

Argentinean Squid (*Illex argentinus*) Fishery

Fishery Improvement Project (FIP) Scoping Document

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Introduction

During September 2020 a pre-assessment was carried out under the MSC standard by Naunet Fisheries Consultants of the Argentine shortfin squid jiggling fishery in Argentina's EEZ waters for the client "Cámara de Armadores Poteros Argentinos" (CAPA). The pre-assessment identified the critical points that need to be strengthened before to initiate a full-assessment processes. In general terms, 15 of the PIs would be on SG80, 11 between SG60 - SG79 and 3 under SG60. As a result, the report recommends the elaboration of collective action plans between managers and actors in a Fishery Improvement Project (FIPs).

The Argentinean Squid FIP was formally launched on March 11th 2022 by CAPA and Dr. Enrique Morsan, by means of Specific Agreement N2. The final version of the MSC Pre-Assessment (MSC PA) was completed by Jose Crespo, MSC technical consultant and the Naunet Fisheries Consultant team and is available in the Documents Section of the FIP profile at FisheryProgress.org. This document summarizes the findings detailed in the MSC PA for PIs below 80 points, and the improvement recommendations considered when designing the FIP Action Plan.

FIP Unit of Assessment (UoA)

Table 1. FIP Unit(s) of Assessment

UoA 1	Description
Target species (common and scientific name)	Argentine Squid (<i>Illex argentinus</i>)
Stock	Continental shelf stocks: South Patagonic Stock (SPS), Summer Spawning Stock (SSS), Bonaerense-North Patagonic Stock (BNPS) and Spring Spawning Stock (SpSS)
Geographical area	Argentine Exclusive Economic Zone

Fishing method or gear type	Jigging
Fishing fleet or group of vessels, or individuals fishing operators pursuing stock	Argentinean Jiggers

Performance Indicators Summary

Table 2. Summary information for each Performance Indicator highlighted within the MSC pre-assessment or needs assessment as scoring either as fail (SG <60), achieve a conditional pass (60-79), or pass (SG ≥80).

Principle 1

PI Category		Scoring Range	Related PIs
1.1.1	Stock Status SP Stock	SG<60	1.1.2, 1.2.3, 1.2.4
1.1.1.	Stock status of other three stocks	SG 60-79	
1.1.2	Stock Rebuilding	SG<60	1.1.1
1.2.1	Harvest Strategy	SG 60-79	1.2.2, 1.2.3, 1.2.4, 3.2.1
1.2.2	Harvest Control Rules and Tools	SG<60	1.1.1, 1.2.1
1.2.3	Information and Monitoring	SG 60-79	1.2.1
1.2.4	Assessment of Stock Status	SG 60-79	1.2.1

Principle 2

PI Category		Scoring	Related PIs
2.1.1	Primary spp: Outcome Status	>80	2.1.2, 2.1.3
2.1.2	Primary spp: Management Strategy	>80	2.1.1, 2.1.3, 3.2.1
2.1.3	Primary spp: Information/Monitoring	>80	2.1.1, 2.1.2
2.2.1	Secondary spp: Outcome Status	>80	2.2.2, 2.2.3
2.2.2	Secondary spp: Management Strategy	>80	2.2.1, 2.2.3, 3.2.1
2.2.3	Secondary spp: Information/Monitoring	>80	2.2.1, 2.2.2

2.3.1	ETP spp: Outcome Status	60-79	2.3.2, 2.3.3
2.3.2	ETP spp: Management Strategy	60-79	2.3.1, 2.3.3, 3.2.1
2.3.3	ETP spp: Information/Monitoring	60-79	2.3.1, 2.3.2
2.4.1	Habitat: Outcome Status	>80	2.4.2, 2.4.3
2.4.2	Habitat: Management Strategy	>80	2.4.1, 2.4.3, 3.2.1
2.4.3	Habitat: Information/Monitoring	>80	2.4.1, 2.4.2
2.5.1	Ecosystem: Outcome Status	>80	2.5.2, 2.5.3, 1.1.1, 2.1.1, 2.2.1, 2.3.1, 2.4.1
2.5.2	Ecosystem: Management Strategy	>80	2.5.1, 2.5.3, 1.2.1, 2.1.2, 2.2.2, 2.3.2, 2.4.2, 3.2.1
2.5.3	Ecosystem: Information/Monitoring	60-79	2.5.1, 2.5.2, 1.2.3, 2.1.3, 2.2.3, 2.3.3, 2.4.3

Principle 3

PI Category		Scoring	Related PIs
3.1.1	Governance and Policy: Legal and/or Customary Framework	>80	3.1.2, 3.1.3
3.1.2	Governance and Policy: Consultation, Roles and Responsibilities	>80	3.1.1, 3.2.2
3.1.3	Governance and Policy: Long Term Objectives	>80	3.1.1, 3.2.1, 3.2.2
3.2.1	Fishery Specific Management System: Fishery-Specific Objectives	60-79	1.2.1, 1.2.2, 2.1.2, 2.2.2, 2.3.2, 2.4.2, 2.5.2, 3.1.3, 3.2.2, 3.2.5
3.2.2	Fishery specific Management System: Decision-Making Processes	>80	3.1.2, 3.2.1
3.2.3	Fishery Specific Management System: Compliance & Enforcement	60-79	1.2.3, 2.1.3, 2.2.3, 2.3.3, 2.4.3

3.2.4	Fishery Specific Management System: Monitoring and Management Performance Evaluation	60-79	3.2.1
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Recommendations for Improvements by Performance Indicator

This section indicates the current performance of the fishery and provides more detail on the scoring issue level of each MSC PI that is likely to cause the fishery to either fail (SG <60) or pass with conditions (SG 60-79).

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Table 3. Recommendations for PI 1.1.1.

1.1.1. Stock Status (SP Stock)	The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing		
Scoring Guidepost	SG 60	SG 80	SG 100
a) The stock status relative to recruitment impairment	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
b) The stock status in relation to achievement of MSY		The stock is at or fluctuating around a level consistent with MSY	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years
Scoring Range and Rationale	<p>According to the MSC, scoring of PI 1.1.1 is intended to reflect the status of the target stock biomass or abundance. This Performance indicator is normally evaluated in reference to limit (PRI) and target (MSC) reference points. However, the MSC guidance also allows other proxies to be used in place of direct biomass indicators, such as indications of fishing effort or fishing mortality.</p> <p>Other proxies that can be used may include Catch per Unit Effort (CPUE). In these cases, certifiers are required to demonstrate how the proxies are consistent with the PRI and MSY levels. In the particular case of cephalopod fisheries, where reference points are difficult to estimate, the analysis of catch and/or effort data has been used in place of formal assessments to provide information on abundance trends.</p> <p>In 2019, two pre-recruit surveys were undertaken by the INIDEP in order to evaluate the state of the Argentine squid stocks (Ivanovic et al., 2019a and b). The first survey, covering the Southern MU (South of the 44° S) (Ivanovic et</p>		

¹ Color of the cell indicates if the scoring guidepost was considered as deficient or not met in the pre-assessment

	<p>al., 2019a) was mainly aimed to assess the state of the South Patagonian Stock (SSP), the main stock in the area. In 2019, the densities of the SPS by weight varied between 0.002 and 49.72 tonnes/mn2 (it was lower than 1 tonnes/mn2 in 76% of the stations). The estimates of biomass and number of recruits of the SSP were 132,876 tonnes (+/- 123,842 tonnes) and 479 million individuals (+/- 439 million individuals). The average density for the entire area was 2.68 tonnes/mn2 , similar to that observed in 2005 and 2009 (2.18 tonnes/mn2); and well below that estimated for the years considered good, such as 2007 (16.78 tonnes/mn2) and 2014 (8.22 tonnes/mn2).</p> <p>In 2018, Aubone et al., 2018 analysed the current early warning system (SDAT) for the closure of the Argentine squid fishery and developed for the South Patagonian Subpopulation with the intention of achieving a system better adapted to the reproductive biology of the species. In that report, a threshold of 1,350,000,000 individuals was suggested as the minimum number of recruits for an adequate development of the cohort. In the absence of another reference value, it could be used as reference point to score the stock relative to the PRI.</p> <p>Based on the information provided, it seems that the SPS in 2019 was below both the target and limit reference points. Therefore, scoring issue a would not meet SG60 and this performance indicator would fail.</p> <p>In 2020, sixty-nine vessels of the jigging fleet completed or are developing 307 trips that add up to a total of 7,912 days of fishing and 146,967 t of catch (19 t/day). In the South MU, 69 vessels caught 69,249 t (17 t/day). In the North MU, the harvest began on April 1 and, as of July 21, 65 vessels fished 77,718 t (21 t/day). This catch volume is one of the highest of the time series.</p> <p>The score was <60</p>
<p>Improvement Recommendations</p>	<p>The MSC requires two references to reflect the status of the target stock biomass or abundance: a minimum number of recruits that indicate that the stock is over the Point of Recruitment Impairment; and an estimation (or a surrogate) of the MSY as target reference point. Such indicators are difficult to estimate in short-living population and other alternative analysis must be used. Establishment of Point of Recruitment Impairment to estimate the status of the SPS stock is the main task in this PI. The Cephalopods Fisheries Research Group INIDEP needs to establish the PRI, and the status of the stock in relation with it. The actions imply refresh the situation of the SSP stock and the reconsideration of limit reference points (if necessary). The INIDEP will renew the pre-recruit surveys to update the time series of data.</p> <p>A reconsideration of the fishing effort level (number of fishing vessels or open/close season) in combination with surveys could be useful to recover the stock. During the FIP it is expected a increasing trend of CPUE that might suggest that recruitment is occurring and the population is over the PRI.</p>
<p>Priority</p>	<p>High</p>

<p>1.1.1. Stock Status (other sotcks)</p>	<p>The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing</p>		
<p>Scoring Guidepost</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>

a) The stock status relative to recruitment impairment	It is likely that the stock is above the point where recruitment would be impaired (PRI).	It is highly likely that the stock is above the PRI.	There is a high degree of certainty that the stock is above the PRI.
b) The stock status in relation to achievement of MSY		The stock is at or fluctuating around a level consistent with MSY	There is a high degree of certainty that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years
Scoring Range and Rationale	<p>According to the MSC, scoring of PI 1.1.1 is intended to reflect the status of the target stock biomass or abundance. This Performance indicator is normally evaluated in reference to limit (PRI) and target (MSC) reference points. However, the MSC guidance also allows other proxies to be used in place of direct biomass indicators, such as indications of fishing effort or fishing mortality. Other proxies that can be used may include Catch per Unit Effort (CPUE).</p> <p>Either reference points nor proxies consistent with the PRI and MSY levels have been found for the BNPS, SSS and SpSS. Therefore, the MSC Risk Based Framework (RBF) has been used to evaluate these stocks. It is important to highlight that it has been undertaken as scoring exercise by the MSC experts without the participation of any stakeholders. In the case of PI 1.1.1, the MSC methodology indicates that a Consequence Analysis (CA) and Productivity Susceptibility Analysis (PSA) shall both be undertaken if scoring using the RBF.</p>		
Improvement Recommendations	<p>Definition of biological reference points (BRPs) to the other spawning tocks. The absence of an estimation of a limit (minimum number of recruits that indicate that the stock is over the PRI) and a target (a surrogate of MSY) for the SpSS, SSS and BNPS addressed to consider them data-deficient and the use of Risk Based Framework. This analysis is mainly based on biological features (fecundity, trophic level, average size and age) and fishing practices (degree of overlap of fleet operations and stock distribution, selectivity, action of the gear, post-capture mortality). Due to both types of characteristics are difficult (or impossible) to modify, and improve the score, the way to overcome the RBF score is to collect information and establish BRPs to the stocks. The participation of stakeholders (INIDEP, independent experts, client and other stakeholders) is fundamental when this methodology will be used. It known that in cephalopods fishery, the establishment of reference points are difficult to estimate but it is possible use of surrogate to provide information on abundance trends. Information produced during the last decades on these stocks are vast, especially on their reproductive pattern, and approximation to reference points or proxies consistent with the PRI and MSY produced for the SPS can be obtained during the FIP.</p>		
Priority	High		

1.1.2. Stock rebuilding	Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe
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Scoring Guidepost	SG 60	SG 80	SG 100
a) Rebuilding timeframes	A rebuilding timeframe is specified for the stock that is the shorter of 20 years or 2 times its generation time. For cases where 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.
b) Rebuilding evaluation	Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe.	There is evidence that the rebuilding strategies are rebuilding stocks, or it is likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.	There is strong evidence that the rebuilding strategies are rebuilding stocks, or it is highly likely based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the specified timeframe.
Scoring Range and Rationale	<p>Cephalopods have an array of life cycle characteristics that differ from other commercially exploited marine species, and several aspects of cephalopod biology and ecology present particular challenges for their assessment and management (Boyle and Rodhouse, 2005). Cephalopods are characterized by short lifespans, high metabolic rates, and rapid growth. Their growth rates and maturation, as well as life cycle phenology, are highly variable. Although much of this variation seems to be environmentally driven, it also reflects phenotypic plasticity and possibly a genetic component (McKeown et al., 2019). As a consequence of these characteristics, abundance and distribution can vary widely from year to year. Many cephalopods have relatively high fecundities and prolonged spawning periods with intermixing seasonal cohorts that contribute to the effective use of available food resources, resulting in rapid abundance fluctuations and facilitating fast recovery of populations after years of poor recruitment or heavy exploitation (Boyle and Rodhouse, 2005; Arkhipkin, 2013).</p> <p>As other cephalopod fisheries, the Argentine squid fishery is largely affected by these variabilities, which makes very difficult to set (or even think) rebuilding timeframes. Moreover, it is unclear if the decrease in abundance is due to overfishing, unfavourable environmental conditions or other external circumstances (oil prospection, etc). However, no information has been found about the necessity of rebuilding the SPS stock, no rebuilding timeframe has been specified for the stock and there is no evidence that the rebuilding strategies are rebuilding it (CPUEs in the Southern area decreased in 2020, see figures in previous PI). Therefore, scoring issue a does not met SG60 making this PI to fail, and scoring issue b does not met SG80 either.</p> <p>The score range was < 60.</p>		
Improvement Recommendations	The rebuild the SPS is strongly related with the definition of the SPS status (PI 1.1.1) and the necessity of the rebuild the SPS must be defined. Then, depending on the result of the evolution of the status stock in relation with reference points, a planification of the recovery plan could be developed. But,		

	<p>whereas the SPS remains below the limit reference point (minimum number of recruits for an adequate development of the cohort), a timeframe for rebuild must be developed to avoid fail in this PI.</p> <p>Even when the relevance of this indicator depends on the other results, a 5-years schedule with alternative measures must be elaborated in order to protect and recover the stock. It can be based in a combination of a) policies for the international fleet which fish inside the EEZ, b) control of the fishing effort, c) modification of the escapement threshold.</p>
Priority	High

1.2.1. Harvest Strategy	There is a robust and precautionary harvest strategy in place		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Harvest strategy design	The harvest strategy is expected to achieve stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy work together towards achieving stock management objectives reflected in PI 1.1.1 SG80.	The harvest strategy is responsive to the state of the stock and is designed to achieve stock management objectives reflected in PI 1.1.1 SG80.
b) Harvest strategy evaluation	The harvest strategy is likely to work based on prior experience or plausible argument.	The harvest strategy may not have been fully tested but evidence exists that it is achieving its objectives.	The performance of the harvest strategy has been fully evaluated and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels
c) Harvest strategy monitoring	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
d) Harvest strategy review			The harvest strategy is periodically reviewed and improved as necessary.
Scoring Range and Rationale	<p>The Argentine shortfin squid fishery is monitored and the stock is assessed by the INIDEP, and managed by Resolution 973/97, which 4 lays a series of technical measures applied to the fishery, such gear types permitted: the species can only be targeted by vessels equipped with jigging systems or trawlers with a fishing permit for all species, prior to the issuance of resolution No. 959; fishing periods: squid operations may within the EEZ south of the 44th parallel on February 1 (until June 30) and north of the 44th parallel on May 1 (until August 31); and within the Common Fishing Zone (ZCP) north of the parallel of 39° from April 1 to August 31). Other general management measures, such as fishing permits or jurisdictional areas, are also applied to the fishery.</p>		

	<p>As indicated in the introduction, there is a real-time monitoring of the resource to allow a percentage of the stock to escape from exploitation (set to 0.4) to ensure the next year's recruitment. This strategy, it is expected to achieve stock management objectives reflected in PI 1.1.1 SG80. Moreover, this measure seems to be responsive to the state of the stock. For example, in 2019 the final escapement limit was set higher than in the previous years. However, the fishery has been also declared by the government as fully exploited, but measures aimed to control fishing mortality (control the number of vessels or the fishing effort) have not been applied to the fleet, mainly due to the problems caused by the existence of an IUU fishing fleet working inside and outside the Argentina's EEZ. Therefore, it is considered that the scoring issue a only meets SG80 partially.</p> <p>As indicated in the previous paragraph, the fishery is monitored and reviewed by the INIDEP. Therefore, scoring issue c and d, harvest strategy monitoring and review would met SG60 and SG100 respectively.</p> <p>The score of the PI was 60-79</p>
<p>Improvement Recommendations</p>	<p>A harvest strategy is the combination of monitoring, stock assessment, harvest control rules (HCRs) and management actions that are required to bring about the sustainable management of the fishery.</p> <p>Preliminary analysis reveals that all elements of the HS work, but the evidence (low CPUE and pre-recruitment estimates for the SPS stock below the average) highlighted that need to be adjusted. One of the FIP objectives are to produce evidence that the SPS is oscillating around an average biomass. The periodical review of the elements of the management strategy is recommended and improvement when is necessary.</p> <p>The first step is to revise strengths and weaknesses of the elements of the harvest strategy in a participative context (Workshop or technical meeting) and decision of type of approach will be followed to design a HS: best assessment model and fully tested management procedure (explained in the PI 1.2.2., due to the strong relation with HCR).</p> <p>Simultaneously, and derived from the previous step, processing all information recorded by INIDEP OBOs Program, explore to increase the percentage of coverage, and evaluate alternative HCRs.</p> <p>Finally, propose modifications to evaluate the results by an operational model.</p>
<p>Priority</p>	<p>High</p>

<p>1.2.2. Harvest control rules and tools</p>	<p>There are well defined and effective harvest control rules (HCRs) in place</p>		
<p>Scoring Guidepost</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a) HCRs design and application</p>	<p>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</p>	<p>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</p>	<p>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.</p>

		level consistent with ecosystem needs.	
b) HCRs robustness to uncertainty		The HCRs are likely to be robust to the main uncertainties	The HCRs take account of a wide range of uncertainties including the ecological role of the stock, and there is evidence that the HCRs are robust to the main uncertainties.
c) HCRs evaluation	There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation.	Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs.	Evidence clearly shows that the tools in use are effective in achieving the exploitation levels required under the HCRs.
Scoring Range and Rationale	<p>According to the MSC standard, a HCR is a set of pre-agreed rules or actions used for determining a management action in response to changes in indicators of stock status with respect to defined ‘trigger’ reference points. HCRs should be designed to achieve a medium or long-term target reference point while also safely avoiding a limit reference point. The HCRs should also define how a stock will be rebuilt to the target reference point, at times when it falls below this level. HCRs are a critical component of precautionary management frameworks aiming at replacing ad hoc advice and decision-making with a more rigorous and consistent management structure.</p> <p>HCRs are sometimes described as a set of ‘if’ and ‘then’ rules, defining the circumstances that will lead to what management responses (i.e. if the stock falls to x, then the management will respond by y). Typically the rule will be phrased in terms of changes in stock status triggering changes in exploitation rate (catches and/or fishing effort). HCRs should be based on plausible hypotheses about resource dynamics and be reasonable and practicable, in the context of the scale of the fishery, to ensure they are likely to achieve the management goals.</p> <p>In the case of the management of the Argentine shortfin squid fishery in Argentina EEZ waters, no HCR have been considered, explored or tested. Therefore, it is considered that “Generally understood HCRs are NOT in place or available” and scoring issue a does not meet SG60 and the fishery would fail for this Performance Indicator.</p> <p>Finally, it cannot be considered that “There is some evidence that tools used or available to implement HCRs are appropriate and effective in controlling exploitation” as the SPS stock is considered overexploited and no measures have been taken for controlling exploitation.</p> <p>Therefore, scoring issue a would not meet SG60 either.</p>		
Improvement Recommendations	<p>HCR are a pre-agreed measures or actions used for determining a management action in response to changes in indicators of stock status with respect to defined target and limit reference points.</p> <p>The pre-assessment determined that no HCR have been considered, explored or tested, and “Generally understood HCRs are NOT in place or available”. As consequence, the PI does not meet SG60 and the fishery would fail for this</p>		

	<p>reason.</p> <p>The first step is to define a variable over which management has some direct control as a function of some other variable related to the stock.</p> <p>The HCR are a key element of the HS and, for the Illex fishery, must be elaborated in relation with its particular features of life history: short-living species, high fecundity, strongly affected by environmental variations.</p> <p>The establishment of HCRs will require of several steps which include workshops/meetings with the participation to discuss the relevance to add mechanism based on the real time analysis of indicators to aid in the development of definitions of (a) limits, (b) targets for healthy stocks, and (c) targets for rebuilding plans of overfished stocks (Task 3).</p> <p>The second step is to decide what type of approach will be used: a) Use of generic HCR which specify the desired harvest rate as a function of stock size, relative to target and limit reference points, where the performance of HCR is evaluated through MSE using methods that represent a range of possible situations; b) Use of Management Procedure (MP), a feed-back rule that specifies the management actions as a function of data collected, their processing, and is tested by operational models.</p> <p>The third step is defining the HCRs, how their will be monitored and tested and how they will engage with the other components of HS.</p>
Priority	High

1.2.3. Information and monitoring	Relevant information is collected to support the harvest strategy		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Range of information	Some relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy.	Sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy.	A comprehensive range of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available.
b) Monitoring	Stock abundance and UoA removals are monitored and at least one indicator is available and monitored with sufficient frequency to support the harvest control rule.	Stock abundance and UoA removals are regularly monitored at a level of accuracy and coverage consistent with the harvest control rule, and one or more indicators are available and monitored with sufficient frequency to support the harvest control rule.	All information required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent uncertainties in the information [data] and the robustness of assessment and management to this

			uncertainty.
c) Comprehensiveness of information		There is good information on all other fishery removals from the stock.	
Scoring Range and Rationale	<p>Twice a year, surveys are carried out by the INIDEP in order to collect information about the distribution, abundance and areas of squid concentration to assess the reproductive biomass and the pre-recruit abundance of the two squid assessment units. The onboard observer program also conducts biological sampling onboard commercial vessels, recording the individual mantle length (LM), sex, total weight, and maturity stage; and also record catch and effort data among other fishery related data. The stocks are also monitored in real-time during the fishing seasons using the fishery data (fishing trips, fishing days, total catches (in tons) and average daily yield (tons/day)) provided weekly by the commercial vessels (jiggers and trawlers) targeting the stock.</p> <p>The stock structure is also well known. Several subpopulations have been identified, including the one central Brazilian stock, and three Patagonian stocks that spawn in spring, summer, and winter (Brunetti et al. 1998a, b; Haimovici et al. 1998; Perez et al. 2009).</p> <p>Therefore, sufficient relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy and scoring issue a meets SG80. However, due to several reasons (strikes, budget cuts, etc.), in recent years, the biannual surveys to assess the stock at the beginning of the fishing seasons have not been conducted by the INIDEP and the initial biomass has only been calculated using data from the fishing season. Therefore, it is considered that, scoring issue a does not meet SG100. For the same reason, scoring issue b does not meet SG80 because Stock abundance is NOT regularly monitored at a level of accuracy and coverage adequate to support the harvest control rule. As indicated in the introduction, the Argentine shortfin squid is also caught by foreign fleets from Japan, China, Taiwan, Korea and Spain operating in the High Seas, outside the Argentine EEZ. The INIDEP in its fortnightly fishery update reports uses an approximation based on the CPUEs of the Argentinian jig vessels to calculate the catches done by the foreign fleets. Although this approximation only works for the foreign jigging fleet but no for the trawl fleet (Marcela Ivanovic pers.comm.). Therefore, there is NOT good or complete information on all other fishery removals from the stock and it is considered that scoring issue c does not met SG80.</p>		
Improvement Recommendations	<p>The main weakness in the fishery information and monitoring are the regular monitoring of abundance and the removals of the stock produced in other fisheries. Then, two different actions are recommended se aspects compose the two first tasks.</p> <ul style="list-style-type: none"> - Regularity of the surveys. As a part of the operational model to evaluate how the HCR are functioning, the stock abundance needs to be regularly monitored at a level of accuracy and coverage adequate to support the HS. 		

	<p>One of the objectives of the FIP must be explore the possibility of regularity of the surveys in agreement between INIDEP and Fishing companies involved. The restitution of the survey's regularity would improve the SI level.</p> <p>- Information of the removals in other fisheries. The second aspects to be addressed is gathering information about the national and foreign trawling and jigging fleet and the estimation of the removals. The first milestone will be the revision of data collected by OBOs program in the national fleet, the data collection by slips completed by each vessel and design improvement of the entire system if it necessary. Removals from the foreign fleet operating inside and outside the Argentine EEZ must be analyzed and incorporated to the information system.</p>
Priority	Medium

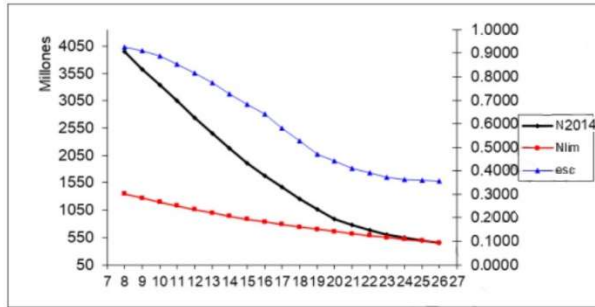
1.2.4. Assessment of stock status	There is an adequate assessment of the stock status		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Appropriateness of assessment to stock under consideration		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
b) Assessment approach	The assessment estimates stock status relative to generic reference points appropriate to the species category.	The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated	
c) Uncertainty in the assessment	The assessment identifies major sources of uncertainty.	The assessment takes uncertainty into account	The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a probabilistic way.
d) Evaluation of the assessment			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
e) Peer review of assessment		The assessment of stock status is subject to peer review.	The assessment has been internally and externally peer reviewed

Scoring Range and Rationale

The assessment and management of the squid fishery in real-time using a escapement limit is also used for the management of the *Illex argentinus* fishery in Malvinas, considered the best-managed cephalopod fishery in the world (Pierce et al., 2010). The approach has been considered elsewhere for management of fisheries for *D. pealeii*, *Loligo reynaudii* (Arkhipkin et al., 2015) and in the European cephalopod fisheries (Pierce et al., 2010), but it has not been widely adopted, although, it is recognized as an adequate assessment/management system for cephalopod resources due to their special characteristics (short lifespans, high metabolic rates, and highly variable growth rates and maturation, largely affected environmental conditions and species phenology). Therefore, it is considered that the assessment is appropriate for the stock but it is unclear if it takes into account the major features relevant to the biology of the species (see paragraph below) and scoring issue a would only meet SG80.

Aubone et al., 2018 analysed the current early warning system (SDAT) for the closure of the Argentine squid fishery and considered that this static system, which aims to a constant escape criteria (proportional escape in number of individuals of 0.4 and escape in biomass of 40,000 t), cannot guarantee an adequate recruitment for the following year. An alternative Dynamic Early Warning System (SDAT) was then developed for the South Patagonian Subpopulation with the intention of achieving a system better adapted to the reproductive biology of the species. This new system could be adapted for the case of the other subpopulations of the Argentine squid and allows for a variable proportional escape, according to the recruitment and survival of the number of individuals in the cohort (affected by fishing). The aim is to meet the objective of facilitating a more stable recruitment / fishing / escape cycle between seasons, making this new system biologically safer. A minimum threshold for the number of recruits was established to allow fishing, based on the observed history of this subpopulation. This threshold was defined based on recruitment, escape biomass and proportional escape, which allowed a development of fishing and of the appropriate subpopulation. An escapement higher than 40% does not necessarily mean a good recruitment in the following year. This may be due to several reasons: the number of specimens that escapes will depend on the number of recruits, and therefore the individuals that escape may not be sufficient in quantity or not of the necessary reproductive quality.

In that report, also explored a threshold limit (1,350,000,000 recruiters in week 8), below which the fishery of the SPS should not be opened. In the figure below an example of the use of this threshold for the 2014 fishing season is shown (Aubone et al., 2018). No initial reference points are currently used by the INIDEP, which means that the fishery has been opened every year independently of the biomass estimates estimated by the pre-recruit surveys. However, it is considered that scoring issue b does not meet SG60 because the escapement goal used by the INIDEP can be considered a generic reference point, but based on the previous information, it does not seem to be appropriate to the stock in all circumstance and SG80 is not met.



Monitoring of the number of individuals, year 2014, escape and acceptable lower limit per week (year 2014) (Aubone et al., 2018).

The assessment undertaken by the INIDEP identifies major sources of uncertainty but based on the information provided in the previous section does not seem to take uncertainty into account. Therefore, scoring issue c does not meet SG 80.

According to Aubone et al., 2018, the new Dynamic Early Warning System (SDAT) for the Argentine squid fishery was first proposed and discussed in November 2004, at the Methodological Discussion Workshop on the Early Warning System of *Illex argentinus*, within the South Atlantic Fisheries Commission, and later presented to the Squid Fishery Monitoring Commission (Federal Fisheries Council). Between 2005 and 2008, it was presented in the international courses organized by JICA-INIDEP. In 2008, the problem of the Early Warning System using a constant escape, and the dynamic escape proposal, was exposed to the INIDEP Resource Assessment Group. Finally, the proposal was presented to experts from Peru, Chile, Japan, Mexico, Spain and the United Kingdom at the International Workshop “Giant Squid Assessment Methodologies (*Dosidicus gigas*)” organized in Peru in September 2017. It was finally presented to the Federal Fisheries Council in 2018. It would constitute an alternative assessment/management option.

Therefore, in reference to scoring issue d, it could be considered that “assessment approaches have been rigorously explored”. However, based on the information provided in the previous paragraph, it cannot state that “The current assessment is robust” as recruitment variability is not taken into consideration. Therefore, SG100 is not met.

In the case of scoring issue e, although the annual recruitment estimates reports are annually presented to the FFC and the SDAT was presented in a number of workshops, it is unclear if there is a regular peer review of the stock assessment or if the stock assessment has been internally and externally peer reviewed. Therefore, this last issue is not scored.

The scoring range was 60-79

Improvement Recommendations

The critical point detected in the pre-assessment is “no initial reference points are currently used by the INIDEP, which means that the fishery has been opened every year independently of the biomass estimated by the pre-recruit surveys”.

To improvement of the stock assessment, taking uncertainty into account, and relative to reference points appropriate to the stock, is recommended a discussion about: - the application of the Dynamic Early Warning System (that was already applied for the SPS to adapt the reproductive pattern of the squids) to other stocks to allow a variable proportional escapement and a stable recruitment; - adjustment of the assessment/management to consider the variability of the recruitment.

	Also, to maintain the regularity of the surveys to support the update of the information. All these considerations are strongly related with those explained in PI 1.1.1. and PI 1.2.2.
Priority	High

Principle 2

2.3.1. ETP species outcome	The UoA meets national and international requirements for the protection of ETP species The UoA does not hinder recovery of ETP species		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Effects of the UoA on population/stock within national or international limits, where applicable	Where national and/or international requirements set limits for ETP species, the effects of the UoA on the population/ stock are known and likely to be within these limits.	Where national and/or international requirements set limits for ETP species, the combined effects of the MSC UoAs on the population /stock are known and highly likely to be within these limits.	Where national and/or international requirements set limits for ETP species, there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits.
b) Direct effects	Known direct effects of the UoA are likely to not hinder recovery of ETP species.	Direct effects of the UoA are highly likely to not hinder recovery of ETP species.	There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species.
c) Indirect effects		Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts.	There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species.
Scoring Range and Rationale	<p>According to the MSC standard “if there are no ETP species caught in the UoAs then the UoA would meet SG 100” Some of the studies consulted, indicate that squid fishing both with and without lights is highly selective gear type (Boyle and Rodhouse 2005, DEH, 2004) and there is virtually no bycatch of fish, seabirds, or marine mammals (Gonzalez and Rodhouse, 1998; Laptikhovsky et al.).</p> <p>None of the INIDEP reports consulted in this study have registered any record of direct or indirect catches of ETP in the squid fishery caught by jiggers. This information has subsequently been confirmed through Zoom interviews with the client and Head of the Cephalopod fisheries programme of INIDEP (PhD Marcela Ivanovic).</p> <p>However, in the PAN-Birds (2010), according to surveys conducted among observers and crew members of the jigging fishing vessels, 27% of respondents confirmed the occurrence of bird entanglements in fishing gear. The most abundant species were the royal albatross, the wandering albatross and the white-chinned petrel. Of the total birds hooked, 34% were released by the crew and 1% were released by themselves. Among the species released</p>		

9% were unharmed, 21% were seriously injured and 2% died. On the other hand, 11% of the fishers interviewed indicated that there could be cases of intentional capture of birds.

An exploratory study on board the jigging fleet, operating in the St Matias Gulf, reported occasional bycatch of Black-browed albatross (Savigny et al. 2005). Under the SMBSA project (FPN - WCS) and the On-Board Observer Program of Rio Negro province, two campaigns were carried out in the San Matías Gulf (June - August 2003, 41 days in total) to survey the presence of seabirds associated with the Illex jigging fishery. 300 fixed-radius censuses of marine birds and mammals, both associated and in transit, were undertaken, plus observations of the use of the discarded residues by the superior fauna. A total of 22 species of seabirds were recorded. The incidental capture of 2 specimens of *T. melanophris*, a collision of *Pelecanoides urinatrix*, and a phenomenon of attraction of about 10,000 continental birds by the lights of the ship were recorded. The resultant mortality of this last group was not estimated numerically. This study represents the first survey of the interaction of birds with jigging vessels developed in the Argentinean Sea and a similar project has been proposed for the jigging fleet that operates intensively over the continental slope (Savigny, 2005).

There are also informal reports of catches of Rockhopper penguin and Magellanic penguins in the fishery (Frere & Gandini unpublished data, PAN-Aves, 2010). In other regions, this fishing gear generates bird mortality as birds are blinded by the powerful lights used by the vessels and collide with the vessel or fishing gear (Kock 2001).

Regarding marine mammals and turtles, no mention was found about interactions by the squid jigging fleet in the PAN-MAM and PAN-TM. However, there are a few studies confirming entanglement or interaction of southern elephant seals (*Mirounga leonina*) with squid fishing gear. One study confirmed repeated entanglement of animals in monofilament from the jig fishery on the Patagonian shelf at Península Valdés (42° 04' S, 63°45' W), in some cases with jigs still attached (Campagna et al. 2007). Southern elephant seals forage for squid, fish, and crustaceans (Burton and van den Hoff 2002) to depths that average 500 m so their foraging grounds overlap both spatially and temporally with the jig fishery; however minimal interactions are anticipated (Burton and van den Hoff 2002). Overall, the southern elephant seal is not believed to be substantially impacted by this fishery.

In addition according to the information provided by the client, part of the fleet that carries out evisceration on board, the offal produced is thrown overboard. No information has been found about which species could be attracted by this practice, considering that greater monitoring of the possible attraction of predators due to this practice is necessary.

Therefore, the data provided should be validated in order to verify the assumption that due to the highly selective gear used in the fishery, although bycatch of ETP species is expected to be low.

Scoring issue a, SG80 requires that "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".

In general, there is no evidence that for any of the ETP species mentioned in section 3.4.3, specific population limits have been established. However, lists of ETP species that interact with fisheries have been developed, national and international legislation regulates the conservation and preservation of ETP and national plans have been established to reduce interactions of fishing activities with them (PAN-Aves, PAN-MAM, PAN-TM).

As complementary action to those mentioned above, the observers on board

	<p>the INIDEP collect data on bird, marine mammals and reptiles' bycatch and there is also a regional observer programme.</p> <p>However, it is not possible to conclude from the data available that there is a high degree of certainty that the combined effects of the MSC UoAs are within these limits and no studies have been found that determine the impact of the combined effects ETP'S interactions of the two UoAs.</p> <p>Scoring issue b. SG80 requires that "Direct effects of the UoA are highly likely to not hinder recovery of ETP species".</p> <p>Based on the available information mentioned above and the lack of an accurate record of interactions with ETP, it cannot be determined with high probability that the direct effects of UoA do not hinder the recovery of ETP species.</p> <p>Scoring issue c. SG80 requires that "Indirect effects have been considered for the UoA and are thought to be highly likely to not create unacceptable impacts"</p> <p>Based on the available information mentioned above and the lack of an accurate record of interactions with ETP it cannot be determined with highly likely that the indirect effects do not create unacceptable impact.</p> <p>The score range was 60-79</p>
<p>Improvement Recommendations</p>	<p>The main weakness described in the pre-assessment related with ETP species outcome is that the fishery highly likely to not hinder recovery of them.</p> <p>The argument is based in the lack of records of interactions of ETP species that do not allow the direct and indirect effects with fishing activity.</p> <p>However, there are several aspects that can be addressed in this PI if they are used in synergic way. One of them is the high coverage of on board observers of the INIDEP and some regional programs, that can continue to collect data, organize it in a data base. Other aspect is the successful experience of the NGOs in the improvement of the data collection of OBOs (with video-cameras, design of new protocols) in other certified fisheries where the interaction between ETP and fleet is a challenge.</p>
<p>Priority</p>	<p>Low</p>

<p>2.3.2. ETP species management strategy</p>	<p>The UoA has in place precautionary management strategies designed to: meet national and international requirements; ensure the UoA does not hinder recovery of ETP species.</p> <p>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species</p>		
<p>Scoring Guidepost</p>	<p>SG 60</p>	<p>SG 80</p>	<p>SG 100</p>
<p>a) Management strategy in place (national and international requirements)</p>	<p>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.</p>	<p>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</p>	<p>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</p>

		protection of ETP species.	protection of ETP species
b) Management strategy in place (Alternative)	There are measures in place that are expected to ensure the UoA does not hinder the recovery of ETP species.	There is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species	There is a comprehensive strategy in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species.
c) Management strategy evaluation	The measures are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species).	There is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved.	The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a quantitative analysis supports high confidence that the strategy will work.
d) Management strategy implementation		There is some evidence that the measures /strategy is being implemented successfully.	There is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b).
e) Review of alternative measures to minimize mortality of ETP species	There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA related mortality of ETP species.	There is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA related mortality of ETP species and they are implemented as appropriate.	There is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA related mortality of ETP species, and they are implemented, as appropriate.
Scoring Range and Rationale	<p>Scoring issue a, SG80 requires 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”. Although national action plans have been developed to reduce interactions with birds, marine mammals and sea turtles in Argentine waters, it does not establish any specific mitigation measures to reduce the impact of the jigging fishing fleet on ETP species. Scoring issue c and d, the management system is specific to <i>Illex argentinus</i>, (Resolución CFP N° 14/2016).</p> <p>However, the fact that the directed <i>Illex argentinus</i> fishery can only be extracted using jigging gear can be considered a management measure in itself due to the high specificity and selectivity of the gear. Therefore, it is</p>		

	<p>considered that SG100 would not be reached in any of the two scoring components.</p> <p>Scoring issue e. The review of these plans is triennial for the PAN-MAM and the PAN-TM; and annual in the PAN-AVES. Therefore, it not considered that It would reach the SG100.</p> <p>Scoring range was 60-79</p>
Improvement Recommendations	<p>Some qualitative information describes birds' entanglement in the jigging fleet (royal albatross, the wandering albatross and the white-chinned petrel), and non-lethal interactions with marine mammals.</p> <p>The client will work in cooperation with INIDEP and sea bird study group of Universidad Nacional de Mar del Plata, in order to address participative action to address the design a management strategy. The client might works with scientific groups and NGOs to develop a strategy for managing the jigging fleet on ETP species (sea birds, marine mammals and sea turtles) based in the data collected (described above), including measures to minimize mortality, that will be included in the PAN-AVES in order to achieve national and international requirements.</p>
Priority	Low

2.3.3. ETP species information	<p>Relevant information is collected to support the management of UoA impacts on ETP species, including:</p> <p>Information for the development of the management strategy;</p> <p>Information to assess the effectiveness of the management strategy; and</p> <p>Information to determine the outcome status of ETP species</p>		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Information adequacy for assessment of impacts	<p>Qualitative information is adequate to estimate the UoA related mortality on ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Qualitative information is adequate to estimate productivity and susceptibility attributes for ETP species.</p>	<p>Some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.</p> <p>OR</p> <p>If RBF is used to score PI 2.3.1 for the UoA: Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species.</p>	<p>Quantitative information is available to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status of ETP species.</p>

<p>b) Information adequacy for management strategy</p>	<p>Information is adequate to support measures to manage the impacts on ETP species.</p>	<p>Information is adequate to measure trends and support a strategy to manage impacts on ETP species.</p>	<p>Information is adequate to support a comprehensive strategy to manage impacts, minimize mortality and injury of ETP species, and evaluate with a high degree of certainty whether a strategy is achieving its objectives</p>
<p>Scoring Range and Rationale</p>	<p>Scoring issue a, SG100 requires that “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” Although there is some qualitative and quantitative information on the interactions of the jigging fleet on ETP (PAN-Aves, Campagna et al, 2007, Savigny et al 2005). The quantitative information is not considered sufficient to understand the interaction of the fishery with seabird’s species and some marine mammals. The available information on seabirds would probably only reach the minimum level of SG80. In case of a full assessment, more specific studies (including in PANs the monitoring of jigging fleet and increasing number of observers on board) should be undertaken to estimate and characterise the interactions of the UoA with seabirds and other ETP species, as well as to quantify the individual and combined impacts of the UoAs.</p> <p>Scoring issue b, the SG80 requires that "Information is adequate to measure trends and support a strategy to manage impacts on ETP species”. It is considered that the information is not sufficient to reach the SG80, since with the information available it is not possible to determine with a high degree of certainty whether the strategy is succeeding in reducing both the individual and combined impacts of the UoAs.</p> <p>The scoring range was 60-79</p>		
<p>Improvement Recommendations</p>	<p>In this PI, pre-assessment prevents about some lack of information collect in situ of identified species and nature and degree of impact able to develop a strategy to quantify and prevent ETP species injuries.</p> <p>Some qualitative information describes birds’ entanglement in the jigging fleet (royal albatross, the wandering albatross and the white-chinned petrel), and non-lethal interactions with marine mammals. As has been detailed above, the client might work in cooperation with INIDEP (Cephalopods group and OBOs) and sea bird study group of Universidad Nacional de Mar del Plata, in order to design a plan of monitoring seabird interaction to collect information to assess effects of the squid fleet (real or potential mortality). The objective must be to provide quantitative information adequate to assess the impact and related mortality in seabirds and marine mammals. This implies: - to design a protocol to record entanglement or collapse of sea birds with the ship produced by attraction by the lights during fishing time or entanglement of marine mammals with monofilament when the fishing operations overlaps with foraging areas; - to include the monitoring of jigging fleet in PANs and; increasing the degree of coverage by OBOs.</p>		
<p>Priority</p>	<p>Medium</p>		

2.5.3. Ecosystem information	There is adequate knowledge of the impacts of the UoA on the ecosystem		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Information quality	Information is adequate to identify the key elements of the ecosystem.	Information is adequate to broadly understand the key elements of the ecosystem	
b) Investigation of UoA impacts	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but have not been investigated in detail.	Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.	Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and have been investigated in detail.
c) Understanding of component functions		The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known.	The impacts of the UoA on P1 target species, primary, secondary and ETP species and habitats are identified and the main functions of these components in the ecosystem are understood.
d) Information relevance		Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred.	Adequate information is available on the impacts of the UoA on the components and elements to allow the main consequences for the ecosystem to be inferred.
e) Monitoring		Adequate data continue to be collected to detect any increase in risk level.	Information is adequate to support the development of strategies to manage ecosystem impacts.
Scoring Range and Rationale	<p>SG60 only concerns two scoring components: a and b.</p> <p>Scoring issue a, SG80 requires that “Information is adequate to broadly understand the key elements of the ecosystem. Although there is no conclusive information available to support the analysis of the fishery’s impact on the ecosystem, it is considered that there is sufficient and adequate information to comprehensively understand the key elements of the ecosystem. Therefore, it would probably achieve, an unconditional pass, reaching a minimum of SG80.</p> <p>Scoring issue b, SG80 requires that “Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and some have been investigated in detail.”. Again, it is considered that the SG80 would be achieved; although the complexity of the trophic relationships of the Illex</p>		

	<p>argentinus is a significant challenge, it can be considered that the sum of the research efforts developed during the last decades has produced enough information to allow inferring some of the main effects of the AoU on the key elements of the ecosystem.</p> <p>Points c, d and e are assessed from the SG80 only.</p> <p>Point c, SG80 requires that “The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are known” Although it cannot be concluded definitively that the main functions of all ecosystem components are known, it could be argued that at least at a baseline level the main functions of the most important ecosystem components are known. Therefore, this area could be considered as reaching the SG80.</p> <p>Scoring issue d, the SG80 requires 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 SG80 would probably be reached.</p> <p>Scoring issue e, the SG80 implies that " Adequate data continue to be collected to detect any increase in risk level.". In this case it should be examined whether the SG80 is actually achieved. It should be verified that data on the main components of the ecosystem are indeed being collected on a regular basis, and that the quality of this information is sufficient and adequate to detect increases in the level of risk. With the available information, there is no evidence that this is happening; it would not reach the SG80.</p>
Improvement Recommendations	<p>The marine ecosystem of the Argentine Continental Shelf has been studied by decades and a great body of information has been collected and, probably, need to be integrated. However, the ecosystem is modified by human activities and climatic change that alter the abundance of species transforming it in a continuous “moving target”. Then, two actions were identified to this PI: - design a strategy to collect ecosystem components information in a continuous way; - regular updating the information of ecosystem components and their variation in order to detect any increase in risk level produced by the fleet activity.</p> <p>The client must collaborate with the scientific groups to establish a protocol to regularly collect information of the ecosystem components affected by the abundance fluctuation of the squid which can affect the complex trophic relationships.</p>
Priority	Low

3.2.1. Fishery-specific objectives	The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC’s Principles 1 and 2		
Scoring Guidepost	SG 60	SG 80	SG 100
a) Objectives	Objectives, which are broadly consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are implicit within the fishery-specific	Short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC’s Principles 1 and 2, are explicit within the	Well defined and measurable short and long-term objectives, which are demonstrably consistent with achieving the outcomes expressed by MSC’s Principles

	management system.	fishery-specific management system.	1 and 2, are explicit within the fishery-specific management system.
Scoring Range and Rationale	<p>a) Objectives: Fishery-specific objectives for this fishery has been defined along the years in collaboration between the Fishing Authorities (FFC) and the National Fishing Research Institute (INIDEP) in response to the need to regulate a growing fishing sector targeting shortfin squid. As a result, there is a large number of fishery-specific acts and resolutions scattered in several official publications from different institutions (mostly INIDEP and FFC) involved in the management of this fishery. These regulations targeting the shortfin squid fishery are so far resumed in the Resolution No 14/2016. This resolution can be considered as a first attempt to develop a specific management plan for this fishery. It contains in detail the two main operational objectives for this fishery, partially formalizing the long term MSY objective, which includes:</p> <ul style="list-style-type: none"> • Establishing automatic jigging as the authorized fishing method for catch this species setting a maximum limit of 20% for bycatch by trawlers, promoting the use of this high selective fishing gear; • Setting the two management units with seasonal closures that formally recognizes the existence of four population sub-units and ecosystems. <p>However, the main specific long-term objective addressing these two main operational rules is not explicit in this law, which limiting catches to maintain each sub-unit at population levels equivalent to 40% of unexploited biomass.</p> <p>According to the INIDEP advise, this objective is transposed into the fisheries management system as seasonal closures upon the most recent stock survey available. As a result, the fishing dates are set for the two management units and implemented by the FFC. At international level, the Technical Commission of Rio de la Plata River and it Maritime Front Treaty CTMFM has adopted the same fishery-specific objectives, coordinating the corresponding operational fishing dates for its jurisdiction.</p> <p>According to the information consulted, the dates of the seasonal closures have been negotiated upon request of the fishing sector, mostly to guarantee that the national fleet has early access to the resource before being caught illegally in the ZEE or beyond in the unregulated high seas. Moreover, the execution of the two stock assessment entrusted to INIDEP have not been performed regularly.</p> <p>Conclusion: Even if the management for this fishery has developed a large set of specific measures in response to the long-term sustainability of the resource and its surrounding ecosystems, the lack of a specific management plan, where all these measures are organized as part of a comprehensive document, where among other needs, the objective of maintain each sub-unit at population levels equivalent to 40% of unexploited biomass must be explicitly included, as well as operational details of its implementation. For these reasons, the evaluation team considers that this fishery only reaches the minimum SG60.</p> <p>The scoring range was 60-79</p>		
Improvement Recommendations	<p>The PI claims for written evidence that short and long-term objectives to achieve a sustainable harvest of squid stocks and acceptable impact on other</p>		

	<p>species and ecosystem are explicit within a fishery-specific Management Plan (MP), and the pre-assessment concludes that there is a lack of (MP) as a document where the objectives and all the set of management measure applied are compiled.</p> <p>The fishery under a MSC assessment process must has explicit fishery-specific objectives consistent with the expected outcomes for the squid stocks (P1), by-catch species, threatened endangered and protected species (sea birds, marine mammals and turtles) and environment affected by the fishery (P2) in different ways. It is a declaration of such aspects will be considered in the studies and management actions, and that are commonly included in the Management Plan of the fishery.</p> <p>The client group might work with INIDEP and CFP to define short and long-term objectives to achieve a sustainable harvest of squid stocks and interaction with other components of the ecosystem. The actions can include the discussion in meetings/Commission to decide the scope of the MP and formal presentation of the draft MP with explicit fishery-specific objectives.</p> <p>The ideal FIP objective would be the evidence of the management authority has formally established the management plan with the objectives, consistent with the expected outcomes for the squid stocks, by-catch species, threatened endangered and protected species (sea birds, marine mammals, and turtles) and environment affected by the fishery in different ways.</p>
Priority	Medium

3.2.3. Compliance and enforcement	Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with		
Scoring Guidepost	SG 60	SG 80	SG 100
a) MCS implementation	Monitoring, control and surveillance mechanisms exist, and are implemented in the fishery and there is a reasonable expectation that they are effective.	A monitoring, control and surveillance system has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules.	A comprehensive monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules
b) Sanctions	Sanctions to deal with non-compliance exist and there is some evidence that they are applied.	Sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence.	Sanctions to deal with non-compliance exist, are consistently applied and demonstrably provide effective deterrence.
c) Compliance	Fishers are generally thought to comply with the management system for the fishery under assessment, including, when required, providing	Some evidence exists to demonstrate fishers comply with the management system under assessment, including, when	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.	required, providing information of importance to the effective management of the fishery.	information of importance to the effective management of the fishery.
d) Systematic non-compliance		There is no evidence of systematic non-compliance	
Scoring Range and Rationale	<p>a) <u>MSC implementation</u>: A large set of monitoring, control and surveillance tools are in place in the fishery, which are used to control the activities of fishing vessels within Argentine ZEE jurisdiction and surrounding waters, among the most relevant we can include:</p> <ul style="list-style-type: none"> • Fishing licensing vessel registration requirements according to FFR (art. No. 23, No. 24 and No. 26 of the Law No. 24.922) and article 14No. of Federal Decree 748/1999); • Vessel Monitoring System (VMS) requirements (article No 33. of and Disposition SSPyA No. 2/2003 and 206/2010); • Fishing gear and method restrictions (art. No.17and No.21 of FFR Law 24.922); • On board inspectors in many fishing travels (SSPyA Disposition No. 424 / 2004); • Catch reporting system on a weekly basis by the Electronic Fishing Report (PPE = Parte de Pesca Electrónico; Res. No. 45/2020); • Control of landings (e.g. requirement to land only to licensed fish receivers) (SAGyP Resolution NNo. 167/309); • Control of transshipments (art. No 15. and No. 16 of Federal Decree No. 748/1999); • Legal Catch Certification System (SSPyA Disposition No. 8/2009); • Control and surveillance conducted by the PNA/Navy as part of the integrated Control of Fishing Activities (SICAP) system; • A permanent scientific observer program and fishing surveys by INIDEP. <p>Therefore, MCS mechanisms are well implemented in the fishery. With regard to the operative control of the fleet, SSPyA has implemented the Integrated Control of Fishing Activities (SICAP), comprising: a) Satellite Positioning System of the National Fishing Fleet, b) satellite data about the area where foreign fishing vessels operating outside the Argentine EEZ provided by the National Commission on Space Activities, and c) activities of control and surveillance conducted by the PNA, Navy and Air Force, consisting of both marine units (Coast Guard and corvettes) and air units (aircraft and helicopters) to control illegal fishing. This system is complemented with the control of landings and the information collected through the Electronic Fishing Report.</p> <p>At international level, the same MCS tools are applicable by both parts in the Uruguayan-Argentinian Common Fishing Zone (ZCPAU; Law No. 20.645).</p>		

Conclusion: The effectivity of the MCS system largely depends on the ability to control the fleet working beyond the Argentine ZEE, which affects to the sustainability of the target resource. Thus, the lack of regional coordination and the risk of non-compliance by foreign fleets are important issues which need to be addressed by the broader MCS. According to this, we consider that the MSC is not fully comprehensive, unable to demonstrated a consistent ability to deal with the existing level of IUU fishing. This results in a scoring of SG80 for this SI.

b) Sanctions: chapter XIII of the FFR Law No. 24.799, contains more than 19 articles where the sanctions system in force is explained in detail. This chapter is complemented by the chapter VII of the Decree 748/1999 which incorporates 15 articles more about it. Thus, a consistent sanction framework is thought to exist. However, records of sanctions for non-compliance in the national fleet of this fishery have not been founded during this analysis, probably due a consistent application of sanctions and a proven effective deterrence. Also, has been indicated by Administrative Procedure law 19.549 and its Regulatory Federal Decree N° 1759/72 that key parts of the management system, include the law enforcement are subject to regular internal review from the Ministry of Agriculture, Livestock and Fisheries – Internal Audit Unit and occasional external reviews from the National General Syndication and the National General Auditory.

At international level, in the ZCPUA the same sanction regime is applied for the argentine shortfin squid fishery fleet which are forwarded to Argentinian's national authorities and follow the corresponding legal framework. No records of sanctions have been reported for the national fleet in the ZCPUA. However, large IUU fishing operations occur in the high seas, in waters adjacent to the Argentinian ZEE by a foreign fishing fleet which often invades the Argentinian ZEE. As example, recent satellite imagery surveys have reported 95 fishing jigging vessels operating illegally inside the first ten miles of the Argentine ZEE outside border (PESCARE, 2020). Therefore, the efforts made to sanction these incursions in the Argentine EEZ, with the application of the National Action Plan to prevent, deter and eliminate the illegal, unreported, and unregulated fisheries (IUU PAN), among others, do not provide evidence of deterrence due the large levels of IUU activities recorded in recent years.

Conclusion: The arguments mentioned above indicate that this fishery is satisfactorily compliant with the SG60, but not SG80 and SG100.

c) compliance: as mentioned in the previous section 3.2.3, a large set of monitoring control and surveillance tools are in place which are used to control the activities of fishing vessels within the Argentine ZEE and surrounding waters. Part of the evidence that fishers comply with the management system is the implementation of the Electronic Fishing Report (PPE = Parte de Pesca Electrónico; Res.45/2020) for all the vessels authorized to work in the fishery, which makes possible to known when and where the fishing operation takes place and its catch. Moreover, at the end of the fishing season, this PPE is analyzed by the authorities (INIDEP/SSPyA) and published in a yearly final fishery report.

Also there are fishing inspectors (SSPyA officials) monitoring landings at the fishing harbors.

However, the Integrated Control of Fishing Activities (SICAP), which guarantees the efficacy of the MCS system as part of a comprehensive enforcement program, has recorded and reported permanently IUU activities in

	<p>the Argentine ZEE and surrounding waters. Thus, despite this IUU fishing is carried out by a foreign fleet, violations in the Argentina ZEE fall under the control of the national management authority. And although now and then some foreign fishing vessels are caught in the Argentine EEZ and sanctioned by the authorities, it is considered that current sanctions do not provide evidence of effective deterrence of the current MCS system for this UoA.</p> <p>Conclusion: The arguments mentioned above indicate that this fishery meets the SG60 but not the SG80 for this SI.</p> <p>d) <u>systematic non-compliance</u>: As mentioned before in previous SI, no records of infringements indicating persisting violations of the fishing rules have been reported for the national fleet. However, the large systematic non-compliance of the foreign fleet which operates in the high seas and regularly invades the national jurisdiction, is jeopardizing the established MCS system in national waters, and it is considered for the scoring of this SI.</p> <p>Conclusion: The arguments mentioned above indicate that this fishery do not meet the SG80 for this SI</p> <p>The score was 60-79</p>
<p>Improvement Recommendations</p>	<p>The goal to satisfy the requirements of this PI is improve and installing an effective system to prevent and sanction the incursions of the international fleet inside the EEZ.</p> <p>The presence of the many foreign jigging vessels that income inside the EEZ of Argentina is one the most severe weakness of the squid fishery. The key aspect, in the FIP context, is the solution is out of the scope of the client. Even more, the large set of monitoring, control and surveillance tools that are in place in the fishery, which are used to control the activities of fishing vessels within Argentine ZEE jurisdiction and surrounding waters contrast with the number of vessels that, inside or outside the EEZ are waiting for the Argentine squid.</p> <p>The challenge of the FIP is to promote a strong control of the fleet working beyond the Argentine ZEE, which affects to the sustainability of the target resource which might be tiggered by SSPyA.</p> <p>The concrete action will be to interact with national authorities to reinforce two components of the Integrated Control of Fishing Activities (SICAP): a) satellite data about the area where foreign fishing vessels operating outside the Argentine EEZ provided by the National Commission on Space Activities, and b) activities of control and surveillance conducted by the PNA, Navy and Air Force in order to avoid illegal, unreported, and unregulated fishing activities (IUU).</p>
<p>Priority</p>	<p>Medium</p>

<p>3.2.4. Monitoring and management performance evaluation</p>	<p>There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives</p> <p>There is effective and timely review of the fishery-specific management system</p>
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Scoring Guidepost	SG 60	SG 80	SG 100
a) Evaluation coverage	There are mechanisms in place to evaluate some parts of the fishery-specific management system.	There are mechanisms in place to evaluate key parts of the fishery-specific management system.	There are mechanisms in place to evaluate all parts of the fishery-specific management system.
b) Internal/external peer review	The fishery-specific management system is subject to occasional internal review.	The fishery-specific management system is subject to regular internal and occasional external review.	The fishery-specific management system is subject to regular internal and external review.
Scoring Range and Rationale	<p>a) Evaluation coverage: According to article N°85 of the Argentine National Constitution (Law No. 24.430), the General Audit Office of the Nation is designated as the institution in charge of external review of the national public administration, including the Undersecretary of Fisheries and Aquaculture (SSPyA). In addition, there is an Annual External Control Program (AECP) for the public administration defined by Law 24,156 (art. 118). It has been verified that an audit of the environmental management of the SSPyA was conducted (resolution 032/2015) as a result of the annual external control program (AECP) (see https://www.agn.gob.ar/). Also, in coherence with the AECP, INIDEP have incorporated into their administrative structure an Internal Audit Department to evaluate compliance with the policies, plans and procedures established. It is also important to mention that in order to guarantee the coverage and operation of audits in the Argentine nation, Law No. 27,275 (Law on Access to Public Information) establishes as a principle that all information held by the State is presumed to be public, except those exceptions provided for in article 8.</p> <p>Thus, this analysis reveals that there is an comprehensive legal framework that establishes and regulates auditing procedures in the public administration at national level. In addition, key institutions, such as INIDEP, have incorporated internal audit process within its structure. Also, it has been verified that some audits have been carried out on key institutions of the management system for different purposes. However, documentation proving periodical evaluations (internal/external) to the different elements of the management system of the fishery, such as: management regulations, MCS, stock assessment of the fishery, has not been found during this analysis.</p> <p>Conclusion: The arguments mentioned above indicate that this fishery is satisfactorily compliant with the SG60 and SG80 for this SI.</p> <p>b) Internal and/or external review: Despite existing occasional external/internal evaluations to key institutions involved in the management of this fishery, as mentioned in the previous SI, specific reviews for this fishery are not described in the documents consulted, and consequently, we assume that they have not been implemented in the legislation.</p> <p>Conclusion: The lack of a specific management plan for this fishery, as mentioned in point 3.1.1, where the process for regular internal and occasional external review processes for each of the management mechanisms (such as: stock assessment, MCS, Law Enforcement, etc.) should be described, results in</p>		

	a score lower than SG80 for the fishery.
Improvement Recommendations	<p>The fishing administration system has in place permanent mechanisms to review the evolution of any fishery and to introduce corrective actions, if necessary. Key parts of the management system are subject to regular internal review from the Ministerio de Agroindustria – Internal Audit Unit and occasional external reviews from the Sindicatura General de la Nación and the Auditoria 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 these procedures are established by an Administrative Procedure 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 internal review of the performance of the fishery against stated goals takes place more than an annual year meeting that is attended by the interested parties and some meetings at INIDEP with the industry.</p> <p>On board inspectors produce a report forwarded from specific program (Programa Adquisición de Información Biológico- Pesquera y Ambiental) to INIDEP authority (DIRECCION NACIONAL DE INVESTIGACION) and the Application Authority.</p> <p>Fishery statistics are also published in the websites of CFP and the Subsecretaría de Pesca y Acuicultura (SSPyA), like the positioning of fishing vessels, which is regularly updated.</p> <p>The way in which CFP publishes its sessions and decisions, like the Publishing of the INIDEP reports, imply the opportunity for all the stakeholders to assess the system (www.cfp.gob.ar).</p> <p>Therefore, only remain that all these procedures be explicit in the management plan, and no other actions are required.</p>
Priority	Low