>variation in biomass of such taxa with dominance in the community.</p> <p>The second report refers to long terms effects of trawling over diversity, structure and composition of benthic communities associated to Patagonian scallop. Study area chosen was MU B and the period 1998-2009. Major species richness was recorded in the fishing exclusion areas. Fluctuations of abundance of trophic groups (filters and predators) were analysed in relation with the fishing effort. Patagonian scallop, asteorids and gastropods were positively correlated with the fishing effort.</p>
Condition 5: the client group must provide evidence that the fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.	2.4.1	Year 4 (2016)	<p><u><i>The fishery is highly unlikely to reduce habitat structure and function to a point where there would be serious or irreversible harm.</i></u></p> <p>During 2015, a study was addressed to gather information of the invertebrate benthic community in fishing areas and reserve zones within the MU B from data of the survey carried out in 2015; and to compare results with previous surveys 2013. No differences were detected between zones in commercial scallop, total scallop and associated fauna.</p>
Condition 6: the client group must provide information that sufficient data continues to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).	2.4.3	Year 4 (2016)	<p><u><i>Information that sufficient data continues to be collected to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures).</i></u></p> <p>The extended and detailed report by Bogazzi <i>et al.</i> (2013) explored it in order to analyse changes in scallop distribution of fishing effort over the year in MU 2 (now MU B). During the workshop on “Stock Assessment Procedures and Criteria to Establish a Harvest Strategy” conducted in February 2013, there was consensus about the database being old and unable to be used for the analogous analysis in the other MU in a versatile way.</p>

### 4.3 Assessment methodology

#### a. The version number of the FCR used in the assessment of the fishery

The MSC Fishery Certification Requirements v2.0 was used to assess the fishery.

#### b. The version number of the 'MSC Full Assessment Reporting Template' used to produce this report

The MSC Full Assessment Reporting Template v2.0 was used to produce this report.

The Default Assessment Tree was used without adjustments. The RBF methodology v2.0 was not used to assess this fishery.

Stakeholder comments and OIA responses are included in Appendix 3.

### 4.4 Evaluation processes and techniques

#### 4.4.1 Site visits

In consultation with the client group, OIA started the re-assessment process in February 2016. Completing the formal documentation, including the Client Document Checklist, OIA announced to the client group and stakeholders on April 26<sup>th</sup>, 2016, the beginning of the second re-certification assessment, the proposed assessment team, and where and when the on-site visit would be taking place. All stakeholders that have expressed interest and contributed to the full-assessment and surveillances were contacted by email and later by telephone. There was no comment received about the proposed team members.

Interviews with stakeholders (client group, scientists and NGOs) were carried out in Mar del Plata on 26<sup>th</sup> and 27<sup>th</sup> May 2016, where the fishery client is established. All information received is related with the update of relevant scientific-technical documents of Patagonian scallop fishery.

The assessment team reviewed the fishery status and whether the fishery complies with the scoring issues of the default assessment tree and its performance regarding the MSC Standard.

The site visit was comprised of the following parts:

**-Provision of information:** The site visit program and logistical information were provided to stakeholders previously. The notification included also the links of "Stakeholder Guide to the MSC" and the "Template for Stakeholder Input".

**-Meetings:** Individual meetings started with an interview of the Client Group in Mar del Plata at Sheraton Hotel and then with INIDEP's scientists and Fundación Vida Silvestre Argentina's staff. During all interviews, relevant information and documentation regarding the re-assessment process were exchanged. Consulting has taken place on May 26<sup>th</sup> and 27<sup>th</sup>, 2016. Meetings were conducted by the assessment team proposed and were focused in the on-going activities associated with the new process on the fishery as well as the changes that occurred after the last surveillance.

**-Documentation:** Relevant documents regarding the process were provided to the assessment team by Client Group and stakeholders prior and during meetings. After these, follow up emails were sent to stakeholders requesting additional information. All documents received by team members during audit activities are reviewed and detailed in Reference section.

OIA gave the opportunity that all stakeholders identified in the certification process could provide information (e.g. fisheries and fishery managers, scientists, NGOs, citizens, government agencies, others). The assessment team inspected the following issues:

-Any potential or actual changes in management systems.

-Any changes, additions or deletions in regulations.

- Any personnel changes in science, management and industry and their impact on the management of the fishery.
- Any potential changes to the scientific base information, including stock assessments.
- Any changes affecting traceability.

#### 4.4.2 Consultations

Details of people interviewed as local residents, representatives of stakeholder organisations, including contacts with any regional MSC representative are provided in the following table:

Table 7. Outline of surveillance activities

Stakeholders notification: surveillance visit scheduled		April 26 <sup>th</sup> , 2016
Surveillance year 4: visit on-site		Mar del Plata, May 26 <sup>th</sup> and 27 <sup>th</sup> , 2016
MEETING ATTENDEES AND ORGANIZATIONS		
Opening surveillance meeting with Client Group		
Name	Affiliation	
Pedro Böhnsdalen	Wanchese Argentina S.R.L.	
Pedro Ibar Böhnsdalen	Wanchese Argentina S.R.L.	
Marcelo Bocian	Glaciar Pesquera S.A.	
Oscar Iribarne	CONICET	
Ezequiel Navatta	Glaciar Pesquera S.A.	
Gabriel Suarez	Glaciar Pesquera S.A.	
INIDEP group meeting		
Name	Affiliation	
Dr. Marcelo Pájaro	Responsible of “Dirección de Pesquerías Pelágicas y Ambiente Marino”, INIDEP	
Lic. Silvana Campodónico	Head of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Lic. Ana Massa	Head of “Pesquerías de Condrictios” Program, INIDEP	
Eng. Ricardo Roth	Head of “Desarrollo de Artes de Pesca, Métodos de Captura y Transferencia de Tecnología” Program, INIDEP	
Lic. Mariana Escolar	Researcher of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Susana Herrera	Researcher of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Dra. Laura Schejter	Researcher of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Julian Bastida	Researcher of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Matias Schwartz	Technical of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Ronaldo Díaz	Technical of “Pesquerías de Moluscos Bentónicos” Program, INIDEP	
Dr. Jorge Colonello	Researcher of “Pesquerías de Condrictios” Program, INIDEP	
Lic. Aníbal Aubone	Researcher of “Desarrollo de Artes de Pesca, Métodos de Captura y Transferencia de Tecnología” Program, INIDEP	
T.O. Julio García	Technical of “Desarrollo de Artes de Pesca, Métodos de Captura y Transferencia de Tecnología” Program, INIDEP	
NGO meeting		
Name	Affiliation	
Guillermo Cañete	Responsible of “Programa Marino”, Fundación Vida	

A summary of information obtained in site visit framework is provided in the Appendix 3. The following topics have been discussed:

- Implications of re-certification process
- Stock status and fleet participation
- Stock assessment changes
- Primary, secondary and ETP species related with the fishery and potential impact
- Documents related to collecting data
- Execution of INIDEP's OBO Program
- Unwanted catch in the fishery
- Measures carried out to control unwanted catch
- Technique-scientific information available

#### **4.4.3 Evaluation techniques**

Site visits to the fishery were performed by OIA and the assessment team, and consultations were done with interested stakeholders. Performance indicators and the pertaining scoring systems were evaluated, and it was judged if the fishery meets the requirements for MSC certification. In order to fulfil the requirements for certification the following minimum scores are required:

- The fishery must obtain a score of 80 or more for each of the three MSC Principles, based on the weighted aggregate scores for all Performance Indicators under each Criterion in each Principle.
- The fishery must obtain a score of 60 or more for each Performance Indicator under each Criterion in each Principle.

Even though a fishery fulfils the criteria for certification, there may still be some important potential risks to future sustainability that are revealed during assessment. These are performance indicators that score less than 80, but more than 60. In order to be granted a MSC fishery certificate, the client group must agree to comply with further improvements to raise the score to 80. OIA sets a timescale for the fishery to improve the relevant areas, so that the certification process can continue.

All stakeholders were invited to form part of the site visit via email, newsletter or any other way of contact.

## 5. Traceability.

### 5.1 Eligibility date

Expiration date of the current certificate is 25<sup>th</sup> March 2017. The target eligibility date for this fishery is therefore the date the re-certification is completed. This means that any scallop caught by the certified fleet following that date will be eligible to enter the chain of custody as certified product.

However, due to a delay in re-certification process, OIA requested to MSC a certificate extension. MSC granted it and the current certificate expires on **21<sup>st</sup> September, 2017**. More information is available in MSC website.

It is important to mention that this fishery is continuous in the year. Measures taken by the client to account risks within the traceability of the fishery – and therefore generating confidence in the use of this date for target eligibility – are detailed in the rest of this section.

### 5.2 Traceability within the fishery

The fleet assessed catches during 24 h per day throughout the year, completing 27 trips per year of 40-60 days each one (depending on fuel availability and storage capacity) (INIDEP Technical Report N° 34/2016).

Scallops are placed on decks (in the stern of the vessel) and then fall by gravity into holes. They are transported by a conveyor belt to the washing machine (spinning rollers); at this stage species equal or less than 55 mm are discarded as well as benthic fauna not required (unwanted catch).

Scallops are transported to the cooking machine at 120 °C. Shell is separated of scallop meat. Then meat is placed into a screening drum to remove any impurities or remaining shell. The soft parts fall into a gutter with water, separating shells and sand residues.

Scallops arrive at a peeling table, where by mechanical action of rollers, meat is separated from impurities. Calluses are dried before entering the IQF tunnel (Individually Quick Freezing). The freezing process is performed at a temperature under 20 °C below 0° C for 15 minutes.

Frozen scallop meat is placed in a polyethylene bag and master cartons. Boxes are identified with the following information: company data, vessel name, quantities (gross and net weights), scallop size, production / expiry dates and FAO fishing area. Products are stored in vessel until arrival to port. After each production day, the processing manager issues a daily report ("PARTE DIARIO DE PRODUCCIÓN") to the trading office that includes quantities of entire and processed scallops. The conversion rate estimated is established according to the CFP Resolution N° 12/2014 by management authorities for on board processing. As it is operationally impossible to weigh the total scallop caught with the fishing gear, it is determined a factor to calculate the total catch. The conversion rates are estimated with observation data/samples by fishing inspector. For scallop meat, it is used a factor of 7.14 (14.3% app) from final product obtained.

Scallops are unloaded in port supervised by the company staff and an SSPyA's inspector that weighs and recounts boxes to verify catches previously declared by captain through a form ("PARTE FINAL DE PESCA") that includes total fish caught by species. This checking is registered in the "ACTA DE DESCARGA" and SSPyA staff ensures the scallop weighing complies with the regulation.

As the product is frozen, scallop could be transported directly to customer or processing plants with a WAYBILL. Goods are transported by subcontracted/owner company in sealed containers. All products sold are registered in "CERTIFICADO DE ORIGEN", including species, total weight, number of boxes and the receiving company. Traceability data is obtained with this document. All information provided above must be completed by each vessel and company. Subsequently, there is

no risk of mixing non-certified with certified fish in the unloading and transportation processes (or prior to entering in the chain of custody). Also, as UoC is the same UoA, all scallops are certified against MSC Standard.

Scallop could be traced from their origin using the documents mentioned and traceability is maintained. This process is deemed robust enough to allow tracing fish products back to the area and day of catch, through a series of Argentinean required documents and dispatches records provided by the company.

All scallops caught by freezing fleet using bottom otter trawl net can be considered to be MSC certified under re-assessment and so there will be no risk of mixing MSC and non-MSC scallop in the unload process. Tracking and tracing of certified scallop will be guaranteed via the following system:

- Logbooks and Vessel Monitoring System (VMS) will allow tracing of catch back to the location and date of landing;
- Outgoing documentation (waybills) states species and origin.

*Table 8. Traceability factors within the fishery.*

Traceability Factor	Description of risk factor if present. Where applicable, a description of relevant mitigation measures or traceability systems (this can include the role of existing regulatory or fishery management controls)
Potential for non-certified gear/s to be used within the fishery	<p>It is established according to CFP Resolution N° 4/2008 – Article 3° that scallop must be harvested using trawl, the 4 vessels authorized to catch scallop (see vessels name detailed on page 12) use only bottom otter trawl net in MUs, due the use of dredges is only for INIDEP's research purposes and its authorization must be made by CFP.</p> <p>Also, the enforcement authority has implemented in the traceability system the document 'PARTE FINAL DE PESCA' that includes a declaration of fishing gear used to catch species and the marine area being harvested. This official form shall be completed by the captain for every fishing trip and must be presented in the landing port. This document is used by management authority to monitor TACs and assess stock status of species.</p> <p>According above mentioned, there is no potential risk to mix scallop catch by other fishing gear.</p>
Potential for vessels from the UoC to fish outside the UoC or in different geographical areas (on the same trips or different trips)	<p>The fleet (see vessels name detailed on page 12) must only operate in the MUs established by CFP (CFP Resolution N° 5/2014). All MUs are certified against MSC Standard since 2006.</p> <p>To control this aspect, it is mandatory the usage of GPS in all vessels by fishing management authority. This requirement is part of VMS or SICAP (see section <b>3.5.4 Monitoring, control and surveillance and enforcement</b>) and all fishing trips are tracked and landings are recorded. In case fishing outside the assigned area, sanction measures established in the Law N° 24.922 are applied.</p> <p>Therefore, there is no potential risk for vessels from the UoC to fish outside the UoC or in different geographical area.</p>
Potential for vessels outside of the UoC or client group fishing the same stock.	The Patagonian scallop fleet are composed by 4 freezer vessels covered by the MSC certification (see vessels name detailed on

	<p>page 12). There are no other vessels outside the client group fishing the same stock.</p> <p>To monitor that only vessels with authorization catch scallop, Argentine legislation requires keeping logbooks, which are verified by SICAP (VMS) scheme. The fishery records the location and landings, including vessel name, which accompanies landing documentation, allowing the fishery product to be traced.</p> <p>There is no risk that potential vessels outside of the UoC or client group fishing the same stock.</p>
Risks of mixing between certified and non-certified catch during storage, transport, or handling activities (including transport at sea and on land, points of landing, and sales at auction)	<p>As it is mentioned above, all MUs of Patagonian scallop have been certified since 2006, included 4 freezer vessels (see vessels name detailed on page 12) that operate in this fishery. So, all scallops stored, transported and handled are certified.</p> <p>The fishery lands frozen product, which is clearly identified with the landing documentation until change of ownership occurs and then, a separate Chain of Custody certification is required. Landing process is supervised by control authority (SSPyA's inspector). Registration of this surveillance is recorded in the "ACTA DE DESCARGA".</p> <p>Therefore, there is not non-certified scallop on board. So, there is no risk of mixing.</p>
Risks of mixing between certified and non-certified catch during processing activities (at-sea and/or before subsequent Chain of Custody)	<p>As it is mentioned above, all MUs of Patagonian scallop have been certified since 2006, included 4 freezer vessels that operate in this fishery (see vessels name detailed on page 12). Also, all vessels process on board scallop as unique product.</p> <p>There is no risk of mixing certified and non-certified at sea. The transshipment at sea is forbidden in Argentinean waters (see below).</p>
Risks of mixing between certified and non-certified catch during transshipment	<p>Transshipment at sea is forbidden in Argentinean waters, but under exceptional circumstances (described under Federal Fishing Law N° 24.922 and Decree N° 748/99). Authorization must be sought and can only occur in ports of places close to the shore. It does not occur in this fishery.</p>
Any other risks of substitution between fish from the UoC (certified catch) and fish from outside this unit (non-certified catch) before subsequent Chain of Custody is required	<p>As it is mentioned above, all MUs of Patagonian scallop have been certified since 2006, included 4 freezer vessels that operates in this fishery (see vessels name detailed on page 12). Scallops are weighted and recounted by management authorities to verify previous fishing declaration of captain ('PARTE FINAL DE PESCA'). This reduces the opportunity for mixing or substitution with other non-certified product.</p> <p>Parte Final de Pesca clearly identifies the scallop eligible to be certified as MSC. This document supports the origin of scallops stating if the scallop belongs to UoC. The document provides data of the fishing area (latitude and longitude), including fishing gear used.</p> <p>Documents accompanying the boxes are waybill and Declaración Legal de Captura. Information detailed on them is described in the report, allowing cross checking of what is sold with what is delivered.</p> <p>The system in place to ensure that any non-certified product</p>



	does not enter certified supply chains is monitored by management authority that controls the landing process and transportation.
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### 5.3 Eligibility to enter further chains of custody

**-Ports of landing:** There are two eligible points of landing for scallop to enter into further Chains of Custody: Mar del Plata (Buenos Aires Province) and Ushuaia (Tierra del Fuego Province).

**-Point of intended change of ownership of product:** For scallops landed at Mar del Plata and Ushuaia products will be sold directly to clients in boxes that have MSC ecolabel, which are intended to change ownership under that situation, or to be conducted to a processing plant of the same company for re-classification process. The change of ownership will occur upon purchase of the seafood. If scallops are sold directly to clients, its transportation shall be completed by an approved sub-contractor and this shall be covered within the scope of the fishery certificate.

**-Point from which Chain of Custody is required:** Separate Chain of Custody Certification will be required from the first point of sale (when scallop changed of ownership) or when frozen product arrives at the processing plant. Consequently, all processing plants are required to carry out Chain of Custody's certification.

**-Conclusion for product eligibility to be sell as MSC certified:** Catch location in MSC certified management units is verifiable through VMS data. Traceability documentation allows tracing of the products back to the area, day and method of capture. Waybill, 'Parte Final de Pesca' and 'Declaración Legal de Captura' provides clear identification of product into further chains of custody. The conclusion of the team is that all scallop caught by vessels linked to the client group (*i.e.* whole fleet) can be sold as MSC.

### 5.4 Eligibility of inseparable or practicably inseparable (IPI) stock(s) to enter further chain of custody

There are no IPI stocks included in the re-assessment process.

## 6. Evaluation results.

### 6.1 Principle level scores

The PIs were re-assessed according the Fishery Certification Requirements FCRv2.0.

All references cited in rationale texts are presented in the background of re-certification report.

Table 9. Final principle scores

Final Principle Scores	
Principle	Score
Principle 1 – Target Species	85.8
Principle 2 – Ecosystem	87.0
Principle 3 – Management System	93.8

### 6.2 Summary of PI level scores

Table 10. Summarize of scores.

Principle	Component	Wt	Performance Indicator (PI)	Wt	Score
One	Outcome	0.333	1.1.1 Stock status	1.0	80
	Management	0.667	1.2.1 Harvest strategy	0.25	95
			1.2.2 Harvest control rules & tools	0.25	80
			1.2.3 Information & monitoring	0.25	90
			1.2.4 Assessment of stock status	0.25	90
Two	Primary species	0.2	2.1.1 Outcome	0.333	100
			2.1.2 Management	0.333	80
			2.1.3 Information	0.333	85
	Secondary species	0.2	2.2.1 Outcome	0.333	100
			2.2.2 Management	0.333	80
			2.2.3 Information	0.333	85
	ETP species	0.2	2.3.1 Outcome	0.333	95
			2.3.2 Management	0.333	85
			2.3.3 Information	0.333	90
	Habitat	0.2	2.4.1 Outcome	0.333	85
			2.4.2 Management	0.333	80
			2.4.3 Information	0.333	80
	Ecosystem	0.2	2.5.1 Outcome	0.333	100
			2.5.2 Management	0.333	80
			2.5.3 Information	0.333	80
Three	Governance and policy	0.5	3.1.1 Legal & customary framework	0.333	100
			3.1.2 Consultation, roles & responsibilities	0.333	100
			3.1.3 Long term objectives	0.333	100
	Fishery specific management system	0.5	3.2.1 Fishery specific objectives	0.25	90
			3.2.2 Decision making processes	0.25	85
			3.2.3 Compliance & enforcement	0.25	85
			3.2.4 Monitoring & management performance evaluation	0.25	90

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### 6.3 Summary of conditions

In the re-assessment process, there is no condition assigned for the Patagonian scallop bottom otter trawl fishery.

### 6.4 Recommendations

There are not recommendations established.

### 6.5 Determination, formal conclusion and agreement

The Patagonian scallop bottom otter trawl fishery in Argentine Sea achieved a score of 80 or more in all MSC Principles and did not score less than 60. There are no conditions set by the assessment team.

Following the recommendation of team members and reviewing stakeholder and peer reviewer comments, OIA's decision making entity concluded that the fishery has passed the re-assessment and determined its intention to re-certify as sustainable against the MSC standard.

### 6.6 Changes in the fishery prior to and since Pre-Assessment

#### (OPTIONAL)

Identify any work conducted by the client (or the management agency) specifically targeted at bringing the fishery to the MSC standard, either prior to or since any pre-assessment report that was prepared. This information is particularly valuable for MSC's reporting on the impacts of its programme.

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## Appendices.

### Appendix 1. Scoring and rationales

#### Appendix 1.1 Performance indicator scores and rationale

##### -Principle 1

##### Evaluation Table for PI 1.1.1 – Stock status

PI 1.1.1	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Issue	SG 60	SG 80	SG 100
a	Stock status relative to recruitment impairment		
Guided post	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.
Met?	YES	YES	NO
Justification	<p>The Patagonian scallop fishery is strongly dependent on recruitment. Besides the size of the reproductive stock of scallops, recruitment depends on several factors including oceanographic conditions, faunal composition of the benthos (adequate hydroids for settlement), and adequate substrata. As other population spatially structured as metapopulation (several subcomponents or beds related by larval connectivity), successful recruitment is spatially localized and settlers are frequently produced in a bed placed far away. For this reason, in this fishery it is not established an explicit point where recruitment would be impaired (PRI). However, is indirectly assessed by the trend of biomass and TAC. Since 2012, 10 Management Unit (MU) were defined and monitored independently. Stock assessment of Patagonian scallop is based on annual surveys on some MUs, and both total and commercial biomass is estimated. Consequently, a TAC is set annually at 40% of the lowest confidence interval of the estimated commercial biomass. It also depends on the demographic composition (<i>i.e.</i> proportion of juveniles/adults).</p> <p>The actual fishing area is only a small proportion of the total ground, and harvest rate (relation between TAC and commercial biomass) was less than 0.18 for the period 2007–2015. The database shows fishing covers 13.5% of the total area of beds with commercial density, and 1.4% of the total area of the Management Units</p> <p>The lack of declining trend of total biomass over all the history of the fishery shows that recruitment has not been impaired. Annual records of estimated biomass, TAC set, indicate that it is highly likely that the stock is above the point where recruitment would be impaired.</p> <p>As complementary proxy, the reference fishing mortality <math>F_{max}</math> has been estimated by a simulation study that incorporates all relevant ecological characteristics on the Patagonian scallop. It has been estimated as 0.54 year<sup>-1</sup>. Real fishing mortality rate estimated for 6 MUs varied between 0.05 to 0.4 year<sup>-1</sup>, and for cases was less than natural mortality rate.</p> <p>The complexity of the recruitment processes makes it impossible to be sure that there is a high degree of certainty that the stock is above the point where recruitment would be impaired. However, the stability of scallop biomass throughout the history of the fishery, points to recruitment not been effected so far.</p> <p>In conclusion, there is no strong evidence to support that the information available can provide a high degree of certainty required meeting the SG100 requirement; and so the</p>		

		fishery meets the SG80 level of performance for this SI.		
b	Stock status in relation to achievement of MSY			
	Guided post		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.
	Met?		YES	NO
	Justification	<p>The scallop stock is spatially structured as a meta-population. In this spatially structured population each component (bed) can fluctuate in abundance, but the whole stock can remain stable; or the stock can be declining but the individual component keep similar abundance but depleted sequentially. This type of population is unable to apply the MSY concept like finfish fisheries. Management of this fishery is based on direct estimation of biomass. When biomass decreases in a particular bed, TAC in that bed is set low. The fleet fishes until the TAC is reached and then moves to another bed. This scheme has been followed for the 20 years of the fishery. The fixed harvest rate, <math>0.4 B_{\text{commercial}}</math>, acts like a reference point. Considering the commercial estimated biomass and total landings by year, the harvest rate fluctuated between 0.06–0.35 for the last ten years. As a consequence, the estimated biomass has no declining trend indicating that the stock is at a highly productive level that can be consistent with the MSY.</p> <p>Kittlein &amp; Lasta (2010) performed a simulation model using a database containing the complete historical records of the <i>Z. patagonica</i> fishery. The models predicted a ten-year projection of biomass dynamics and suggested that no serious reduction in biomass values is expected if fishing intensities remain constant at their historical average value.</p> <p>The surrogate reference points applied in this fishery (based on direct estimation) has been met since the beginning of the fishery (20 years). Recruitment has not depended only on the reproductive stock and there is no evidence that there is a high degree of certainty that the stock has been fluctuating around its target reference point or has been above its target reference point, over recent years.</p> <p>Therefore, while there is enough evidence to support that the stock is at, or fluctuating around its target reference point, or above its target reference point over recent years, we consider that the information available does not provide the high degree of certainty required to meet the SG100 requirements and so the fishery meets the SG80 level of performance for this SI.</p>		
References		Lasta <i>et al.</i> , 2001; Kittlein, 2007; Milessi <i>et al.</i> , 2010; Kittlein & Lasta, 2010; Campodónico <i>et al.</i> , 2015a, 2015b.		
Stock Status relative to Reference Points				
	Type of reference point	Value of reference point	Current stock status relative to reference point	
Reference point used in scoring stock relative to PRI (SIa)	Direct biomass estimation $Z = n_{\text{commercial}} / n_{\text{total}}$ must be over 0.5 to open fish in an area within a bed.	It depends on the result of direct biomass estimation	Recruitment remains unaffected, as biomass has remained stable.	
Reference point used in scoring stock relative to MSY (SIb)	$B_{\text{lim}}$ TAC is defined as 40% of minimum confidence	Harvest rate of commercial scallop: 0.4 It depends of the results	Harvest rate of commercial scallop 0.09 – 0.35 for the period of elapsing the last ten years. The	

	limit for the commercial scallop stock biomass estimation. $F_{max}$	of direct biomass estimation (should there be no annual estimation, the bed will remain closed) $F_{max} = 0.54$	biomass of the fishery has remained stable, <i>i.e.</i> the fishery is sustainable, under this regime. Values of $F$ was estimated between 0.05 – 0.4 in 6 MUs.
OVERALL PERFORMANCE INDICATOR SCORE:			80

#### Evaluation Table for PI 1.1.2 – Stock rebuilding

PI 1.1.2	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe		
Scoring Issue	SG 60	SG 80	SG 100
a	Rebuilding timeframes		
Guidepost	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years.		The shortest practicable rebuilding timeframe is specified which does not exceed one generation time for the stock.
Met?			
Justification	SI not assessed as PI 1.1.1 scored 80 or more (MSC FCR v2.0, SA2.3.1).		
b	Rebuilding evaluation		
Guidepost	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.
Met?			
Justification	SI not assessed as PI 1.1.1 scored 80 or more (MSC FCR v2.0, SA2.3.1).		
References	N/A		
OVERALL PERFORMANCE INDICATOR SCORE:			N/A

#### Evaluation Table for PI 1.2.1 – Harvest strategy

PI 1.2.1	There is a robust and precautionary harvest strategy in place		
Scoring Issue	SG 60	SG 80	SG 100
a	Harvest strategy design		
Guidepost	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	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.

		1.1.1 SG80.	
Met?	YES	YES	YES
Justification	<p>The harvest strategy is responsive for the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.</p> <p>The harvest strategy has been applied since the beginning of the Patagonian scallop fishery (1999) including adjustments introduced through the years, and it is based on stock assessment per management unit (MU) (i.e. survey-based biomass estimation, spatially explicit TAC), monitoring, harvest control rules and management actions. According to the progress observed on the state of the stock, it is evident that the harvest strategy is not only expected, but designed to achieve stock management objectives reflected in proxy indicators.</p> <p>The harvest strategy is at safe levels and working successfully as the removals over the last 18 years is based in these key elements:</p> <p>i) Survey information of each MU to determine: 40% of the commercial biomass (lower confidence limit) corresponds to the annual TAC's, while removals correspond to the actual catches which have been much lower than the TAC's (Table 3 and Figure 3); and the polygon inside each MU where density is over 10 t/km<sup>2</sup>, and the relation commercial sized scallop/total scallop is over 0.5.</p> <p>ii) On board information of the fishery, which is collected with 100% coverage.</p> <p>iii) Vessel Monitoring System (VMS) and electronic slips filled in by skippers are mandatory. Electronic slips contain daily information on muscle production by size, classes, number of hauls, nets per haul, trawling time, and mean depth and position.</p> <p>iv) Catch control is being done by electronic slips and the fleet is warned when TAC is being reached or when satellital monitoring detects fishing operations outside fishing zone.</p> <p>In case that the proportion of commercial size scallops respecting to the total biomass does not exceed 50%, it is recommended to close the fishing area in the study management unit for a period of one year. In order to preserve, protect and manage marine living resources, CFP establishes TAC annually for different species in accordance with Law N° 24.922. TAC is established per management unit (CFP Resolutions N° 15/2016 and N° 2/2017), according to INIDEP's technical advisory (INIDEP Technical Reports N° 47/2016, N° 5/2017 and N° 6/2017).</p> <p>The resultant management measures for Patagonian scallop fishery were formally expressed in the CFP Resolution N° 4/2005, which states that:</p> <ul style="list-style-type: none"> <li>-The catch of Patagonian scallop species will be taking place throughout the calendar year, and CFP may establish closure of a fishing area, that can be fixed or mobile, temporary or by area, when scientific reports advise so.</li> <li>-TAC (ton of whole scallops of commercial size) is determined annually by CFP according to technical advice of INIDEP per management unit.</li> <li>-It shall report the emergence of a new fishing bed in order to establish its TAC.</li> <li>-Only vessels with national permission and capture authorization may operate in scallop fishing beds.</li> <li>-Minimum fishing size (&gt;55mm shell length). All juveniles and incidental catch species will be returned to sea.</li> <li>-A Commission for analysis and monitoring Patagonian scallop fishery is created, with the participation of representatives of Enforcement Authority, INIDEP and fishing companies (i.e. Glaciar Pesquera S.A. and Wanchese Argentina S.R.L.). It defines the Commission created as an advisory body, and states that meetings should be done at least twice a year (CFP Resolution N° 21/2014), with the obligation to provide CFP both the minutes and</li> </ul>		

		<p>conclusions of those meetings.</p> <p>-Each vessel shall have 20 days per year for research tasks.</p> <p>-Each vessel shall have a scientific observer on board assigned by INIDEP on each fishing trip.</p> <p>Also, there are complementary harvest measures, such as:</p> <p>-Catches may be performed using trawls, as established by the specific fishing permits.</p> <p>-It is forbidden to carry out commercial catches in spawning areas established in ex-SAGPyA Resolution N° 150/1996.</p> <p>-In order to limit the catch in new areas until the respective assessment is carried out, authorized vessels will be able to operate in this new area for a period of 60 days considering the beginning as the arrival of the ship to the new area.</p> <p>-Catch controls shall be carried out by a management unit. Once TAC is achieved, the fishing area will be closed during that year.</p> <p>-DNCP shall keep a weekly control of catches of each fishing area. It will inform in writing to each company and INIDEP when a 10% capture of TAC set for each MU is missing.</p> <p>-The vessels will be permanently monitored through the Satellite Monitoring System (SICAP).</p> <p>There is no evidence that these harvest rates (HR: TAC / Commercial scallop) averaged 15% since 1996 and never were over 35%. It had no detrimental effect on the stock (estimated biomass remains stable).</p> <p>Therefore, the assessment team considers there is enough evidence to support that the harvest strategy is responsive to stock status and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80, and to the fishery meets with SG100 level of performance of this SI.</p>		
b	Harvest strategy evaluation			
	Guided post	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.
	Met?	YES	YES	NO
	Justification	<p>The harvest strategy of Patagonian scallop fishery may have not been fully tested, but there is evidence that it is achieving its objectives. During the last ten years the harvest strategy has not varied, maintaining the scheme of assessment, spatial-explicit decision rules and harvest monitoring. As a result, the biomass estimation and annual TACs have no trend to remain oscillating around a mean value.</p> <p>Patagonian scallop stocks are spatially structured as subpopulations of sedentary individuals, which are connected with each other through the dispersal of pelagic larvae. When fishing follows a rotational harvest strategy that can be monitored and is fully controlled, and when several areas remain un-fished, the consequences of stock removal are difficult to test.</p> <p>The population is assessed annually in each MU so the effectiveness of the management strategy is also directly evaluated each year. These assessments show the management regime is achieving its objectives at the scale of MU.</p> <p>However, as well as other sedentary stocks, the Patagonian scallop stock is strongly</p>		

		<p>dependent on recruitment. Besides the size of the reproductive stock of scallops, recruitment depends on several factors including oceanographic conditions, faunal composition of the benthos, and adequate substrata. The complexity of the recruitment processes makes it very difficult to be sure trawling does not affect recruitment in some beds. It is considered that, despite the harvest strategy is precautionary, it has been tested by model (Kittlein &amp; Lasta, 2010) and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels. The harvest strategy cannot be considered fully evaluated in relation to the scale and intensity of the fishery.</p> <p>Therefore, the Patagonian scallop does not fully comply with the SG100 level for this scoring issue, and meets a SG80 level for this SI.</p>		
c	Harvest strategy monitoring			
	Guidepost	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	YES		
	Justification	<p>Monitoring is in place, as it was mentioned in the rationale of SI a) that it is expected to determine whether the harvest strategy is working.</p> <p>Monitoring is based in a satelital system named Vessel Monitoring System (VMS), which allows to observe the on line position of the four vessels of the fleet. The information is centralized by the Authority, but can be simultaneously revised by INIDEP and PNA. The second element is the electronic slips filled in by skippers, which is mandatory. Electronic slips contain daily information on muscle production by size classes, number of hauls, nets per haul, trawling time, and mean depth and position. Besides, an Observers On Board Programme has been implemented to monitor the fishery since its beginning in 1996 (Morsan <i>et al.</i>, 2012).</p> <p>The third element is the information by the Observers On Board Programme. Observers record scallop catches (total and commercial size), vessel activity (position, tows, date), and scallop on board processing (sorting efficiency, returning of under-sized scallops and by-catch species, muscle yield) (Escolar <i>et al.</i>, 2009; Schejter <i>et al.</i>, 2012). Other collected data are bycatch, benthic community composition, and endangered, threatened, or protected species (Bremec <i>et al.</i>, 2003). Observer's on board information is cross-checked with the electronic slips.</p> <p>Even it is established in harvest strategy that each vessel shall have 20 days per year for research tasks and DNCP shall keep a weekly control of catches at each fishing area for which a TAC is established, there are formal documents (<i>e.g.</i> 'PARTE FINAL DE CAPTURA') completed by fishers, where catches volumes per species, location, number of fishing sets and fishing gear used are declared and then, this is used by entities to control the harvest strategy. This information is reviewed and monitored by an inspector of Subsecretaría de Pesca during the unloading process in port.</p> <p>Consequently, the fishery complies with SG60 for this scoring issue.</p>		
d	Harvest strategy review			
	Guidepost			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			YES
	Justification	Since the beginning of the fishery, the harvest strategy has been and is periodically reviewed and modified in order to improve the original division of the fishery, from two management zones (Northern sector (N) and Southern sector (S)) to 10 MU (CFP Resolution N° 4/2005 and reviewed versions: CFP Resolutions N° 9/2006. N° 4/2008. N°		



		5/2008, N° 5/2009 and N° 9/2016). The TAC is established for each unit. Each unit can be opened and closed following rotational criteria.		
		Information derived from fleet operations define the area to be surveyed by the research vessels, under a Bayesian criterion.		
		Evidence presented demonstrates that fishery meets this scoring issue for SG100.		
e	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Justification	Not relevant. The target species is a not a shark species.		
f	Review of alternative measures			
	Guidepost	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.
	Met?	YES	YES	YES
	Justification	There are more than biannual reviews of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality. Practices oriented to reduce mortality of unwanted catches of target species are implemented in different ways:  - Fishing zones are opened and annually established based on survey information. The criteria are density and low percentage of juveniles (Z index) and a polygon inside which fishing actions are allowed is designed.  - Catch composition, specially the presence of juveniles are monitored by INIDEP's Observers On Board Program. Percentage of coverage is 10%. All records are annually reviewed in order to analyse potential effectiveness.  -The fleet is moved away from the fishing area when juveniles are detected in the catch.  -During 2012, a workshop was carried out in order to discuss the fishing gear used, comparing efficiency and selectivity and proposing improvements in its functioning. As result alternative  Measures have been tested and reviewed as assays with square mest otter nets and survivorship of scallops. All tests were documented by INIDEP.  Actually, at least two annual meetings are established to be held by the Commission, reviewing effectiveness and practicality of the harvest strategy and alternative measures.  Therefore, the fishery meets with SG100 level of performance of this scoring issue.		
References		CFP Resolutions N° 4/2005, 9/2006, 4/2008, 5/2008, 5/2009, 21/2014, 9/2016, 15/2016, 2/2017.  SAGPyA Resolution N° 15/2016.  INIDEP Technical Reports 47/2016, 5/2017 and 6/2017.  Bremec <i>et al.</i> , 2003; Escolar <i>et al.</i> , 2009; Kittlein & Lasta, 2010; Schejter <i>et al.</i> , 2012.		

OVERALL PERFORMANCE INDICATOR SCORE:

95

**Evaluation Table for PI 1.2.2 – Harvest control rules and tools**

PI 1.2.2		There are well defined and effective harvest control rules (HCRs) in place		
Scoring Issue		SG 60	SG 80	SG 100
a	HCRs design and application			
	Guided post	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.
	Met?	YES	YES	NO
	Justification	<p>Since the beginning of the fishery (1996), a set of measures was agreed and well defined. HCRs were established prior opening to fishing. A MU can be opened independently, where a polygon for fishing actions, areas of no-fishing has been clearly defined using survey information. Number of vessels (4) operating with otter trawl net and other measures applied during the fishing season (commercial size, proportion of adult/total must be up to 0.5 in catches, undersized scallop must be returned at sea) were established from the beginning of the fishery. They are consistent with the harvest strategy, ensuring that the exploitation rate is reduced as the PRI is approached, and are expected to keep the stock fluctuating around a target level consistent with proxy indicators. These rules are monitored by observers on board. Also, vessel position is monitored by Prefectura Naval Argentina via satellite system.</p> <p>The described set of pre-agreed rules is used for determining the management action in response to changes in stock status indicators regarding to TAC.</p> <p>The TAC is designed to prevent overfishing and the quota is a percentage of it, then the amount of scallops caught is closely monitored by INIDEP, SSPyA and the fishing companies. When a company reaches the quota, CFP implements the closure within 1-3 days of the fleet reaching the TAC. These actions are consistent with harvest strategy and guarantee that the exploitation rate is not exceeded the target level. Satellite monitoring shows the positions of each vessel in real time and OBOs records allow cross-information. Once the TAC is reached, the MU is closed. The satellite monitoring and observer records confirm no further fishing occurs there.</p> <p>Vessel Monitoring System (VMS) and electronic slips filled in by skippers are mandatory. Electronic slips contain daily information on muscle production by size classes, number of hauls, nets per haul, trawling time, mean depth and position. Besides, an Observer On Board Programme has been implemented to monitor the fishery.</p> <p>In response to the information collected by this monitoring scheme, when the TAC is being reached in a MU, the vessels operating inside are notified, and forced to migrate to another area.</p> <p>Harvest control rules are consistent with a precautionary approach. Decision rules establish that changes in biomass or population structure in a MU, imply changes in fishing effort (eventually closure of the MU). As a result, during the last years both biomass and TAC are fluctuating around a mean value which can be considered a proxy of MSY.</p> <p>Therefore, the fishery complies with SG80 level for this issue.</p>		

b	HCRs robustness to uncertainty			
	Guidepost		The HCRs are likely to be robust to the main uncertainties.	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
	Met?		YES	NO
	Justification	<p>The selection of harvest control rules takes into account the main uncertainties, as it is flexible and responsive to stock status as advised by regular and frequent assessments. In INIDEP technical reports, a relevant recommendation to the management authority uncertainties were incorporated into the projections, considering current biomass, composition by age groups, recruitments and seasonality of exploitation. The main sources of uncertainties are: i) estimation of biomass of scallop harvested within a MU is done using the muscle production and the use of Conversion Factor (CF). The variation of CF has been studied; ii) previously non-detected patches with prevalence of juveniles (Z index below 0.5, and an uncertainty about the small scale spatial distribution) are detected by observers on board and can produce changes in effort allocation; iii) positioning of the fleet is followed by satellite monitoring.</p> <p>The HCR allows an administrative rapid-response and viable management of the resource. The use of CF proposed by INIDEP has varied from 7.14 to 12.16 depending on the scallop size, bed, and seasonal variability of scallop condition. However, CFP always used a single value because of the extreme difficulty to have a different one for every bed, every year modify it considering all sources of variability. Now this CF is fixed at 7.14. The use of the one conversion value to estimate biomass landed, is pragmatic but using the lowest mean value encountered, is conservative and likely to result in fishers catching less biomass than the TAC.</p> <p>While the selection and design of the harvest control rules takes into account the main uncertainties, there is no evidence that the design of HCR takes into account a wide range of uncertainties such as several oceanographic factors and environmental fluctuations that dependent the recruitment. So, the Patagonian scallop fishery meets with this issue in SG80 level of performance of this SI.</p>		
c	HCRs evaluation			
	Guidepost	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
	Met?	YES	YES	NO
	Justification	<p>There is available evidence that tools used to implement harvest control rules are appropriate and effective in controlling exploitation, and it indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules.</p> <p>HCRs are derived from the direct estimation of biomass of each MU. Biomass estimation is based on survey information applying a geostatistical method. In this method regionalized variables, total scallop density (all sizes individuals) and commercial scallops (commercial size individuals), are considered random variables. Results of surveys are analyzed in each MU in independent way.</p> <p>The index Z is used as a criterion in the selection of harvest areas. Within the monitored</p>		

	<p>zone, areas with <math>Z&gt;0.5</math> are identified and a polygon is designed to include them.</p> <p>The TAC is estimated as 40% of lowest limit of confidence of commercial biomass (<math>Z&gt;0.5</math>), and the area opened to fishing is: i) the polygon that includes areas with <math>Z&gt;0.5</math> if the previous fishing information provides an adequate definition of bed limits, or ii) the entire MU, if there is not enough information or there are not enough recruits in the surveyed area.</p> <p>The fishery-dependent information is collected at a very fine scale allowing analysis of CPUE and total catch for each bed. The CPUE data provides an index of biomass allowing changes in biomass of each bed to be followed as well as providing information defining the next survey.</p> <p>TACs are assigned per MUs by CFP by resolutions based on the information provided by INIDEP. In addition to this, CFP raises weekly reports detailing catch levels in order to control the appropriate use and effective in achieving exploitation levels. INIDEP OBOs data allows determining the effective catch done by the fleet. Annually, INIDEP as technical advisor of CFP, reviews stock assessment and recommends according to it, the respectively TAC.</p> <p>Satellite monitoring and observer records show the position of each vessel in real time. Once the TAC is reached, the MU is closed. The satellite monitoring and observer records confirm no further fishing occurs there and no TAC overrun occurs.</p> <p>As consequence of the tools applied in the fishery the relation of Catch / Commercial Scallop Biomass has been maintained fluctuating around 0.18 during the last 10 years. During this period both TAC and landing showed no trend fluctuating around a mean value. Proportion of juveniles (measured as biomass of non-commercial scallop / total scallop biomass) showed a declining trend from 2006 (0.48) to 2011 (0.18), and a posterior rebound to 2016 (0.34).</p> <p>However, some degree of uncertainty exists related to the conversion factor to estimate the real catch.</p> <p>The combination of decision rules derived from survey, satellite monitoring and observer reporting shows that all the HCR are being accomplished by fishers, and the biomass estimated from the annual surveys can be rigorous and tending to sustainable fishing, the CAB considers that more clear evidence showing the effectiveness of the HCRs is possible.</p> <p>Therefore, the fishery meets with the SG80 of performance for this SI.</p>
References	INIDEP Technical Reports N° 16/2016, N° 47/2016, N° 5/2017 and N° 6/2017.
OVERALL PERFORMANCE INDICATOR SCORE:	
	80

#### Evaluation Table for PI 1.2.3 – Information and monitoring

PI 1.2.3		Relevant information is collected to support the harvest strategy		
Scoring Issue		SG 60	SG 80	SG 100
a	Range of information			
	Guided post	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 is 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 related to the current harvest strategy, is available.
Met?	YES	YES	YES	YES
Justification	<p>There is a comprehensive range of information available related to on stock structure, stock productivity, fleet composition, stock abundance, fishery removals and other information such as environmental information, including some that may not be directly related to the current harvest strategy which is sufficient to implement the harvest strategy.</p> <p>Stock structure:</p> <p>Data is provided by landings and survey samplings (size and age) and then, analysed by INIDEP.</p> <p>There is a considerable scientific knowledge about scallop throughout its whole area of distribution. The spatial structure has been mapped in fine detail by the analysis of grid pattern dredge surveys (Lasta <i>et al.</i>, 2001; Bogazzi, 2015a).</p> <p>The distribution of the beds is closely related to the distribution of the oceanographic fronts along the edge and within the Continental Shelf (Bogazzi <i>et al.</i>, 2005).</p> <p>Stock productivity:</p> <p>The dispersion of larvae by the South-North currents along the Continental Shelf has been modeled to investigate the linkages between the beds (Bogazzi <i>et al.</i>, 2005).</p> <p>Reproductive cycle was described by Campodónico <i>et al.</i> (2007). Spatial variation in growth rate was estimated by Lomowasky <i>et al.</i> (2007, 2008) in several beds. Studies on larval spatial movements within the zones has been studied by Franco (2010).</p> <p>Connectivity between beds has been explored by genetic studies.</p> <p>Kittlein (2007) and Milessi <i>et al.</i> (2010) modeled fishing mortality rate for sectors and MU.</p> <p>Stock abundance is estimated yearly in each MU, to establish TAC, and stock removal is estimated daily from fishing forms filled by captain, for each vessel and from OBO data. Spatial dynamic of the fishing effort is monitored by satellite. The position of every tow by the scallop trawlers is recorded from satellite position by PNA. Catch composition is recorded by OBOs program. Oceanographic research projects of INIDEP has been carried out to complement Patagonian scallop and other fisheries information.</p> <p>Fleet composition:</p> <p>The fleet is registered by fishery management authority in a database, including information of vessel size, catch capacity, fishing gear, dimension of net, etc.</p> <p>UoA removals:</p> <p>In Argentina, there are 4 vessels with catch authorization to harvest Patagonian scallop. The fisheries removals are detailed in: (1) landing declarations, (2) landing controls, (3) landing sampling. Species that not comply with commercial size are returned to the sea.</p> <p>Fishing grounds:</p> <p>All vessels have a satellite monitoring system and their location and speed is known on real time by the management authority.</p> <p>Other information such as species that compose the benthic community, trends of the biomass of predators and scavengers, presence of fishes, presence of occasional species (e.g. stone corals; Schejter <i>et al.</i>, 2015), type of sediment collected during surveys and by observers on board.</p> <p>Therefore, the fishery fully complies with SG100 of this scoring issue.</p>			

b	Monitoring			
	Guidepost	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty.
	Met?	YES	YES	NO
	Justification	<p>Stock abundance and fishery 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. As it was mentioned in the background information, the decision rules for this fishery are included in the Federal Fishing Law. Indicators become mandatory. All information required by the harvest control rule is collected and monitored with high frequency by INIDEP. Stock abundance in each MU is estimated annually in biomass surveys. Harvest levels in each MU is reported and monitored daily. Harvesting positions are monitored in real time by satellite position tracking. Further verification of vessel catches and position of all tows comes from daily observer records. This allows precision on the UoA removals.</p> <p>The decision rules for this fishery are well documented in Federal Fishing Law, its complementary Decree, resolutions and minutes of CFP. The measures are adjusted to reality and are consistent with the limitations of the data. The decision rules are evaluated once or twice a year.</p> <p>Until 2013, biomass estimation in a haul of survey was done based on the visual estimation of the degree of fullness of the net. The procedure reduces the bias in the biomass estimation (Schwartz <i>et al.</i>, 2016), but remain under analysis.</p> <p>However, it cannot be assured that there is a high degree of certainty, since there is no evidence that all inherent uncertainties in the information are well understood, and also, the robustness of assessment and management to this uncertainty. The main uncertainty in catch data is from estimating the catch biomass using a standard muscle landing biomass conversion factor (CF). As the lowest of a range of conversion factor is used to estimate biomass of the catch, this estimate will be conservative. The muscle yield varies annually, seasonally, by area, by scallop size, and even by processing plant. A linear model fitted the relation between muscle weight and covariates (year, semester, scallop bed, scallop size, and two interaction terms) and explained 42% of the variability (Bogazzi, 2009).</p> <p>CFP does not apply measures to correct conversion coefficient because of the complexity of the variation in CF and the practical difficulty in collecting precise information, particularly at the scale of the fishery.</p> <p>Even when some uncertainties about the estimation of catch are understood (Bogazzi, 2009) and the practicality in the application unables the application of other CF, the assessment team considers that this is not enough to support that “all information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and that there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this uncertainty”, and so this issue is not fully met for SG100.</p> <p>For that reason, the fishery meets with SG80 for this SI.</p>		

c	Comprehensiveness of information		
	Guidepost		There is good information on all other fishery removals from the stock.
	Met?		YES
	Justification	<p>There is good information on all other fishery removals from the stock, due to not being other vessels outside or not covered by the UoC; and no other fishery takes place in the area where scallops beds occur; so scallops are not harvested as bycatch in any fishery.</p> <p>The fishery meets with SG80 for this scoring issue.</p>	
References		<p>Lasta <i>et al.</i>, 2001; Bogazzi <i>et al.</i>, 2005; Campodónico <i>et al.</i>, 2007; Kittlein, 2007; Lomowasky <i>et al.</i>, 2007, 2008; Bogazzi, 2009; Franco, 2010; Milessi <i>et al.</i>, 2010; Bogazzi, 2015a; Schejter <i>et al.</i>, 2015.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:			90

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

PI 1.2.4	There is an adequate assessment of the stock status		
Scoring Issue	SG 60	SG 80	SG 100
a	Appropriateness of assessment to stock under consideration		
	Guidepost		<p>The assessment is appropriate for the stock and for the harvest control rule.</p> <p>The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.</p>
	Met?	YES	YES
	Justification	<p>The assessment is appropriate for the stock and for the harvest control rule, taking into account the major features relevant to the biology of the species and the nature of the fishery.</p> <p>The procedure has been detailed in Morsan <i>et al.</i> (2012) and Soria <i>et al.</i> (2016). The area of spatial distribution of scallop beds was divided in MUs. In each one that will be opened to fishing, an annual survey is conducted in order to estimate the absolute biomass and to collect information on size structure, reproductive condition and composition of the benthic community. The sampling design is a regular grid which covers locations and surrounding areas where fishing has been recorded. Distance between sampling stations is 9.3 km. Between 1999 and 2008, samples were collected by a dredge of 2.5 m width. Since then, the surveys have been conducted by commercial vessels and samples have been taken by commercial otter net. Biomass estimation was based on a geostatistical model. In this method, regionalized variables, total scallop density (individuals of all sizes) and commercial scallops (market size individuals), were considered random variables. In the analysis the spatial structure is modelled and used for interpolation.</p> <p>The index Z, defined as the proportion of individuals of commercial size (nc) for total of individuals sampled (nt) (<math>Z = nc / nt</math>), is used as a criterion in the selection of harvest areas.</p> <p>The results of surveys are analyzed in each MU independently: i) Within the monitored zone, areas with Z index &gt; 0.5 are identified and a polygon is designed to include them; ii) The fishery-dependent information is collected at a very fine scale allowing analysis of CPUE and total catch for each bed. The CPUE data provides an index of biomass allowing changes in biomass of each bed to be followed as well as providing information defining the next survey.</p> <p>The TAC is estimated as 40% of lowest limit of confidence of commercial biomass (<math>Z &gt; 0.5</math>), and the area opened to fishing is: i) the polygon that includes areas with <math>Z &gt; 0.5</math> if the previous fishing information provides an adequate definition of bed limits, or ii) the entire</p>	



		<p>MU, if there is not enough information or there are not enough recruits in the surveyed area.</p> <p>Information of the MUs that not will be opened to fishing is collected by two ways: i) including some sampling points in the annual surveys in order to monitor possible recruitment and, ii) by observers on board because a minimal TAC is set to allow exploratory fishing and detect recruitment or new dense patches.</p> <p>Assessment per MU continues to be carried out annually under the decribed protocol.</p> <p>Therefore, the fishery meets with SG100 for this scoring issue.</p>		
b	Assessment approach			
	Guidepost	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated.	
	Met?	YES	YES	
	Justification	<p>The assessment estimates stock status relative to reference points that are appropriate to the species category and stock, and can be estimated. The fishery is managed using a fixed harvest rate and the TAC is estimated annually per MU based on survey information.</p> <p>The assessment takes into account uncertainty and estimates (and evaluates) stock status relative to reference points in a probabilistic way. The fishery is managed using a fixed rule based on survey information: 0.4 of less confidence limit of biomass of commercial scallops in each bed, and spatial criteria depending on population composition (proportion of juveniles/adults).</p> <p>The mean annual CPUE for main beds has shown a slowly declining trend since the beginning of the fishery, rebounding when robust year-classes recruited. Bogazzi (2008) showed that the non-random allocation of effort and in turn CPUE, reflects the movement of each vessel among patches of different density within a bed which are sequentially depleted and abandoned. Consequently, CPUE may be hyperstable, not reflecting the true rate of depletion. However, estimations of both commercial and total biomass does not reveal declining trends.</p> <p>Therefore, the fishery meets with SG80 for this scoring issue.</p>		
c	Uncertainty in the assessment			
	Guidepost	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account.	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
	Met?	YES	YES	YES
	Justification	<p>Stock abundance, size-age composition, and spatial distribution of recruitment are monitored by annual survey in the main MUs. In this way, uncertainties related to this features are taken into account in the assessment. Due to the biological nature of the resource (sedentary, external fertilization, pelagic larvae, and sensitive phase of settlement), the most relevant uncertainty is related with recruitment. This is specially considered because the relation between juveniles/adults in the Z index defines the open-closing decision rule.</p> <p>Therefore, the fishery meets with SG100 for this scoring issue</p>		
d	Evaluation of assessment			
	Guidepost			The assessment has been tested and shown to be

				robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			NO
	Justification	The assessment has not been tested but is considered robust. The assessment plan set for this fishery has no considered alternative hypotheses and assessment approaches, because the sedentary nature of the resource suggests that the direct biomass estimation drives the decision rules adequately. There are no evidences that alternative hypotheses and assessment approaches have been rigorously explored.  Consequently, the fishery does not meet with SG100 level of performance for this SI.		
e	Peer review of assessment			
	Guidepost		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed.
	Met?		YES	NO
	Justification	The assessment of stock status is subject to formal peer review process as it is established in the INIDEP Internal Resolution N° 75/2008 in the Article 3°. All INIDEP reports have to be audited and approved by the National Director Research.  INIDEP research group explained in the last surveillance process, that the report about assessment methodology of Patagonian scallop ( <i>Zygochlamys patagonica</i> ) biomass from survey research data, will be published in “Revista de Investigación y Desarrollo Pesquero”, which is a peer review journal. However, we consider this process as an internal peer review because the journal is edited by INIDEP, and we believe that the revision must be more exhaustive.  There is no evidence that the assessment has been externally peer reviewed. Therefore, the fishery only complies with the SG80 level of performance for this SI.		
References		Bogazzi, 2008; Morsan <i>et al.</i> , 2012; Soria <i>et al.</i> , 2016.  INIDEP Internal Resolution N° 75/2008		
OVERALL PERFORMANCE INDICATOR SCORE:				90

## -Principle 2

### Evaluation Table for PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the PRI and does not hinder recovery of primary species if they are below the PRI.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main primary species stock status			
	Guidepost	<p>Main primary species are likely to be above the PRI</p> <p>OR</p> <p>If the species is below the PRI, the UoA has measures in place that are expected to ensure that the UoA does not hinder recovery and rebuilding.</p>	<p>Main primary species are highly likely to be above the PRI</p> <p>OR</p> <p>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</p>	<p>There is a high degree of certainty that main primary species are above the PRI and are fluctuating around a level consistent with MSY.</p>

			categorise this species as main, to ensure that they collectively do not hinder recovery and rebuilding.	
	Met?	YES	YES	YES
	Justification	<p>The primary species for MSC are usually species of commercial value to either the UoA or fisheries outside the UoA, with management tools controlling exploitation as well as known reference points in place.</p> <p>The assessment team reviewed all the available information of P2 species for Patagonia scallop fishery, considering: (i) if the catch does not comprise 5% or more by weight of the total catch of all species by the UoA, or (ii) if the species is classified as “less resilient” and the catch of the species by UoA comprise 2% or more by weight of the total catch of all species the UoA.</p> <p>According to Tables 5 and 6 described in the background and following Decision Tree (Figure GSA3 of FCRv2.0), Patagonian scallop is the main group of total catches of the fishery and there are no main primary species identified.</p> <p>Moreover, the fishery is pursued in a habitat and depth range in which demersal fish are not common. The gear is rigged with doors attached by bridles directly to the net and with the net having a low headline height and being towed slowly, it neither herds fish nor captures any above the seafloor. Observer records show that no species other than the target are retained in this fishery. Observers continue monitoring this situation.</p> <p>Based on the previous statements, it is concluded that the UoA has not impacted on Primary species components; and is intended to continuing like this, with ongoing monitoring to ensure that no impact occurs in the future.</p> <p>If any species other than scallops began to be affected during the period of certification, then this PI would have to be reassessed.</p> <p>Therefore, the fishery meets with SG100 of performance for this SI.</p>		
b	Minor primary species stock status			
	Guided post			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
	Met?			YES
	Justification	<p>As it is detailed above, there are no primary species identified in the Patagonian scallop bottom otter trawl fishery. So, the UoA has not impacted on Primary species component; and it is intended to continuing like this, with ongoing monitoring to ensure that no impact occurs in the future.</p> <p>If any species other than scallops begin to be affected during the period of certification, then this PI would have to be reassessed.</p> <p>Consequently, the fishery meets with SG100 level of performance for this SI.</p>		
References		INIDEP Technical Reports N° 84/2015 Escolar <i>et al.</i> , 2009.		
OVERALL PERFORMANCE INDICATOR SCORE:				100

**Evaluation Table for PI 2.1.2 – Primary species management strategy**

PI 2.1.2		There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guidepost	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.
	Met?	YES	YES	NO
	Justification	As it is mentioned in the PI 2.1.1, there are no primary species identified and the UoA has no impact on this component. So, a management strategy is not being required. Following FCRv2.0 scoring issue (a) does not need to be scored for SG60 and SG80, and to score a 100 on this component, a management strategy should be in place for the UoA for P2 species, since gear loss or other incidental impacts could still occur.  From all exposed above, at the moment, it is not necessary a partial strategy in place to maintain or not hinder rebuilding of main primary species at/to levels which are highly likely to be above the point where recruitment would be impaired. So, the fishery meets with SG80.		
b	Management strategy evaluation			
	Guidepost	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is 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.
	Met?	YES	YES	NO
	Justification	As it is mentioned above, there are no primary species identified in the Patagonian scallop fishery. Based on information directly about the UoA obtained by monitoring of INIDEP OBO Program, at the moment, it is not necessary to implement measures or a partial strategy. So the fishery meets with SG80 level of performance for this SI.		
c	Management strategy implementation			
	Guidepost		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).
	Met?		YES	NO
	Justification	As it is mentioned in SI b), interaction data registered indicates that, at the moment, it is not necessary to implement measures or a partial strategy for primary species since the UoA has no impact on this component.  Therefore, the fishery meets with SG80 of performance for this SI.		

d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Justification	Not relevant. There are no sharks identified as primary species.		
e	Review of alternative measures			
	Guidepost	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.
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Justification	As it is explained in SI a), there is no unwanted catch of primary species and this SI is not scored by the assessment team.		
References		INIDEP Technical Reports N° 84/2015 Escolar <i>et al.</i> , 2009.		
OVERALL PERFORMANCE INDICATOR SCORE:				80

#### Evaluation Table for PI 2.1.3 – Primary species information

PI 2.1.3		Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impact on main species			
	Guidepost	Qualitative information is adequate to estimate the impact of the UoA on the main primary species with respect to status.  OR  If RBF is used to score PI 2.1.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.	Some quantitative information is available and is adequate to assess the impact of the UoA on the main primary species with respect to status.  OR  If RBF is used to score PI 2.1.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.	Quantitative information is available and is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status.
	Met?	YES	YES	NO
	Justification	As it is mentioned above, there are no Primary species identified in the Patagonian scallop bottom otter trawl fishery. There is a robust systematic quantification of catches (see Tables 5 and 6), due to the 100% observer coverage, the available quantitative information shows that there are no Primary species catches.  However, the team considers that since gear loss or other incidental impacts could still		

		occur, this possibility should be considered to assess the impact with a high degree of certainty, and so, the fishery meets with SG80 level of performance for this SI.		
b	Information adequacy for assessment of impact on minor species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			YES
	Justification	There is some quantitative information adequated to estimate the impact of the UoA on Primary species with respect to status. Information is available due the to the Observer On Board Program and samplings collected research surveys (INIDEP Technical Reports N° 84/2015 and N° 36/2015). These data are used by INIDEP Benthic Mollusc Fisheries Program to assess fauna accompanying and survival reports.  Therefore, the fishery meets with the SG100 level of performance for this scoring issue.		
c	Information adequacy for management strategy			
	Guidepost	Information is adequate to support measures to manage main primary species.	Information is adequate to support a partial strategy to manage main Primary species.	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.
	Met?	YES	YES	NO
	Justification	Information is adequate to support a strategy to manage Primary species, if required. Information from INIDEP OBO Program as well as from annual research surveys provides relevant knowledge on the basic biological structure to support a strategy to manage primary species. The OBOs Program sampling schemes and landing control carried out by management authorities provide information to support a strategy to manage Primary species if needed.  However, the team considers that since gear loss or other incidental impacts could still occur, this possibility should be considered when assessing the impact with a high degree of certainty. Subsequently, the fishery meets with the SG80 level of performance for this SI.		
References		INIDEP Technical Reports N° 84/2015 and N° 36/2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				85

#### Evaluation Table for PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biological based limit and does not hinder recovery of secondary species if they are below a biological based limit.		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guidepost	Main Secondary species are likely to be within biologically based limits.	Main secondary species are highly likely to be above biologically based limits	There is a high degree of certainty that main secondary species are within biologically based limits.
		OR	OR	
		If below biologically based	If below biologically based	

		limits, there are measures in place expected to ensure that the UoA does not hinder recovery and rebuilding.	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. AND 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.	
	Met?	YES	YES	YES
	Justification	<p>Secondary species usually include fish and shellfish species that are not managed according to reference points and birds/mammals/reptiles/amphibians (all species that are out of scope of the standard) that are not ETP species.</p> <p>The assessment team reviewed all the available information of P2 species for Patagonian scallop fishery, considering: (i) if the catch does not comprise 5% or more by weight of the total catch of all species by the UoA, or (ii) if the species is classified as “less resilient” and the catch of the species by UoA comprise 2% or more by weight of the total catch of all species the UoA.</p> <p>According to Tables 5 and 6, described in the background and following Decision Tree (Figure GSA3 of FCRv2.0), Patagonian scallop is the main group of total catches of the fishery and there are no Secondary species identified. Also, species listed in Table 6 represent biota structure of habitat.</p> <p>Moreover, the fishery is pursued in a habitat and depth range in which demersal fish are not common. The gear is rigged with doors attached by bridles directly to the net and with the net having a low headline height and being towed slowly, it neither herds fish nor captures any above the seafloor. The 100% observer coverage provides quantitative information showing that no such species are caught or retained meeting both qualitative and quantitative conditions. Should any commercial species (other than the target species) be retained, the quantitative information from the observer coverage would allow estimation of the outcome status with respect to biologically based limits.</p> <p>Based on the previous statements, it is concluded that the UoA has not impacted on Secondary species components; and it is intended to continuing like this, with ongoing monitoring to ensure that no impact occurs in the future.</p> <p>If any species other than scallops begin to be affected during the period of certification, then this PI would have to be reassessed.</p> <p>Therefore, the fishery meets with SG100 of performance for this SI.</p>		
b	Minor secondary species stock status			
	Guidepost			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
	Met?			YES
	Justification	<p>As it is detailed above, there are no Secondary species identified in the Patagonian scallop bottom otter trawl fishery. So, the UoA has not impacted on Secondary species component; and it is intended to continuing like this, with ongoing monitoring to ensure that no impact occurs in the future.</p> <p>If any species other than scallops begin to be affected during the period of certification, then this PI would have to be reassessed.</p> <p>Therefore, the fishery meets with SG100 level of performance for this SI.</p>		
References		<p>INIDEP Technical Reports N° 84/2015.</p> <p>Escolar <i>et al.</i>, 2009.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				100

#### Evaluation Table for PI 2.2.2 – Secondary species management strategy

PI 2.2.2		There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch.		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place			
	Guided post	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.
	Met?	YES	YES	NO
	Justification	As it is mentioned in the PI 2.2.1, there are no Secondary species identified and the UoA has no impact on this component. So, a management strategy is not required. Following FCRv2.0 scoring issue (a) does not need to be scored for SG60 and SG80, and to score a 100 on this component, a management strategy should be in place for the UoA for P2 species, since gear loss or other incidental impacts could still occur.  From all exposed above, at the moment, it is not necessary a partial strategy in place to maintain or not hinder rebuilding of main Secondary species at/to levels which are highly likely to be above the point where recruitment would be impaired. So, the fishery meets with SG80.		
b	Management strategy evaluation			
	Guided post	The measures are considered likely to work, based on plausible argument (e.g. general experience, theory or	There is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about	Testing supports high confidence that the partial strategy/strategy will work, based on information directly about the UoA

		comparison with similar UoAs/species).	the UoA and/or species involved.	and/or species involved.
	Met?	YES	YES	NO
	Justification	As it is mentioned above, there are no Secondary species identified in the Patagonian scallop fishery. Based on information directly about the UoA obtained by monitoring of INIDEP OBO Program, at the moment, it is not necessary to implement measures or a partial strategy. For that reason, the fishery meets with SG80 level of performance for this SI.		
c	Management strategy implementation			
	Guidepost		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).
	Met?		YES	NO
	Justification	As mentioned above, there are no Secondary species identified in the Patagonian scallop fishery. Based on information directly about the UoA obtained by monitoring INIDEP OBO Program, at the moment, it is not necessary to implement measures or a partial strategy. So, the fishery meets with SG80 level of performance for this SI.		
d	Shark finning			
	Guidepost	It is likely that shark finning is not taking place.	It is highly likely that shark finning is not taking place.	There is a high degree of certainty that shark finning is not taking place.
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Justification	Not relevant. There are no sharks identified as Secondary species.		
e	Review of alternative measures to minimise mortality of unwanted catch			
	Justification	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main secondary species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all secondary species, and they are implemented, as appropriate.
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Guidepost	As it is explained in SI a), there is no unwanted catch of Secondary species and this SI is not scored by the assessment team.		
References		Schejter <i>et al.</i> , 2008; Sánchez <i>et al.</i> , 2011; Escolar <i>et al.</i> , 2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				80

#### Evaluation Table for PI 2.2.3 – Secondary species information

PI 2.2.3		Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species.		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts on main secondary species			
	Guidepost	Qualitative information is	Some quantitative	Quantitative information is

	ost	adequate to estimate the impact of the UoA on the main secondary species with respect to status.  OR  If RBF is used to score PI 2.2.1 for the UoA:  Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species.	information is available and adequate to assess the impact of the UoA on main secondary species with respect to status.  OR  If RBF is used to score PI 2.2.1 for the UoA:  Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species.	available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status.
	Met?	YES	YES	NO
	Justification	<p>As it is mentioned above, there are no Secondary species identified in the Patagonian scallop bottom otter trawl fishery. There is a robust systematic quantification of catches (see Tables 5 and 6), due to the 100% observer coverage, the available quantitative information shows that there are no Secondary species catches.</p> <p>The main data is obtained by INIDEP OBOs Program in research sampling or program and results are available in technical scientific reports. Observers are periodically trained by INIDEP researchers. There is in place a protocol to carry out data or samplings (<i>i.e.</i> organic material) to identify species. This organic material is analyzed in laboratory by experts.</p> <p>Information is collected on a haul basis. Each observer produces an on board report, following specific protocols developed by INIDEP Observers On Board Program and recording electronically all the information, which is immediately presented to INIDEP at their arrival.</p> <p>However, the team considers that since gear loss or other incidental impacts could still occur, this possibility should be considered to assess the impact with a high degree of certainty, and so, the fishery meets the SG80 level of performance of this SI.</p>		
b	Information adequacy for assessment of impacts on minor secondary species			
	Guidepost			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			YES
	Justification	<p>There is some quantitative information adequated to estimate the impact of the UoA on Secondary species with respect to status. Information is available due to the observer program and samplings collected research surveys (INIDEP Technical Reports N° 84/2015 and N° 36/2015). These data are used by INIDEP Benthic Mollusc Fisheries Program to assess fauna accompanying and survival reports.</p> <p>Therefore, the fishery meets with the SG100 level of performance for this scoring issue.</p>		
	Information adequacy for management strategy			
c	Guidepost	Information is adequate to support measures to manage main secondary species.	Information is adequate to support a partial strategy to manage main secondary species.	Information is adequate to support a strategy to manage all secondary species, and evaluate with

				high degree of certainty whether the strategy is achieving its objective.
	Met?	YES	YES	NO
	Justification	<p>Information is adequate to support a strategy to manage Secondary species, when required. Information from INIDEP OBO Program as well as from annual research surveys provides relevant knowledge on the basic biological structure to support a strategy to manage Secondary species. The OBOs Program sampling schemes and landing control carried out by management authorities provides information to support a strategy to manage Secondary species, if needed.</p> <p>However, the team considers that since gear loss or other incidental impacts could still occur, this possibility should be considered to assess the impact with a high degree of certainty, and so, the fishery meets with the SG80 level of performance of this SI.</p>		
References		INIDEP Technical Reports N° 84/2015 and N° 36/2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				85

#### Evaluation Table for PI 2.3.1 – ETP species outcome

PI 2.3.1		The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Effects of the UoA on population/stock within national or international limits, where applicable			
	Guided post	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population/stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
	Met?	YES	YES	NO
	Justification	<p>The assessment team reviewed the available information of P2 species for Patagonian scallop fishery, and no ETP species are considered to be captured or reported to be impacted by this fishery. The lists of species covered under the National Action Plan (PAN) to protect, preserve and minimize the impact of the fishery on Birds (PAN-Aves) and on sharks (PAN-Tiburones), are detailed in 'Annex I' and 'Annex III' of these programmes, respectively.</p> <p>The INIDEP Technical Report N° 93/14 presents data collected from 56 commercial tides targeted to Patagonian scallops, between the years 2011 and 2013, registered by observers (according to the detailed protocol explained in Campodónico &amp; Escolar (2013)), were analysed and compositions (at a level of genus and size distribution) were determined.</p> <p>The number of hauls in which 'identification, quantification and sampling of chondrichthyes' were performed was between 0.2 and 9% (mean <math>\pm</math> SD = 2.2 <math>\pm</math> 1.7). Although the coverage rates with chondrichthyes sampling are low, it should be considered that this fleet makes a high frequency of hauls (up to 120 sets per day) with little spatial dispersion. In the hauls 'with identification of chondrichthyes', rays were the most frequent species (the highest proportion were the ones from genus Bathyrja, followed by Psammobatis, Dipturus and Amblyraja). 75-80% of the observed hauls presented catches of less than 20 specimens of rays, with a size range between 15 cm and 120 cm LT. Although, the percentage of hauls observed in each tide is low; and although the variability of the number of individuals recorded per haul in each tide also makes it</p>		

difficult to weight, it is a beginning of approach to the impact of the fishery.

In the 4 tides from which rays' eggs were obtained, 921 eggs were identified at the genus or species level. The largest proportion corresponded to genus *Bathyrāja*, with *B. macloviana* being the most frequent species. Most (~83%) of the collected eggs were empty, with no oocytes or embryos present in the interior; and 41% of the empty eggs show signs of predation caused by benthic organisms (*i.e.* gastropods).

Table 11. Composition (%) at a specific level from rays egg capsules collected by Observers On Board in four comercial tides targeting Patagonian scallop during years 2011 and 2012. (Source: INIDEP Technical Report N° 93/14)

AÑO		Año 2011	Año 2011	Año 2012	Año 2012
Meses		jun-jul	ago	mar-abr	abr-may
Rango de profundidad (m)		92-114	98	104-121	91-105
Rango de latitud (LS)		41-43°	41°	43-45°	39-41°
HUEVOS	Número observado	213	418	113	177
	Vacios	82,63	85,65	86,73	80,79
	Llenos	17,37	14,35	13,27	19,21
	Llenos con ovocitos	67,57	53,33	40	58,82
	Llenos con embriones	32,43	46,67	60	41,18
EJEMPLARES	<i>Bathyrāja</i> spp.	85,02	84,65	100	83,33
	<i>Dipturus</i> spp.	3,59	3,33	0	3,51
	<i>Amblyrāja</i> spp.	6,53	4,53	0	3,51
	<i>Psammobatis</i> spp.	4,87	7,48	0	9,65
	Número observado	781	508	80	228

The INIDEP Technical Report N° 88/15, data collected by observers on board in two commercial tides of the "Erin Bruce" vessel targeting Patagonian scallop were analysed. The first tide was performed between April 10<sup>th</sup> and May 9<sup>th</sup>, 2015 and the catch of rays was quantified in 101 hauls (7.7% of the total) over Management Units E and F. The second tide was performed between June 4<sup>th</sup> and July 4<sup>th</sup>, 2015, and the catch of rays was quantified in 99 hauls (8.3% of the total) over Management Units D, E and F. The results are shown below:

Table 12. Number of specimens collected and percentual composition at a genus level, in hauls from two comercial tides targeting Patagonian scallop on different Management Units, during years 2011 and 2012 (Source: INIDEP Technical Report N°88/15).

Marea	Unidad de Manejo	Número de Lances	Número de Ejemplares	Composición (%) de captura a nivel de Género			
				<i>Bathyrāja</i>	<i>Psammobatis</i>	<i>Dipturus</i>	<i>Amblyrāja</i>
1	E	49	177	73,4	22,6	2,8	1,1
	F	52	195	72,8	16,9	5,1	5,1
2	D	10	71	67,6	15,5	12,6	4,2
	E	71	268	74,6	17,9	4,4	2,9
	F	18	74	66,2	17,5	10,8	5,4

Although, there is no evidence of a scallop-target unwanted catch of Chondrichthyes, there are estimations from SSPyA that provides statistics from the landings of all species by year, species and fleet.

Table 13. Landings of main chondrichthyes species landed, by fleet, during Year 2016.

Periodo: 01/01/2016 - 31/12/2016											
Especie	Fresqueros				Congeladores						
Peces	Costeros	Fresqueros	Rada o Ria	Arrastreros	Palangreros	Poterros Nacionales	Tangoneros	Tramperos	Surimeros	Total	
Cazon	38,8	21,3	3,5								63,6
Chucho	0,2	2,1	0,4								2,7
Gatuzo	2.720,50	358,8	457,8	0,6	0,1						3.537,80
Pez angel	2.179,30	324,4	345,6	0							2.849,30
Pez gallo	1.094,80	691,2	62	0,6							1.848,60
Raya de círculos	122,9	15,6									138,5
Raya hocicuda / picuda	132,2	346,8	1,4	68,6							549
Raya lisa	14,3		0,3								14,6
Raya marmolada	1,5		16								17,4
Raya pintada	15,8										15,8
Rayas nep	7.123,10	9.258,00	923,1	369,1	0,1				20,9		17.694,30
Tiburón bacota		0	0,1								0,1
Tiburón espinoso	21,5	3,5	1,3	6,5							32,7
Tibur? moteado			0,1								0,1
Tibur? pintaroja				0,3							0,3
Tiburones nep	402,6	98	54,5								555,1
Vieira, callos				4.977,00							4.977,00
Total 2016	124.058,10	199.634,90	22.333,20	172.140,60	401,9	54.576,90	100.826,20	2.477,30	23.859,00	700.308,30	

However, national and international measures to reduce incidental mortality of ETP species are in place, such as PAN Chondrichthyes (to protect sharks and rays), PAN Birds (in line with FAO International Action Plan and ACAP objectives) and PAN Mammals.

The starfish, *Calyptaster spp.*, appears to be a top predator in this area, most likely preying on gasteropods, but not directly on scallops (Botto *et al.*, 2006).

No whales, other mammals and turtles have ever been seen by observers along the Patagonian Shelf Break Front. While seabirds are common coastally particularly along coastal fronts, they are not found along the Shelf Break Front, and turtles are only found coastally in the northern sector (G. Blanco, *pers. com.*). Therefore, these cannot be affected by the fishery. The footrope and head rope of the trawl are attached directly to the doors and without sweeps the gear does not herd fish well and combined with the low headline height, the trawl catches few demersal fish.

With the slow towing speed (3.8 knots), and narrow mouth opening (1-1.20 m high; E. Gonzalez Lemmi, *pers. com.* and 11.5-12.6 m wide; Lasta & Iribarne, 1997), the trawl would not readily catch any birds or mammals that might stray into the fishery area. OBO records show none do. Each fishing trip is accompanied by an observer on board and the catch is sampled rigorously.

Therefore, it is considered that the effects of the fishery are known (and it is negligible) and where national and/or international requirements set limits for ETP species, but there is no evidence with a high degree of certainty that the ‘combined effects’ of the MSC UoAs are within these limits due to the lack of knowledge of many potential indirect impacts.

For that reason, the fishery meets the SG80 level of performance for this SI.

b	Direct effects			
	Guidepost	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Known direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
	Met?	YES	YES	YES
	Justification	There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop so ETP species will not be impacted by this fishery, and so, the fishery meets the SG100 level of performance for this SI.		

c	Indirect effects			
	Guidepost		Indirect effects have been	There is a high degree of

	ost		considered and are thought to be highly likely to not create unacceptable impacts.	confidence that there are no significant detrimental indirect effects of the fishery on ETP species.
	Met?		YES	YES
	Justificación	There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop so ETP species will not be impacted by this fishery, and the fishery meets the SG100 level of performance for this SI.		
References		Lasta & Iribarne, 1997; Botto <i>et al.</i> , 2006; INIDEP Technical Reports N° 93/2014 and N° 88/2015		
OVERALL PERFORMANCE INDICATOR SCORE:				95

#### Evaluation Table for PI 2.3.2 – ETP species management strategy

PI 2.3.2		<p>The UoA has in place precautionary management strategies designed to:</p> <ul style="list-style-type: none"> <li>• meet national and international requirements;</li> <li>• ensure the UoA does not hinder recovery of ETP species.</li> </ul> <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species.</p>		
Scoring Issue		SG 60	SG 80	SG 100
a	Management strategy in place (national and international requirements)			
	Guided post	There are measures in place that minimise the UoA-related mortality of ETP species, and are expected to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be highly likely to achieve national and international requirements for the protection of ETP species.	There is a comprehensive strategy in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to achieve above national and international requirements for the protection of ETP species.
	Met?	YES	YES	NO
	Justificación	<p>As mentioned in PI 2.3.1, the assessment team reviewed the available information of P2 species for Patagonia scallop fishery, and no ETP species have been recorded in the fishery area; nor captured or reported to be impacted by this fishery.</p> <p>However, if any ETP species might interact with the Patagonia scallop fishery, there are set requirements for protection or rebuilding provided through national ETP legislation, based on international agreements as National Action Plans (PAN-Aves, PAN-Tiburones and PAN-Mamíferos).</p> <p>Moreover, the CFP Resolution N° 3/2001 establishes that the INIDEP OBOs Program will be also monitoring birds, mammals and chondrichthyes. With regards to non-binding international instruments, Argentina endorsed the Code of Responsible Fisheries Conduct and adopted a National Action Plan to prevent, deter and eliminate the illegal, unreported and unregulated catch (PAN-IUU).</p> <p>Therefore, it is considered that 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.</p> <p>However, at the moment, there is not enough evidence of a complete and tested strategy designed to achieve above national and international requirements for the protection of ETP species. And so, the fishery meets with SG80 level of performance for this SI.</p>		



b	Management strategy in place (alternative)			
	Guided post	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species.	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species
	Met?	NOT RELEVANT	NOT RELEVANT	NOT RELEVANT
	Justification	See rationale mentioned in SI a).		
c	Management strategy evaluation			
	Guided post	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
	Met?	YES	YES	NO
	Justification	<p>General experiences indicate that the strategy is consider likely to work, and there is an objective basis of confidence that the strategy will work, based on the information directly about the fishery and/or species involved.</p> <p>There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop so ETP species might not be impacted by this fishery. The starfish, <i>Calyptaster spp.</i>, appears to be a top predator in this area, most likely preying on gasteropods, but not directly on scallops (Botto <i>et al.</i>, 2006).</p> <p>The absence of encounters is monitored by observers on board on 100% of vessels.</p> <p>The management authority has developed National Action Plans to follow the FAO International Action Plans for Sharks and Seabirds for all Argentinean fisheries. The Observers Program monitors any interactions between the fleet and Sharks and Seabirds, if they occur. The data supports high confidence that the strategy does work, and the fishery has no impact on ETP species.</p> <p>An indirect strategy to minimise mortality, if happened, is to decrease fishing effort. However, although there is an objective basis of confidence that the strategy will work, based on information directly about the fishery and/or the species involved, due to the lack of knowledge of many potential indirect impacts, there is no evidence of a quantitative analysis that supports high confidence that the strategy will work, and so, the fishery meets with SG80 level for this SI.</p>		
d	Management strategy implementation			
	Guided post		There is some evidence that the measures/strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
	Met?		YES	YES
	Justification	There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop so ETP species will not be impacted by this fishery.		

		<p>Juvenile chondrichthyes are caught occasionally and the numbers are recorded for every tow by the observers, who return them to the sea. No birds or mammals have ever been recorded. There is clear evidence that the strategy is being implemented successfully and the fishery has no impact on ETP species.</p> <p>So, the fishery meets the SG100 level of performance for this SI.</p>		
e	Review of alternative measures to minimize mortality of ETP species			
	Guidepost	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality ETP species, and they are implemented, as appropriate.
	Met?	YES	YES	NO
	Justification	<p>There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop, so ETP species will not be impacted by this fishery.</p> <p>Juvenile chondrichthyes are caught occasionally and the numbers are recorded for every tow by observers, who return them to the sea. No birds or mammals have ever been recorded.</p> <p>The absence of encounters is permanently monitored by observers on board on 100% of vessels. 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 Observers On Board Program monitors any interactions between the fleet and Sharks and Seabirds, if they occur. The data supports with high confidence that the strategy does work, and the fishery has no impact on ETP species.</p> <p>However, there is no evidence that this review is biennially made, and so the fishery does not comply with the SG100 level.</p> <p>Therefore, the fishery meets with the SG80 level of performance for this SI.</p>		
References		<p>INIDEP Technical Reports N° 88/2016 and N° 36/2016.</p> <p>CFP Resolution N° 3/2001.</p> <p>Botto <i>et al.</i>, 2006.</p>		
OVERALL PERFORMANCE INDICATOR SCORE:				85

#### Evaluation Table for PI 2.3.3 – ETP species information

PI 2.3.3		Relevant information is collected to support the management of UoA impacts on ETP species, including: <ul style="list-style-type: none"><li>• Information for the development of the management strategy;</li><li>• Information to assess the effectiveness of the management strategy; and</li><li>• Information to determine the outcome status of ETP species.</li></ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guidepost	Qualitative information is adequate to estimate the UoA related mortality on ETP species.	Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of	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
		OR		

		If RBF is used to score PI 2.3.1 for the UoA:  Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.	the ETP species.  OR  If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.	of ETP species.
	Met?	YES	YES	NO
	Justification	There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop so ETP species will not be impacted by this fishery; but 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.  There has been a 100% coverage of national OBOs. OBOs are trained according to INIDEP sampling protocol designed by the research project. Information is analyzed by INIDEP and presented as Advice and Transference Report (not published) or Technical Report (published). This includes information on numbers, weights and lengths of incidentally caught species and can be used to confirm their non commercial nature, both in quantity and size. Dockside monitoring records on 100% of landings provides the amounts of all landed species in this fishery. Information on directed and other incidental species is also available from commercial logbooks.  However, while there is sufficient information available to quantitatively estimate fishery related mortality and the impact of fishing for ETP species, the lack of knowledge of many potential indirect impacts, might not provide strong evidence with a high degree of certainty that the magnitude of UoA-related impacts, mortalities, injuries and consequences for the status of ETP species are quantitatively available.  Therefore, the fishery meets the SG80 level of performance for this SI.		
b	Information adequacy for management strategy			
	Guided post	Information is adequate to support measures to manage the impacts on ETP species.	Information is adequate to measure trends and support a strategy to manage impacts on ETP species.	Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives.
	Met?	YES	YES	YES
	Justification	There are no populations of protected, threatened and endangered species in the habitat of the Patagonian scallop, so ETP species will not be impacted by this fishery.  Observer's reports show the fishing operation ensures no ETP species are impacted.  The observer data is adequate to support a comprehensive strategy (if needed) 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. In that case, that the fishery has no impact on ETP species.  Therefore, the fishery meets the SG100 level of performance for this SI.		

References	Observer On Board Manual Procedure and Fishing Trips Records. National Action Plans for Sharks and Seabirds ( <a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a> )	
OVERALL PERFORMANCE INDICATOR SCORE:		90

#### Evaluation Table for PI 2.4.1 – Habitats outcome

PI 2.4.1	The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area(s) covered by the governance body(s) responsible for fisheries management.		
Scoring Issue	SG 60	SG 80	SG 100
a	Commonly encountered habitat status		
Guided post	The UoA is unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm.
Met?	YES	YES	NO
Justification	<p>The Patagonia Scallop bottom otter trawl fishery's commonly encountered habitat is 'mud – flat – small encrusting'. The fishery takes place in a restricted band of platform waters (within the country's EEZ).</p> <p>The biota of the fishing area presented in richness studies resulted in near 40 different taxa, (not specifying between the large Bryozoa, Porifera and Hidrozoa taxa, nor have been counted the exclusively epibiont organisms), and, as mentioned in Schejter <i>et al.</i> (2014a), benthic invertebrate associations in the different MUs of Patagonian scallops have been maintained over time, and the differences recorded between years were mainly due to variations in the biomass of the highest contribution taxa and not to a disappearance or change in species composition.</p> <p>Species <i>Zygochlamys patagonica</i>, Porifera, <i>Diplasterias brandti</i>, <i>Ctenodiscus australis</i>, <i>Fusitriton magellanicus</i>, <i>Ophiacanta vivipara</i>, <i>Austrocidaris canaliculata</i>, <i>Sterechinus agassizii</i>, Pterasteridae, <i>Actinostola crassicornis</i>, <i>Sympagurus dimomorphus</i>, Actiniaria and Ascidiacea were part of the most conspicuous species association during the period 1998-2009. And thirty-four species belonging to Gasteropoda, Asteroidea, Ophiuroidea, Echinoidea, Polychaeta, Holothuroidea, Crustacea, Cnidaria, Porifera, Chordata and Mollusca (represented exclusively by the Patagonian scallop) groups formed the most conspicuous association of species in the MU B during 1998-2009.</p> <p>Data processed by the INIDEP, and provided by the INIDEP Observers On Board Program suggests a minimal impact of the Patagonia scallop fishery on benthic species. These data are geo-referenced and correspond to several individuals, discriminated by species, recorded by haul.</p> <p>Based on extensive worldwide literature, bottom gear impact likely produces footprints on benthic habitat. However, the existence of wide areas of untrawlable bottom and mandatory closed areas are two factors that may limit the impact of trawling on benthic habitats. Alemany <i>et al.</i> (2015) analysed the bottom trawl fisheries in Patagonia using satellite data for the 2006–2012 period, and provided the evidence that the spatial distribution of trawling activity is patchy and trawling hotspots were small, comprising annually &lt;5% of the shelf extension or &lt;7% of the total trawlable area.</p> <p>The seabed environment where the fishery occurs is characterised by relatively stable, dynamic mud with low structural complexity due to natural sedimentation processes. This habitat continues well beyond the range of the fishery, meaning that the proportion on</p>		

		<p>which the fishing takes place is very small.</p> <p>Spatial distribution of trawling activity in the Argentine Economic Exclusive Zone (AEEZ) is patchy, with few areas characterized by high trawling effort. However, such hotspots were relatively small, comprising &lt;5% of the total AEEZ extension, and showing little variation in their spatial location between years.</p> <p>Vulnerable Marine Ecosystem habitats are also protected by zones of exclusion to trawling such as Patagonian Closed Area (established in 1997) and Burkwood bank.</p> <p>The Burdwood bank, also called Namuncura, is a sensitive area, which was set as a protected area ("Area Marina Protegida Namuncura - Banco Burdwood") by Camara de Diputados y Senadores of Argentina, with the following objectives:</p> <p>a) Conservation of Burdwood Bank, due to its high environmental sensitivity and its relevance to the protection and management of biodiversity of the marine seafloor. By Argentine law, it is a marine protected area.</p> <p>b) Promotion of environmental and economic sustainable management of the marine benthic ecosystem</p> <p>c) Promotion of scientific research addressed to the application of ecosystem approach of fishing activities and mitigation of global changing effects.</p> <p>Aleman <i>et al.</i> (2014) identified the effects of Marine Protected Areas located on the Southwest Atlantic Patagonian Shelf on fish assemblages. They analysed 8 years of satellite data of spatial distribution of fishing effort and data of many trawling stations of scientific surveys. They concluded were a trend towards increasing abundance of the demersal fish assemblages, the target and non-target fish species, and these positive trends support the case for offshore, large-scale MPAs.</p> <p>Given the spatially restricted nature of the fishery, light gear, the dynamic nature of the habitat, the fishery is highly unlikely to cause serious or irreversible harm to the mud habitat it commonly encounters.</p> <p>Evidence presented indicate that the fishery complies with SG80 level of performance.</p>		
b	VME habitat status			
	Guided post	The UoA is unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	The UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.	There is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm.
	Met?	YES	YES	NO
	Justification	On the basis of the substratum, geomorphology and biota, this habitat has been characterised as a soft bottom muddy-sandy substrate (soft); flat surface (except for the parts where there are scallops rubble banks; and small erect/encrusting/burrowing biota (see Principle 2, description 3.4.3 scallop beds). <p>There are no Vulnerable Marine Ecosystem (VME) habitats in the area where the fishery operates, as defined in paragraph 42 of FAO Guidelines; neither minor habitats.</p> <p>However, the team considers that since not all the MUs have been periodically assessed, evidence is not considered to be enough. Consequently, the fishery meets with SG80 of performance for this SI.</p>		
c	Minor habitat status			
	Guided post			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.
	Met?			YES
	Justification	<p>There is evidence that the UoA is highly unlikely to reduce structure and function of the habitats to a point where there would be serious or irreversible harm. There are no Vulnerable Marine Ecosystem (VME) habitats in the area where the fishery operates, as defined in paragraph 42 of FAO Guidelines; nor minor habitats.</p> <p>Specific richness research and the nature and quantity of incidental bycatch has been performed and also, the variation of the benthic community regarding closures, both in time and space has been analysed (Escobar <i>et al.</i>, 2015).</p> <p>The studies of Schejter <i>et al.</i> (2008) and Sanchez <i>et al.</i> (2011) indicate there has been little or no change since the commencement of the fishery in populations of bycatch species in the benthic environment. Additionally, it has been demonstrated the importance of spatial closures and temporary fishery for benthic community due to there is evidence that biomass of species impacted by trawling is recovered more quickly in the exclusion area. The importance of this partial strategy is noteworthy a control area or baseline to distinguish between natural changes and those caused by trawling.</p> <p>Therefore, the fishery meets with the SG100 level of performance for this SI</p>		
References		Schejter <i>et al.</i> , 2008, 2014; Sánchez <i>et al.</i> , 2011; Escobar <i>et al.</i> , 2015.		
OVERALL PERFORMANCE INDICATOR SCORE:				85

#### Evaluation Table for PI 2.4.2 – Habitats management strategy

PI 2.4.2	There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats.			
Scoring Issue	SG 60	SG 80	SG 100	
a	Management strategy in place			
	Guided post	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.
	Met?	YES	YES	NO
	Justification	<p>There are measures, and there is even a partial strategy in place for managing the impact on habitats, which expects to achieve the Habitat Outcome 80 level of performance or above.</p> <p>As scallops are a key species in the benthic habitat, the Management Plan ensuring sustainability of scallop populations (Principle 1), indirectly will also ensure the sustainability of benthic habitat of scallop beds. Significant areas of each scallop bed are closed to fishing and consequently, will preserve some of the habitat from disturbance. Fishers follow a rotational fishing strategy so that no area of a bed is fished for prolonged periods; shells of processed scallops are returned to sea at point of capture in order to help preserving the habitat structure. These measures are expected to achieve the Habitat Outcome 80 level of performance.</p> <p>The sea floor of the Patagonian Shelf Large Marine Ecosystem is muddy- sandy and similar across the whole shelf. Abundance of all benthic species is heightened under the highly Shelf Break Front where bento-pelagic coupling maintains high benthic production. As the scallops are the principal keystone species that structures the benthic habitat of scallop</p>		

		<p>beds, successful management under Principle 1, will ensure sustainability of the fishery habitat.</p> <p>Significant areas of each scallop bed are periodically closed (before the beginning of each year, it is informed which MUs are closed and which are available to be used) to preserve habitat and maintain recruitment of scallops and the benthic habitat. Fishers follow a rotational harvest strategy that results in fishing moving on from beds before scallops and bed structure.</p> <p>There are neither “othe MSC” nor “non-MSC” fisheries in the area; and the fishery plan, that results in sustainability of the scallop fishery ensures that the habitat is primarily structured by the Shelf Break Front and the scallops themselves, are also preserved.</p> <p>However, although significant areas of each scallop bed are closed to fishing in order to preserve habitat and maintain recruitment of scallops and the benthic habitat, the team considers that since not all the MUs have been periodically assessed, it cannot be supported. There is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats and so, the fishery meets with SG80 of performance for this SI.</p>		
b	Management strategy evaluation			
	Guidepost	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.
	Met?	YES	YES	NO
	Justification	<p>This partial strategy (rotational fishing strategy, so that no area of a bed is fished for prolonged periods; shells of processed scallops are returned to the sea) for habitat conservation has been used since the beginning of the fishery and proved to be effective. Not only has the scallops stock been maintained over time above a point where recruitment would be impaired, but also benthic invertebrate associations in the different MUs of Patagonian scallops (Schejter <i>et al.</i>, 2014).</p> <p>So, it is understood that the measures are considered likely to work, based on plausible argument; and that there is some objective basis for confidence that the partial strategy will work, based on information directly about the fishery and/or habitats involved.</p> <p>Scallop biomass and populations of bycatch species within beds has been maintained through the period of the fishery. Information obtained directly from the fishery, gives objective confidence that this strategy is effective.</p> <p>However, no testing has been conducted neither estimate the outcome of the strategy nor to support high confidence that the strategy will work, based on information directly about the fishery and/or habitats involved.</p> <p>So, the fishery scores 80 for this SI.</p>		
c	Management strategy implementation			
	Guidepost		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).
	Met?		YES	NO
	Justification	There is some quantitative evidence that the measures/ partial strategy is being		



	tion	implemented successfully, but the reasonable uncertainty related to the effects of trawling exists avoiding to define it as clear. Scallop biomass within beds has been maintained through the period of the fishery. Hence the habitat scallops structure has also been maintained.  On the other hand, while some changes in composition of bycatch species over time have been observed, they were not considered significant. The benthic habitat preserved in the un-fished reserved areas would provide a source of recruits for scallops and species of the benthic habitat, as well as important undisturbed sites for experimental investigations and control sites in testing the effects of fishing.  Then, no clear evidence that the strategy is being implemented successfully for preserving habitat types is available. So, the fishery meets with SG80 level for this SI.		
d	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
	Guidepost	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.
	Met?	YES	YES	NO
	Justification	While there is no need of a partial strategy in place due to the impact of UoA in VME habitats involved, 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.  In Argentina, management fishery is integrated for all fisheries, including close/protection areas that could be restricted for some specific fishery. Statements are determined by management authorities, CFP and CTMFM, and published in their websites. Monitoring control is applied by vessel monitoring system (VMS) using GPS. If a vessel enters in a close area using bottom trawl nets, the management authority requests its return to port and applies respective sanctions.  The Patagonian scallop fishery overlaps with closed areas restricted for the use of bottom trawl net, and sanctions for non-compliment are established in the CTMFM Resolutions N° 10/00 and N° 01/09.  However, there is still not enough evidence to affirm that this quantitative evidence is clear, since no further management requirements have ever been needed by the date.  Therefore, the fishery meets with SG80 level of performance for this SI.		
	References	Schejter <i>et al.</i> , 2014  Scallop fishery Management Plan (CFP Resolution N° 4/2008)  CTMFM Resolutions N° 10/00 and N° 01/09.		
OVERALL PERFORMANCE INDICATOR SCORE:				80

#### Evaluation Table for PI 2.4.3 – Habitats information

PI 2.4.3	Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat.		
Scoring Issue	SG 60	SG 80	SG 100

a	Information quality			
	Guidepost	<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>
	Met?	YES	YES	NO
	Justification	<p>It is considered that there is not only a basic understanding, but the nature, distribution and vulnerability of all main habitat types in the fishery are known from the extensive sampling by trawl and dredge during annual biomass surveys. Preliminary investigation of the physical environment of the seafloor has indicated relationships between sediment composition and structure and scallop beds.</p> <p>The benthic habitat of the Patagonian Shelf Large Marine Ecosystem is simple and widespread and similar across the outer shelf and scallop beds. Scallops are widespread across the shelf but the dense beds occur only at the Shelf Break Front. The scallop beds themselves are the main habitat type. The sediment of the seafloor of the Patagonian Shelf Large Marine Ecosystem is primarily fine sand with some mud and has little relief.</p> <p>The continuing series of annual biomass surveys with their fine-scale sampling shows the nature and distribution of the main habitat types of this fishery is stable. Taking into account the likelihood of the encounterability and eventual alteration of the habitat due to the fishing gear, there is enough evidence to consider that these habitats are not vulnerable to fishing at the scale and intensity of fishing.</p> <p>Although the benthic habitat of the entire Patagonian Shelf Large Marine Ecosystem has not been systematically sampled, the evidence from the scallop fishery and other fisheries further inshore, point out to be largely one simple habitat. Scallop fishing occurred on the firmer more reflective habitat of fine sand. The sediments show strong linear distribution patterns along the shelf indicating that seafloor currents are important in sediment transport and probably are an important factor in structuring benthic habitat as well.</p> <p>Although INIDEP has swath-mapped parts of the scallop beds in 2004 and 2005 (INIDEP, 2005), only preliminary results have been presented but further analysis was proposed to develop bottom classification ground trothed by sediment sampling, followed by correlation analysis of sediment type, scallop abundance and biomass of accompanying fauna.</p> <p>Therefore, while it is considered that the nature, distribution and vulnerability of all main habitat types in the fishery are known at a level of detail relevant to the scale and intensity of the fishery and even over their range, there is not enough evidence to affirm that there is particular attention to the occurrence of vulnerable habitat types.</p> <p>So the fishery meets with SG80 level for this SI.</p>		
b	Information adequacy for assessment of impacts			

	Guidepost	Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.  OR  If CSA is used to score PI 2.4.1 for the UoA:  Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats.	Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.  OR  If CSA is used to score PI 2.4.1 for the UoA:  Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	The physical impacts of the gear on all habitats have been quantified fully.
	Met?	YES	YES	NO
	Justification	<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; and this data is sufficient and available to allow the nature of the impacts of the fishery on habitat types to be identified. Moreover, there is evidence that there is reliable information on the spatial extent of interaction, and the timing and location of use of the fishing gear.</p> <p>All data are gathered during the annual biomass surveys. The fishing position data recorded in management, allow precise spatial analysis of information on distribution of fishing effort and habitat. The usefulness of this is illustrated in swath bathymetry information relating sediments to fishing effort. These data give a broad understanding of the main impacts of gear use on the main habitats of the scallop fishery.</p> <p>Spatial data on biomass of the target species and composition of bycatch is collected during the observer monitoring of fishery catch and bycatch as well as in the fishery independent annual biomass surveys. These data are sufficient to identify any change in the habitat types from fishing. Electronic fishery records that permit tow by tow analysis of fishing on scallop beds that can be used to relate to individual catches are kept. Hence localized fishing effort and catch can be analyzed. One example used an overlay of tow data with swath-bathymetry. The data can be used to identify habitat types fished, and whether the habitat is subsequently modified.</p> <p>While sufficient data is being gathered and is available to allow the nature of the impacts of the fishery on habitat types, physical impacts of the gear on the habitat types have not been fully quantified at the moment and the fishery.</p> <p>Therefore, the fishery meets with the SG80 level for this SI.</p>		
	c	Monitoring		
	Guidepost		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in habitat distributions over time are measured.
	Met?		YES	NO
	Justification	Data continues to be collected in the fishery to establish that it has little impact on the distribution and abundance of scallop beds and associated fauna; and these data are		

	<p>supplemented by data gathered independently of the fishery in annual biomass surveys.</p> <p>Several documents have been produced with information about habitat and the effects of fishing. Even when this information is sometimes indirect (referred to Reproductive Reserves and changes in benthic assemblages) it can be supported that this data is sufficient to detect any increase in risk to habitat (e.g. due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures). Changes in habitat distributions over time have not been measured yet.</p> <p>Therefore, the fishery complies with the SG80 level for this SI.</p>
References	Bremec <i>et al.</i> , 2003; Bogazzi <i>et al.</i> , 2013; Campodónico & Mauna, 2014; Escolar <i>et al.</i> , 2015; Daleo, 2015.
OVERALL PERFORMANCE INDICATOR SCORE:	
80	

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

PI 2.5.1	The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Ecosystem status		
Guided post	The UoA is unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	The UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.	There is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm.
Met?	YES	YES	YES
Justification	<p>There is evidence that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be serious or irreversible harm.</p> <p>Considering the wider system structure and function, it arises that Scallops are the keystone species in the habitat and the ecosystem of the Atlantic Shelf Break Front.</p> <p>The Patagonian Shelf Large Marine Ecosystem is too large in relation to the area of scallop beds (scallop beds cover 0.006% of the area of the ecosystem), and its productivity depends on physical attributes rather than the biological ones of the scallop beds. So, the fishery is unlikely to disrupt the key elements of underlying ecosystem structure and function. This supports the hypothesis that the fishery is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm, and can be considered as evidence.</p> <p>The Patagonian Shelf Large Marine Ecosystem is supported by a high primary production resulting from the “upwelling” of cold waters of the Malvinas Current that when reaching the surface fuel a high primary production (this is named the Atlantic Shelf Break Front). This permanent Shelf Break Front has remained stable in position from year to year and its production is strongly linked to the seafloor in a stable bento-pelagic coupling. The production of algae and detritus provides food for the scallop populations, which are particularly dense underneath the front. Eddies in this frontal system are capable of retaining scallop larvae over these populations and are probably important. Scallops are the keystone species in the habitat and the ecosystem of the Shelf Break Front.</p> <p>As a result of the Patagonian Shelf Break Front production, the whole Argentinean shelf has associated high secondary production, which supports important pelagic (squid) and demersal (hake) fisheries. These fisheries are outside the area of the scallop fishery. It is</p>		

	<p>not yet clear whether the high density of scallops associated with the front is due to larval retention rather than increased food supply, but it is probably caused by both. An important species assemblage of suspension feeders, deposit feeders and predators are closely associated with the scallop dominated habitat in this rich feeding zone.</p> <p>There are no signs of trophic cascade depletion of top predators or gross changes species biodiversity so the fishery is highly unlikely to disrupt the key elements of the underlying ecosystem structure and functions to a point where there would be serious or irreversible harm.</p> <p>Scallop beds have remained unchanged in position and density since the inception of the fishery and the composition and diversity of bycatch has also remained unchanged, but further analyses are required to fully document the evidence of this stability.</p> <p>The fishery meets with SG100 level of performance for this SI.</p>
References	Botto <i>et al.</i> , 2006; Mauna <i>et al.</i> , 2008; Alemany <i>et al.</i> , 2009; Franco, 2010; Matano <i>et al.</i> , 2010.
OVERALL PERFORMANCE INDICATOR SCORE:	
100	

#### Evaluation Table for PI 2.5.2 – Ecosystem management strategy

PI 2.5.2	There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function.		
Scoring Issue	SG 60	SG 80	SG 100
a	Management strategy in place		
Guided post	There are measures in place, if necessary which take into account the potential impacts of the fishery on key elements of the ecosystem.	There is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.	There is a strategy that consists of a plan, in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place.
Met?	YES	YES	NO
Justification	<p>There are measures, and even a partial strategy in place to ensure that the fishery taking into account potential impacts of the fishery on key elements of the ecosystem; also considers available information, and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance.</p> <p>Patagonian scallop is a key species in the Ecosystem, and the Fishery Management Plan (implemented and described in Principle 1) legally reflected in CFP Resolution N° 4/2008 is ensuring sustainability of scallop populations (Principle 1), and indirectly will also ensure the sustainability of benthic habitat of scallop beds. Significant areas of each scallop bed are closed to fishing and therefore, will preserve some of the habitat from disturbance. Fishers follow a rotational fishing strategy so no area of a bed is fished for prolonged periods and shells of processed scallops are returned to sea at point of capture.</p> <p>Bento-pelagic coupling in the Patagonian Shelf Break Front determines the production of food for scallop and associated species in the benthic community. Eddies in the currents associated with the front probably ensure larvae of scallops and associated species in the benthic community are retained close to parent populations. Fishing has no effect on the dynamics of this major oceanographic feature.</p> <p>Scallop fishing is confined to the area under the Patagonian Shelf Break Front. Scallop fishing has no impact on the ecosystem beyond the limits of the Shelf Break Front.</p>		

		However, although there is a strategy in place, and the impacts are, in general, periodically assessed, the team considers that there is not enough evidence that this strategy has been turned into a plan; which contains measures to address all main impacts of the UoA on the ecosystem. So, the fishery meets with SG80 of performance for this SI.		
b	Management strategy evaluation			
	Guided post	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
	Met?	YES	YES	NO
	Justification	Not only measures, but also the partial strategy is considered likely to work, based on plausible arguments. INIDEP Reports and general experience indicate that because such a small portion of the ecosystem is trawled, and even on a rotational basis, fishing does not pose a risk to this very large ecosystem.  This partial strategy (rotational fishing strategy so no area of a bed is fished for prolonged periods; shells of processed scallops returned to the sea) for habitat and ecosystem conservation is being used since the beginning of the fishery and proved to be effective. Not only the scallops stock has maintained above a point where recruitment would be impaired, but also benthic invertebrate associations in the different MUs of Patagonian scallops has been maintained over time (Schejter <i>et al.</i> , 2014).  The partial strategy of un-fished area in each MU would provide a source of larvae for scallops and associated species of benthic community, as well as ecological services to the area. Therefore, even when the partial strategy is considered likely to work, based on plausible argument, there is not enough prior experiences documented involved guaranteeing that the measures are considered likely to work based on this, and the fishery meets with SG80 level of performance for this SI.		
c	Management strategy implementation			
	Guided post		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).
	Met?		YES	NO
	Justification	There is some evidence that the measures comprising the partial strategy are being implemented successfully. Satellite monitoring and observer records show the un-fished areas remains undisturbed by fishing.  There is also some other evidence of the success of the management plan in maintaining stability of the benthic portion of the ecosystem, but it is still waiting for analysis.  Therefore, because of the lack of complete analyzed or reliable information, or statistical tests that may provide strong evidence that the measures are being implemented successfully, the fishery meets with SG80 level of performance for this SI.		
References		Scallop fishery Management Plan (CFP Resolution N° 4/2008)  Schejter <i>et al.</i> , 2014		
OVERALL PERFORMANCE INDICATOR SCORE:				80

**Evaluation Table for PI 2.5.3 – Ecosystem information**

PI 2.5.3	There is adequate knowledge of the impacts of the UoA on the ecosystem.		
Scoring Issue	SG 60	SG 80	SG 100
a	Information quality		
Guidepost	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem.	
Met?	YES	YES	
Justification	<p>Information is adequate not only to identify, but also to broadly understand the key elements of the ecosystem. The Patagonian Shelf Large Marine Ecosystem is huge, but the key elements can be identified from the extensive investigations of its structure and productivity.</p> <p>The Patagonian Shelf Large Marine Ecosystem covers 2.7 million km<sup>2</sup>. The scallop fishery operates only 15,000 km<sup>2</sup> along the Patagonia Shelf Break Front. The Shelf Break Front is the source of the high productivity of phytoplankton dominated by dinoflagellates, coccolithophorids and cyanophyciens, which bloom throughout the year unlike coastal driven productivity. Living and dead algae are transported to the seafloor along the front and enhance the productivity of the benthos of the marine ecosystem in this local area. The information is adequate to broadly understand the key elements of the ecosystem.</p> <p>The fishery meets with SG80 level of performance for this SI.</p>		
b	Investigation of UoA impacts		
Guidepost	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
Met?	YES	YES	NO
Justification	<p>Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some has been investigated in detail.</p> <p>As mentioned in Schejter <i>et al.</i> (2014), benthic invertebrate associations in the different MUs of Patagonian scallops have been maintained over time, and the differences recorded between years were mainly due to variations in the biomass of the highest contribution taxa and not to a disappearance or change in species composition.</p> <p>According to INIDEP's Research Report N° 84/2015, which analysed the effect of the trawling on the diversity, structure and composition of the benthic community in the long term in the MU B (using the historical benthic fauna database obtained through the evaluation campaigns of the resource), a greater specific richness was recorded in areas of fishing exclusion and/or areas without activity of the Patagonian scallop fleet. This report shows how fishing effort influences the biomass and distribution of many species in the community. As a result, although the same species were recorded throughout the area and throughout the study period, the area subjected to greater fishing effort showed lower values of biomass throughout the analysed period. Additionally, it was demonstrated, for the first time, the importance of the spatial and temporal closures of the fishery for the benthic community, registering a recovery of the biomass after the implementation of the successive closures to the fishery.</p> <p>The scale of the fishery compared to the size of the ecosystem, as well as the dependence of key elements of the ecosystem on physical aspects of the environment rather than the biological, shows that scallop fishing can have little impact on the ecosystem. Main interactions between the fishery and the ecosystem elements have been investigated. Thirty-four species belonging to the groups Gasteropoda, Asteroidea, Ophiuroidea,</p>		



		<p>Echinoidea, Polychaeta, Holothuroidea, Crustacea, Cnidaria, Porifera, Chordata and Mollusca (represented exclusively by the Patagonian scallop) formed the most conspicuous association of species in the MU B during the period 1998-2009 (Table 5).</p> <p>The scale of the Patagonian Shelf Large Marine Ecosystem and its dynamics renders the likelihood of detecting changes due to scallop fishing, and these changes are unlikely.</p> <p>Therefore, while main impacts and some interactions of the UoA on key ecosystem elements can be inferred from existing information, and some have been investigated in detail; the team considers that not all main interactions between the UoA and ecosystem elements can be inferred from existing information, nor there is enough evidence to support they have been investigated in detail. Subsequently, the fishery meets the requirements for SG80 level of performance for this SI.</p>		
c	Understanding of component functions			
	Guidepost		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.
	Met?		YES	NO
	Justification	<p>The main functions of the components (<i>i.e.</i>, P1 target species, Primary, Secondary and ETP species and Habitats) in the ecosystem are known and understood.</p> <p>The impacts of the fishery on target, Primary, Secondary and ETP species are identified and some impacts of these components in the ecosystem are known and understood. All these groups of species and habitats depend on the production of the Patagonian Shelf Break Front as Primary or Secondary Consumers, or predators of the rich algae and fauna developed there. The same fauna exists right across the rest of the ecosystem but at much lower densities and productivity.</p> <p>As mentioned in Schejter <i>et al.</i> (2014), benthic invertebrate associations in the different MUs of Patagonian scallops have been maintained over time, and the differences recorded between years were mainly due to variations in the biomass of the highest contribution taxa and not to a disappearance or change in species composition.</p> <p>According to INIDEP's Research Report N° 84/2015, which analysed the effect of the trawling on the diversity, structure and composition of the benthic community in the long term in the MU B (using the historical benthic fauna database obtained through the evaluation campaigns of the resource), a greater specific richness was recorded in areas of fishing exclusion and/or areas without activity of the Patagonian scallop fleet. This report shows how fishing effort influences the biomass and distribution of many species in the community. As a result, although the same species were recorded throughout the area and throughout the study period, the area subject to greater fishing effort showed lower values of biomass throughout the analysed period. Additionally, it was demonstrated, for the first time, the importance of the spatial and temporal closures of the fishery for the benthic community, registering a recovery of the biomass after the implementation of the successive closures to the fishery.</p> <p>The fishery has had no measurable impact on the density and distribution of the scallop target species or on that of the Primary, Secondary or ETP species.</p> <p>However, while the main functions of the components are known and understood, the team considers that not all the potential impacts of the UoA on P1 target species, Primary, Secondary and ETP species and Habitats are fully identified and understood; and so, the fishery meets the requirements for SG80 level of performance for this SI.</p>		

d	Information relevance			
	Guidepost		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
	Met?		YES	NO
	Justification	<p>Sufficient and adequate information is available on the impacts of the fishery on the components in the ecosystem to allow some of the main consequences for the ecosystem to be inferred. The ecological community and ecosystem in which the fishery operates is well known.</p> <p>Since the beginning of the activity in 1996, information has been collected from research and commercial trips, including collection of all activity by the commercial fleet, campaigns annual assessment, sampling of benthic fauna by observers on board and establishment of areas of closures were implemented permanent (Bremec &amp; Lasta, 2002; Lasta, 2000; CFP Resolutions N° 4/2008, N° 5/2009 and N° 15/2012).</p> <p>Research trips have been periodically performed, the Argentina biogeographic scheme has been detailed, and experiences with the objective to improve efficiency and selectivity have been carried out by both fishing companies in association with research institute. In the research work carried out by Escolar <i>et al.</i> (2015), the structure and composition of the benthic invertebrate community that make up the catch of Patagonian scallop fishery through a gradient of fishing effort, using a historical database has been analyzed. While there are reports that involve a time series (Bremec <i>et al.</i>, 2006; Escolar <i>et al.</i>, 2009; Shejter <i>et al.</i>, 2014), this is the first to also consider the fishing effort.</p> <p>Escolar <i>et al.</i> (2011) and Schejter <i>et al.</i> (2014) also observed as varied distribution rates of the species and demonstrated the importance of spatial closures and temporary fishery for benthic community, registering a biomass recovery after implementing the successive fishery closures; and the effect of the trawling on the diversity, structure and composition of the benthic community in the long term was analysed on INIDEP's Research Report N° 84/2015.</p> <p>So, although is is considered that 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; the team considers that this information is not enough to support strong evidence that all elements are considered and all the main consequences can be inferred. And so, the fishery complies with SG80 level for this SI.</p>		
e	Monitoring			
	Guidepost		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
	Met?		YES	NO
	Justification	<p>Data are continuously collected to detect any increase in risk level (<i>e.g.</i> due to changes in the outcome indicator scores or the operation of the fishery or the effectiveness of the measures), although it may not be fully analyzed and published, or may not be sufficient.</p> <p>Bycatch is continued to be monitored by the Observers On Board Program. Changes in the benthos, if they occur within the fished area can be detected. Changes across the rest of the ecosystem outside the area fished are not being monitored.</p> <p>Therefore, while sufficient data continues to be collected to detect any increase in risk, information is still not sufficient to support the development of strategies to manage</p>		

	ecosystem impacts. So, the fishery complies with SG80 level for this SI.
References	Lasta, 2000; Bremec & Lasta, 2002; Bremec <i>et al.</i> , 2006; Schejter <i>et al.</i> , 2014; Escolar <i>et al.</i> , 2009, 2011, 2015. CFP Resolutions N° 4/2008, N° 5/2009 and N° 15/2012.
OVERALL PERFORMANCE INDICATOR SCORE:	
80	

### -Principle 3

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

PI 3.1.1		The management system exists within an appropriate legal and/or customary framework which ensures that it: <ul style="list-style-type: none"> <li>Is capable of delivering sustainability in the UoA(s); and</li> <li>Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and</li> <li>Incorporates an appropriate dispute resolution framework.</li> </ul>		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guidopost	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.
	Met?	YES	YES	YES
	Justification	<p>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. In addition to the solid national legal system, the Federal Fishing Law N° 24,922 was implemented in 1999 and the participation in the CFP of different areas of the National Public Administration related to the fishing activity and the coastal provinces. This has led to the consolidation of a management system that has proved to be effective, with binding procedures governing cooperation with other parties, which provides management results consistent with MSC Principles 1 and 2. In the case of the Patagonian scallop fishery, there are, in addition to the Federal Fishing Law No. 24,922, agreements and policies that govern the actions of the authorities and actors involved in the management of the UoA.</p> <p>In the national fishing area, the management system is consistent with the Federal Fishing Law N° 24.922/1998 (Regulatory Decree N° 748/1999) which creates Consejo Federal Pesquero (CFP) as the management authority, which fixes the general fishing and research policies.</p> <p>The Articles 1° and 17° from the Federal Fisheries Law N° 24.922/1998 are aimed at achieving sustainable fisheries in accordance with MSC Principles 1 and 2. The Article 1° promotes the exercise of fishing according the rational use of marine living resources, the effective protection of national interests related to fisheries and the sustainability of fishing activity for encouraging long-term resource conservation. The Article 17° establishes the restrictions for the conservation of resources, with the objective of avoiding excesses of exploitation and to prevent harmful effects on the environment and the unity of the ecological system.</p>		

		Moreover, Argentina approved other binding and non-binding international instruments related indirectly to conservation as it is reviewed in the background. In the case of illegal, unreported and unregulated fishing activities, even if Argentina is not one of the 46 member states that signed FAO's Agreement, since 2008, has adopted these international measures. Argentina developed a National Actional Plan (PAN-IUU) to prevent and monitor such practices. From evidence exposed before, the overarching legal framework meets with SG100 level of performance for this scoring issue.		
b	Resolution of disputes			
	Guidepost	The management system incorporates or is subject by law to a mechanism for the resolution of legal disputes arising within the system.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA.	The management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes that is appropriate to the context of the fishery and has been tested and proven to be effective.
	Met?	YES	YES	YES
	Justification	<p>The management system is subject by law to a transparent mechanism for the resolution of legal disputes (<i>i.e.</i> issues and dispute involving allocation of quota and access to marine resources) that is appropriate to the context of the fishery and has been tested and proven to be effective.</p> <p>The dispute resolution system is well defined in the Federal Fishing Law N° 24.922. Usually, CFP receives and discusses in their public minutes any comment which emerges from any stakeholder group. There is a formal dispute-resolution mechanism, but it is not independent of the Management Authority. When the resolution of the dispute is not accepted, affected parties have recourse to the legal system. There is an elaborate sanction and penalty structure in the Fisheries.</p> <p>Consejo Federal Pesquero as management authority acts when a legal dispute arises, under request from a stakeholder. Decisions are written in minutes that are published in <a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a> as transparency system and efficiency has been tested during years of practice. Additionally, verbatim transcripts of the proceedings of CFP do exist, which can be consulted by everyone interested if it is necessary to clarify issues related to the spirit of its decisions.</p> <p>It provides a mechanism for parties to challenge decisions of administrative bodies. In case of civilian disputes against administration decisions, the Administrative Procedure Law N° 19.549 and its Regulatory Federal Decree N° 1759/1972, which establish, inter alia, mechanisms for dispute resolutions. Fisheries regulations (Laws N° 24.922, N° 25.470 and Federal Decree N° 748/1999) repeat the same recursive procedures than Law N° 19.549.</p> <p>So, the overarching legal framework meets the SG100 level of performance for this SI.</p>		
c	Respect for rights			
	Guidepost	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.
	Met?	YES	YES	YES
	Justification	Due to there are no aboriginal and indigenous people dependent on fishing for food or livelihood, it is not necessary to develop a Management System that has a mechanism to formally commit to 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. Then, the overarching legal framework meets the SG100 level of performance for this SI.		
References		Federal Fishing Law N° 24.922 – Regulatory Decree N° 748/1999; Laws N° 25.470 and 19.549 – Regulatory Decree N° 1759/1972.		
OVERALL PERFORMANCE INDICATOR SCORE:				100

#### Evaluation Table for PI 3.1.2 – Consultation, roles and responsibilities

PI 3.1.2		The management system has effective consultation processes that are open to interested and affected parties. The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties		
Scoring Issue		SG 60	SG 80	SG 100
a	Roles and responsibilities			
	Guided post	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are generally understood.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for key areas of responsibility and interaction.	Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.
	Met?	YES	YES	YES
	Justification	<p>The Patagonian scallop fishery identifies all organizations and individuals involved in the management process, including implementing agencies, fishery business groups, national and provincial government and food inspection agency. Functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction.</p> <p>All organizations and individuals in the management process have been identified and its functions, roles and responsibilities are explicitly defined in the Federal Fishing Law N° 24.922 and Federal Decree N° 214/99, Federal Decree N° 373/2007 establishes specific functions, Federal Decree N° 1030/2014 updates SSPyA's functions.</p> <p>Federal Law N° 21.673/1977 creates INIDEP as the Federal Scientific Authority. Annually, INIDEP Resolution is approved by the Activities Planning for each of its dependent research, operative and administrative areas. The current organizational chart is available in its website.</p> <p>PNA and the Navy collaborate in the control of closed areas, illegal foreign vessels fishing, navigation safety, amongst other functions. Sanitary control is in charge of the Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), who acts in accordance to ex SAGPyA Disposition SSPyA N° 552/2006.</p> <p>Ministerio de Relaciones Exteriores y Culto serves many roles in the fishery area. It is responsible for developing foreign policy in the Exclusive Economic Zone (EEZ) and the adjacent regions of Argentina, promotes the fishery sector in the international markets, represents the country in International Commissions and signs International Agreements.</p>		

		<p>All of these public agencies have missions and functions perfectly well defined and established by laws, while respecting manuals and instructions specific to procedures on each particular situation.</p> <p>The private sector actors (<i>i.e.</i> fishing companies) integrate and participate regularly in consultation meetings of Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica and also, through the respective Cámara de Comercio and by integrating Comisión Asesora Honoraria of CFP. This Commission has an advisor nature and establishes meetings at least twice a year. Conclusion minutes are submitted to CFP.</p> <p>Therefore, the overarching legal framework meets this SI at the SG100 level of performance.</p>		
b	Consultation processes			
	Guidepost	The management system includes consultation processes that obtain relevant information from the main affected parties, including local knowledge, to inform the management system.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information obtained.	The management system includes consultation processes that regularly seek and accept relevant information, including local knowledge. The management system demonstrates consideration of the information and explains how it is used or not used.
	Met?	YES	YES	YES
	Justification	<p>The Management System includes consultation processes that regularly seeks and accepts relevant information, from the stakeholders, including local knowledge, to inform the Management System by Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica created by CFP Resolution N° 4/2005, after replaced by CFP Resolutions N° 9/2006 and N° 4/2008. The Management System demonstrates consideration of the information and explains how it is used or not used. After each meeting of Commission, representants elaborate a minute, exposing its conclusions and submitting it to CFP for its reviewing. CFP as management authority can or not take into account this information for the management system. As an example, CFP Resolution N° 9/2016 could be mentioned which taking the suggestion of Act N° 18/2016 of the Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica, modified Articles 13° and 14° of CFP Resolution N° 9/2016, establishing among other measures, a margin of tolerance of a maximum of 20% of sizes smaller than the minimum.</p> <p>The progress is reflected in INIDEP (<a href="http://www.inidep.edu.ar">www.inidep.edu.ar</a>) and Consejo Federal Pesquero (<a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a>). Regularly, INIDEP updates the research program to obtain information and knowledge in order to advice the Management System (<i>i.e.</i> INIDEP Resolution N° 133/2010). As well, Law N° 24.922 recognizes that scientific data can be provided by other research institutions.</p> <p>Secretaría de Política Ambiental, Cambio Climático, Ambiente y Desarrollo Sustentable regularly organizes different workshops, where stakeholders, environmental institutions and NGOs are able to discuss the impact of fishing on birds, chondrichthyes and marine mammals. Any information about Management System is opened to stakeholders, considering its views in the process to make a decision. Representative at CFP from the Ministerio de Ambiente y Desarrollo Sustentable provides the conclusions from these workshops to be carried out by CFP, who is responsible for the approval of the action plans aimed to mitigate interactions between fisheries y the mentioned species. Actions from CFP include dispositions and resolutions which are mandatory for all fishers operating in Argentinean waters.</p> <p>In conclusion, the Management System has a clear and transparent consultation process</p>		

		that seeks, accepts and demonstrates consideration of relevant information including local knowledge, when available; and there is evidence that the process explains how the information is used or not used. So, the overarching legal framework meets the SG100 level of performance for this scoring issue.		
c	Participation			
	Guidepost		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.
	Met?		YES	YES
	Justification	<p>The consultation process provides opportunity and encouragement for all interested and affected parties to be involved, and facilitates their effective engagement. As it is mentioned, Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica, which is consulted by CFP and SSPyA authorities prior to taking any decision on the fishery (CFP Resolution N° 4/2008). Interested stakeholders have the opportunity to be involved in the consultation process and facilitate their effective engagement supported by Consejo Federal Pesquero and Ministerio de Ambiente y Desarrollo Sustentable.</p> <p>In the Article 1° of the CFP Resolution N° 21/2014 establishes: “Authority is instructed to Law Enforcement N° 24.922 to conduct invitations to monitoring committees of the various fisheries and they could settle in the future with a minimum frequency of two (2) times per year”. According this article, in the case of Patagonian scallop fishery, it is established that the Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica will meet at least twice a year and shall submit to CFP its minutes of meetings with the issues and respective conclusions.</p> <p>Therefore, the overarching legal framework meets with SG100 level of performance for this scoring issue.</p>		
References		Federal Fishing Law N° 24.922; Federal Decrees N° 214/99, N° 373/07, N° 1030/14; Law N° 21.673; SAGPyA Resolution N° 552/2006; CFP Resolutions N° 4/2005, N° 4/2008, N° 21/2014 and N° 9/2016; Act N° 18/2016; INIDEP Resolution N° 133/2010		
OVERALL PERFORMANCE INDICATOR SCORE:				100

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

PI 3.1.3		The management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard, and incorporates the precautionary approach.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guidpost	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.
	Met?	YES	YES	YES
	Justification	Argentinean fisheries management has a solid legislative foundation through the clear long- term objective that guide decision-making, it is consistent with MSC Principles and Criteria and the precautionary approach are explicit within the Federal Law N° 24.922 and		



	<p>required by management policy.</p> <p>The Federal Fishing Law N° 24.922 (Article 1°) establishes that Argentina will foster the practice of maritime fishing in function of a maximum development compatible with the rational exploitation of living marine resources, will promote the effective protection of national interests related with fishing and will encourage the sustainability of the fishing activity, the long-term conservation of the resources, the development of industrial processes environmentally appropriate to reach the maximum added value and the maximum employment.</p> <p>In the management plan is established long-term political objectives specifically for Patagonian scallop fishery (CFP Resolution N° 4/2008). In Articles 1° and 3°, the main objective of the fishery is to maintain the sustainability, minimizing impact on the seabed. Also, it is determined that CFP may establish closure areas (fixed or mobile, temporary or spatial), based on scientific reports, to preserve juvenile or reproductive fraction of the population.</p> <p>Long-term political objective on rational exploitation, stocks productivity protection, social and inter generation equity and species conservation approach is included in technical recommendations.</p> <p>The precautionary approach is also present in the stock assessment models and in the technical recommendations of biologically acceptable capture. This is included in the Law N° 24.922 expressed in its Article 8° of its Regulatory Federal Decree N° 748/99: "It must be understood as Maximum Sustainable Yield (MSY) of a species, the maximum biomass that can be captured annually without affecting its conservation".</p> <p>Additionally, other sections of the Federal Fishing Law N° 24.922 are related with preventing excesses on exploitation and the sustainable utilization fishery resources.</p> <p>The Emerging Species Policy sets out the requirements and procedures for new fisheries that must be followed before the fishery can be initiated. A cornerstone of the policy is the establishment of a scientific base with which stock responses to new fishing pressures can be assessed and that was established at the beginning of the fishery allowing two vessels to an exploratory fishery. Later, with the results of one year fishery the Argentine Government by means of Resolution ex-SAGPyA N° 150/1996 authorized the fishing of the Patagonian scallop to be carried out by 4 factory vessels belonging to two fishing companies. In essence, Argentina established a legal regulation in order to ensure that the fishery is developed following scientific advice.</p> <p>The Policy to Manage the Impacts of Fishing on Sensitive Benthic Areas deals with the mitigation of the impacts of fishing on sensitive benthic areas or avoidance of impacts of fishing that are likely to cause serious or irreversible harm to sensitive marine habitat communities and species.</p> <p>Also, the Patagonian scallop fishery is under the CIRC scheme, which limits the increase of the fleet that can fish as a target species. This policy is seen as a limitation of the extractive activity and encourages the adoption of long term objectives on the part of companies that are compatible with the sustainability of the resource.</p> <p>Therefore, evidence supports that the overarching legal framework fully meets this SI at the SG100 level of performance.</p>
References	<p>Federal Fishing Law N° 24.922. CFP Resolution N° 5/2009. Federal Fisheries Law N° 24.922 and in the Regulatory Decree N° 748/1999, CFP Resolution N° 14/2008, CFP Act N° 48/2007, CFP Resolution N° 4/2008, and N° 9/2016.</p>
OVERALL PERFORMANCE INDICATOR SCORE:	
100	

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

PI 3.2.1		The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2.		
Scoring Issue		SG 60	SG 80	SG 100
a	Objectives			
	Guided post	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.
	Met?	YES	YES	PARTIAL
	Justification	<p>There are short and long term objectives well defined, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principle 1, that are reviewed and updated every 5 years, However, objectives to achieve the wide range of Principle 2 are operationally less measurable and they are not explicit within the fishery's specific Management System; which is reviewed and updated every 5 years.</p> <p>The scallop fishery shares the general objectives stipulated in Law N° 24.922 and other legal normative related to the exploitation of fisheries resources in Argentina. The Management System is based on fishing licenses allowing the access to the exploitation of fishery resources (i.e. ITQ system), establishing closures, obligatory discard of bycatch species immediately and with the least damage as possible, for marine birds, chondrichthyan, cetaceans and turtle protection. Data collection of environmental aspects of the fishery during fishing operations is the responsibility of the Observers On Board Program, and INIDEP Benthic Mollusc Fisheries Program, which also states objectives of scallop and associated research species (INIDEP Resolution N° 133/2010).</p> <p>In relation to achieving the outcomes expressed by MSC's Principle 1, maintaining the stock at level consistent with the ecosystem needs, is expressed in CFP resolution to establish the respective TAC for each MU. In recent resolutions (CFP Resolutions N° 10/2015, N° 14/2015 and N° 3/2016), it is mentioned: "for the purpose of conservation, protection and management of marine living resources shall be established annually the TAC for different species in accordance with the Articles 8° and 9° of Law N° 24.922, to avoid excess of exploitation and ensure long term preservation".</p> <p>Also, CFP Resolution closures are suggested for certain sub-areas of the MU. The CFP Resolution N° 10/2015 prohibited for one year (2016) the catch in the MU D.</p> <p>The Management Plan for Patagonian scallop fishery is explicitly established in the CFP Resolutions N° 9/2006, N° 4/2008 and N° 9/2016 as it is described in the Background (Section 3.5.3 Objectives for the fishery).</p> <p>The Management System also plans research cruises to obtain relevant data, including density index and stocks identification (INIDEP Resolution N° 133/2010).</p> <p>Explicit objectives for marine birds' protection are established in the National Action Plan for Birds (CFP Resolution N° 3 and 15/2010). Recently, CFP Resolution N° 3/2017 established that trawling freezer vessels were obliged to carry out the trawling tasks with two scarecrow lines (LEPs) arranged one to port and one to starboard of the trawl lines, to prevent contact of seabirds with them. This resolution will come into effect on May 1<sup>st</sup>, 2017 and will be applied voluntarily until April 30<sup>th</sup>, 2018 and mandatory as from that date.</p> <p>Explicit objectives for chondrichthyes, marine mammal and sea turtles protection are</p>		

	<p>established in the National Action Plan for Chondrichthyes (CFP Resolutions N° 6/2009 and N° 4/2013 and Annex 1 of CFP Act N° 42/2015), in the National Action Plan for Marine Mammals (CFP Resolution N° 11/2015) and in the National Action Program for Sea Turtles (CFP Act N° 37/2016); respectively.</p> <p>The Federal Law N° 25.577 protects Cetaceans from any kind of intentional catch. Federal Law N° 25.052 and its complementary Decree N° 598/2003 prohibit catch and commercialization of Killer Whale (<i>Orcinus orca</i>).</p> <p>Consejo Federal Pesquero also regulates by means of its Resolution N° 3/2001, data collection and analysis of birds, reptiles and mammals bycatch during fishing activities.</p> <p>Therefore, even though explicit short and long term objectives consistent with achieving the outcomes expressed by MSC's Principle 1 are well defined and are explicit within the fishery's Management System, there are no objectives to achieve wide range of outcomes of Principle 2, due to being operationally less measurable. Thus, it is considered that SG100 performance indicator is partial completed, and the Patagonian scallop bottom otter trawl fishery scores 90 for this PI.</p>
References	Laws N° 24.922, N° 25.577, N° 25.052; Decree N° 598/2003; CFP Resolutions N° 3/2017, N° 10/2015, N° 14/2015, N° 3/2016, N° 9/2006, N° 4/2008, N° 9/2016, N° 3/2010, N° 15/2010, N° 6/2009, N° 11/2015, N° 3/2001; INIDEP Resolution N° 133/2010; CFP Act N° 37/2016
OVERALL PERFORMANCE INDICATOR SCORE:	
90	

#### Evaluation Table for PI 3.2.2 – Decision-making processes

PI 3.2.2	The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery.		
Scoring Issue	SG 60	SG 80	SG 100
a	Decision-making processes		
Guided post	There are some decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives.	There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives.	
Met?	YES	YES	
Justification	<p>There are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. Decision-making processes are formal and clearly outlined in the Federal Fishing Law N° 24.922, the Federal Decree N° 748/1999, N° 373/2007, N° 571/2008 and N° 1030/2014, amongst other legal documents. Consejo Federal Pesquero is the main authority, who establishes the TAC based on scientific biological recommendations issued by INIDEP and other social and economic aspects. CFP has the responsibility to ensure that it is provided with carefully alternatives for taking into account before making any decisions.</p> <p>In case meetings re carried out by the Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica, stakeholders concerns are exposed and, if necessary, the CFP may determine measures or strategies. In the meeting carried out on May 12<sup>th</sup>, 2016, the Committee requested reviewing measures established in the Articles 13° and 14° of CFP Resolution N° 4/2008, in order to comply with the return of no-commercial size scallop at sea (Act N° 18/2016). This request is taken into account by CFP in its Resolution N° 9/2016, previous recommendation by INIDEP. In the mentioned resolution, CFP established that only 20% of non-commercial size scallop (&gt;55mm) could be retained by the freezer fleet and the remaining shall be returned to the sea immediately with the accompanying fauna. Also, in cases that it is observed in one fishing day the presence of more than 50% of non-commercial size scallop in the total catch, the vessel shall change the fishing area and do</p>		

		not returned until research survey is held.		
		So, the Patagonian scallop bottom otter trawl fishery meets the SG80 level of performance for this SI.		
b	Responsiveness of decision-making processes			
	Guidepost	Decision-making processes respond to serious issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions.	Decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.	Decision-making processes respond to all issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions.
	Met?	YES	YES	NO
	Justification	Decision-making processes responds to serious and other important issues identified in relevant research monitoring, evaluation and consultation, in a transparent, timely and adaptive manner, and takes into account the wider implications of decisions.  The decision-making process can be considered to respond to requirements for this indicator, integrating the scientific knowledge, the monitoring, the evaluation, and the consultation processes of the interested parties through the use of INIDEP Technical Reports and Commission meeting reports. The outcome of these activities are considered when taking decisions on fisheries management. The TAC decisions and fishing measures have been accepted after scientific review and all decisions are available in CFP website through resolution and/or official acts (CFP Resolutions N° 4/2008, N° 15/2014, N° 20/2014, N° 10/2015, N° 14/2015, N° 3/2016 and N° 9/2016, and CFP Acts N° 45/2015, N° 48/2015, N° 5/2016, N° 7/2016 and N° 12/2016). In the case of annual TAC; INIDEP recommendations (INIDEP Technical Report with scientific data) are cited in the CFP Resolution, respectively. This mechanism ensures the transparency of the decision-making process.  So, there are no evidence provided that all issues identified in relevant research, monitoring, evaluation and consultation respond to decision-making process. The Patagonian scallop bottom otter trawl fishery meets with SG80 of this performance issue.		
c	Use of precautionary approach			
	Guidepost		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		YES	
	Justification	Decision-making processes use the precautionary approach in the exploitation of marine resources based on best available information and is legislatively enshrined in the Federal Fisheries Law N° 24.922 and the Federal Decree N° 1030/2014, amongst other legal documents. Consejo Federal Pesquero that obligation is detailed in the sustainable fisheries framework and fishery decision-making framework incorporating the precautionary approach to ensure that the precautionary approach is built into fisheries management decisions (see rationale of scoring issue a).  A formal Precautionary Approach Framework has been implemented in the scallop fishery, the existence of a Management Plan, whose main objective is maintaining the sustainability of the Fishery, consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, MU are defined and precisely delimited. CFP Resolution N° 5/2014 set coordinated scallop MU. TAC is set annually for each MU in tons of total legal sized scallop.		

		CFP Resolutions N° 10/2015, N° 14/2015 and N° 3/2016 describes TAC scallops for UM A, B, C, E, F, G, H, I and J for the year 2016.		
		Therefore, it is considered that decision-making processes use the precautionary approach and are based on best available information, and so, the Patagonian scallop bottom otter trawl fishery meets with SG80 of this performance issue.		
d	Accountability and transparency of management system and decision-making process			
	Guidepost	Some information on the fishery's performance and management action is generally available on request to stakeholders.	Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.	Formal reporting to all interested stakeholders provides comprehensive information on the fishery's performance and management actions and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity.
	Met?	YES	YES	NO
	Justification	Information on the fishery's performance and management action is available on request. Explanations are provided for any actions (or lack of actions) associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. These are released in INIDEP Technical Reports. These reports are referred to CFP and its reception published in its meetings' records, which in turn are published on its website ( <a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a> ). Once published by CFP, they become available for anyone who wants to obtain a copy, on INIDEP's web site ( <a href="http://www.inidep.edu.ar">www.inidep.edu.ar</a> ). Fishery statistics are also published in CFP's and SSPyA's websites, as well as the positioning of fishing vessels, which is updated twice a day ( <a href="http://www.minagri.gob.ar">www.minagri.gob.ar</a> ).  On the other hand, CFP makes public in their minutes any considerations, technical and legal advice taken into account in decision-making as well as the concerns being submitted or exposed for any stakeholders to CFP.  However, since there is no clear evidence that formal reporting to all interested stakeholders describing how the Management System responds to findings and relevant recommendations emerging from research, monitoring, evaluation and reviewing activity, it is considered that the Patagonian scallop bottom otter trawl fishery does not fully comply with SG100 level, and so, a score of SG80 is assigned to this SI.		
e	Approach to disputes			
	Guidepost	Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery.	The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges.	The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.
	Met?	YES	YES	YES
	Justification	The Management System or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges.		

	<p>The management authority has no records that the Patagonian scallop bottom otter trawl fishery has been repeatedly violating the same law or regulation necessary for the sustainability issue.</p> <p>The Subsecretaría de Pesca y Acuicultura acts proactively to avoid legal disputes and its staff involves lawyers specialized in fishery activities and regulations.</p> <p>To minimize the legal wrangling, any decision of the administration affecting the rights of third parties requires a control and legal opinion prior to its sanction. Such control is carried out by a statutory body external to the agency that promotes the sanction of the rule.</p> <p>The Constitución Nacional Argentina establishes that judicial decisions are mandatory for any authority from the fisheries administrative system and they must be implemented immediately. If not, the responsible officer will incur in civilian disobedience.</p> <p>Therefore, the fishery meets with the SG100 level of performance for this SI.</p>	
References	<p>Federal Fisheries Law N° 24.922, the Federal Decrees N° 748/1999, N° 373/2007, N° 571/2008 and N° 1030/2014, CFP Resolutions N° 4/2008, N° 5/2014, N° 15/2014, N° 20/2014, N° 10/2015, N° 14/2015 and N° 3/2016. Published on its website <a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a>, INIDEP Technical Reports are available in <a href="http://www.inidep.edu.ar">www.inidep.edu.ar</a>.</p>	
OVERALL PERFORMANCE INDICATOR SCORE:		85

#### Evaluation Table for PI 3.2.3 – Compliance and enforcement

PI 3.2.3		Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with.		
Scoring Issue		SG 60	SG 80	SG 100
a	MCS implementation			
	Guided post	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules.
	Met?	YES	YES	YES
	Justification	<p>There is a comprehensive monitoring, control and surveillance system that has been implemented in the fishery and demonstrates a consistent ability to enforce relevant management measures, strategies and rules. This system includes electronic Vessel Monitoring Systems (VMS) on each vessel, at-sea observations by patrol vessels and fixed-wing aircraft, 100% dockside monitoring of landings, catch and effort data, onboard observer coverage in all certified vessels with protocols to monitor fishing operations and mandatory submission of fishing vessel log books.</p> <p>The system has not only demonstrated a reasonable expectation that is effective, but it also has demonstrated a consistent ability to enforce relevant management measures, strategies and rules. Argentina endeavors to deter fisheries-related offenses through a successful prosecution and deterrent penalties. Penalties for fisheries-related offenses include fines and forfeiture of fish, vessels, other property and quota (Law N° 25.470, Federal Fisheries Law N° 24.922 and Federal Decree N° 748/1999).</p> <p>A number of monitoring, control and surveillance tools are used in order to control the activities of vessels fishing within Argentine fisheries waters. They are described in the</p>		

		<p>Certification Report of the Patagonian scallop bottom otter trawl fishery.</p> <p>All this control tools are well implemented and seems to be extremely efficient, to the point where there are no systematic non-compliance with in force regulations, as a consequence of a very strict control system, proving its ability to enforce relevant management measures, strategies and/or rules. The main rules to control in the fishery are TAC, non-commercial size scallop, temporal closure areas, annual research surveys, OBO Program monitoring and all of them are conscientiously controlled by means of landing control system and VMS system. The VMS system is called SICAP and allows to know the location of each vessel in real time and rebuild its course. This works very well and is mandatory to be used by the fleet.</p> <p>The observation on board for this fleet was implemented by CFP Resolution N° 4/2008. In 2015, the Observer On Board Program covered 85% of fishing trips (INIDEP Technical Report N° 16/2016).</p> <p>The DNCP controls the catches of each MU and reports companies and INIDEP when it reaches 90% of the TAC (Articles 7° and 10° of the CFP Resolution N° 4/2008). Since April 2017, the fishing statistics publishes on the MINAGRI website details of the catches by MU, which allows to know the state of exploitation of each one of them.</p> <p>Therefore, evidence indicates that there is a comprehensive monitoring to obtain data and then carry out the respective measures or strategies. There is a monitoring, control and surveillance system that has been implemented in the fishery under assessment and has demonstrated an ability to enforce relevant management measures, strategies and/or rules as reflected in the low number of infractions over a long period. And so, the Patagonian scallop bottom otter trawl fishery meets the SG100 level of performance for this SI.</p>		
b	Sanctions			
	Guidepost	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
	Met?	YES	YES	NO
	Justification	Sanctions to deal with non-compliance exist and there is evidence that they are consistently applied and thought to provide effective deterrence, in case that an unacceptable issue in the fishery occurs. If it is the case, sanctions are applied through the administration of the fishery through a court-based system, where there are many instances of negotiation to resolve understanding of the rights of the fishers and even legal recourses, if required.		
		However, there is no clear evidence on how consistently these measures are applied and how demonstrably provide with the effective deterrence. So, the Patagonian scallop bottom otter trawl fishery meets with SG80 for this SI.		
c	Compliance			
	Guidepost	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.
	Met?	YES	YES	NO
	Justification	There is some evidence to demonstrate that fishers comply with the Management System		



	tion	<p>under assessment, including when required, providing information of the importance to the effective management of the fishery.</p> <p>During the re-certification process, the assessment team interviewed the Dirección Nacional de Coordinación Pesquera and Dirección Nacional de Planificación Pesquera. They commented that there have been no non-compliance sanctions neither during the last years, nor from the beginning of the fishery. The very low rate of violations indicates that fishers comply with the Management System under assessment. Nevertheless, if any exist, it is unlikely to be related to a negative impact on fishing recourses or to the stock's detriment. This attests to the effectiveness of the system as well as attitude of the harvesters toward the resource. Fishers provide information through mandatory reporting as well as voluntarily through such programs as onboard and port sampling. Industry programs attest to responsible stewardship.</p> <p>However, while some evidence exists, there is no strong evidence supporting 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. Therefore, the Patagonian scallop bottom otter trawl fishery meets with SG80 for this SI.</p>		
d	Systematic non-compliance			
	Guidepost		There is no evidence of systematic non-compliance.	
	Met?		YES	
	Justification	Although sanctions with non-compliance exist and are thought to provide effective deterrence, there is no evidence of systematic non-compliance.		
		The Patagonian scallop bottom otter trawl fishery meets the SG80 level of performance for this SI.		
References		Law N° 25.470, Federal Fisheries Law N° 24.922 and Federal Decree N° 748/1999.		
OVERALL PERFORMANCE INDICATOR SCORE:				85

#### Evaluation Table for PI 3.2.4 – Monitoring and management performance evaluation

PI 3.2.4		There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives. There is effective and timely review of the fishery-specific management system.		
Scoring Issue		SG 60	SG 80	SG 100
a	Evaluation coverage			
	Guidepost	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
	Met?	YES	YES	YES
	Justification	As it is shown in the same section of this report, the fishing administration system has in place permanent mechanisms to review the evolution of any fishery and to introduce corrective actions, if necessary.  The performance of the Management System against the stated objectives is constantly monitored through the fishing season by the industry and INIDEP in the Comisión de Análisis y Seguimiento de la Pesquería de Vieira Patagónica. Key parts of the Management System are subject to regular internal reviews from the Ministerio de Agroindustria – Internal Audit Unit and occasional external reviews from the Sindicatura General de la Nación and the Auditoría General de la Nación. Also, any decision of the administration affecting the rights of third parties requires a control and legal opinion prior to its sanction. Such control is carried out by a statutory body, external to the agency that promotes the sanction of the rule. All this procedures are established by an Administrative Procedure		

		<p>Law N° 19.549 and its Regulatory Federal Decree N° 1.759/1972.</p> <p>The fishery has in place mechanisms to evaluate key parts of the Management System composed by a full internal review of the performance of the fishery against stated goals; which takes place more than an annual year meeting that is attended by the interested parties as mentioned above and some meetings at INIDEP with the enterprises. Presentations are made on the status of the stock, management measures used and operational issues, as well as on an overview of the monitoring of the fishery by the surveillance program for the previous year; adjustments are made subsequently to the Management System as required.</p> <p>On board inspectors produce a report forwarded to specific department from the Application Authority, in order to assess the performance of the inspector.</p> <p>Frequently workshops are conducted with all interested parties to participate the issues prior to the decision-making, even when there is not much record reporting on the use of such methodology in Patagonian scallop fishery. However, the same is of current use of both the administration and research systems, so, it can be used if necessary.</p> <p>Fishery statistics are also published in the CFP websites and the Subsecretaría de Pesca y Acuicultura (SSPyA), like the positioning of fishing vessels, which is updated twice a day (<a href="http://www.minagri.gob.ar">www.minagri.gob.ar</a>). The way in which CFP publishes its sessions and decisions, like the Publishing of INIDEP reports, imply the opportunity for all the stakeholders to assess the system (<a href="http://www.cfp.gob.ar">www.cfp.gob.ar</a>).</p> <p>Therefore, the Patagonian scallop bottom otter trawl fishery complies with the SG100 level of performance for this SI.</p>		
b	Internal and/or external review			
	Guidepost	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
	Met?	YES	YES	NO
	Justification	As it was said in PI 3.2.4 a), the fishery specific management system is subject to regular internal and occasional external review. The Sindicatura General de la Nación (Constitution Organization) and Auditoría General de la Nación (depending on the Congress) are considered instances out of the Management System (Directive GSA4.10.1).		
		Therefore, the Patagonian scallop bottom otter trawl fishery complies with the SG 80 level of performance for this SI.		
References		Law N° 19.549 and Regulatory Federal Decree N° 1759/1972.		
OVERALL PERFORMANCE INDICATOR SCORE:				
				90

### **Appendix 1.2 Conditions**

In this stage, there are no conditions needed for certification. So, it is not necessary to carry out an Action Plan.



## Appendix 2. Peer review reports

### Summary of Peer Reviewer 1 Opinion

<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</b>	Yes	CAB Response
<i>Justification: The peer reviewer has identified many issues related to the justifications for the scores allocated to the individual PIs. However, these issues reflect the form and format of the justifications. As such the draft determination to recertify the fishery appears to be appropriate, although the average weighted scores for the three Ps may need to be adjusted.</i>		Not applicable. The assessment team agrees with the peer reviewer.
<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</b> <i>[Reference: FCR 7.11.1 and sub-clauses]</i>	Yes	CAB Response
<i>Justification: While the peer reviewer has identified many issues in the form and format of many of the scoring justifications, he considers it unlikely that any reconsideration by the audit team will lead to any PI achieving a score of less than 80; hence there may be no conditions related to the certification of the fishery.</i>		Not applicable. The assessment team agrees with the peer reviewer.
If included:		
<b>Do you think the client action plan is sufficient to close the conditions raised?</b> <i>[Reference FCR 7.11.2-7.11.3 and sub-clauses]</i>	NA	CAB Response
<i>Justification: Due to there being no conditions to certification a client action plan is not required.</i>		Not applicable.



### Performance Indicator Review

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification  Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	NO	NO	NA	See note 1 below on how the CAB shall treat assessments of metapopulations. The TAC may not be an indicator of stock status. Table 2 suggests there are some issues in some of the MUs.  The CAB scored PI 1.1.1 at 80. It is anticipated that this score will be maintained following revision of the rationale.	<b>Note 1 was answered below.</b>  The assessment team agrees with the comment about the TAC. There is not an indicator of stock status. In the case of sedentary resources, CPUE can be misleading. The rationale was strengthened, including other issues as complementary in order to bring a composition of stock status.
1.1.2	NO	NO	NA	A stock rebuilding strategy is not required. However, the CAB should consider the approach to the scoring of the metapopulation and if one is needed in some of the Mus.	Stock rebuilding was not considered by INIDEP research group nor management authorities, due to management measures implemented (e.g. temporary or permanent closure of MUs that allow to maintain the sustainability of seabeds).
1.2.1	NO	NO	NA	Note MSC CR 2.0 Pages 405 / 406: "Key elements of harvest strategies include: the control rules and tools in place, including	The rationale was revised in accordance with the MSC FCRv2.0.  The reviewed version describes all elements



				<p>the ability of the management system to control effort, taking into account issues such as overcapacity and its causes; the information base and monitoring stock status and the responsiveness of the management system and fleet to stock status”</p> <p>The rationale is limited to consideration of some of the elements of a harvest strategy. In addition, there appears to be confusion between harvest strategy and harvest control tools (PI 1.2.2).</p> <p>As a result the CAB does not provide the evidence required to conclude that the fishery meets SG100 Sia. Furthermore, the lack of a comprehensive approach to analysis of the harvest strategy leads to weakness in the rationale presented for the scoring of Sib, Sic, Sid and Sif.</p> <p>The CAB scored PI 1.2.1 at 95. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p><b>of the harvest strategy of this fishery and provide all available evidence to support the score.</b></p> <p><b>The key elements of harvest strategy are explicated and connected with the rationale in the corresponding SI.</b></p> <p><b>There were not confusion between harvest strategy and harvest control rules concepts, just a lack of some elements. This rationale was modified.</b></p>
1.2.2	NO	NO	NA	<p>Sia: no evidence is presented to show that the HCR takes account of the ecological role of the target species.</p> <p>Sic: it is not clear why the fishery does not meet SG100.</p> <p>The CAB scored PI 1.2.2 at 85. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a</p>	<p><b>SI a): A well-defined HCR exist but they do not take into account the ecological role of the target species.</b></p> <p><b>SI c): The fishery does not meet with SG100 level due HCR do not take into account the ecological role of the target species.</b></p> <p><b>The score was adjusted to 80.</b></p>



				score of at least 80.	
1.2.3	NO	NO	NA	<p>Sia: as “other information such as environmental information), including some that may not be directly related to the current harvest strategy” does not appear to be considered there is lack of evidence to support a score of 100.</p> <p>The CAB scored PI 1.2.3 at 90. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p><b>SI a): Other information such as environmental information), including some that may not be directly related to the current harvest strategy was included in the rationale. The score was maintained at 90.</b></p>
1.2.4	NO	NO	NA	<p>Sia: only evidence related to the fishery in MUs B, D &amp; E appears to be taken into consideration. As this stock comprises a metapopulation, no evidence is provided to justify a score of 100 (if the UoA comprises the whole population – a point that must be clarified in Section 3.1 of the report).</p> <p>Sic: No evidence is provided to score the fishery at 100 i.e. “The assessment .... Is evaluating stock status relative to reference points in a probabilistic way”.</p> <p>The CAB scored PI 1.2.4 at 90. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p><b>SI a): Even when annual survey do not include all fishing grounds due to economic reasons, all the main beds are monitored or during survey or by exploratory fishing.</b></p> <p><b>SI c): Probabilty is not considered by the Research Group because the assessment is based on direct estimation of biomass, minimal density and its demographic composition, using CPUE as income to reorganize information to next survey.</b></p> <p><b>A probability of reach a reference point is a methodology used in other type of assessment (e.g. predictive models). Scallop stock strongly depends of the recruitment which is ahightly variable and depends of many environmental aspects. The CAB considers that the direct evaluation supported by a clear decision rule is the best way to manage the uncertainty.</b></p>





2.1.1	YES	YES	NA	<p>The evidence is sufficient to show that no primary species interact with the fishery.</p> <p>The need for the sentence “If any species other than scallops began to be affected during the period of certification, then this PI would have to be reassessed” in Sia and Sib should be reconsidered.</p> <p>The score of 100 for PI 2.1.1 appears to be appropriate.</p>	<p>The assessment team agrees with the peer reviewer comment. As it is mentioned, during surveillance period, any interaction with primary species detected, will be reviewed by the team.</p>
2.1.2	YES	YES	NA	<p>The score of 80 for PI 2.1.2 appears to be appropriate.</p>	<p>The assessment team agrees with the peer reviewer.</p>
2.1.3	NO	NO	NA	<p>Sia / Sic: if it is the case that the effects of gear loss and other incidental impacts are unknown is it possible for the fishery to meet SG100 for both scoring issues?</p> <p>The CAB scored PI 2.1.3 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p>Both the scoring rationale and the scoring guidepost reached have been adjusted.</p>
2.2.1	YES	YES	NA	<p>The evidence is sufficient to show that no secondary species interact with the fishery.</p> <p>The need for the sentence “If any species other than scallops began to be affected during the period of certification, then this PI would have to be reassessed” in Sia and Sib should be reconsidered.</p> <p>The score of 100 for PI 2.2.1 appears to be appropriate.</p>	<p>The assessment team agrees with the peer reviewer comment. As it is mentioned, during surveillance period, any interaction with secondary species detected, will be reviewed by the team.</p>



2.2.2	YES	YES	NA	The score of 80 for PI 2.2.2 appears to be appropriate.	The assessment team agrees with the peer reviewer.
2.2.3	NO	NO	NA	<p>Sia / Sic: if it is the case that the effects of gear loss and other incidental impacts are unknown is it possible for the fishery to meet SG100 for both scoring issues?</p> <p>The CAB scored PI 2.2.3 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	Both the scoring rationale and the scoring guidepost reached have been adjusted.
2.3.1	NO	NO	NA	<p>Sia: the first paragraph is confused; it mentions fish and not ETP species. In identifying the potential for interactions between a fishery and ETP species it is usual for a CAB to identify the ETP species that may be found in the area of the fishery and the risk that there may be some interaction. Seabirds is a generic term and not all seabird species may be categorised as ETP species. Equally, the species of turtle should be specified. The mention of fish and demersal fish tends to confuse rather than enlighten and does not contribute to a robust scoring rationale.</p> <p>The question posed is whether or not indirect impacts have been considered. No evidence is presented to allow the fishery to meet SG80 and SG100.</p> <p>The CAB scored PI 2.3.1 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a</p>	<p>This whole rationale has been reformulated according to reviewer's suggestion to enlightenment.</p> <p>There are no ETP species in the area of the fishery, there are not records of ETP species in the records of OBO's program, nor have been identified ETP species (either fish, mammal or bird) during research trips.</p>



				score of at least 80.	
2.3.2	NO	NO	NA	<p>Sia. There is a need to define the potential ETP species. If there are none in the fishery area there is no need to mention the shark POA</p> <p>Sic. If there is no knowledge of potential indirect impacts, is it possible for the fishery to meet SG100?</p> <p>Sid. There is a lack of precision on the potential ETP species e.g “birds” and “chondrichthyes” (I understand this comprises morethan 1,000 individual species). Marine mammals are not mentioned.</p> <p>Sie: The first paragraph is misleading, it notes primary and secondary species. Which species of rays are considered ETP?</p> <p>The CAB scored PI 2.3.2 at 90. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p><b>SI a): This whole rationale has been reformulated according to reviewer's suggestion to enlightenment.</b></p> <p>There are no ETP species recorded in the area of the fishery, there are not records of ETP species in the records of OBO's program, nor have been identified ETP species (either fish, mammal or bird) during research trips. The AT considers there is no need to define potential ETP species since there are not historical records of any capture of them. However, precautionary action plans which are in place in Argentina are mentioned for the case any ETP species might occur.</p> <p><b>SI c): Parts of the rationale have been reformulated according to reviewer's suggestion to enlightenment.</b></p> <p>There are no ETP species recorded in the area of the fishery, there are not records of ETP species in the records of OBO's program, nor have been identified ETP species (either fish, mammal or bird) during research trips. However, due to the lack of knowledge of many potential indirect impacts, the scoring guidepost was adjusted.</p> <p><b>SI d): This whole rationale has been reformulated according to reviewer's suggestion to enlightenment.</b></p> <p>There are no ETP species recorded in the area of the fishery, there are not records of ETP species considerably captured in the</p>



					<p>records of OBO's program, nor have been identified ETP species (either fish, mammal or bird) during research trips. Due to national action plans (PAN-Aves; PAN-chondrichthes and PAN-mammals), all these groups were considered as 'potential' ETP species.</p> <p>SI e): Parts of the rationale have been reformulated according to reviewer's suggestion to enlightenment.</p> <p>There are no ETP species in the area of the fishery, there are not records of ETP species in the records of OBO's program, nor have been identified ETP species (either fish, mammal or bird) during research trips. Chondrichthyies, besides their IUCN or CITES status, are protected under a National Action Plan (PAN-chondrichthyies or PAN-tiburones), so all of them were considered to be 'potential' ETP species.</p>
2.3.3	NO	NO	NA	<p>Sia / Sib: If there is no knowledge of potential indirect impacts, is it possible for the fishery to meet SG100?</p> <p>The CAB scored PI 2.3.3 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p>The rationale of SI a) was reviewed and modified. The assessment team score a SG80 for SI a). However, SI b) was adjusted to comply with SG100 level of performance. The PI 2.3.3 scored 90.</p>
2.4.1	NO	NO	NA	<p>MSC CR 2.0 Para G3.13 states "When determining which benthic habitats are impacted by the UoA, the team should consider habitats on the basis of the</p>	<p>Parts of the rationale have been reformulated according to reviewer's suggestion to enlightenment, in the base of SGB (from Table GSA6). Additional</p>



				<p>substratum, geomorphology, and (characteristic) biota (SGB) characteristics". Reference should be made to Table GSA 6.</p> <p>The scoring justification is limited to consideration of biota. The CAB should define the commonly encountered habitat types, if there are any VMEs in the area of the fishery and if there are any minor habitats. If the whole fishery is being assessed all MUs should be covered. This appreciation relates to point 8 and highlights why the main body of text should be reviewed.</p> <p>The CAB scored PI 2.4.1 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p>information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.</p>
2.4.2	NO	NO	NA	<p>Sia. It appears that there may be some confusion between management of the impact on habitat with management of the impact on the ecosystem (2.5.2).</p> <p>Sib. If they are to be used as evidence, the "other shellfish fisheries" should be identified with a reference provided. The second paragraph appears to relate to ecosystem (PI 2.5.2).</p> <p>Sic. Some of the rationale may be more appropriate to ecosystem (PI 2.5.2).</p> <p>The CAB scored PI 2.4.2 at 80. It is anticipated that there will be sufficient evidence to justify this score.</p>	<p>The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.</p>



2.4.3	YES	YES	NA	A score of 80 appears to be justified.	The assessment team agrees with the peer reviewer.
2.5.1	YES	YES	NA	A score of 100 appears to be justified.	The assessment team agrees with the peer reviewer.
2.5.2	NO	NO	NA	<p>Sia. It is unclear how the fishery is scored at 100; which part of the FMP constitutes “a plan ...which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place”. Consideration of SG80 is not explicit.</p> <p>Sib: A partial strategy is not considered in Sia and thus it is difficult to see how the fishery may meet SG80.</p> <p>The CAB scored PI 2.5.2 at 85. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.
2.5.3	NO	NO	NA	<p>Sib: No evidence is presented to show that “Main interactions between the UoA and these ecosystem elements ... (and all) have been investigated in detail”.</p> <p>Sic: The scoring guideline refers to “function” and not “impact”. No evidence is provided to show that the fishery meets SG80.</p> <p>Sid. The rationale mainly consists of the scoring guideline without providing evidence that the fishery meets SG80.</p>	The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.



				The CAB scored PI 2.5.3 at 90. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.	
3.1.1	YES	YES	NA	The allocated score of 100 appears to be justified.	The assessment team agrees with the peer reviewer.
3.1.2	NO	NO	NA	<p>Sia. The CAB restricts consideration to public sector actors and does not consider the role of private sector stakeholders. Without such consideration, it cannot be concluded that the fishery meets SG60.</p> <p>Sib: No evidence is presented to show that there is an explanation of how information from consultations is used or not used.</p> <p>The CAB scored PI 3.1.2 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80.</p>	<p>SI a): The role of private sector as fishing companies are included in this scoring issue in order to complement the rationale provided.</p> <p>SI b): In the rationale provided, it is presented how information from consultations is used or not. However, the assessment team strengthened the justification to clarified it.</p> <p>As it is explained above, it is not modified the score.</p>
3.1.3	NO	NO	NA	<p>No evidence is provided to show that clear long term objectives are <i>required</i> by management policy. The key words in the rationale are “<i>foster</i>”, “<i>promote</i>” and “<i>encourage</i>”</p> <p>The CAB scored PI 3.1.3 at 100. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80</p>	<p>It is clarified the long-term objectives of fishery specified in the CFP Resolution N° 4/2008.</p> <p>The assessment team considered that rationale provided is adjusted to SG100 level, so the score is maintained in 100.</p>
3.2.1	YES	YES	NA	The allocated score of 90 appears to be	Not applicable. The assessment team agrees





				justified.	with the peer reviewer.
3.2.2	NO	NO	NA	<p>Sib. There is no evidence to show “Decision-making processes respond to ALL issues ... and take account of the wider implications of decisions”</p> <p>Sid The second paragraph relates to PI 3.2.3.</p> <p>The CAB scored PI 3.2.2 at 95. While this score may be revised, it is anticipated that there will be sufficient evidence to justify a score of at least 80</p>	<p><b>SI b) The assessment team reviewed the rationale provided and agrees with peer reviewer about SG80 level is meet. This SI complies with SG80 level of performance.</b></p> <p><b>SI d) the paragraph suggested by peer reviewer was removed and related to PI 3.2.3.</b></p> <p><b>The score of PI 3.2.2 was reviewed (85).</b></p>
3.2.3	YES	YES	NA	The allocated score of 85 appears to be justified.	<b>Not applicable. The assessment team agrees with the peer reviewer.</b>
3.2.4	YES	YES	NA	The allocated score of 90 appears to be justified; however, the rationale for Sib is not easy to understand.	<b>The rationale provided in the SI b) was reviewed in order for easy understand.</b>

#### **General Comments on the Peer Review Draft Report**

1. The scoring rational for PI 1.1.1 Sia states “As other population spatially structured as metapopulation (several subcomponents or beds related by larval connectivity) successful recruitment is spatially localized and settlers are, frequently produced in in a bed placed far away”.

2. MSC CR 2.0 requires (Page 261)

“In some cases, stocks may be structured as “metapopulations” – “systems in which local populations (= sub-populations) inhabit discrete habitat patches and inter-patch dispersal is neither so low as to negate significant demographic connectivity, nor so high as to eliminate any independence of local population (LP) dynamics. In these cases, the assessment team should consider the connectivity between components of the metapopulation that defines the underlying source-sink dynamics and thereby clearly define the actual unit stock that is to be assessed against Principle 1”

and



“Assessment teams should therefore be alert to the special issues of metapopulation in assessing a fishery. At the time of reporting on the fishery assessment, teams should include detailed information in section 3.1 (UoC and scope of certification) of the assessment reports, clarifying whether the unit stock is based on one or more LPs or on a metapopulation. Details should be provided on the appropriateness of the level of assessment and management chosen, explaining: In the case that management is based on the whole metapopulation, how it is expected to avoid local depletion; If based on one or more local populations, whether these are believed to be sources or sinks, the relationship among subpopulations and how management avoids over exploitation within both the selected local populations and more broadly in the whole metapopulation”.

The fishery is then scored according to requirements defined in table G2 on page 262.

Section 3.1 does not include detailed information on the metapopulation and as such it is possible that the scoring rationale for the P1 Pls is not appropriate.

**CAB Response for points 1 and 2:** The information regarding to metapopulation was described in certification and several surveillance reports. Then, the CAB agrees with the Peer Reviewer’s observations and included a synthesis of the main related papers and manuscripts in the section 3.1. They include genetic studies which define two clear barriers between beds based in molecular markers (Inter Sequence Simple Repeat, ISSR), documents reporting oceanographic conditions and currents affecting the scallop beds to infer connectivity between beds.

A fishery over a sedentary resource produces a local depletion of the original density. Harvest strategy must try to reduce the extension and intensity of the depletion in order to maintain patches inside beds/entire beds with enough concentration of individuals to allow the successful of reproductive process. The major risk is produced by serial depletion, which occurs when the fleet harvest over the all fishing grounds sequentially, starting from the most dense and producing a series of local depletions. In this case, the fleet has freedom to move over the fishing grounds and to harvest at level to reduce the density. A common consequence is the reduction of total abundance without a detectable trend of CPUE, which is hyperstable.

In the Patagonian scallop fishery, the UoC is the whole metapopulation. The harvest strategy was designed and implemented to avoid unacceptable depletion level: i) Scallop beds are composed by patches of different densities and composition; ii) annual survey is conducted to estimate total and commercial biomass of scallops, iii) each MU, composed by one or more beds, is assessed individually in an annual survey and opened (or not) to fishing depending of density, spatial distribution of abundance and demographic composition; iii) Density up to 1t/km<sup>2</sup> is considered as part of a bed and is included in the area to be surveyed; iv) a sub-sector inside the MU is defined in order to include commercial sizes and density up to 10 t/km<sup>2</sup>, and a TAC is established (40% of lower confidence limit of commercial biomass. There are non-fishing zones determined to maintain the original density.

The CAB considers that this pre-agreed set of actions determining the management action are a precautionary approach that prevent the depletion of fishing grounds.

3. The standard of written English is less than optimal. This impacts the effective review some of the scoring rationales as it is not always clear what the authors mean; this is especially the case where the justifications are more technical in nature. On that basis, those stakeholders with a limited knowledge of the MSC process and fisheries in general may have difficulty to review the report and whether the evidence presented proves the sustainability credentials of the fishery against the MSC standard. This difficulty may be more pronounced if English is not the first language of the stakeholders reviewing the report. I recommend that the CAB completes a thorough revision of the whole report to identify and correct the numerous errors.

**CAB Response:** The final version of the report was revised to improve the wording.



4. The drafting of the scoring justifications does not meet MSC requirements. Many, if not all, of the rationales for the scoring of the individual issues repeat what is written in the scoring guidelines. Indeed, the rationale for some the scoring issues is limited to repeating the wording of the scoring guidelines, without providing the evidence needed to confirm the allocated scoring. In the peer reviewer's opinion, to a large part this is due to the CAB failing to respond to MSC requirements i.e. MSC CR2.0 7.10.6 "To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met. 7.10.6.1 A rationale shall be presented to support the team's conclusion. 7.10.6.2 The rationale shall make direct reference to every scoring issue and whether or not it is fully met". None of the scoring rationales meet this requirement. This leads to the practical difficulty of reviewing the robustness of the individual scoring rationales; in general, and as applicable, for each scoring issue a scoring rationale should present the evidence that the fishery meets SG60; additional evidence should be presented to indicate whether the fishery meets SG80; and finally, additional evidence should be presented to determine if the fishery meets SG100. As applicable, the scoring rationales must consider each identified scoring element.

**CAB Response:** The CAB decides to repeat the wording of the scoring issue at beginning of the rationale to avoid misunderstanding and to make a direct reference to everyone. Then, the CAB proceeds to justify and support the score. All the rationales were revised and, eventually modified, to provide the evidence needed to confirm the allocated scoring in a correct way.

5. There are several examples where there appears to be confusion between the requirements of MSC CR 1.3 and MSC CR 2.0; for example, retained / bycatch and primary / secondary; and recommendation and draft determination. While this is not a major issue, there is the potential to confuse stakeholders.

**CAB Response:** The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.

6. The CAB should clarify why, in Table 2, there is a difference between the TAC and the UoA share of the TAC if the fishery is limited to the four licensed vessels. Furthermore, it would be useful to have a breakdown of the catch by individual Mus as opposed to a statement that the major part of the fishing effort is restricted to three MUs. Finally, in table 2 is the word "suggested" appropriate; is it not the case that the measures have been "implemented"?

**CAB Response:** Fishing effort is allocated to the MUs which were opened to fishing based in the presence of commercial sized scallop and density over 10 t/km<sup>2</sup>. In other MUs a minimum TAC is assigned to allow exploratory hauls in order to detect new recruitment areas or undetectable high density (e.g.: small patches). "Suggested" was replaced by "implemented".

7. Could Page 15 be clarified: "The volume of scallop landings in the Argentine Sea has been on a downward trend from over 11,000 t in 2009 to 4,400 t in 2015 (Figure 2). In value terms, the fleet decreased its share of landings into 60% in the last 6 years". There should be a clear distinction between catch weight and landed weight. I do not understand the second sentence. To understand the situation in the fishery, it would be useful to understand the reason for reduced effort in the fishery and whether it is related to e.g. the stock, the market or fleet economics.

**CAB Response:** The sentence is confused and it was removed. The fishing effort was not reduced, just the catch. One of the possible reasons is a modification of the spatial distribution of the patches inside the beds, probably more difficult to be localized by the fleet. However, the stock biomass remain stable and the proportion of juveniles is maintained. This issue was explained in the section 3.3, c).

8. While there is some mention of the character of the sea floor, it would be better for this to be explicit in the report and add to the description of the depth at which the trawl operates. The report states "Bottom otter trawls interact physically with the bottom sediment, which might result in removal or damage of sedentary living organisms (e.g. seaweed or coral) and in the case of uneven bottom surface displacement of stones or other larger objects. On flat sandy/muddy bottom the sediments



might be whirled up into the water masses and suspended. The major negative impact of bottom otter trawls on the biological environment is related to the capture and frequently discarding of non-target sizes and species both of fish and non-fish species. Regulation concerning minimum mesh size in the cod-end is the most commonly used methods to limit the capture of non-target fish sizes. In recent years, such size selectivity has been improved by the introduction of square mesh cod-ends and selection devices like grids". From the content of the rest of the report, I assume this is a generic statement about the impact of bottom trawls; if so this should be made clear (or deleted) and is it may lead stakeholders to question the related scoring rationale.

**CAB Response:** This sentence was removed from main text.

9. Figures and tables should be referred to in the text e.g. Figure 7 on Page 20.

**CAB Response:** Figures and tables were referred in the text.

10. I would question the relevance of pages 24-30 that contain an extensive description of the ecosystem in the Argentine sea. I would suggest that this is edited to provide a more precise indication of the role of Patagonian scallop within the ecosystem and the influence of the ecosystem on the abundance of Patagonian scallop.

**CAB Response:** The section was modified. The main feature of the Patagonian scallop in relation with the ecosystem in the Argentine sea is the presence of shelf break frontal system which favors the presence of high abundance of several species including the highest beds of this fishery.

11. In section 4.2 Page 54, the CAB writes that all conditions applying to the second certification period had been closed as progress was sufficient to comply with the (client) action plan proposed. This indicates a misunderstanding of the MSC process: Paragraph 7.23.13 clearly indicates that progress is measured against the defined milestones and not the client action plan (note: I do not propose to review previous work associated with this fishery certification). It would however be useful to know if the various Pis were rescored and how this impacted the weighted score for each of the three Ps.

**CAB Response:** In the last surveillance report, the assessment team rescored various PIs. However, the impact of the weighted score for each Principle was not considered in this reassessment, due a old version of the Default Assessment Tree (FAM 6.1). So, it is not possible to assess the impact.

12. On page 61 of the report reference is made to an RBF workshop. However, RBA was not used to score any of the PIs.

**CAB Response:** This sentence was removed due not correspond to this certification process.

13. I find Section 5.1 to be slightly confusing.

**CAB Response:** This section was reviewed.

14. Section 6.4. Recommendations. I would not define this as a recommendation; rather it is a requirement of the MSC process.

**CAB Response:** The assessment team agrees with this comment. The note provided by the client group in order to provide any new information in the surveillance audits were moved to Appendix 3 to strengthen the compliance of MSC requirements.



### Summary of Peer Reviewer 2 Opinion

<b>Has the assessment team arrived at an appropriate conclusion based on the evidence presented in the assessment report?</b>	YES	CAB Response
<u>Justification:</u> In the Executive Summary, the CAB and the assessment team concluded that the fishery should be certified as a MSC Sustainable Fishery. The peer reviewer does not oppose this statement but noted the need to continue and even strengthen the monitoring of the fishery given the current scenario of decreasing catches and recurrent recruitment failure in some important management units. INIDEP has expressed its concern about the future of the fishery.		The decrease in the catches is produced basically by the failure in the recruitment. The lack of renewals reduces the area of patches opened to fishing as consequences of the application of harvest control rules.  Thus, it is expectable that landings could have a pulse of high catches when a strong cohort is being caught (e.g. 2006-2009). Posteriorly, the catches decrease due to reduction of density. However, there are concern about the absence of recruitment and the future of the fishery. For this reason, is necessary that the protocol of assessment and decision rule about opening-close areas or entire management units be without modification.
<b>Do you think the condition(s) raised are appropriately written to achieve the SG80 outcome within the specified timeframe?</b> <i>[Reference: FCR 7.11.1 and sub-clauses]</i>	NA	CAB Response
<u>Justification:</u> No conditions were raised.		Not applicable.
If included:		
<b>Do you think the client action plan is sufficient to close the conditions raised?</b> <i>[Reference FCR 7.11.2-7.11.3 and sub-clauses]</i>	NA	CAB Response
<u>Justification:</u> No client action plan was presented because no conditions were raised		Not applicable.



### Performance Indicator Review

Performance Indicator	Has all available relevant information been used to score this Indicator? (Yes/No)	Does the information and/or rationale used to score this Indicator support the given score? (Yes/No)	Will the condition(s) raised improve the fishery's performance to the SG80 level? (Yes/No/NA)	Justification Please support your answers by referring to specific scoring issues and any relevant documentation where possible. Please attach additional pages if necessary.  Note: Justification to support your answers is only required where answers given are 'No'.	CAB Response
1.1.1	YES	YES	NA	Please see General Comments (1)	See response below.
1.1.2	-----	-----	-----	This PI was not assessed, since PI 1.1.1 scored 80.	Not applicable.
1.2.1	YES	YES	NA	Please see General Comments (2)	See response below.
1.2.2	YES	NO	NA	Scoring issue c): the peer reviewer was unable to understand the rationale provided for this issue.	The rationale was modified. It is detailed more explicitly the decision rules that define the HCRs and the reason of the score set.
1.2.3	YES	YES	NA		Not applicable.
1.2.4	NO	NO	NA	Scoring issue a): Section 3.3 (Principle 1. Target species background) contains all the relevant information to score this PI, but the assessment team does not make full use of	The rationale was re-written, detailing the procedure to assess the stock. Due this fishery has a wide body of publications about biology, population dynamic and harvesting, it is included



				this data/information. On the other hand, the information provided in the rationale (i.e. INIDEP Reports N° 5/2017 and N° 6/2017) is the most recent in regards to the stock assessment, but it is not included in the background of Principle 1.	only two documents which sintetize the assessment protocol.
2.1.1	YES	YES	NA	No primary species were recorded.	Not applicable.
2.1.2	YES	YES	NA	There is no need of measures or strategies	Not applicable.
2.1.3	YES	YES	NA		Not applicable.
2.2.1	YES	YES	NA	No secondary species were recorded.	Not applicable.
2.2.2	YES	YES	NA	There is no need of measures or strategies. Please see General Comments (3)	See response below.
2.2.3	YES	YES	NA	Please see General Comments (3)	See response below.
2.3.1	YES	YES	NA	Please see General Comments (4)	See response below.
2.3.2	YES	YES	NA	Please see General Comments (4)	See response below.
2.3.3	YES	YES	NA		Not applicable.
2.4.1	NO	NO	NA	Scoring issue a): A wealth of information regarding the benthic habitats and fishing impacts is provided in the background section	Parts of the rationale have been reformulated according to reviewer's suggestion to enlightenment, in the base of





				(3.4. Principle 2. Ecosystem Background) and a number of researches dealing with these issues are cited in the References section (page 69). However, no enough convincing evidence that the UoA is highly unlikely to impact the habitats is given in the rationale of this PI.	SGB, and the scoring guidepost was revised.
2.4.2	YES	YES	NA		Not applicable.
2.4.3	YES	YES	NA		Not applicable.
2.5.1	YES	YES	NA		Not applicable.
2.5.2	YES ??	NO	NA	Scoring issue b): The reviewer is not sure to have fully understood the provided rationale, in particular the last paragraph.	The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.
2.5.3	YES	YES	NA		Not applicable.
3.1.1	YES	YES	NA		Not applicable.
3.1.2	YES	YES	NA		Not applicable.
3.1.3	YES	YES	NA		Not applicable.
3.2.1	YES	NO	NA	Scoring issue a): The reviewer agrees that the	The assessment team agrees with this



				specific short and long term objectives are explicit and consistent with achieving the outcomes expressed by Principle 1, but objectives to achieve the wide range of outcomes of Principle 2 are operationally less measurable and not so explicit.	comment. It was reviewed the rationale in order to support the given score.
3.2.2	YES	YES	NA		Not applicable.
3.2.3	YES	YES	NA		Not applicable.
3.2.4	YES	YES	NA		Not applicable.

#### **General Comments on the Peer Review Draft Report**

1. Two (2) different ranges for the harvest rate over the last ten years are presented in the text of this PI.

**CAB Response:** One of them was removed to avoid confusion. The harvest rate considered is TAC / commercial scallop.

2. Scoring issue a): the assessment team points out that “...the removals over the last 18 years have being (sic) 40% of estimated commercial absolute biomass.” This statement is not correct. 40% of the commercial biomass (lower confidence limit) corresponds to the annual TAC’s, while removals correspond to the actual catches which have been much lower than the TAC’s, as shown in table 3 and figure 3 of the draft report.

**CAB Response:** This sentence was reviewed in the assessment table of PI 1.2.1.

3. In the justification of scoring issues a) and c), the assessment team should replace the word primary by the word secondary. The same applies to scoring issue c) in PI 2.2.3.

**CAB Response:** The assessment team reviewed rationales and adjusted them to secondary species.

4. In respect to PI 2.3.1 the assessment team clearly states that the patagonian scallop fishery (except for some minor and occasional events) has no identified interactions and impacts on ETP species. So the fishery meets SG 100 for this PI. In regard to PI 2.3.2 the assessment team reiterates that no impacts on ETP species exist and -this being the case- the reviewer should understand that the measures and strategies mentioned in the justification of the scoring issues are those implemented for all of the Argentinean fisheries and that no specific measures /strategies exist for managing the UoA (Patagonian scallop fishery) impact (since at present there is no need to have them). In the case of the UoA the strategy could be to continue to use the current fishing methods/gears and continuing the ongoing monitoring to ensure that no impact occurs.



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**CAB Response:** The rationale has been revised according to reviewer's suggestion to enlightenment. Additional information (from the main body of the text) was added in order to clarify the rationale, and the scoring guidepost was revised.

5. The assessment team should be aware of the following: i) figure 7 is not referred to in the text; ii) legend of table 1 should be modified to match with the actual content of the table; iii) the information concerning abundance of the Patagonian scallop in the different MU's (pages 21-22) is confusing /unclear. This would greatly improve should the information be provided in table form, as in the original INIDEP's reports; iv) in some cases the references included in the Evaluation Tables for PI's are not included or do not match with those of the References section (page 69 of the draft report)

**CAB Response:** i) All figures and tables were referred in the corresponding text; ii) legend of table 1 was modified; iii) a table was included in order to clarify information concerning about abundance of Patagonian scallop in the different MUs; and iv) references included in Evaluation Tables were included in the References section.

### Appendix 3. Stakeholder submissions

#### a. Summary of the information obtained from the stakeholder meetings, including the range of opinions.

Buenos Aires, 26 de Mayo de 2016.

#### **Minuta sobre la reunión realizada con el GRUPO CLIENTE, en el marco de la Re-Certificación de la Pesquería de Vieira Patagónica.**

En el marco de la Re-Evaluación de Pesca Sustentable MSC de la Pesquería de Vieira Patagónica, se realizó una reunión en la Ciudad de Mar del Plata, Provincia de Buenos Aires, con representantes de las empresas interesadas en la certificación, GLACIAR PESQUERA S.A. y WANCHESE ARGENTINA S.R.L., y se conversaron algunos temas claves para el proceso de re-evaluación y los últimos trabajos realizados.

*-Área de operación de la flota:* El área arrastrada por los barcos factorías es relativamente pequeña respecto a la distribución del recurso, de acuerdo al análisis efectuado en los últimos años, por lo que se puede inferir que el nivel de impacto en el ecosistema también ha sido bajo.

*-Arte de pesca:* Se pretende probar la red sin nudo (telar japonés), que ha sido empleada en otras pesquerías (merluza). Este tipo de red evita que en el musculo del pescado se generen moretones. Se planea estimar si esta red en la pesquería de vieira evita que las valvas sufran rotura y a su vez, aumente la tasa de sobrevivencia de aquellas vieiras que no alcanzan la talla comercial. Además, por ser una malla cuadrada, podría aumentar la selectividad, y al no tener nudos, se disminuiría el roce con el fondo marino. Cabe destacar, que la vieira tiene una tasa de sobrevivencia de 2 a 3 días desde que son capturadas. Esto permite seleccionarlas y devolver al mar los ejemplares pequeños.

A futuro, se quiere comenzar a utilizar dos copos pequeños (uno dentro del otro) en lugar de uno solo grande para también disminuir la rotura de las valvas.

*-Unidades de Manejo:* De acuerdo a la recomendación del INIDEP, hay algunas unidades de manejo (ej. B) que han sido restringidas, dado que se ha detectado muy poco recurso de talla comercial por parte de los operadores. En el caso de la Unidad de Manejo B, las empresas informaron al Consejo Federal Pesquero para que cerrase el área de forma preventiva hasta que el INIDEP informe del estado de situación del banco. El CFP prosiguió con lo solicitado y una vez obtenido los resultados del INIDEP, se cerró la unidad de manera definitiva.

Por otra parte, más allá de las medidas de manejo que determina el CFP con respecto a la talla comercial, los empresarios son conscientes que las tallas menores no se pueden procesar, generando una merma en la producción y a su vez, no son rentables comercialmente, ya que el callo de vieira se comercializa de acuerdo a su tamaño. A mayor tamaño, mayor es el precio de mercado.

Buenos Aires, 26 de Mayo de 2016.

**Minuta sobre la reunión realizada con el INIDEP, en el marco de la Re-Certificación de la Pesquería de Vieira Patagónica.**

En el marco de la Re-Evaluación de Pesca Sustentable MSC de la Pesquería de Vieira Patagónica, se realizó una reunión en la Ciudad de Mar del Plata, Provincia de Buenos Aires, con científicos e investigadores de los Programas de Pesquería de Moluscos Bentónicos, Pesquería de Condrictios y Desarrollo de Artes de Pesca, Métodos de Captura y Transferencia de Tecnología, y se conversaron algunos temas claves para el proceso de re-evaluación y los últimos trabajos realizados.

*-Evaluaciones de stock:* Se estuvo revisando métodos de evaluación de otras pesquerías de vieiras en el mundo para poder realizar una revisión del propio utilizado por el INIDEP. Esto permitiría obtener datos más confiables y solventes, minimizando la incertidumbre en los datos de capturas. La captura total (incluyendo posterior descarte) es estimada por el capitán a “ojo” de acuerdo al porcentaje de llenado de la bolsa. Esto hace que mientras menor sea la captura, mayor sea la sobrestimación, debido a que la bolsa no es pesada previamente al proceso. De todos modos, el problema de sobrestimación que hay con la red de arrastre comercial, es solucionado con las campañas de investigación, en las cuales se utiliza la ‘rastra’.

*-Revisión por pares:* Las evaluaciones anuales de stock siempre han sido revisadas por la Dirección del Instituto, quienes no forman parte del grupo de investigación. Sin embargo, igualmente se realizará una publicación de la última evaluación que irá a referato y que será presentada en el mes de agosto.

*-Condrictios:* El grupo de investigación de condrictios ha mencionado que durante el periodo nuevo de re-certificación de la pesquería se trabajará con los observadores a fin de mejorar el monitoreo de rayas y tiburones, y obtener un impacto real de la pesquería sobre los mismos, inclusive de aquellos que son categorizados como ETPs. Para esto se han realizado charlas pre y post embarque de observadores y se han mejorado los protocolos existentes.

Buenos Aires, 26 de Mayo de 2016.

**Minuta sobre la reunión realizada con el Fundación Vida Silvestre Argentina, en el marco de la Re-Certificación de la Pesquería de Vieira Patagónica.**

En el marco de la Re-Evaluación de Pesca Sustentable MSC de la Pesquería de Vieira Patagónica, se realizó una reunión en la Ciudad de Mar del Plata, Provincia de Buenos Aires, con el jefe del Programa Marino de Fundación Vida Silvestre Argentina, Lic. Guillermo Cañete, y se conversaron algunos temas claves para el proceso de re-evaluación y los últimos trabajos realizados.

Para FVSA, la pesquería ha presentado diversas mejoras en aspectos de sustentabilidad desde su certificación inicial. Para ellos, es recomendable contar con un nuevo estudio comparativo que permita analizar el estado del área arrastrada antes y después de varios años de operación.

**b. Client group agreement in order to comply MSC requirements**

As there is no condition set in the second re-certification, the assessment team proposes any new information is provided (*i.e.* technical reports, committee acts, CFP resolutions) for its review, and in case any change is detected, re-score the assessment tables.


It is important to sent OIA an agreement of client group that allows to provide relevant information during the certification period.

Agreement signed by Client Group about recommendation





c. Explicit response from the team to stakeholder submission

www.msc.org						
						
Marine House 1 Snow Hill London EC1A 2DH United Kingdom Tel: +44 (0)20 7246 8900 Fax: +44 (0)20 7246 8901						
Date 12/07/2017						
SUBJECT: MSC Review and Report on Compliance with the scheme requirements						
Dear Enrique Mario Mo						
Please find below the results of our partial review of compliance with scheme requirements.						
CAB	Organización Internacional Agropecuaria (OIA)					
Lead Auditor	Enrique Mario Morsan					
Fishery Name	Patagonian scallop ( <i>Zygochlamys patagonica</i> ) bottom otter trawl fishery					
Document Reviewed	Public Comment Draft Report					
Ref	Type	Page	Requirement	Reference	Details	PI
27087	Major	80	FCR-7.10.6.2 v.2.0	The rationale shall make direct reference to every scoring issue and whether or not it is fully met.	PI 1.2.1 SI(f): Some alternative measures are listed but the current sentence structure makes it hard to understand. Additionally, the rationale does not directly address the requirements at SG100 regarding the potential effectiveness and practicality of the alternative measures and whether they are implemented.	1.2.1
27088	Guidance	81			PI 1.2.2 SI(a): The rationale is unclear in the first paragraph.	1.2.2
27089	Major	82-83	FCR-7.10.6.1 v.2.0	A rationale shall be presented to support the team's conclusion.	PI 1.2.2(c): The provided rationale outlines how the HCRs/TAC are derived and explains how the rules and tools each operate in line with the HCR. However, evidence is not presented to show that it has been both appropriate and effective.	1.2.2
MSC – the best environmental choice in seafood						
Company Reg. 3322023 Limited by guarantee. Registered Office: 1 Snow Hill London EC1A 2DH Registered Charity No. 1066806						
						Page 1 of 3





www.msc.org						
27126	Guidance	63, 64	FCR_7.12.1 v.2.0	The CAB shall determine if the systems of tracking and tracing in the UoA are sufficient to ensure all fish and fish products identified and sold as certified by the UoA originate from the appropriate Unit of Certification (UoC).	In Table 8 where references are made to the 4 freezer vessels, please add a cross reference to the table with vessel names on page 12.	
27127	Major	116	FCR-7.10.6.1 v.2.0	A rationale shall be presented to support the team's conclusion.	PI 3.1.1 SI(a): It is not clear with the present rationale if the management system has been tested and proven to be effective.	3.1.1
27128	Minor	48, 49, 63	FCR-7.12.1.3 v.2.0	The CAB shall determine if the systems of tracking and tracing in the UoA are sufficient to ensure all fish and fish products identified and sold as certified by the UoA originate from the appropriate Unit of Certification (UoC). The CAB shall document the risk factors outlined in the "MSC Full Assessment Reporting Template", identifying any areas of risk for the integrity of certified products and how they are managed and mitigated.	On page 12, the fishing gear described for the UoA is bottom otter trawl. However, on page 48 and 49 and in Table 8 it is mentioned that "...catches must be made with trawl nets and dredges. In the last one, the use of dredges must be authorized by CFP to minimize impact with seabeds". Does this mean that a vessel may use both types of gear to catch scallops, and if so, please clarify how eligible catches made by otter trawl may be separated from non-eligible catches made by dredge? Likewise, how will any catches made by dredge by other vessels be separated at landing from catches made by vessels using otter trawl?	
27132	Minor	28, 93	FCR-7.10.6 v.2.0	To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met.	PI 2.2.1 SI (a): The bycatch of rays, sharks and invertebrates are referenced in the bycatch sections of the report. What is not clear is the relative catch composition of hauls (e.g. catch profile to demonstrate the relative proportions of scallops vs non-target catches.) with regards to designation as main or minor and considerable catches as outlined in SA 3.7.2.2.	2.2.1
27134	Major	39, 97	FCR-7.10.6 v.2.0	To contribute to the scoring of any PI, the team shall verify that each scoring issue is fully and unambiguously met.	PI 2.3.1 SI(a). The rationale lacks a comprehensive list of all species/species groups covered by the relevant legislation in which the UoA operates and some clarification of how each of these groups interact (or where there is specifically no or limited interaction) with the UoA.	2.3.1
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27136	Major	103	FCR-7.10.6.1 v.2.0	A rationale shall be presented to support the team's conclusion.	PI 2.4.1 SI (a): Whilst there has been some characterisation of the habitats encountered within the UoA, there is no quantification presented of what impact the UoA is on the habitats encountered. (e.g. what is the likely recovery rate of habitat impacted by the UoA). See SA3.13.4 and related guidance.	2.4.1

This report is provided for action by the CAB and ASI in order to improve consistency with the MSC scheme requirements; MSC does not review all work products submitted by Conformity Assessment Bodies and this review should not be considered a checking service. If any clarification is required, please contact Philippa Kohn on +1 (206) 631-2903 for more information."

If you have any questions regarding this response, please do not hesitate to contact the relevant Fisheries Assessment Manager for this fishery.

Marine Stewardship Council

cc: Accreditation Services International

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**CAB responses:**

MSC comments		CAB specific response
Ref.	Details	
27087	p. 80. PI 1.2.1 SI (f): Some alternative measures are listed but current sentence structure makes it hard to understand. Additionally, the rationale does not directly address the requirements at SG100 regarding the potential effectiveness and practicality of the alternative measures and whether they are implemented.	The assessment team agrees with this comment, and modified the rationale in order to clarify the justification.
27088	p. 81. PI 1.2.2 SI (a): The rationale is unclear in the first paragraph	The first paragraph of SI a) was improved in order to clarify.
27089	p. 82-83. PI 1.2.2 SI (c): The provided rationale outlines how the HCRs/TAC are derived and explains how the rules and tools each operate in line with the HCR. However, evidence is not presented to show that it has been appropriate and effective.	The rationale of SI c) was improved, including evidences.
27126	p. 63-64. In Table 8 where references are made to the 4 freezer vessels, please add a cross reference to the table with vessel name on page 12.	It was introduced a cross reference in the Table 8 to clarify vessel name on page 12.
27127	p. 116. PI 3.1.1 SI (a): It is not clear with the present rationale if the management system has been tested and proven to be effective.	The rationale provided was improved in order to reach SG100 level in SI a).
27128	p. 48-49, 63. On page 12, the fishing gear described for the UoA is bottom otter trawl. However, on page 48 and 49 and in Table 8 it is mentioned that "...catches must be made with trawl nets and dredges. In the last one, the use of dredges must be authorized by CFP to minimize impact with seabeds". Does this mean that a vessel may use both types of gear to catch scallops, and if so, please clarify how eligible catches made by otter trawl may be separated from non-eligible catches made by dredge? Likewise, how will any catches made by dredge by other vessels be separated at landing from catches made by vessels using otter trawl?	The use of dredges is only for INIDEP's research purposes. This aspect was clarified in the background and traceability section. So, there is no potential risk for non-certified gear/s to be used within the fishery.
27132	p. 28, 93. PI 2.2.1 SI (a): The bycatch of rays, sharks and invertebrates are	According to SA 3.7.2.2: 'Considerable catches should be interpreted as those where main secondary species

	<p>referenced in the bycatch sections of the report. What is not clear is the relative catch composition of hauls (e.g. catch profile to demonstrate the relative proportions of scallops vs non-target catches.) with regards to designation as main or minor and considerable catches as outlined in SA 3.7.2.2.</p>	<p>comprises more than 10% of the catch by weight of the UoA'.</p> <p>While out of scope species (birds, reptiles, amphibians, mammals) are always considered as main species, regardless of their total catch volume; since there is a National Action Plan to protect, preserve and minimize the impact of the fishery on Birds (PAN-Aves) and on sharks (PAN-Tiburones). Both species groups have been considered as ETP species and analysed in PI 3.1.1 to PI 3.1.3.</p> <p>As detailed in the P2 Background section, since 1995, prior to the beginning of the commercial exploitation of the Patagonian scallop, studies have been developed to know and monitor the qualitative and quantitative composition of the community associated with this fishery resource (Bremec &amp; Lasta, 2002; Schejter <i>et al.</i>, 2013a, 2013b and 2014).</p> <p>Technical reports were released with all kind of 'sorting identification, weighing and counting of lowest possible taxa of all benthos species' (including a comparison with fished and un-fished areas and between MU and 'out of the MU area'); qualitative and quantitative comparative studies of the benthic communities of the Reserve Area and MU B were done and compared with previous surveys (Schejter <i>et al.</i>, 2014 and 2015).</p> <p>As mentioned in Schejter <i>et al.</i> (2014a), benthic invertebrate associations in the different MUs of Patagonian scallops have been maintained over time, and the differences recorded between years were mainly due to variations in the biomass of the highest contribution taxa and not to a disappearance or change in species composition. Moreover, no differences were detected between zones in commercial scallop, total scallop and associated fauna. It was concluded that the differences detected could be produced as a result of the presence of new species and not by the influence of the fishing, as the MU B remained remaining closed during several years. These results were consistent with those reported by Schejter <i>et al.</i> (2014) and the biological association of invertebrates has been persistent over time (see Tables 5 and 6 for further information).</p> <p>Based on the previous statements, it is concluded that the UoA has not impacted on secondary species components; and it is intended to continue like this, with ongoing monitoring to ensure that no impact occurs in the future.</p>
27134	<p>p. 39, 97. PI 2.3.1 SI (a): The rationale lacks a comprehensive list of all species/species groups covered by the relevant legislation in which the UoA operates and some clarification of how each of these groups interact (or where there is specifically no or limited interaction) with the UoA.</p>	<p>The rationale was improved in order to clarify ETP interaction with the UoA.</p>

<b>27316</b>	<p>p. 103. PI 2.4.1 SI (a): Whilst there has been some characterisation of the habitats encountered within the UoA, there is no quantification presented of what impact the UoA is on the habitats encountered (e.g. what is the likely recovery rate of habitat impacted by the UoA). See SA3.13.4 and related guidance.</p>	<p><b>The rationale provided was modified in order to improve the justification.</b></p>
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#### Appendix 4. Surveillance frequency

As the assessment team determined that the fishery complies with MSC Standard and there are no conditions set (including that the fishery has no outstanding conditions), it is established that the default surveillance level could be reduced to a Minimum Surveillance Level.

Table 4.1. Surveillance level rationale.

Year	Surveillance activity	Number of auditors	Rationale
1	Off-site audit	1 auditor off-site	Due there are no conditions established in the second re-certification process and considering the recommendation set by assessment team, the CAB proposes to have an off-site audit with 1 auditor – this is to ensure that all the information is collected and because it can be provided remotely.
2 and 3	Review of information	1 auditor off-site	Due there are no conditions established in the second re-certification process and considering the recommendation set by assessment team, the CAB proposes to have a review of information with 1 auditor – this is to ensure that all the information is collected and because it can be provided remotely.
4	On-site surveillance audit & re-certification site visit	1 auditor on-site supported by 1 auditor remotely	This surveillance audit will be taking place with the re-certification site visit, so the CAB proposes to have an on-site audit with 1 auditor and the remaining members of the assessment team from a remote location – this is to ensure that all the information is collected and because it can be provided remotely.

Table 4.2. Timing of surveillance audit.

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
1 to 4	September 2018	September 2018	At the moment, there are no reasons to postpone the surveillance audit timing.

Table 4.3. Fishery surveillance program.

Surveillance Level	Year 1	Year 2	Year 3	Year 4
Level 1	Off-site surveillance audit	Review of information	Review of information	On-site surveillance audit & re-certification site visit

#### **Appendix 5. Objections process**

There was no objection presented in the re-assessment process.



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## **ORGANIZACIÓN INTERNACIONAL AGROPECUARIA (OIA)**

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