WESTERN ASTURIAS OCTOPUS TRAPS FISHERY OF ARTISANAL COFRADÍAS

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ANNOUNCEMENT COMMENT DRAFT REPORT

NOVEMBER 2020

Conformity Assessment Body (CAB)	**Bureau Veritas Certification Holding SAS** Contact: icc.mscfisheries@es.bureauveritas.com; macarena.garcia@bureauveritas.com
Assessment team in the ACDR	**Angel F. González González, Gonzalo Macho Rivero, José Ríos and Macarena García**
Fishery client	**Asociación de armadores de la pesquería de pulpo con certificado de sostenibilidad (ARPESOS)**
Assessment Type	**First Reassessment**

1 Contents

2 Glossary

Below are presented the abbreviations and acronyms used in the report. The terms defined here do not contradict terms used in the MSC-MSCI vocabulary.

Concepts, terms, Institutions, Organizations, Bodies, Working Groups, regulations and agreements

ACDR	(MSC) Announcement Comment Draft Report
ARPESOS	Certified octopus ship owners' association (Asociación de armadores de la pesquería de pulpo con certificado de sostenibilidad)
BOPA	Official Gazette of the Principality of Asturias (Boletín Oficial del Principado de Asturias)
B_{MSY}	Biomass (population size) that enables a fish stock to deliver the maximum sustainable yield (MSY).
BV	Bureau Veritas
CAB	Conformity Assessment Body (in this case Bureau Veritas)
CEDER	Local Development Center (Centro de Desarrollo Navia-Porcía)
CEP	Fisheries Experimentation Centre (Centro Experimentación Pesquera)
CFP	Common Fisheries Policy of the European Union
CoC	(MSC) Chain of Custody
COFWG	Certified Octopus Fishery Working Group
CPRDR	(MSC) Client and Peer Review Draft Report
CPUE	Catch per unit effort
DGMARE	Directorate-General for Maritime Affairs and Fisheries, European Commission
DGPM	General Directorate of Maritime Fisheries, Government of Asturias (Dirección General de Pesca Marítima, Gobierno del Principado de Asturias)
EC	European Commission
EMFF	European Maritime and Fisheries Fund
ETP	Endangered, threatened and protected species
EU	European Union
F	Fishing mortality
FAO	Food and Agriculture Organization of the United Nations
FCP	(MSC) Fisheries Certification Process
FCR	(MSC) Fisheries Certification Requirements (superseed by FCP and FS)
FDR	(MSC) Final Draft Report
FiB	Fishing in Balance Index
FS	(MSC) Fisheries Standard
GCR	(MSC) General Certification Requirements

HCR	Harvest Control Rules
IEO	Spanish Institute of Oceanography (Instituto Español de Oceanografía)
ICES	International Council for the Exploration of the Sea
LFI	Large Fish Indicator
LTL	Low Trophic Level
MAPA	Spanish Ministry of Agriculture, Fisheries and Food (Ministerio de Agricultura, Pesca y Alimentación, Gobierno de España)
MCS	Monitoring, Control and Surveillance system
MSC	Marine Stewardship Council
MSY	Maximum Sustainable Yield
MTI	Marine Trophic Index
NGO	Non-governmental organization
OFMC	Octopus Fishery Monitoring Committee (Comisión de Seguimiento del Plan de Gestión del pulpo común)
OFMP	Octopus Fishery Management Plan (Plan de Gestión del pulpo común)
OMA	Asturian Marine Observatory (Observatorio Marino de Asturias)
P1, P2, P3	(MSC) Principles 1, 2, 3 respectively
PCR	(MSC) Public Certification Report
PI	(MSC) Performance Indicator
PRI	Point of Recruitment Impairment
RMTI	Region-based MTI (Marine Trophic Index)
SA	(MSC) Surveillance audit
SI	(MSC) Scoring Issue
SG	(MSC) Scoring Guidepost
SGP	General Secretariat for Fisheries, Spanish Government (Secretaría General de Pesca, Gobierno de España)
s st.	Sensu stricto
SV	Surveillance
TAC	Total Allowable Catch
UoA	(MSC) Unit of Assessment
UoC	(MSC) Unit of Certification
WWF	World Wide Fund for Nature

3 Executive summary

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

This fishery was assessed against MSC Fisheries Certification Requirements (FCR) version 2.0, and got the MSC-Fisheries certificate on February 10, 2020. As a result of the initial assessment four conditions were raised on Performance Indicators (PI) 1.2.2 (HCRs & tools), 3.2.1 (Fishery specific objectives), 3.2.2 (Decision making processes), and 3.2.3 (Compliance & enforcement). However, during the first surveillance PI 3.2.3 was re-scored based on new findings and downgraded; condition 4 was therefore modified and a new condition was established (modified condition was called 4A). As a result of forth surveillance audit, condition 1 (PI 1.2.2) was found 'behind target' and a remedial action was set, condition 2 (PI 3.2.1) was already closed on 3SA, PI 3.2.2 was rescored to 85 and therefore condition 3 was closed, and condition 4A (PI 3.2.3) was found 'on target' but condition remains open. Progress on these two open conditions will be checked during the site visit planned for the beginning of 2021. Both pending conditions should be closed before the certificate expires on 9th August, 2021.

The reassessment process follows FCP v2.2, and the performance of the fishery will be assessed against FS v2.01. The MSC Reporting Template v1.2 will be used to prepare the mandatory reports along the assessment process (ACDR, CPRDR, PCDR, FDR and PCR). Current Announcement Comment Draft Report (ACDR) provides details, first to the client, and then to relevant stakeholders and public on the status of fishery at entering re-assessment, including the likely scores against all Performance Indicators (PI). After reviewing the ACDR, the client agreed to enter re-assessment process. The ACDR will be published at the MSC website together with the notification that the fishery is entering re-assessment. The CAB shall allow at least 30 days for stakeholder input before the site visit takes place.

Current report was prepared by Bureau Veritas Iberia. The assessment team for this ACDR was comprised of Ángel Gonzalez (mainly responsible for assessing P1), Gonzalo Macho (mainly responsible for Principle 2 and 3) and José Ríos (team leader and mainly responsible for assessing Principle 2). However, Jose Rios was replaced by Macarena García before the publication of the ACDR, from now onwards Macarena García will take up on his assigments as Team Leader.

The reassessment site visit is scheduled for the second half of January 2021 and it will take place in several cities and ports of Asturias.

The main strengths of the UoA are listed below:

- The monitoring of the fishery and the studies undertaken evidenced that despite the variability of abundance of these short-lived cephalopod, the explotation rate is low from 1990 onwards.
- The fishing effort has dropped since 2000, which certainly contributed to maintain the stock under acceptable exploitation levels.
- The fishery has a regular on-board observer program established which allows to: (i) have detailed information on the catches composition, including the discarded fraction; (ii) determine the survival rate of the discarded fraction at the time of being removed from the trap.
- There are no main primary or secondary species impacted by the UoA.
- The only ETP species impacted by the UoA is the pink lady (*Charonia lampas*). All individuals caught are returned alive to the sea, and a post-capture survival study indicates that all individuals are still alive in laboratory 2 weeks after being captured.
- The fishery does not encounter VMEs
- All the UoA fleet is permanently tracked by a mandatory GPS-GPRS device (the fishing operation can be distinguished from navigating).
- The artificial bait is frequently used by the UoA (in particular in some of the ports), allowing to reduce the total volume of bait species used by the UoA.
- There is a strong governance and policy framework and, generally a strong fishery specific management system as well.
- The management policy and the fishery have explicit long and short term objectives to guide decision-making and to achieve the outcomes expressed by MSC's Principles 1 and 2.
- The fishery has a responsive and transparent decision-making process in which all stakeholders are actively participating, mainly through the Octopus Fisheru Monitoring Committee, which has become the main forum for discussion around the fishery.
- The fishery has a strong monitoring system in place with an on-board observer program, a good landings monitoring, a formal stock assessment and a vessel tracking monitoring system for the whole fleet.

On the other hand, the main weaknesses of the UoA are detailed below:

- It is not proved that the harvest strategy is responsive to the state of the stock, and it would be necessary to have a precaucionary HCR in place.
- There is general knowledge of the catches made by other fisheries in the stock, but this information has not been updated since 2014.
- The estimation of bait species used by the UoA is based on a single query performed in 2017 among the fishers. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.
- Two of the bait species used by the UoA come from stocks which are below PRI (Atlantic horse mackerel and sardine from the Cantabrian Sea and Atlantic Iberian waters) and another two comes from species (bogue and garfish), whose stock status are unknown since they are data deficient. This revels deficiencies in the evaluation and implementation of the fishery strategy regarding the species/stocks used as bait.
- A great fraction of all the catches are discarded. However, almost 99% of the discarded individuals are returned alive to the sea.
- The implemented Monitoring Control and Surveillance system currently suffers a shortage of operational means (human and material resources) which is causing a lack of ability to enforce and sanction relevant management measures, specially the maximum number of traps at sea.

4 Report details

4.1 Authorship and peer review details

To be drafted at Announcement Comment Draft Report stage

Peer reviewer information to be completed at Public Comment Draft Report stage

The team in charge of preparing the ACDR was comprised by:

Ángel Francisco González González, holds over twenty-five years' experience working in marine resources from temperate, tropical and polar ecosystems. From the commencement of his research, participated in many projects devoted to fishery science, marine ecology and relationships between climatic factors and the population dynamics of marine species, especially cephalopods, studied from a holistic perspective and targeting an ecosystem approach. Fisheries studied include industrial and small-scale stocks in the western and eastern Atlantic, Pacific and Antarctic waters. During his early career, the main aim was to analyze the fishery biology, fishery potential and bioecology of north-eastern Atlantic squid stocks. After that period, the goals continued to afford studies on the fishery management of cephalopods from two different perspectives: a) in 1995 at the Graduate School of Oceanography, University of Rhode Island (USA), studying assessment taking into account the life cycle, and particularly their age, which regulates and determines the migration patterns and behaviour of highly mobile species in Georges Bank (USA); b) in 1996 at British Antarctic Survey (NERC), Cambridge, UK, targeting the fishery biology and ecology of sub Antarctic populations based on the influence of the oceanography, which influences the presence and catchability of sympatric species in the Falkland Islands and South Georgia and South Sandwich conservation zones. Later, once back in Spain, the main target was to adapt the knowledge obtained during the previous years to be applied in other resources worldwide, but especially in the north-eastern Atlantic waters, which ended in the participation in several projects in ecology and fishery management. These projects included the influence of unreported or misreported CPUE data of important teleost and cephalopods in fishery management data to apply fishery management, the review, analysis, assessment and sustainable management of cephalopod stocks in European waters, the impact of fisheries on cetaceans, and also the impacts of anthropogenic influence, such as the oil spill event of the vessel Prestige in the important small scale common octopus fishery in north-western Spanish waters or the effects of the bioaccumulation of pollutants on the reproductive success of small cetaceans. Finally, the influence of climatic variables in the interannual variability of stock abundance and fisheries was one of the main tasks of his research during the last fifteen years. Collaborations with oceanographers and ecologists of recognized international prestige have allowed progress in the influence of atmospheric-oceanic factors on the spatial and temporal distribution of common octopus larvae in nature, for the first time worldwide. After demonstrating the influence of physical and chemical factors, he managed to include an important factor in the models: the trophic ecology of octopus larvae in nature from pioneering studies using molecular techniques, which were also the first time they were applied in cephalopod larvae. This work incorporates the opening of a new field of study, the mesozooplankton.

All these aspects are reflected in the projects he participated during his career. In summary, his research career has allowed to supervise eight PhD Thesis, lead and consolidate a multidisciplinary line of work that translates into the publication of more than 125 articles indexed in the SCI / WoS, which have been based on a collaborative and inclusive vision. This issues are accredited by the collaboration with 180 authors from 71 institutions and 23 countries belonging to five continents, in addition to more than twenty chapters and complete books on marine ecology. He was part of the team in charge of the initial assessment of the Western Asturian octopus trap fishery of small scale cofradías and has no conflicts of interest for this fishery. For this re-certification his responsibilities will be mainly related to assessing Principle 1.

Gonzalo Macho Rivero holds a BSc (1997) in Marine Sciences, a MSc (2000) in Marine Ecology & Ecosystems Functioning and a PhD (2006) on Barnacles Ecology & Population dynamics from the Univ. of Vigo (Spain). Afterwards he has done postdoctoral research (2008-2015) at the Univ. of Washington (Seattle, USA), CENPAT-CONICET (Puerto Madryn, Argentina) and the Univ. of South Carolina (Columbia, USA). He has a background as a marine ecology and fishery scientist (1998 - ongoing), as a fishery practitioner on shellfish resources (bivalves, echinoderms, crustaceans and algae) for a Fisher´s guild and the Regional Fisheries Authority of Galicia, Spain (2007-2008), and as an independent consultant in fisheries & marine ecology (2011 - ongoing). He has published over 20 papers in SCI peer-reviewed journals, another 20 technical reports and has participated in more than 25 national and international scientific projects on population dynamics of shellfish resources (razor clams, cockles, gooseneck barnacle, clams & sea urchins),

fisheries management and governance (octopus, razor clams, gooseneck barnacle, scallops, abalones, pelagic and deep-sea fishes in Argentina, Chile, Spain, Portugal and EU), reform of the EU common fisheries policy, marine socio-ecological systems and climate change impacts on marine invertebrates.

He has worked on shellfish stock status since 2007 while hired as a practitioner leading a razor clam fishery assessment project, and has been involved in other assessments of octopus fishery in Madagascar (2017-18) and another razor clam fishery in Spain (2018-20). He has an extensive background on the biology, life cycle and population dynamics of shellfish with a focus on bivalves by being involved since 1999 in many projects (cephalopods (2017-20 & 2017-18), edible stalk barnacles (2017-20, 1999-2002), clams (2015-17 & 2011-15), Razor clams (2017-20, 2010-13 & 2007-10), Sea urchins (2005-08), intertidal invertebrates (2003-06) and cockles (2001-03)), ensuring he meets qualification and competency criteria for stock assessment & stock biology & ecology.

Several of the projects mentioned and job background as a practitioner in fisheries management, have dealt with the impact of fisheries and other drivers on the fishery; monitoring of impacts and fauna associated in shellfish fisheries (2007-08), oil spills impact on marine benthonic invertebrates (2003-06), discards in the razor clam fishery and minimization through changes in the closed season and fishing grounds rotation (2017-20 & 2007-10) and the impact of the stalk barnacle fishery on the rocky ecosystem (2017-20). This ensures he meets qualification and competency criteria for fishing impacts on aquatic ecosystems.

He also has experienced since 2007 on fisheries management and governance as a practitioner first (2007-08) and then as a researcher (2008 - to present) and independent consultant (2011 - to present) in several different countries (Spain, Portugal, France, Argentina, Chile, USA, Madagascar…). He has participated in around 10 national and international scientific projects on the management and governance and the social implications, understanding fisheries as socio-ecological systems and applying ecosystem based management frameworks. This ensures he meets qualification and competency criteria for fishery management and operations.

He has recently coordinated the FAO project Illuminating Hidden Harvests (IHH): Case study on small-scale fisheries in Spain (2020, client: FAO-Univ. Vigo) and finished a review (2019, client: MSC) on 3 octopus fisheries (Spain, Indonesia and Australia) for identifying potential obstacles to MSC certification for octopus' fisheries and revision of the MSC certification scheme for this kind of fisheries (3 pre-assessment were conducted).

Gonzalo has worked since 2014 as an assessor on 22 MSC certifications (5 Full Assessments, 6 Annual Surveillances, 3 Peer reviews and 8 Pre-assessments) within Europe, USA, Australia, Asia and Latin America acting as Team member on P1, 2 and 3 and as peer-reviewer. He was part of the team in charge of the initial assessment of the Wester Asturias octopus traps fishery of artisanal cofradías, and all the subsequent surveillance audits. Furthermore, he has completed the MSC training in the use of the RBF. For this re-assessment his responsibilities will be mainly related to assessing Principle 2 and 3. He has no conflicts of interest for this fishery.

Jose Rios, holds a degree in Sea Sciences from the University of Vigo and an MSc in Fisheries and Aquaculture from the University of Wales-Bangor. He has more than 15 years of experience working in fisheries from different angles and places around the world. In 1999 he worked at the ICM-CSIC on trophic ecology of demersal fish species and participated in different research cruises on board the r/v Garcia del Cid. In 2001/02 he was hired by the University of Azores as observer and fisheries inspector assessing an experimental fishing license for Orange roughy. Between 2003 and 2010 he was responsible for designing and monitoring fisheries management plans for several marine resources (clams, cockles and barnacles) for the Regional Fisheries Authority of Galicia (Spain). In 2008-09 he developed and implemented a scientific monitoring scheme for an experimental octopus fishery in the waters of Namibia (IIM-CSIC). Between 2008 and 2012, as part of different projects funded by the Spanish International Cooperation Agency (AECID), he supported local fisheries and aquaculture management bodies to strengthen organizational and managing capacities of the fishing and rural aquaculture sector in Namibia, Cape Verde, Colombia and Mozambique. Since 2013, as part of the fisheries team of WWF Spain, he promoted different initiatives to improve fisheries management in coastal Spanish fisheries. As the WWF representative in fisheries co-management committees, he took part in the daily management of the following coastal fisheries in the Spanish Mediterranean: Catalan sandeel, Balearic boat seines, and Palamós red shrimp. Since April 2016 he is a full-time employee at Bureau Veritas Fisheries Department and he has participated in a number of MSC fisheries assessments and surveillance audits, including all surveillance audits for the Western Asturias octopus traps fishery of artisanal cofradías. . Furthermore, he has completed the MSC training in the use of the RBF.

His 7 years in charge of designing and monitoring fisheries management plans for the exploitation different marine resources in Galicia, together with his experience on trophic ecology of demersal fish species in the Mediterranean (ICM-CSIC), his work with the University of Azores assessing an experimental fishing license for Orange roughy in the Azores islands, and his experience designing and monitoring an experimental fishing license for octopus in Namibia (IIM-CSIC) ensure he meets qualification and competency criteria established in PC3 for (i) Fishing impacts on aquatic ecosystems. Also, his 3 years of experience as a practicing fishery manager as a WWF representative in 3 Mediterranean fisheries, together with his 7 years of experience participating in the implementation of fisheries management plans in Galicia and his experiences assessing experimental fishing licenses in the Azores and Namibia ensure he meets qualification and competency criteria established in PC3 for (ii) Fishery management and operations. For the preparation of the ACDR his main responsibilities will be acting as team leader and assessing Principle 2. He has not a conflict of interest for this fishery.

However, Jose Ríos will not be part of the assessment team after the ACDR is published and Macarena García will take up on his assigments as Team Leader.

Macarena Garcia, her academic background includes a Bachelor of Science Degree in Environmental Science from the Madrid Polytechnic University (Spain) and a Master degree in Sustainable Management of Marine and Coastal Systems from Barcelona University (Spain). She was the manager in Inemar (Association for innovation in marine resources and sea studies) developing sustainable projects. She has worked as an assistant in the Spanish Ministry of the Environment and Rural and Marine Affairs, carrying out different projects involving human activities and sea resources.

She has participated in several scientific publications, such as the “Ecological framework for the management of the different habitats in Spain (Council Directive 92/43/CE)”, “Supporting report accompanying the thematic cartography of the MedRAS Project”, and “Draft of the Basis for Marine Planning in Spain”. She was responsible for the scientific and technical coordination of the bilingual publication “The Seas of Spain” from the Spanish Ministry of the Environment and Rural and Marine Affairs, and responsible for the scientific and technical coordination of the bilingual publication “Human Activities in the Seas of Spain”

She is the MSC fisheries manager at Bureau Veritas and specialises in sustainable fisheries. She has particular expertise with the MSC Certification requirements and has completed numerous MSC full assesssments, pre-asessments, surveillance audits. Furthermore, she is in charge of other seafood sustainable projects developing private sustainable labels and seafood companies’ policies. She is lead auditor for Friends of the sea, MSC Chain of custody, and other quality labels (DOP, Mexillon de Galicia, Pesca de Rías).

She meets the qualification criteria for local knowledge, local fishery context and traceability. She meets the qualification and competency requirements for team leader, traceability and the CoC Standard set out in Annex PC of the MSC Fisheries Certification Process v2.2. She also has knowledge of the country, language and local fishery context. Bureau Veritas confirms she has no conflicts of interest in relation to the fishery audit. For this re-assessment she will act as team leader. She has not a conflict of interest for this fishery.

4.2 Version details

Details on the version of the fisheries program documents used for this assessment are presented in **table 4.2.1**, as required in the ‘MSC Surveillance Reporting Template v2.01’.

Table 4.2.1 – Fisheries program documents versions

Document	Version number, date of publication (and date effective)
MSC Fisheries Certification Process	FCP v2.2, 25 March 2020 (25 September 2020)
MSC Fisheries Standard	Version 2.01, 31 August 2018 (31 August 2018)
MSC General Certification Requirements	Version 2.4.1, 7 May 2019 (28 September 2019)
MSC Reporting Template	Version 1.2, 25 March 2020 (25 September 2020)

5 Unit(s) of Assessment and Certification and results overview

5.1 Unit(s) of Assessment and Unit(s) of Certification

Bureau Veritas has confirmed that the assessed fishery is within the scope of the MSC fisheries certification since:

- This is a wild-capture fishery
- The fishery is not based on any introduced species
- It does not target species classified as 'out-of-scope' (amphibians, reptiles, birds, mammals)
- The fishery does not make use of any kind of poisons or explosives
- The assessed fishery takes place within Spanish waters and its management depends on the local authority (Government of Asturias, General Directorate of Maritime Fisheries –DGPM-), although in agreement with the Spanish and European fisheries regulations. The fishery is not conducted under any controversial unilateral exemption to an international agreement and its management regime includes mechanisms for resolving disputes
- Spain has been a member of the International Labour Organization (ILO) since 1956. The country has ratified 133 conventions, including the 8 fundamental conventions and the 4 governance conventions. The CAB is not aware that none of the fishing operators included in the UoA have been prosecuted for a forced or child labour in the last 2 years
- The client has completed and submitted to the CAB the 'Certificate Holder Forced and Child Labour Policies, Practices and Measures Template' to detail the policies, practices and measures in place to ensure the absence of forced and child labour. This template was submitted to the CAB in September 2019 and it is available at the MSC since then, as required in FCP 7.4.4.4.

Besides, Bureau Veritas has checked that:

- There are no MSC-certified or under-assessment overlapping enhanced fisheries.
- There are no catches of non-target species that are inseparable or practically inseparable (IPI) from target stock.
- The fishery has not previously failed an assessment and has no certificate withdrawn. At the time of entering re-assessment the MSC certified status for this fishery is: 'Certified'.

5.1.1 Unit(s) of Assessment

To be drafted at Announcement Comment Draft Report stage

Table 5.1.1 – Unit of Assessment (UoA)

UoA 1	Description
Species	*Octopus vulgaris*
Stock	*Octopus vulgaris* stock from Asturian waters (metapopulation description).
Geographical area	Cantabrian Sea (FAO 27). ICES division VIIc The fishing grounds where the UoA operates as included in the OFMP (Octopus Fisheries Management Plan) is from the estuary Ria del Eo (7° 01 'W) to the San Esteban de Pravia estuary (6º 04´ W), always within internal waters of Asturias.
Fishing gear type	Artisanal baited octopus traps
Fishing fleet included in the current UoC and client group	ARPESOS (Asociación de armadores de la pesquería de pulpo con certificado de sostenibilidad). Arpesos is an association of shipowners targeting octopus with traps in Western Asturias waters. This association was created after the certification of the fishery and includes initially certified shipowners from the following fishers' guilds: Tapia de Casariego, Viavélez, Ortiguera, Puerto de Vega. The latest list of certified vessels, published on January 21, 2020, comprised 29 vessels from the following fishers' guilds in the Region of Navia-Porcía: Tapia de Casariego, Viavélez, Ortiguera, Puerto de Vega, Luarca, Oviñana and Figueras.
Other eligible fishers	The number of vessels in the OFMP has been around 40-50 vessels per season in the last 5 years (43 vessels in the last 2018-19 fishing season). All vessels belonging to a fishers' guild included in the Asturian OFMP (Cudillero, Oviñana, Luarca, Puerto de Vega, Ortigueira, Viavelez, Tapia de Casariego y Figueras) and complying with the requirements stated at the

	certificate sharing published at the MSC website (https://fisheries.msc.org/en/fisheries/western-asturias-octopus-traps-fishery-of-artisanal-cofradias/@@assessments).

5.1.2 Unit(s) of Certification

To be drafted at Client and Peer Review Draft Report stage

To be completed at Public Certification Report stage

The report shall include a justification for any changes to the proposed Unit(s) of Certification (UoC).

Reference(s): FCP v2.1 Section 7.5

Table 5.1.2 - Unit of Certification (UoC)

UoC X	Description
Species	
Stock	
Geographical area	
Harvest method / gear	
Client group	
Other eligible fishers	

5.2 Assessment results overview

5.2.1 Determination, formal conclusion and agreement

To be drafted at Final Draft Report

To be completed at Public Certification Report

The report shall include a formal statement as to the certification determination recommendation reached by the assessment team on whether the fishery should be certified.

The report shall include a formal statement as to the certification action taken by the CAB's official decision-makers in response to the Determination recommendation.

Reference(s): FCP v2.1 Section 7.21

5.2.2 Principle level scores

To be drafted at Client and Peer Review Draft Report

The report shall include scores for each of the three MSC principles in the table below.

Reference(s): FCP v2.1 Section 7.17

Table X - Principle level scores

Principle	UoA 1	UoA 2	UoA 3	UoA 4
Principle 1 – Target species				
Principle 2 – Ecosystem impacts				
Principle 3 – Management system				

5.2.3 Summary of conditions

To be drafted at Client and Peer Review Draft Report

The report shall include a table summarising conditions raised in this assessment. Details of the conditions shall be provided in the appendices. If no conditions are required, the report shall include a statement confirming this.

Reference(s): FCP v2.1 Section 7.18

Table X – Summary of conditions

Condition number	Condition	Performance Indicator (PI)	Related to previous condition?
			Yes / **No** / **NA**
			Yes / **No** / **NA**
			Yes / **No** / **NA**

5.2.4 Recommendations

To be drafted at Client and Peer Review Draft Report stage

If the CAB or assessment team wishes to include any recommendations to the client or notes for future assessments, these may be included in this section.

6 Traceability and eligibility

6.1 Eligibility date

The report shall include the eligibility date and the justification for selecting this date, including consideration of whether the traceability and segregation systems in the fishery are appropriately implemented.

Reference(s): FCP v2.1 Section 7.8

The existing MSC fishery certificate for this fishery expires on the August 9, 2021. The eligibility date for this fishery will be the same date as the expiry of the existing certificate.

6.2 Traceability within the fishery

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

6.2.1 Description of the tracking, tracing and segregation systems within the fishery

Operations on board in the case of the assessed fishery consists in three basic operations: baiting, setting the lines of traps and hauling them on board after a sufficient time has passed since setting. Once on board each trap is empty manually and octopus weighting 1kg or more are killed and stored in buckets, while octopus below 1kg are returned to the sea. Commercial bycatches are stored in separate buckets while non-commercial bycatches which are not subject to landing obligation are returned to the sea.

The OFMP (BOPA, 2019) establishes that trap fishery targeting octopus will be carried out only during daytime hours, and the boats must return to port before 5:00 p.m.. Further, fishing is prohibited from 5:00 p.m. on Friday until 12:00 p.m. on Sunday, although it is authorized to leave the baited traps at sea during this resting period. However, this measure can be revised along the fishing season depending on the catch trend and status of the target species according to the monitoring performed by the DGPM. Also, the OFMP establishes a closed season, which normally last from mid-July to mid-December, although it might vary slightly between years (e.g. closed season in 2019 lasted from July 12 until December 2). Fishing season is defined from December to next July.

The authorized landing and auction points are limited to those ports and auction points included in the original PCR (Gonzalez et al., 2016) and fishery certificate:

- Puerto de Vega port and its auction point
- Tapia de Casariego port and its auction point
- Viavélez port and its auction point
- Ortigueira port (although fishers from this port sell their catches at the Puerto de Vega auction point)

Once at port, fishers carry the daily catches to the authorized auction points, where the ‘guardapescas’ (coastguards hired by each of the fishers’ guilds) proceed to check that the minimum landing individual weight is being respected and no octopus below 1kg are landed, then they proceed to weight and store the catch in the cold store until auction take place. The catch corresponding to each vessel is electronically registered, so each fisher gets a delivery note (and a transport guide in case he/she wants to sell the catches in a different port). The fishers’ guilds are obliged to report all catches to the DGPM on a monthly basis.

The sale during the auction is done electronically and so that the origin of each batch sold can be traced back to the vessel and fishing day. Every vessel has a different code, and every sale generates an automatic batch code which can be traced in the sales note (see Figure 6.2.1). Further, during the first surveillance audit it was verified that a specific code was created for octopus sold as MSC certified from octopus sold as non-MSC certified. The code for non-certified octopus is used for all octopus landed by non-certified vessels.

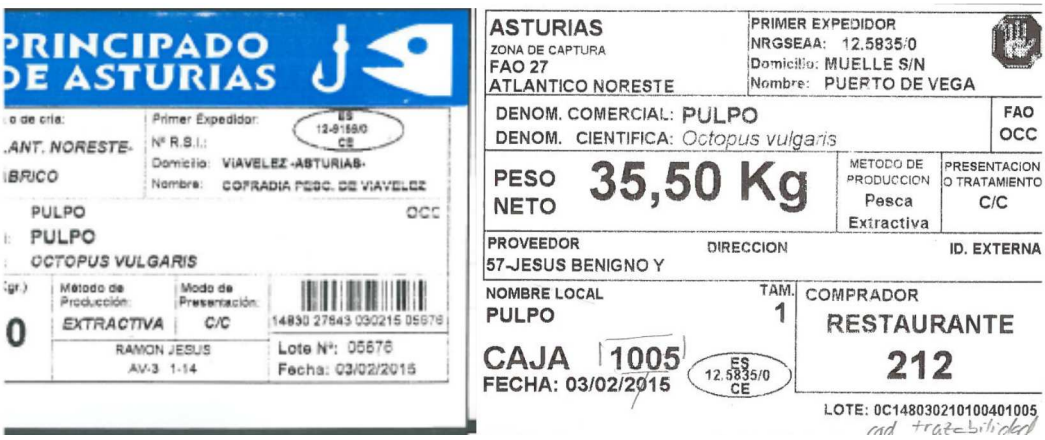


Figure 6.2.1. *Example of two labels from the action points (Viavelez and Puerto de Vega)*

Moreover, the Surveillance and Control Unit within the DGPM has between 10 and 16 enforcement officers inspecting both at sea and on land. These inspectors are entitled to raise disciplinary proceedings for any infringements detected, while the 'guardapescas' do not have any enforcement capacity. The Surveillance and Control Unit of the DGPM works in coordination with the 'guardapescas' to ensure compliance at landings.

The annual report on the follow-up of the octopus fishing season elaborated by the CEP contains data from the previous fishing year and also provides a historical overview of the fishery. This includes dates of sales, fishing efforts (vessels, days), catches, catches per unit of effort (kg/day), weight distribution, and price (€/kg), per monthly and yearly periods and per association (with regard to the previous fishing year).

To conclude, the tracking, tracing and segregation systems within the fishery allow any products sold as MSC certified to be traced back to the UoC. The traceability system is robust.

6.2.2 Determination of risk associated to traceability factors prior to entering CoC

In accordance to MSC requirements Table 6.2.1 includes a description of factors that may lead to risks of non-certified fish being mixed with certified fish prior to entering CoC. For each risk factor, there is a description of whether the risk factor is relevant for the fishery, and if so, a description of the relevant mitigation measures or traceability systems in place

Table 6.2.1 – Traceability within the fishery

Factor	Description
	Only those vessels included in the census of small scale vessels and in possession of the fishing permit issued by the Asturian Ministry of Rural Development, Agriculture and Fisheries to target octopus using traps are allowed for this type of fishery.
Will the fishery use gears that are not part of the Unit of Certification (UoC)? If Yes, please describe: - If this may occur on the same trip, on the same vessels, or during the same season; - How any risks are mitigated.	The OFMP (Resolución de 21 de Noviembre de 2019) determines that baited traps is the only fishing gear allowed to target octopus. This regulation also determines the technical characteristics of this fishing gear, including the mandatory identification when the lines of traps are at sea. Despite artisanal vessels have different permits to use different fishing gears along the year, they can only have one type of fishing gear on board and every time they change of fishing gear they have to report this issue to the DGPM. Thus, they are not allowed to use other fishing gears when fishing for octopus and they are subjected to inspections both at sea and on shore performed by the Surveillance and Control Unit of the DGPM. **This risk never occurs within the assessed fishery**

Will vessels in the UoC also fish outside the UoC geographic area? If Yes, please describe: - If this may occur on the same trip; - How any risks are mitigated.	The scope of the management plan (OFMP) ranges from the Ria del Eo to the Ría de San Esteban de Pravia (Resolución de 21 de Noviembre de 2019). Vessels belonging to the OFMP are not allow to target octopus outside its territorial scope. The operation of this fishery (small vessels working with a passive fishing gear during the morning and unloading before 17h) does not allow vessels to travel far than the limits previously described. Besides, landings must always be carried out at the authorised ports which are within the territorial area of the OFMP. The fisher shall get a delivery note from the authorised port and a transport guide in case he/she wants to transport the catch to another port for the first sale. From 2018 onwards (Resolución del 4 de Diciembre de 2018 and Resolución de 21 de Noviembre de 2019), the management plan states that: "In order to determine the fishing areas and the fishing effort made, a GPS / GPRS tracking device, provided and installed by the CEP, shall be installed on the vessels that are part of the management plan. Vessels must have adequate maintenance of the devices installed by the CEP". **This risk never occurs within the assessed fishery**
Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities. - Transport - Storage - Processing - Landing - Auction If Yes, please describe how any risks are mitigated.	*Please state whether any of these activities occur within the fishery and a description of this activity including how this potential traceability risk is addressed or mitigated.* *If this is covered by relevant regulatory frameworks, you may link to the relevant section in Section 5 MSC Fisheries Standard – Principle 3 – Effective management.* The fleet does not process the catch at sea. All the individuals of octopus over 1kg are landed and sold whole and fresh. All octopus captured by certified vessels will be considered as a certified product. Therefore, **this risk never occurs until the catches are landed and weighted at the authorised ports.** Despite vessels are normally landing at their base ports it might happen that they do land and/or sell in a neighbour port. Thus, non-certified vessels from Luarca might land and sell at Puerto de Vega. It might also be the case that not all vessels from Puerto de Vega are interested in the MSC certificate, so they decide to stay outside of Arpesos. That way, authorised ports might deal with landings from other vessels included in the UoA but not in the UoC. **Therefore, this risk occurs regularly at the authorised ports.** As explained in **section 6.2.1**, every vessel has a different code, and every sale generates an automatic batch code which can be traced in the sales note (see **Figure 6.2.1**). Further, during the first surveillance audit it was verified that a specific code was created for octopus sold as MSC certified from octopus sold as non-MSC certified. The code for non-certified octopus is used for all octopus landed by non-certified vessels.
Does transhipment occur within the fishery?	Fishing permits are issued in the name of the vessel and can only be transferred via the sale of the vessel. The OFMP regulates that the annual catch limit per vessel (10

If Yes, please describe: - If transhipment takes place at-sea, in port, or both; - If the transhipment vessel may handle product from outside the UoC; - How any risks are mitigated.	tonnes/vessel*year) is non-transferable, and cannot therefore be assigned to other vessels (Resolución de 21 de Noviembre de 2019). Transhipment is not allowed. **This risk never occurs within the assessed fishery**
Are there any other risks of mixing or substitution between certified and non-certified fish? If Yes, please describe how any risks are mitigated.	**No other risk** endangering traceability of the catches have been identified by the team.

6.3 Eligibility to enter further chains of custody

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

The CAB used the previous information to determine that the tracking, tracing and segregations systems within the assessed fishery are appropriate, and as such, the whole and fresh octopus caught by the vessels included in the UoC, landed at authorised ports and sold at authorised auction points is eligible to enter into further certified chains of custody without any restriction. As such, this product is eligible to be sold as MSC certified or carry the MSC ecolabel.

The list of vessels included in the UoC is regularly updated by the CAB in accordance with the client, and published at the MSC website at least once before every fishing season. The latest list was updated on January 22, 2020, and it is available here: https://fisheries.msc.org/en/fisheries/western-asturias-octopus-traps-fishery-of-artisanal-cofradias/@@certificates

The authorized landing and auction points are limited to those ports and auction points included in the PCR and fishery certificate:

- Puerto de Vega port and its auction point
- Tapia de Casariego port and its auction point
- Viavélez port and its auction point
- Ortigueira port (although fishers from this port sell their catches at the Puerto de Vega auction point)

The change of ownership will start after the first sale at one of the four auction points covered by the certificate. That is, after the fisher guilds included in the client group issues the sales note for the buyer. These buyers will be required to have a valid MSC CoC certificate whenever they want to market the product bought with an MSC certificate.

The vessels included in the UoC (the list is being regularly updated and published at the MSC website), landing at the authorised ports and selling at the authorised auction points are the only eligibles to use the MSC fishery certificate and sell whole fresh octopus as certificated.

The product caught by the UoC and traced and segregated according to the description above is eligible to be sold by the client group as MSC certified and enter further certified CoC without restrictions.

6.4 Eligibility of Inseparable or Practicably Inseparable (IPI) stock(s) to enter further chains of custody

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

No IPI stocks have been identified by the CAB during the assessment.

7 Scoring

7.1 Summary of Performance Indicator level scores

To be drafted from Announcement Comment Draft Report

Table 7.1.1. PIs scores of the re-assessed fishery (in orange scores below 80, meaning a condition would be raised for that PI).

Principle	Component	Weight	Performance Indicator (PI)		Weight	Likely score
One	Outcome	0,333	1.1.1	Stock status	0,500	≥80
			1.1.2	Stock rebuilding	0,500	NA
	Management	0,667	1.2.1	Harvest strategy	0,250	60-79
			1.2.2	Harvest control rules & tools	0,250	60-79
			1.2.3	Information & monitoring	0,250	60-79
			1.2.4	Assessment of stock status	0,250	60-79
Two	Primary species	0,200	2.1.1	Outcome	0,333	≥80
			2.1.2	Management strategy	0,333	60-79
			2.1.3	Information/Monitoring	0,333	≥80
	Secondary species	0,200	2.2.1	Outcome	0,333	≥80
			2.2.2	Management strategy	0,333	60-79
			2.2.3	Information/Monitoring	0,333	≥80
	ETP species	0,200	2.3.1	Outcome	0,333	≥80
			2.3.2	Management strategy	0,333	≥80
			2.3.3	Information strategy	0,333	≥80
	Habitats	0,200	2.4.1	Outcome	0,333	≥80
			2.4.2	Management strategy	0,333	≥80
			2.4.3	Information	0,333	≥80
	Ecosystem	0,200	2.5.1	Outcome	0,333	≥80
			2.5.2	Management	0,333	≥80
			2.5.3	Information	0,333	≥80
Three	Governance and policy	0,500	3.1.1	Legal &/or customary framework	0,333	≥80
			3.1.2	Consultation, roles & responsibilities	0,333	≥80
			3.1.3	Long term objectives	0,333	≥80
	Fishery specific management system	0,500	3.2.1	Fishery specific objectives	0,250	≥80
			3.2.2	Decision making processes	0,250	≥80
			3.2.3	Compliance & enforcement	0,250	60-79
			3.2.4	Monitoring & management performance evaluation	0,250	60-79

7.2 Principle 1

7.2.1 Principle 1 background

7.2.1.1 Outline of the target species

7.2.1.1.1 Biology and distribution

Phylum: Mollusca
Subphylum: Cephalopoda
Clase: Cephalopoda
Subclase: Coleoidea
Orden: Octopoda
Suborden: Incirrata
Familia: Octopodidae

Nombre científico: *Octopus vulgaris*
Nombres comunes: pulpo (español), poulpe de roche (francés), common octopus (inglés).

Figure 7.2.1 Adult specimen of Octopus vulgaris and species taxonomic status

Octopuses are amazing animals. They can change color, texture and shape. They have three hearts, one systemic and two branquial, pumping blue copper-based blood and are jet powered and are considered the most intelligent of invertebrates. They have also, sometimes, the ability to get into fishers' traps, eat the crabs and get out again, dismantle the aquariums they are kept in, and escape, and also, even grow a new arm when one is bitten off (Mather et al., 2010).

The diagnostic characters of the Family Octopodidae, which include *Octopus vulgaris*, share the following features: body short, muscular, sac-like, without lateral fins (**Figure 7.2.1**). Eight arms around the mouth, but no tentacles with suckers in one or two rows and not cirri on arms; the suckers have not chitinous rings and are setting on arms without stalks. One of the third arms modified in males (hectocotylus), as an open sperm groove (running along ventral edge of the arm) and a modified terminal tip (ligula), typically spoon-like. Hectocotylus not detachable. Internal shell reduced to a pair of stylets or lost. Stomach and caecum posterior to digestive gland. Lateral radula teeth (if present) simple, with single cusp. The size of the animals belonging to this Family ranges from pygmy species mature at under one gram to the giant Pacific Octopus of the North Pacific reaching weights in excess of 150 kilograms with an arm span of over 5 m (Guerra et al., 2014).

Regarding the species subjected to this assessment, the common octopus *Octopus vulgaris* has a maximum total length of about 140 cm. This species is especially abundant in the eastern Atlantic and the Mediterranean Sea. Although *O. vulgaris* was reported to be a cosmopolitan species from tropical, subtropical and temperate waters, its distribution has been redefined to conform to modern biogeographical boundaries. Guerra et al (2010) showed that the phylogenetic and genetic divergence estimates indicate that the octopuses from the Indian Ocean (South Amsterdam and Saint Paul Islands) belong to *O. vulgaris* sensu stricto, and confirm that COI and COIII are useful for inferring evolutionary relationships and distinguishing among closely related octopuses (Söller et al., 2000; Warnke et al., 2004; Guzik et al., 2005). The maximum likelihood trees performed by Guerra et al. (2010) showed that the specimens from the Indian Ocean area clustered with *O. vulgaris* from the Mediterranean Sea, France, Galicia (NW Iberian Peninsula), Senegal, Tristan da Cunha, and South Africa. All these regions are within the typical geographic range of *O. vulgaris* s. str. (Mangold, 1998). All specimens then clustered with *O. vulgaris* from Japan and Taiwan, south Brazil, Rio de Janeiro, and Venezuela, which are also areas where *O. vulgaris* s. str. has been recorded (Warnke et al., 2004). These results confirm the complexity and adaptability of the common octopus worldwide. One of the reasons that would explain the plasticity of its geographical range would be the capacity of dispersion during the larval planktonic phase, subjected to the prevailing currents.

A more recent study (Amor et al., 2016) investigated the morphological relationships among seven phylogenetic clades of the broadly distributed *Octopus vulgaris* species complex and close relatives. Morphological analyses in this study were successful in delimiting *O. sinensis*, Brazilian *O. vulgaris* and *O. vulgaris* sensu stricto, which was congruent with the molecular findings of this study. Analyses based on male morphology were successful in proving to be a more reliable indicator of species-level relationships in comparison with female morphology. The majority of characters with the greatest discriminatory power were male sexual traits. Significant morphological differences were also recorded among sampling localities of conspecifics, with phenotype showing correlation with local environmental data. The findings of this study

support the hypothesis that multiple *O. vulgaris-like* species are currently being incorrectly treated under a single species name, *O. vulgaris* (**Figure 7.2.2.a,b**). Octopuses being exported globally under the name *O. vulgaris* are of extremely high fisheries market value and profile. These findings have potentially significant implications for the naming and conservation of commercially harvested members of this species complex throughout their ranges.

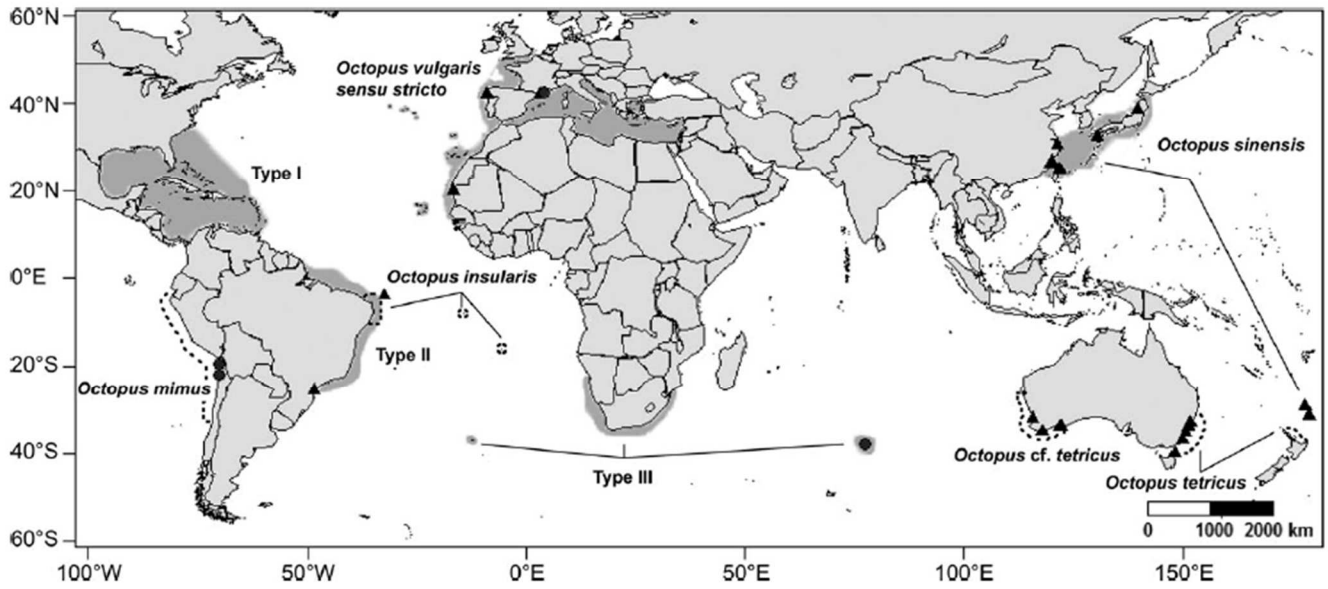


Figure 7.2.2a Sampling localities (triangles) for whole animals/tissue samples of members of the Octopus vulgaris species group and close relatives.Distributions of O. vulgaris sensu stricto and species 'Types' are shaded in dark grey (Norman et al. 2014a). Distributions of non-vulgaris species are represented by dashed lines. Externally sourced data (Banyuls-sur-Mer, France; Table 1) are represented by a circle. From Amor et al. (2016).

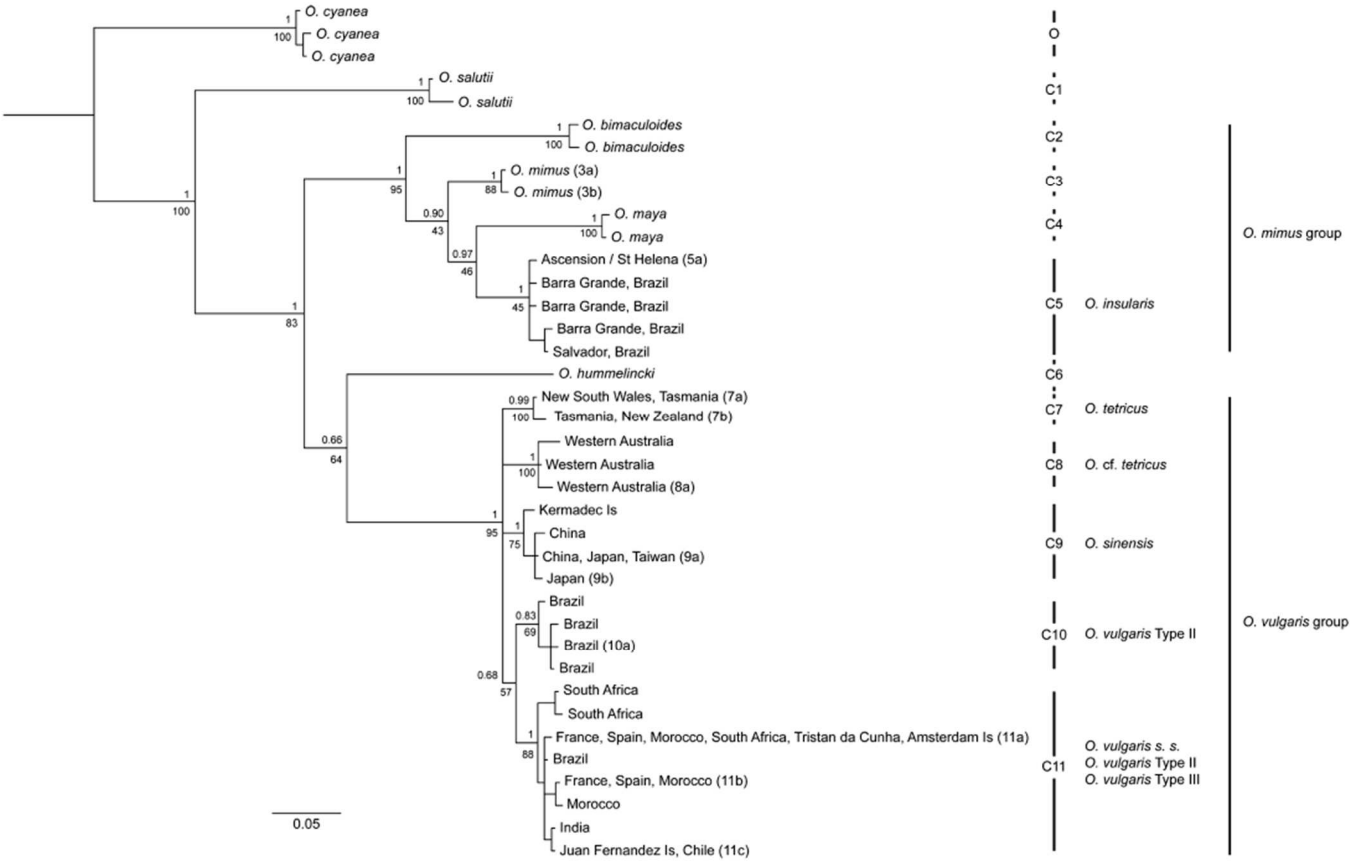


Figure 7.2.2.b. Bayesian topology depicting the relationships among members of the Octopus vulgaris species group and close relatives. Analyses are based on partial sequence of the mitochondrial COI gene, showing Bayesian inference posterior probabilities above and maximumlikelihood bootstrap values below major nodes. Out-group is O. cyanea. Node labels represent geographic localities of each haplotype. Clade number is also shown (C1-11). Octopus vulgaris 'Types' refer to; Mediterranean/NE Atlantic (O. vulgaris s. s.), southern Brazil (Type II) and South Africa (Type III) (Norman et al. 2014a). Haplotype characters in parentheses correspond to individuals in Table S1. From Amor et al. (2016).

The common octopus, *Octopus vulgaris* Cuvier 1797, is a truly coastal species living between the surface and a depth of about 100 to 150 m. On a world-wide basis, *O. vulgaris* encounters temperatures between 6 and 33ºC, but it is more often found in waters warmer than 10ºC and cooler than 30ºC. The salinity ranges from about 32 to 40 in the areas where the species in known to occur. (Magold,1987). It is one of the most important harvested cephalopod around the world but, as previously mentioned, the taxonomic redefinition of the species has delimited the distribution of *O.vulgaris* sensu stricto, which corresponds with several small–scale fisheries, such as the Asturian and Galician ones that have an enormous social and economic impact.

7.2.1.1.2 Reproduction

Compared with most benthic octopods, the majority of the available biological data concern the common octopus *Octopus vulgaris*. Segregation by sex depends on the area studied. Thus, no segregation between sexes was observed in the central-eastern Atlantic population (Guerra et al., 2014), although these relationship could have different results depending on the local population studied and season. Thus, Alonso-Fernández et al (2016) investigated the spatio-temporal dynamics in sex-ratio (SR) using more than 115,000 individual records obtained from onboard observers over a 14-year period. Generalized linear models were used to evaluate the abiotic and biotic factors affecting the variation in SR. The probability of catching a female decreased with size. Seasonal differences in SR resulted in a female-biased ratio in autumn and male dominance in summer. SR also varied along the bathymetric gradient with larger female proportion at deeper waters in winter and spring. The probability of catching a female was lower in hard substrates mainly in summer. They also pointed that upwelling intensity and sea surface temperature did not show substantial effects on SR. The analysis neither revealed an influence of local density on SR. The spatio-temporal patterns of SR in O. vulgaris are likely based on differences in sexual behavior and life history which may affect catchability rates.

The potential fecundity of the mature females ranges from 100 000 to 500 000 oocytes (Mangold, 1987). The eggs are small of about 2.5x1 mm. Potential fecundity was significantly correlated with length and weight in both sexes. However, atresia, which has been poorly examined in cephalopods, could have important implications of the fecundity estimatins since only in LV microstage oocytes of *O. vulgaris* in pre-spawning ovaries of common octopus should be considered in fecundity estimations since this microstage does not experience atresia until spawning ends. Another plausible method would be to apply a correction factor if percentages of atretic oocytes could be calculated for each type of ovary. Atresia occurred all year round in immature and mature females and in previtellogenic and vitellogenic oocytes. However, more mature females were more prone of being atretic. This occurred mainly in spring when females had atretic previtellogenic oocytes in mature macrostages. By contrast, vitellogenic atresia occurred mainly from spawning to post-spawning females. Females attach the eggs to several substrates, mainly rocks, and take care of the eggs until the hatching. The spawning season extends throughout the year with two peaks in spring and autumn in the Atlantic populations. The egg stage duration depends on the temperature (20-25 days at 25º C and 125 days at 13º C). The hatchlings have about 1-2 mm mantle length and stay in the water column (planktonic stage) from two to about five months, depending on the season. Reproductive strategy of *O. vulgaris* populations corresponds with simultaneous terminal spawners (Rocha et al., 2001), are typically unstable and respond rapidly to changes in environmental conditions (**Fig. 7.2.3**).

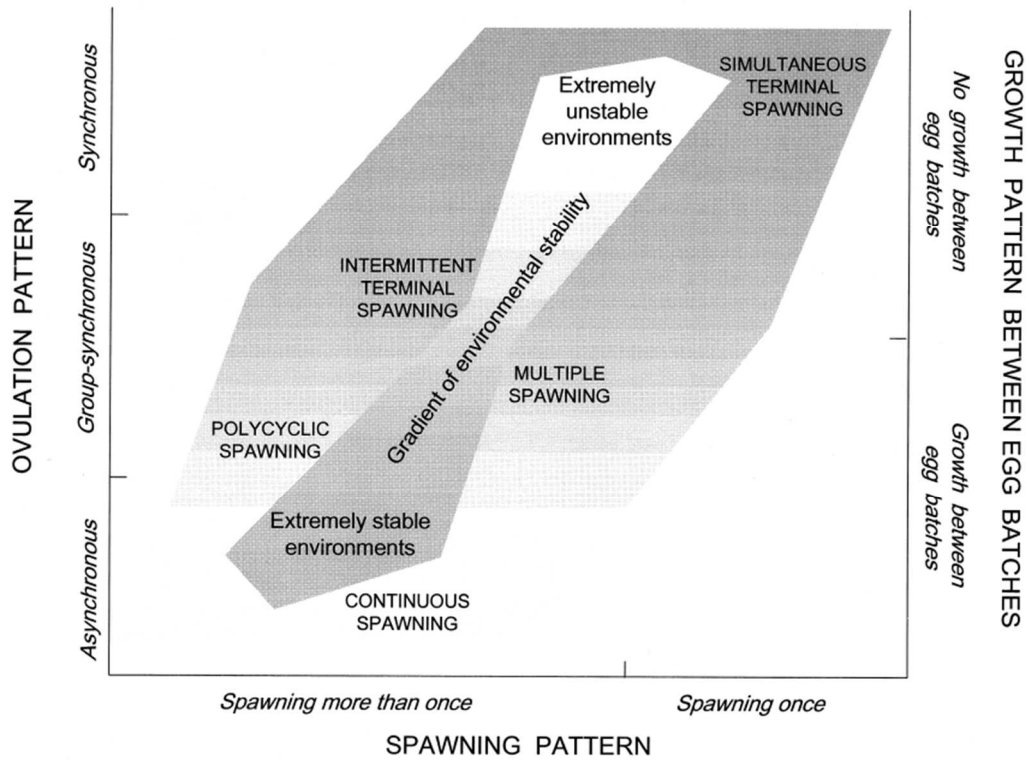


Figure 7.2.3. Diagram illustrating the cephalopod reproductive strategies in relation to the type of ovulation, the spawning pattern and whether or not somatic growth between egg batches occurs. These strategies are adapted to a given degree of environmental stability, as successful adaptations of each species to the different environmental and demographic pressures faced during evolutionary processes. From Rocha et al. (2001)

A recent study in Galician waters advanced in the knowledge of the life cycle of a pre-spawning event. For that purpose, a brooding *Octopus vulgaris* female was monitored during 128 days in her natural habitat (Garci et al., 2016). The main reproductive events and embryonic development in relation to the temperature inside the spawning den, which was recorded by long-battery-life minidata loggers, were described in the wild. The den temperature ranged from 12.9 to 19.4C. The total number of egg strings was 160, and the total number of eggs spawned ranged between 139,040 and 241,760 (mean 190,400). The brooding period, the egg laying interval and the duration of the hatching course lasted 128, 35 and 43 days, respectively. Both egg laying and hatching were intermittent processes. The time taken for embryonic development was variable (85–128 d) and depended on the laying date, temperature and position of the string in the egg cluster and the position of the egg in the egg string. The first hatching observed occurred after a progressive and gradual increase of the temperature from 14.9 to 19.38C. The 280 min of video recordings taken by scuba divers showed that several times, this female opened and closed a small window in the obstructions of the den entrance to facilitate a way out for the hatchling batches.

Reproduction in *O. vulgaris* implies the mobilization of resources from somatic to gametic tissues, noting that final maturation seems to be partially reached at the expense of the body muscles and the digestive gland (O'Dor and Wells, 1987; Tait, 1986). Conversely, those former studies contrast with recent ones standing that for egg production this species use energy directly from food, rather than from stored products The condition (digestive gland to body weight ratio) of females increased proportionally with maturity stage and mature individuals had higher gonad investment suggesting that energy for gonad growth was derived from the diet rather than endogenous reserves (Rosa et al., 2002; 2004, Otero et al., 2007).

Similar to most other works on *O. vulgaris* (e.g. Gonçalves, 1993; Silva et al., 2002; Oosthuizen and Smale, 2003) males from Galician waters reach sexual maturity at a smaller size than females. The smallest mature specimens sampled were 12 cm of dorsal mantle length (DML) and 394 g of body weight (BW) in females, and 10 cm DML and 323 g BW in males (Otero et al., 2007). Size-at-maturity of females from this area (903 and 1788 for males and females, respectively) was similar to that recorded for animals collected off the Gulf of Cádiz and South Africa, whereas corresponding figures for males were generally greater than previous estimates (Silva et al., 2002; Oosthuizen and Smale, 2003). This results contrast with previous estimations made by Mangold and Boletzky (1973), Guerra (1975) or Smale and Buchan (1981), who reported size at first maturity ranging from 800 and 1000g. These differences could be explained by the different

methodologies used by the authors since some of them consider the animals caught during the season previous to the spawning, and other consider octopus samples during the whole year, which could lead to an overestimation of the weight at maturity (Fernández-Nuñez et al., 1996).

Taking into account the spawning result in Galician waters and that the peak of early hatched paralarvae occurs at the end of summer and autumn months (i.e. at the end of the upwelling season), it is suggested that the reproductive strategy is tightly linked to the seasonal dynamics of the major local environmental process (Otero et al., 2007).

7.2.1.1.3 Age and growth

Although the growth pattern in *Octopus vulgaris* is well known in juveniles and adults and as coinciding with other cephalopods, is very fast and temperature dependent the estimation of age is not as well studied as in oegopsyd and myopsid squids. The life span of *Octopus vulgaris* was estimated in two years for males and females. The natural mortality of cephalopods in general and the common octopus in particular during the paralarval and settlement stages is very high and is associated with environmental factors, which ultimately control the abundance of food for the paralarvae (zooplankton).

Information on age is critical for managing fish resources, especially species experiencing heavy fishing pressure. In the absence extensive studies on age information, our understanding of octopus growth, recruitment, and productivity relies on methods using morphological and catch data. However, such methods are considered inaccurate in estimating growth rates and longevities (Jackson, 1994; Boyle and Boletzky, 1996) owing to the high intrinsic variability of cephalopod growth, the mixture of different age microcohorts at the same size, and the absence of a validated technique to estimate age and growth in these species (Doubleday et al., 2006; Leporati et al., 2008a).

During the last decade, the age and growth of *O. vulgaris* has been determined at an individual and a population level in the laboratory or in the wild using different methods. However, those studies did not achieve consensus in the growth models and age estimates (Hermosilla et al., 2010). Hermosilla et al. (2010) validated the daily periodicity of growth increments in stylets of northeastern Atlantic wild-caught Octopus vulgaris maintained under controlled conditions (Fig. 12). It was corroborated by staining the stylets either with oxytetracycline (OTC) or tetracycline (TC), and comparing the number of rings produced with the number of days elapsed. **Figure 7.2.4**.

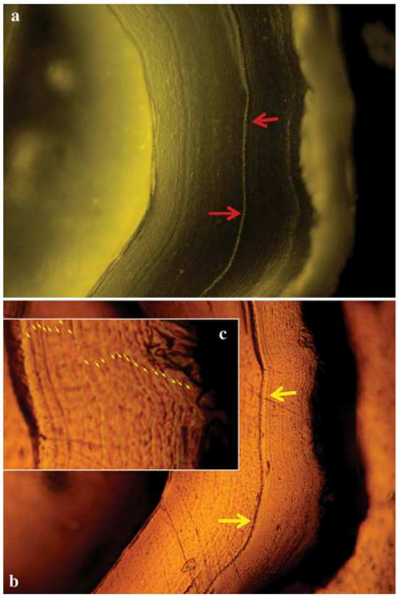


Figure 2. (a) Section of a stylet showing the fluorescent OTC mark in a female of 1140 g (injected 124 mg kg^{-1}). A second mark close to the border is also clear; this mark is an artefact caused by heating during the preparation procedure. (b) The same section in transmitted light. Arrows indicate the location of OTC marks. (c) Detail of the increments counted indicated by arrows.

Figure 7.2.4. Section of a stylet showing the fluorescence OTC mark in a female of 1140 g. Hermosilla et al., 2010.

The potential of other structures to estimate age was approached by Perales et al. (2014) who demonstrated the daily deposition of increments in Octopus vulgaris beaks for both lateral wall surfaces (LWS) and rostrum

sagittal sections (RSS). They used forty-nine marked wild animals kept in aquaria (weight range, 158–3,521 g) and 24 captive-reared known-age individuals (paralarvae, 0–98 days old; adults, 200–734 days old) were studied, encompassing for the first time the full age range of the species, including known-age individuals older than 1 mo. The daily deposition of beak increments was validated in the LWS by injection of Calcofluor, and in the RSS by environmental marking (thermal, confinement, capture, and stress of the chemical marking process). A total of 111 successful validations (when beak increments corresponded precisely to days elapsed) were achieved, and the maximum validated periods were 57 days (LWS) and 112 days (RSS). In the pelagic stage and transition to the settlement stage, a new pattern of microincrements that record age was demonstrated in the lateral hood surfaces of upper jaws, where stress checks were observed. In the benthic stage, tip erosion in beak RSS results in some underestimation of age;however, the demonstration that RSS can record environmental stress renders it a potentially useful tool for documenting life events. This technique was also pointed to offer a potentially superior approach. Beaks are present in all extant species of cephalopods than other techniques because they are are easily extracted and preserved, and their microstructures are not affected by freezing (Perales-Raya et al. 2010).

In paralarvae, the embryonic development of cephalopod beaks is poorly known. The presence of pre-hatching increments on the reading areas (rostrum and lateral walls) is unclear and there are no data on temperature influence, egg clusters of *Octopus vulgaris* were reared at 16, 19, 21, 23, and 26 °C. The extracted upper beaks were observed by Armelloni et al (2020), in order to validate the age of first daily increment formation, assessing the accuracy of age inferred from the two reading areas (**Figure 7.2.5**). The growth rate was calculated for beaks reared at 21 °C, and the overall dimensions were compared among all incubation temperatures. Three ad hoc developmental stages were proposed for the upper beak of *O. vulgaris* embryos. Increments on lateral walls appear during the second phase, whereas the first increment on the rostrum is visible only at hatching. Consequently, only the accuracy of age inferred from the rostrum surface is confirmed for the early stages. The growth rate of the rostrum region accounted for a drop in growth during the third phase. Conversely, the growth rate increased until hatching in lateral walls, suggesting that the heterogeneity of the growth rate could be due to the different role played by the beak areas. Temperature influenced beaks in terms of overall size, as embryos reared at a warm temperature (23 °C) were smaller than the others. These results confirm that the incubation environment could alter hatchling characteristics thus affecting the recruitment conditions (Armelloni et al. (2020).

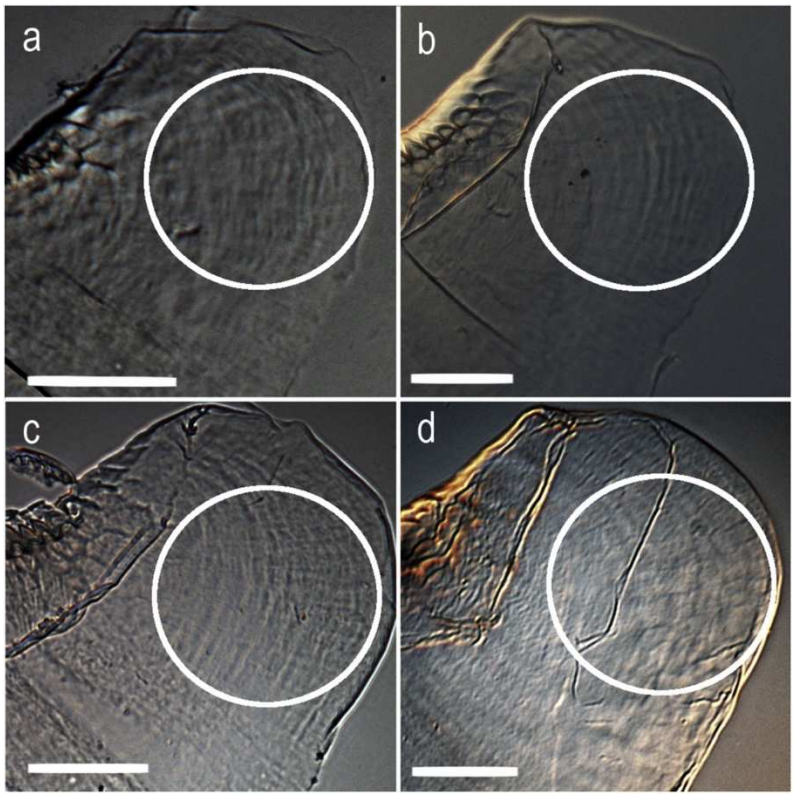


Figure 7.2.5. Follow-up of pre-hatching increments (see the area surrounded by the white circle) on the lateral walls: (a) phase 2; (b) beginning of phase 3; (c) hatching; (d) paralarva of 7 days. Bars =50 µm (From Armelloni et al., 2020).

7.2.1.1.4 Trophic Ecology

Sánchez et al. (2015) describe the trophical relationships of the common octopus *O. vulgaris*. The diet of *O. vulgaris* consists of crustaceans, fish, molluscs, and polychaetes. No significant variation in diet has been reported for subadults and adults. Anraku et al. (2005) showed that prey selection under experimental conditions depended on chemical stimuli detected by chemoreceptors in the arms and lip, for a description of the nervous system of the arms). Octopuses drill holes in the shells of shelled molluscs, allowing them to inject cephalotoxin, secreted by the posterior salivary glands, to paralyse the prey (Nixon, 1979, 1987). Coastal fish (*Epinephelus marginatus, Serranus* sp., *Atherina presbyter*) attracted to *O. vulgaris* egg masses during hatching periods have been observed preying on paralarvae (Villanueva and Norman, 2008). Further, paralarvae of 6.5–18 mm TL have been recorded in the stomach contents of albacore (*Thunnus alalunga*) (Bouxin and Legendre, 1936). Predators of subadult and adult *O. vulgaris* include fish, marine mammals, birds, man, and other cephalopod species (Hanlon and Messenger, 1996). *Octopus vulgaris* has been found in the stomachs of bottlenose dolphin (*Tursiops truncatus*) (Blanco et al., 2001), Risso's dolphin (*Grampus griseus*) (Blanco et al., 2006), and Mediterranean monk seal (*Monachus monachus*) (Pierce et al., 2011) in the Mediterranean Sea. Marine mammal predators of *O. vulgaris* in Galician waters include common dolphin (*Delphinus delphis*), long-finned pilot whale (*Globicephala melas*), and sperm whale (*Physeter macrocephalus*) (Table 3.3, see also at González et al., 1994; López, 2002; Santos et al., 2004, 2013, 2014).

Concerning the planktonic paralarvae, where the natural mortality is higher surpassing by large the 90%, the diet was first untangled in the wild by Roura et al., (2012). External digestion of prey and posterior suction of the liquefied contents by wild *O. vulgaris* paralarvae made the morphological identification of gut contents impossible. Thus, a PCRbased method using group-specific primers was selected to identify prey consumed by *O. vulgaris* paralarvae in the pelagic realm. The mitochondrial ribosomal 16S gene region was chosen for designing group-specific primers, which successfully amplified DNA of prey by using a semi-nested PCR-based approach and posterior cloning. The phylogenetic analysis clustered ingested prey into 12 families of crustaceans (11 belonging to the order Decapoda and 1 to the order Euphausiacea) and two families of fishes (Gobiidae and Carangidae). The trophic niche breadth of *O. vulgaris* paralarvae is low (CI = 0.13), indicating that these paralarvae are specialist predators at least during the first weeks of their life cycle. It is the first time that natural prey has been identified in *O. vulgaris* paralarvae collected in the wild worldwide, and such knowledge is critical to increasing the survival of *O. vulgaris* hatchlings in captivity, a goal that has been actively pursued since the 1960s by aquaculture researchers. This study was enhanced and completed using New Generation Sequencing by Olmos et al. (2017). DNA from the dissected digestive glands of 64 *O. vulgaris* paralarvae was amplified with universal primers for the mitochondrial gene COI, and specific primers targeting the mitochondrial gene 16S gene of arthropods and the mitochondrial gene 16S of Chordata. Following high-throughput DNA sequencing with the MiSeq run (Illumina), a total of 122 Molecular Taxonomic Units (MOTUs) belonging to several taxa of decapods, copepods, euphausiids, amphipods, echinoderms, molluscs, and hydroids were identified. . Redundancy analysis showed seasonal and spatial variability in the diet of *O. vulgaris*. General Additive Models of the most frequently detected prey families of *O. vulgaris* revealed seasonal variability of the presence of copepods (family Paracalanidae) and ophiuroids (family Euryalidae), spatial variability in presence of crabs (family Pilumnidae) and preference in small individual octopus paralarvae for cladocerans (family Sididae) and ophiuroids (**Fig. 7.2.6**).

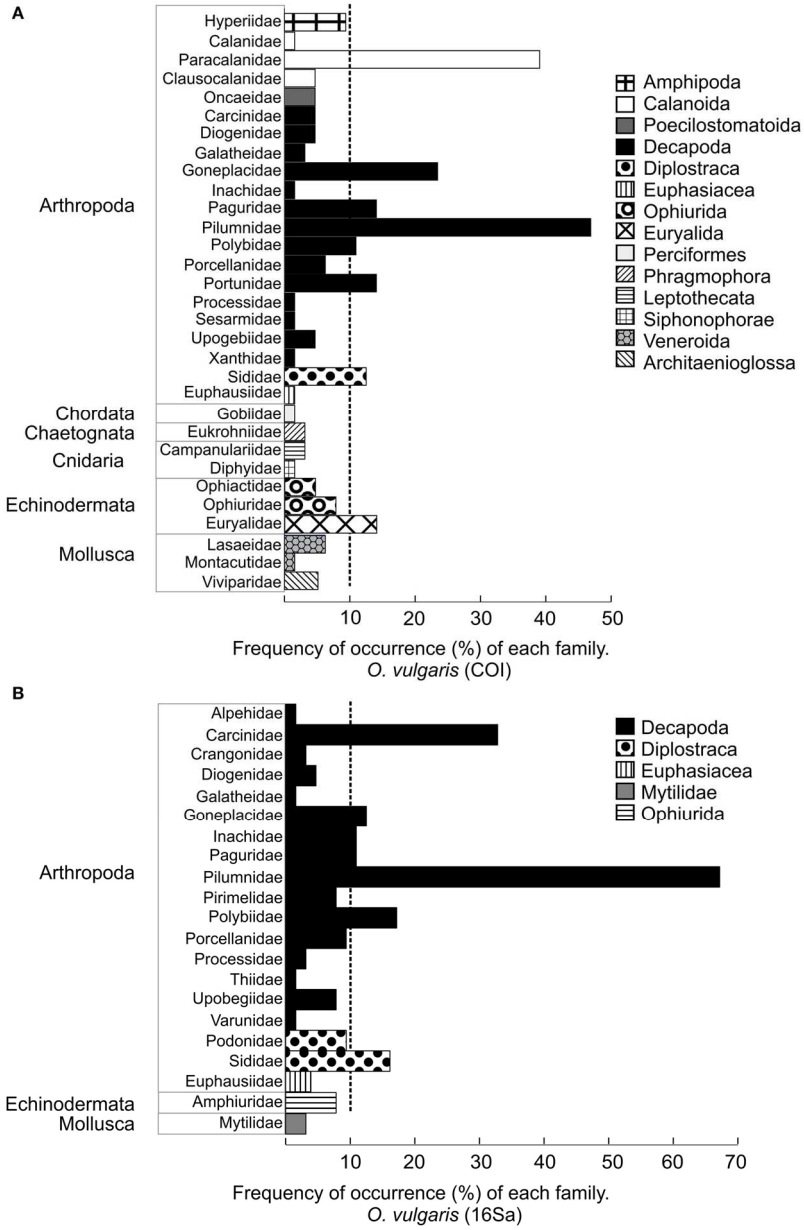


Figure 7.2.6. Frequency of the occurrence of the families (FF) detected in wild paralarvae of *O. vulgaris* with primers COI (A) and 16S (B) with primer COI. Dashed areas represent different orders. The corresponding phylum is indicated on the left. Vertical dashed line indicates the families detected in more than 10%

The common octopus *O. vulgaris* is not considered as a key Low Trophic Level species. The common octopus is not one of the species types listed in Box SA1 (mictophids, euphausiids, clupeids, etc), and in its adult life cycle phase does not meet at least two of the sub criteria in SA2.2.9a.i–iii *(a: a large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency; b: A large volume of energy passing between lower and higher trophic levels passes through this stock; c: There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (i.e., the ecosystem is 'wasp-waisted')*. Additionally, this species do not feed predominantly on plankton. Finally, although is characterised by early maturity, high fecundity and short life span, it does not forms dense schools and could reach 120 cm total length, indicating that it is not a small size species. On the other hand, a recent publication by Lourenço et al. (2015) using nitrogen isotopes estimated that the trophic level of this species ranged from 4.40 and 4.66, in two Atlantic populations of the Iberian Peninsula.

7.2.1.1.5 Environment & climate change

The biological cycle of the common octopus (*Octopus vulgaris*) is characterised by a pelagic larval stage, rapid growth, a short life cycle of approximately 2 years and high fecundity. Consequently, specimens caught during a fishing season are the fishery's recruitment from the previous year. Because of these determinants,

in a cycle ranging from 1 to 2 years for this species the population is completely renewed, such that recruitment success will depend primarily on favourable oceanographic conditions during the period in which the larvae are found in the water column, and also on settlement occurring in nearby areas with sufficient abundance to replace the previous population. The high fecundity (more than 200,000 eggs) helps to ensure this replacement occurs. However, survival rates during the larval phase also depend on there being adequate food for the newly hatched octopuses, as well as on climate conditions that favour the presence of abundant zooplankton biomass. This correlation with climate parameters explains a large part of the interannual variability in biomass for this population, which will affect catches.

There is high variability in the annual abundance of many cephalopod populations, which suggests that environmental effects on populations tend to be both pronounced and transient. This reflects the short life, rapid and labile growth and maturation patterns, and the lack of overlap between generations. Physiological features that allow squid to have fast life histories include very efficient digestion, sustained growth, with both increase in muscle fibre size and continual recruitment of new muscle fibres, efficient oxygen use, and low levels of antioxidative defence (Pecl and Jackson, 2008; Rosa and Seibel, 2008). Metabolic and life-history parameters are sensitive to environmental variation, and there is no reservoir of old adults to buffer the population against fluctuations in spawning and recruitment success. Nevertheless, populations apparently recover relatively quickly after periods of low abundance. Thus, cephalopods are both sensitive (in terms of rapid response) and resilient (in terms of recovery) to perturbations, including overfishing and, potentially, climate change. It may, therefore, be difficult to distinguish between the effects of directional climate change and local climate variation, and indeed (as is the case for all exploited species) between these effects and the effects of fishing (Pierce et al., 2010).

Impacts of environmental change and variation may occur at all stages of the life cycle, from egg to mature adult. However, the planktonic early life stages (paralarvae) are thought to be particularly sensitive to both physical and chemical oceanographic factors (e.g. temperature and acidity) and to the biotic environment (e.g. phytoplankton productivity and abundance of zooplankton – prey for the paralarvae – and fish (including prey, predator, and competitor species). Environmental effects on eggs and paralarvae are probably the least well understood. Growth and mortality rates during the paralarval phase of the life cycle are high and potentially highly variable (see Pierce et al., 2008b, for a recent review).

As a consequence of high metabolic rate, rapid growth, and short life cycles, cephalopod abundance can be very sensitive to environmental change, with fishing mortality being a less important component of population dynamics than in longlived species. This is probably the key point in favour of using cephalopods as climate-change indicators.

In upwelling systems, fish production appears to be determined by enrichment, concentration, and retention processes, which, in turn, are controlled by climatic factors. An increase in temperature should intensify upwelling, causing a reduction in the concentration and retention processes and therefore resulting in a decline in local fish production (Walther et al., 2002). The reproductive cycle of the common octopus (*Octopus vulgaris*), an important resource species in northwest Spain, is coupled to the coastal wind-driven upwelling, so that females spawn prior to spring months before the upwelling season, and hatching takes place from late summer to early autumn (Otero et al., 2007). This ensures that the newly hatched paralarvae are present in the water column when the ecosystem is still productive. Coastal wind patterns appear to explain up to 82 % of the interannual variation in octopus catches in the Galician artisanal fishery (Otero et al., 2008). Analysis rates of change in abundance and biomass of the *O. vulgaris* early larval phase in the northwest Iberian coast, where upwelling events occur with a frequency of 10 – 20 d from April to September, indicates that the increase in larval abundance and biomass is significantly correlated with the simultaneous decrease in water-column-integrated nitrate, ammonium, and chlorophyll levels. These conditions occur during the early stage of the relaxation phase of coastal upwelling events, when nutrient salts are consumed to produce biogenic matter, which is retained in the system and transferred through the foodweb (Otero et al., 2009). In the northwest African upwelling areas, *O. vulgaris* recruitment depends on the retention processes when paralarvae are present in the plankton (Faure et al., 2000).

The planktonic paralarval stage of cephalopods such as the common octopus is an important dispersal phase that lasts from days to months. Cephalopod paralarvae modify their vertical position in the water in upwelling ecosystems and such behaviour influences their spatial distribution and genetic structure. Studies comparing two upwelling regimes such as the permanent upwelling in Morrocan waters and that of Galican waters showed that three common planktonic dispersal patterns were identified in the Iberian–Canary current eastern boundary upwelling (ICC): coastal, coastal-oceanic and oceanic. Coastal and oceanic dispersal patterns favoured spatio-temporal paralarval retention or “schooling” of different cohorts over the continental

shelf and continental slope in 9 and 11 species, respectively. Such spatio-temporal retention was reflected in the complex haplotype networks and high nucleotide/haplotype diversity recorded for these two groups. The only cephalopod species displaying a coastal-oceanic dispersal pattern was *Octopus vulgaris*, where low nucleotide and haplotype diversity was observed (**Figure 7.2.7**). The observed decline in genetic structure resulted from the dispersal of similar cohorts within upwelling currents and upwelling filaments to the oceanic realm (Roura et al., 2019).

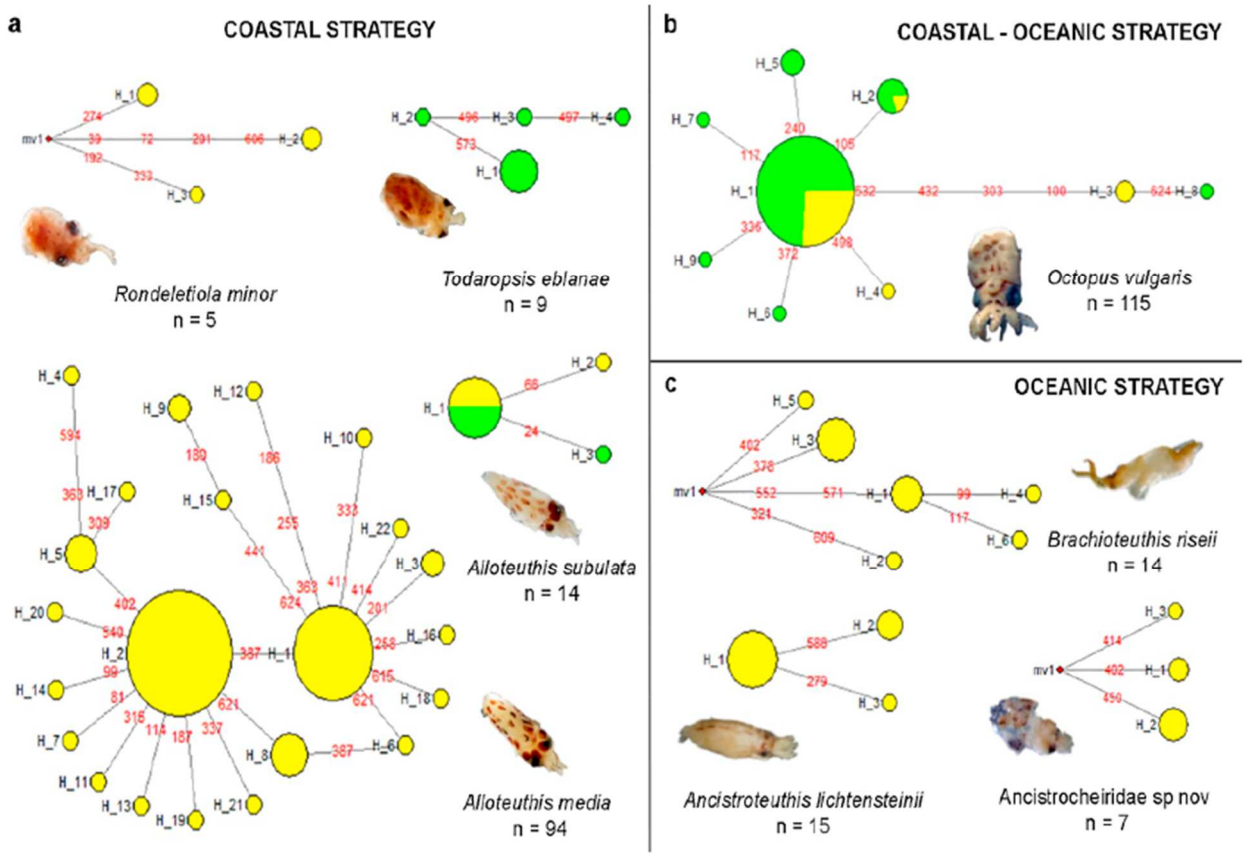


Figure 7.2.7. Haplotype networks obtained for those cephalopod species with more than 5 individuals and more than 3 different haplotypes, grouped according to their dispersal pattern. Colours represent the upwelling regions sampled: green, cape Silleiro (NW Iberian Peninsula); yellow, Cape Ghir (W Morocco).

Other studies indicate that intense precipitation events and flash floods will result in increased run-off from land. Sobrino et al. (2002) demonstrated a negative correlation between rainfall and *O. vulgaris* abundance in the Gulf of Cadiz. All the climate effects described above, singly or in combination, may ultimately affect the movements, distribution, and abundance of cephalopods. Therefore, changes in distribution of some cephalopod species are likely in response to climate change (Pierce et al., 2010).

Various recorded changes in marine communities over the last few decades have been attributed to climate change. Thus, Southward et al. (1995) described changes in the plankton community in the English Channel over 70 years and noted the increase in warm-water species during warm periods, and vice versa. They predicted that global warming would lead to species from the Bay of Biscay becoming common in the English Channel (Pierce et al., 2010).

Numerous studies reviewed here and elsewhere (see Pierce et al., 2008b) have underlined the high sensitivity of cephalopod species to local, regional, and largescale environmental conditions and changes. Cephalopods have the intrinsic flexibility to adapt to climate change; their life history and physiological traits allow them to be opportunists in variable environments (Rodhouse and Nigmatullin, 1996). Additionally, we will not have to wait decades to determine these effects. For species where we have established good baseline data, changes will be immediately obvious. In contrast, for longer-lived predators, it will probably take decades to establish cause and effect on their life histories, populations, and abundance (Pecl and Jackson, 2008).

Environmental effects on early life stages of cephalopods can affect life-history characteristics (growth and maturation rates) as well as distribution. Oceanographic conditions are of particular significance for mobile

pelagic species such as the ommastrephid squid (Pierce et al., 2008a, 2008b). This suggests that recruitment success of pelagic species or of species with pelagic early life stages could be a possible indicator of variations in the oceanographic environment. Understanding climatic effects depends on knowledge of ecology and natural history. Thus, *O. vulgaris* females apparently migrate towards the coast before spawning, presumably in search of rocky substrata with caves and holes that facilitate the protection of the eggs. Nevertheless, it is not known whether or not this behaviour is related to other factors, such as temperature, which, by affecting the rate of embryonic development, can determine hatching time and hence the environmental conditions experienced by the hatchlings.

The lack of long-term data series, even on basic fishery parameters like CPUE, is one of the major constraints on improving our understanding of cephalopod population trends. Long-term dataseries will be imperative to the success of any management strategy to cope with climate variability. It will also be critical to consider interactions between different stressors, such as overfishing, habitat destruction, and climate change (Root et al., 2003).

Although life-cycle plasticity has been demonstrated in a range of cephalopods, the ways in which life-history parameters are linked to environmental conditions are not well understood. There is a need to develop integrated population models that consider both life-cycle parameters and environmental drivers, potentially allowing both a better understanding of the mechanisms linking life history and environment, and a way of evaluating the relative importance of different drivers (e.g. global change vs. overfishing). Such models would be facilitated by availability of accurate estimates of age and mortality. It is also necessary to find ways to introduce environmental information into cephalopod stock assessment and fishery management (Pierce et al., 2010).

7.2.1.2 Stock structure of *Octopus vulgaris and metapopulation = sub-population rationale*

Intra-specific population differentiation can occur at varying levels, and is determined by the level of connectivity or exchange between individuals. It can be difficult to apply the concept of structural subdivisions within marine populations as many marine ecosystems lack obvious barriers to dispersal (Waples 1998); however, marine populations often consist of localised sub-populations that are relatively independent and have distinct biological and genetic properties (Gaffney 2000). Metapopulation concepts have been increasingly used to define the range of population structures, as the case of the common octopus, which consist of partially closed networks of sub-populations, where connectivity occurs across a range of spatial scales (Kritzer & Sale 2004). Recognising such complex population systems is important for improving our understanding of spatial patterns in marine species and thus managing them more effectively.

Assessing and preserving structural complexity is crucial for maintaining healthy marine populations, and has been described as one of the 'ten commandments' for sustainable ecosystem-based fisheries management (Ryman et al. 1995; Francis et al. 2007). Population structure determines the spatial scale at which individuals operate within a population and to what extent they are connected. If a group of individuals form a relatively independent self-recruiting sub-population, for instance, it is logical that it should represent the management unit or scale for assessing population characteristics such as growth rate, age structure, mortality and productivity (Kassahn et al. 2003). Furthermore, understanding connectivity and dispersal is a critical component for designing effective management tools, such as no-take fisheries reserves, which can provide a buffer against overexploitation (Sale et al. 2005). Disregarding population complexity in an exploited population may lead to a decline in stock abundance and the number of localised sub-populations, and thus genetic diversity, which is crucial for maintaining a species' ability to evolve and adapt to environmental change (Carvalho & Hauser 1994; Stephenson 1999). This will not only have negative effects on fishery productivity, but will have large-scale repercussions for respective predator-prey populations and, ultimately, ecosystem stability (Bradbury et al. 2008). Currently, traditional management practices typically assume, without prior knowledge, that populations are simple and singular entities (Stephenson 1999). In the case of cephalopods in general, and the common octopus in particular, it is vital, therefore, that the structure of commercially harvested marine populations are characterised (Doubleday, 2009).

With regard to studies focusing on the state of cephalopod populations in general and of octopods in particular, it is important to mention ICES (the International Council for the Exploration of the Sea), whose objective is to verify whether catch trends in commercial fisheries can be considered as a good indicator of the abundance of the population, based on CPUE and surveys. This organisation recognises that constant monitoring of *O. vulgaris* landings (weight distribution and sex ratios) could be useful in providing an indicator enabling the detection of changes in spawning periods and larval survival, so that administrators can set closed periods at the most appropriate times in order to protect the next recruitment. Regarding this issue, the Demersales surveys annually undertaken, gather and report the catches of *Octopus vulgaris* along the

Spanish Atlantic waters (Velasco et al., 2012). This species is distributed alongl the area surveyed (**Figure 7.2.8**). Bathymetric distribution reflects the preference of this species for the shallowest grounds, with the highest abundances at depths lower than 100 m, and almost no presence in grounds deeper than 200 m.

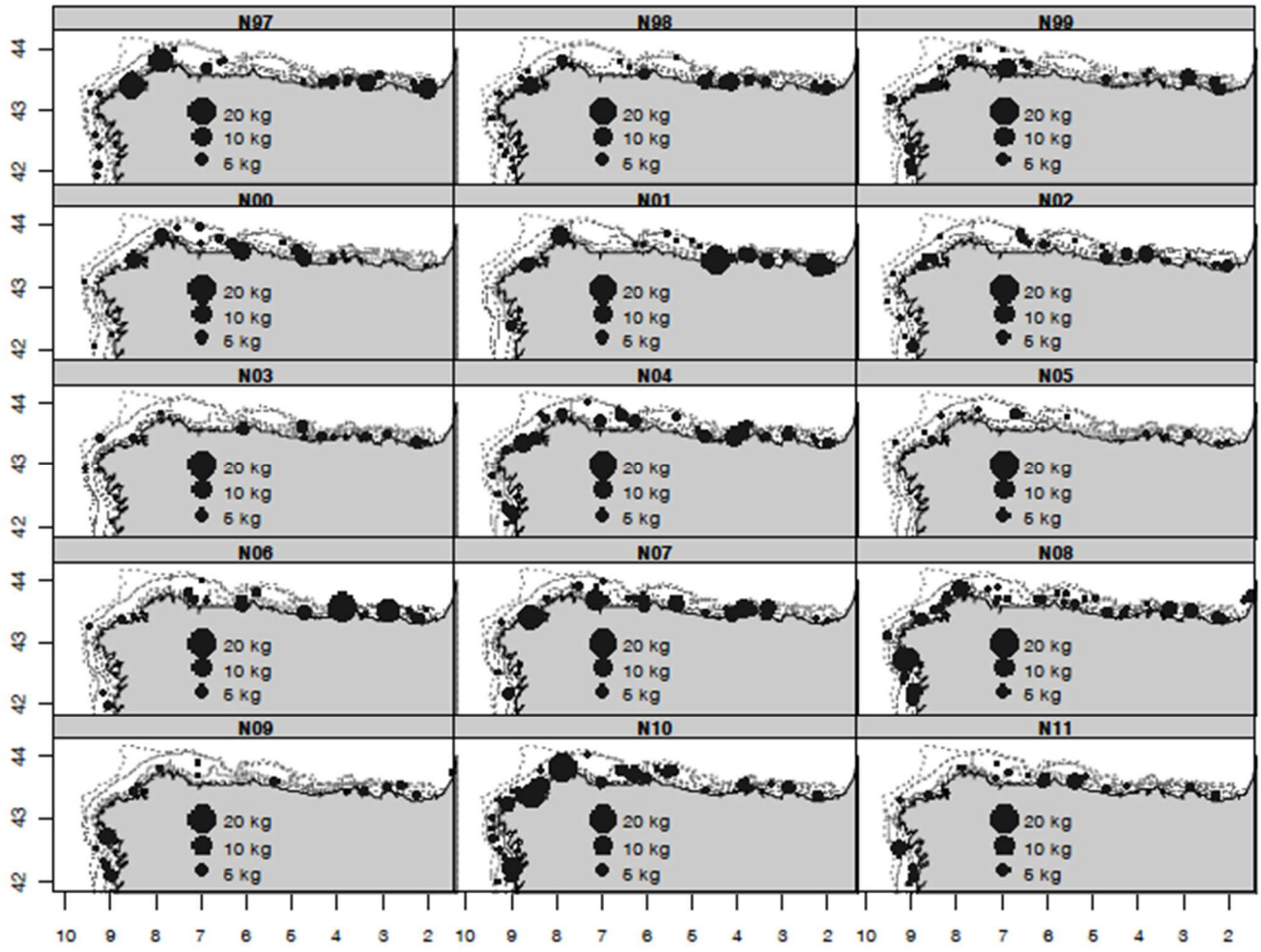


Figure 7.2.8.Geographic distribution of common octopus (*Octopus vulgaris*) during DEMERSALES Survey time series (1997-2011)

The biological and taxonomic status of the common octopus *Octopus vulgaris* was revised, since it was thought to be distributed over a large area and has a complicated population structure with many and variable microcohorts. To date, it is clear that *Octopus vulgaris* is a complex of species that has been treated as a single species in the literature. Currently, *O. vulgaris* sense Cuvier, 1797 was considered to inhabit the Mediterranean Sea, the eastern Atlantic coast from southern England to southwestern Africa, the Azores, the Canary Islands, the Cape Verde Islands, the St Helena Islands, and many localities from the western Atlantic (Guerra et al, 2010). The northeastern Atlantic population of *O. vulgaris* could be considered as metapopulations or composed by local populations (such as the case of the octopus from Asturias waters). The considerations in terms of connectivity of this octopus species ranges from a maximum to minimum connection. Due to the low migration undertaken by the benthic juveniles and adults, the connectivity between local populations are more linked to the dispersion of the paralarvae. Unfortunately, the problem of the common octopus larval studies is the absence of studies targeting this early stages of development in most of its geographical distribution. However, in Galicia, there are several studies that suggested that the larvae can be retained in cells near the coast. Thus, Rocha et al. (1999) and González et al. (2005) hypothesised the relationship between the distribution and movement of cephalopod paralarvae within a circulatory cell in a west–east direction of the upwelling near the coast. In these studies, it was extended that hypothesis, to include transport of paralarvae to the inner part of the Ria during upwelling following the current system. In view of the fact that cephalopod paralarvae show diel vertical migration, the current system in the Ria of Vigo during upwelling would help retention of paralarvae in a circulatory cell, thus allowing them to return near the coast. In upwelling and neighbouring areas, coastal retention appears to be the main environmental factor for *O. vulgaris* recruitment success, whereas upwelling intensity and wind-induced turbulence appear to be secondary beneficial factor. Later, Roura et al. (2019) showed that O. vulgaris was the only paralarvae in

Galician waters that undertake a coastal-oceanic behaviour during its planktoic stage. Based on the studies presented herein, it could be considered that the Asturias is part of a metapopulation with partial isolation or moderate connectivity as stated in Table G2 in regards to stock structure from the MSC FCP v.2.2 (Octopus in the Western Asturias waters would correspond to stock structure Type B).

Despite the biology of *O. vulgaris* was largely afforded in other areas of its distribution range, there is not many biological studies undertaken in waters of Asturias or the Bay of Biscay that can be applied in the fishery subjected of this evaluation. Since the paralarvae of this species is pelagic, there is a high chance that the early stages of development are subjected to the influence of oceanographic conditions, especially those related with physical parameters, such as upweling events, mesoscale eddyes or fronts. Upwelling conditions are related to strong recruitment from Mauritanian to NW Spanish waters. *O. vulgaris* is the most abundant and ubiquitous cephalopod species occurring in the Saharan Bank (NW Africa from 21º N to 26º N).

As pointed, migration of mature animals seems in Asturias could be coastward, becoming those individuals more available to the fishery. Throughout the scientific literature there is an extensive array of terms used to define a biological population. However, all definitions imply that there is a cohesive process that groups individuals together, and these cohesive processes can be broadly lumped into genetic (reproductive) and demographic (social and behavioural) categories (Waples & Gaggiotti, 2006). A key difference between genetic and demographic populations is the level of spatial and temporal integrity by which they are defined. Compared to a demographic population, a genetic population has a high level of integrity, because a very low rate of exchange between individuals is sufficient to maintain genetic homogeneity (Carvalho & Hauser 1994). However, regardless of whether a population is defined as demographic or genetic they are rarely simple and commonly consist of a complex composite of subdivisions.

In Asturias, Cabranes et al. (2007) also indicated the existence of a fine spatial substructure in *O. vulgaris* populations in the Atlantic, which is a function of geographical distance. Significant Mantel tests showed a population model of isolation-by-distance for the Atlantic populations. However, it has to be considered that the comparisons excluded a large part of the fishery along the Portuguese coasts (from the Algarve to Galician waters). Although this study is very clarfying and shed light over the population structure of the common octopus in these Atlantic and Mediterranean waters, the absence of these data between the south and the north part of the Iberian Penisula could bias the results obtained. Thus, conversely, previous studies of the genetic structure of *O. vulgaris* from the Mediterranean Sea using allozymes (Maltagliati et al., 2002) and microsatellite loci (Casu et al., 2002) excluded isolation by- distance in *O. vulgaris* Mediterranean populations. Maltagliati et al. (2002) suggested that *O. vulgaris* in the Mediterranean followed a basic island model in a background of high gene flow. One explanation for the different results could be the difference in geographical area studied.

On the other hand, the studies of Guerra et al. (2010) and those of Warnke et al. (2004) showed that *O. vulgaris* s. str. is monophyletic (i.e. group of organisms that consists of all the descendants of an ancestral population). The analyses performed by Guzik et al. (2005) go further, however, suggesting that the *O. vulgaris* species group, including *O.oculifer* from Galapagos, *O. cf. tetricus* from Western Australia, *O. tetricus* from New South Wales, and *O.vulgaris* s. str. from Port Elizabeth in South Africa, which were the species used by those authors, is also monophyletic. However, because that species group may contain other species such as *O. insularis* (Leite et al., 2008), further study is needed to test whether the *O. vulgaris* species group will hold its monophyletic status when all species are analysed together.

Finally, Guerra et al. (2010) indicated that phylogenetic trees also showed that the genus Octopus is polyphyletic. This agrees with the results of Guzik et al. (2005), who demonstrated that the genus contains a number of distinct and divergent clades and that the systematics of the subfamily Octopodinae require major revision.

On the whole,the statement of *Octopus vulgaris* as a cosmopolitan species worlwide was recently modified. Thus, the findings of Amor et al. (2016) support the hypothesis that multiple *O. vulgaris*-like species are currently being incorrectly treated under a single species name *O. vulgaris* (**Fig 7.2.2 a and b**).

Besides, it is necessary to include environmental factors in the models because the local populations could be influenced by the particular atmospheric-oceanographic factors prevailing

7.2.1.3 Overview of the Octopus vulgaris fisheries and stock assessments

The common octopus, *Octopus vulgaris*, is the most important commercially fished octopus species, and that includes animals collected in the waters of the Atlantic and Mediterranean (Josupiet, 2000). The catch trend

of *O. vulgaris* decreased during the last 50 years but remains quite stable during the last 20 years.(**Figure 7.2.9**). Global catches of the common octopus reached 38447 tonnes in 2017 (**Table 7.2.1**). However, these results seem to represent a clear underestimation since the worldwide records of octopus catch (unidentified) for that year, provided by FAO, was 334326 tonnes andong an overall total catch of octopuses of 405726 tones worlwide (FAO, 2019).

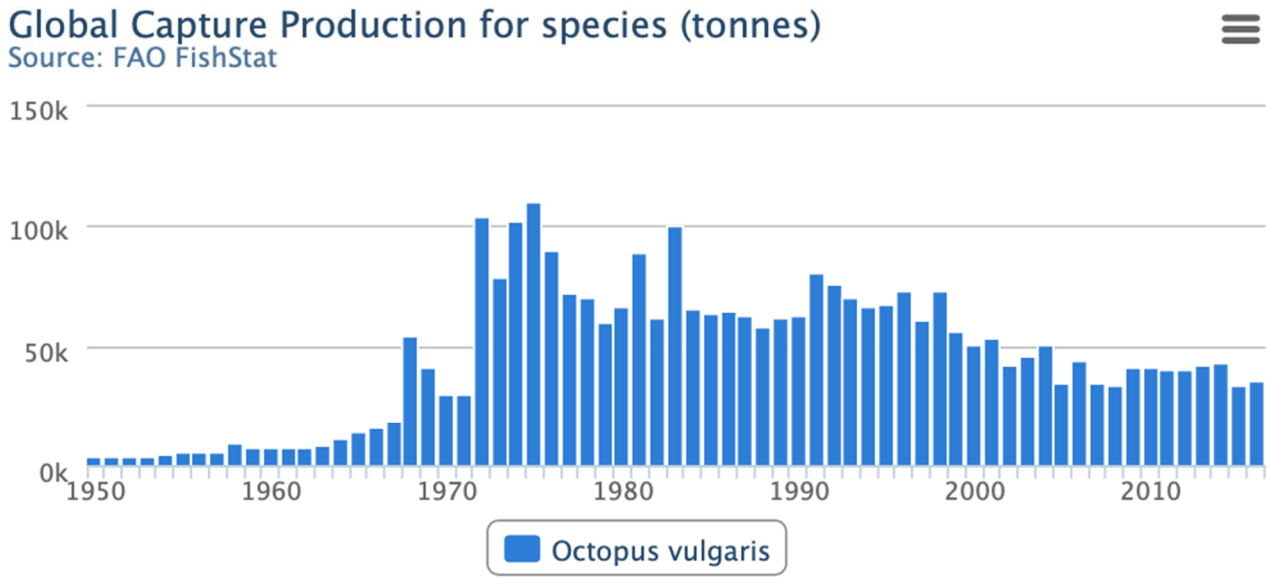


Figure 7.2.9. Evolution of the common octopus catches worldwide from 1950 to 2017 (FAO 2019).

Common octopus	Pieuvre		Pulpo común		*Octopus vulgaris*			3,21(09)005,07		OCC
27 France	3	38	37	70	131	96	59	94	120	76
Portugal	9 160	6 720	10 454	7 199	9 271	11 513	10 945	7 543	9 663	5 776
Spain	...	...	...	...	...	5 894	3 522	3 277	4 750	2 766
27 Fishing area total	*9 163*	*6 758*	*10 491*	*7 269*	*9 402*	*17 503*	*14 526*	*10 914*	*14 533*	*8 618*
31 Dominican Rp	63	57	24	29	29	37	36	45	8	9
Mexico	8 959	16 636	15 325	16 281	16 919	14 369	18 332	12 826	11 176	14 237
31 Fishing area total	*9 022*	*16 693*	*15 349*	*16 310*	*16 948*	*14 406*	*18 368*	*12 871*	*11 184*	*14 246*
34 Congo	8	25	20	44	6	11	30	12	23	20
GuineaBissau	130 F	154	42	7	249	0	...	...	...	...
Italy	1 305	1 387	727	766	326	-	-	219	114	279
Senegal	...	...	...	...	...	...	...	...	...	4 547
Spain	5 792	6 752	4 759	5 317	3 536	337	392	796	561	765
34 Fishing area total	*7 235 F*	*8 318*	*5 548*	*6 134*	*4 117*	*348*	*422*	*1 027*	*698*	*5 611*
37 Albania	82	109	47	113	165	170	173	124	154	137
Croatia	...	146	141	149	166	192	313	331	257	135
France	1 223	1 153	1 584	1 574	1 498	1 794	1 472	1 296	1 439	1 533
Greece	1 554	1 580	1 487	1 426	1 301	1 705	1 835	1 646	3 316	2 741
Italy	3 018	3 454	3 336	4 023	3 010	2 787	2 387	2 461	2 256	2 393
Lebanon	23 F	22 F	21 F	20 F	19 F	18 F	17	6	3	4
Libya	247	...	...	...	...	...	...	...	...	...
Montenegro	23	15	16	13	15	12	15	14	14	9
Slovenia	-	-	-	-	-	0	0	-	-	0
Tunisia	1 280	1 819	3 064	2 987	3 680	2 965	3 551	3 281	1 830	2 857
Turkey	681	649	509	322	361	284	254	215	246	163
37 Fishing area total	*8 131 F*	*8 947 F*	*10 205 F*	*10 627 F*	*10 215 F*	*9 927 F*	*10 017*	*9 374*	*9 515*	*9 972*
Species total	*33 551 F*	*40 716 F*	*41 593 F*	*40 340 F*	*40 682 F*	*42 184 F*	*43 333*	*34 186*	*35 930*	*38 447*

Table 7.2.1. Worlwide catch of *Octopus vulgaris* from 2008 to 2017 (FAO, 2019).

Figure 7.2.10 shows the catches of octopodids in European ICES waters from 2000 to 2017. Octopodidae catches here described usually comprise 3 species: *Octopus vulgaris*, *Eledone cirrhosa* and the muscky octopus *Eledone moschata*. In case of the figure below, most of the catches were recorded in trawlers and so the most abundance species here is *E. cirrhosa* (ICES, 2018).

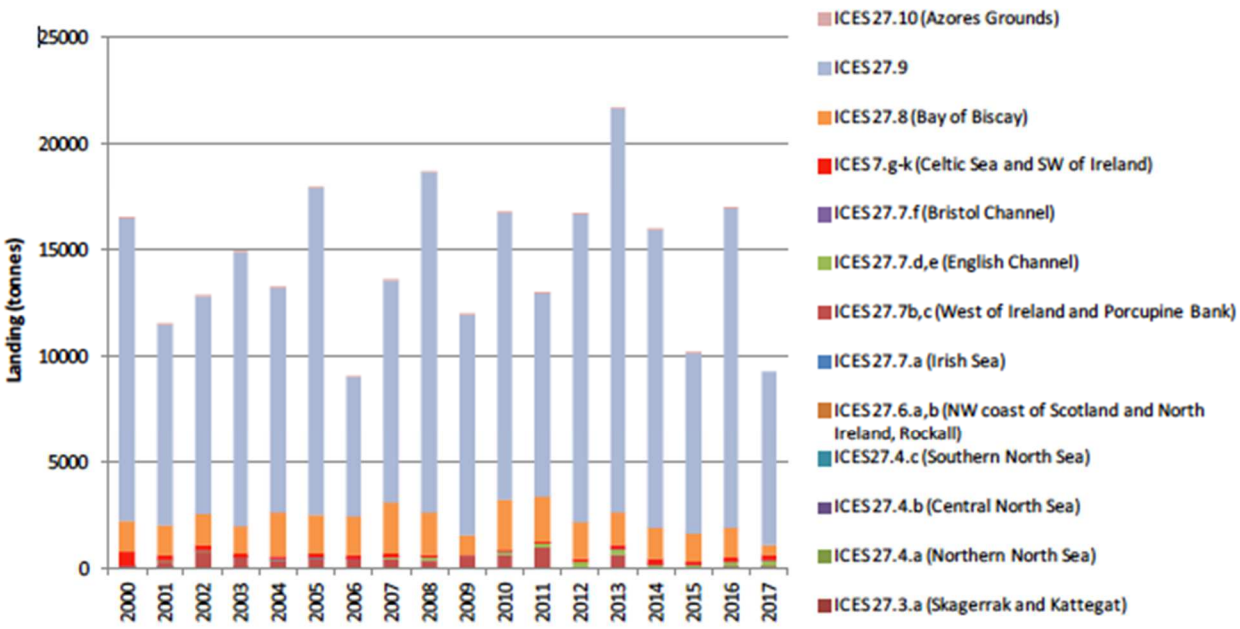


Figure 7.1.10. Octopodis catches in European ICES waters (2000-2017). Data source: ICES 2018

Spain presented important catches of Octopodidae in the first years of the data series, but since 2008 catches decreased and no data is provided for 2011 and 2017. Level of catches for the most important contributor (England) was at around 88 t in average, decreasing in the last years of the series to at 13 t.

For more southern areas (Div. VIIIabd, VIIIc and IXa), main countries exploiting these species are Spain, Portugal and France, with negligible catches recorded by The Netherlands. No species identification has been provided for all countries and areas for commercial catches except for Spain and Portugal in Div. VIIIc and IXa.

7.2.1.3.2 *Octopus vulgaris* stock assessment

Cephalopods are of increasing importance as a fishery resource and many species are taken in directed and bycatch fisheries around the world. The cephalopod fisheries, passed from about 1.5 miilion tonnes worldwide back on the 80's to the actual 3.8 million tonnes in 2017, peaking 4.9 MT in 2014 (**Table 7.2.2**). Those figures indicate the actual importance of cephalopods in a marine realm where the figures show an important reduction of the main fish stocks. That also underlines the importance of managing the cephalopd stocks with caution and reinforce the necessity of managing these stocks under effective stock assessment parameters. Owing to the short life-cycles and variable growth rates of most cephalopods, stocks may be highly volatile, both highly susceptible to recruitment overfishing and, conversely, capable of rapid recovery. Many assessment methods have been applied to cephalopod stocks, including stock recruitment relationships (e.g. the Japanese Todarodes pacificus stock), recruitment indices (e.g. Saharan Bank cephalopod stocks), swept-area biomass estimates (e.g. Northwest Atlantic stocks of the squids *Loligo pealei* and *Illex illecebrosus*), production models (e.g, Saharan Bank cephalopod stocks), cohort analysis (e.g. *Illex argentinus* in the Falkland islands), yield-per-recruit models (e.g. Northwest Atlantic squid stocks), length-based cohort analysis (e.g. *Dosidicus gigas* in and Gulf of California),Bayesian (Central-Eastern Pacific stock of *Dosidicus gigas,* Xu et al., 2017) and depletion estimates of stock size (e.g. *Illex argentinus* in the Falkland islands). Despite the widespread application of assessment methods, few stocks are rigorously managed, and the best example of a regulated fishery is the Falkland islands squid fishery. In contrast, although a number of assessment methods are used in the Japanese fishery, management activities are designed to ensure harmonious operation of the industry rather than maintain stock size. Fisheries for *Loligo forbesi* and *Loligo vulgaris* in the Northeast Atlantic are mainly based on by-catches, although there is some directed fishing, particularly artisanal jig fishing in coastal waters. There is currently no assessment and minimal management for these species, and available management options are constrained by the nature of the fishery and the generally poor quality of available data (Pierce& Guerra, 1991). Besides, owing to the actual knowledge of the importance climatic factors on the population abundances, it is necessary to include environmental factors in the models because the local populations could be influenced by the particular atmospheric-oceanographic factors prevailing.

Species group Groupe d'espèces Grupo de especies	2011 t	2012 t	2013 t	2014 t	2015 t	2016 t	2017 t
46 Krill, planktonic crustaceans Krill, crustacés planctoniques Krill, crustáceos planctónicos	181 010	187 608	239 500	317 615	250 846	273 750	251 958
47 Miscellaneous marine crustaceans Crustacés marins divers Crustáceos marinos diversos	468 209	467 260	487 650	429 345	437 480	377 581	370 568
51 Freshwater molluscs Mollusques d'eau douce Moluscos de agua dulce	374 057	364 962	358 721	347 513	335 864	315 803	359 181
52 Abalones, winkles, conchs Ormeaux, bigorneaux, strombes Orejas de mar, bígaros, estrombos	143 561	154 057	160 916	151 674	160 126	157 369	170 643
53 Oysters Huîtres Ostras	200 592	134 239	136 375	145 766	142 334	126 033	147 819
54 Mussels Moules Mejillones	97 483	103 626	97 394	92 317	101 118	128 347	85 952
55 Scallops, pectens Coquilles St-Jacques Vieiras	859 449	750 826	747 015	740 737	577 525	571 934	631 718
56 Clams, cockles, arkshells Clams, coques, arches Almejas, berberechos, arcas	607 440	601 630	578 903	566 803	608 653	561 066	534 813
57 Squids, cuttlefishes, octopuses Encornets, seiches, poulpes Calamares, jibias, pulpos	3 778 028	4 015 494	4 042 664	4 854 821	4 770 192	3 510 692	3 772 565

Table 7.2.2. Annual catch of cephalopods worlwide (FAO 2019).

Despite the importance of several species for European fisheries, there is limited management of the fisheries and no routine assessment; data collection is often either not part of routine fishery data collection or the data are inadequate for assessment. Increasingly, however, cephalopods are seen as alternative target species to replace overexploited finfish stocks, and the growing fishing effort means that management will almost certainly be needed within the next few years. Also on the horizon is the development of commercial aquaculture, especially for *Octopus vulgaris* .

In one of the meetings of the ICES Working Group on Cephalopods, in this case at IEO (Spanish Institute of Oceanography) in Cadiz, Spain, from 27 to 30 March 2012, emphasis was placed on the need for ICES to call upon all European countries fishing in ICES areas to send their data. Data was provided by the major countries that catch cephalopods. However, this was not the first time that ICES had stressed the need to compile reliable data on catches and efforts, since as early as 1992, during a meeting of this working group in Kiel (Germany), the lack of data from many European countries was noted. The low level of data collection on European cephalopod fishing in relation to the requirements of the high demand for data as a result of their short life cycles meant that there was no analytical assessment of cephalopods in 2011. However, the ICES cephalopod group was able to obtain data on cephalopods prior to the meeting. A preliminary analysis of the data on abundance trends was presented, based on CPUE and abundance indexes from surveys, laying the foundations for ongoing work and calls for future data. In 2014, this working group presented a fisheries management model based on an estimation between biomass models and taking into account environmental factors. This was carried out in the Gulf of Cadiz octopus fishery (ICES 2014). The first prerequisites have been met, such as the existence of long time series for catches and efforts. Now this type of model needs to be taken further in order to establish the minimum levels of resource abundance from which exhaustive fishery inspections should be conducted. It is believed that information on knowledge of octopus populations can be improved. However, catch levels in Asturian waters since the beginning of the OFMP have enabled responsible fishing, despite the interannual variations in abundance resulting from factors other than fishing.

Thanks to the insistence of this regulatory board and its successive warnings, data from the last few years has been provided and the successive working groups of ICES gathered important information that is being used to sharpen the future accurate monitoring of different cephalopod species in Europe. However, the catch matrix could present inconsistencies due to the lack of updated landing data from all European countries for years prior to 2008. Nevertheless, there is evidence that octopus catch trends have progressively decreased over the last 10 years in northern Spanish waters. In the case of areas affected by seasonal upwelling, as in Galician waters, it has been observed that the intensity of north winds has fallen over the last 20 years, which means that the upwelling of nutrient rich waters, fuel for the entire marine food

web in this zone, will be limited. Consequently, the abundance of phytoplankton and zooplankton will be low, and the smaller quantities of live prey (mesozooplankton) available to common octopus paralarvae will result in lower larval survival rates (Otero et al., 2008, 2009). Since then, an increasingly amout of information was provided to undertake approaches for obtaining the first assessment measures concerning cephalopods, especially the common octopus *Octops vulgaris*. That was noticeably in Andalucía (Sobrino et al, 2002, 2020), Galicia (Otero et al., 2008, Bañón et al., 2018) and Asturias, which measures implemented during the last years allowed to improve the knowledge of the fishery and ended in a stock assessment model developed for the management of the octopus fishery in Asturias (Roa-Ureta, 2019).

As pointed out above, monitoring of cephalopod resources requires precise data on catches and efforts. However, the characteristics of cephalopods mean that the traditional models applied to fish species are sometimes ineffective, probably due to the influence of atmospheric-oceanographic parameters, in particular on the first stages of development, but also on juvenile and adult phases.

7.2.1.3.3 Octopus trap fishery in Asturias

In Spain, *O. vulgaris* is mainly caught by artisanal fleets using traps (as target species) and trawlers (as bycatch). In the Cantabrian Sea (Division VIIIc) and the Galician waters (Subdivision IXa North) the artisanal fleet accounts for most of the *O. vulgaris* by traps comprising more than 90% of octopus landings.

Herein, we introduced the status of the population of *O. vulgaris* in waters of the northeastern Atlantic. The Asturias local population, similarly than in neighbouring areas such as Galicia, the stock is not well defined but adult animals could reach more than 100m depth, the limit of our unit of assessment. However, most of the resource is concentrated in rocky areas. That situation explained that most of the catches come from the artisanal fishery rather that from other gears, such as trawlers. Besides, there is a gap in the separation of the common octopus and the white octopus *Eledone cirrhosa* in the official statistics of the trawling activities. Thus, in the trawls, high quantities of *E. cirrhosa* are collected by this gear, while the importance of the octopus in the declared catches is reduced in comparison with the musky white octopus and gives more importance to the trap fishery in waters of Asturias. Regarding the other gears, the relevance of “rascos” (small-scale driftnet) or hand collection is practically negligible. Bottom trawling, which cannot operate in waters shallower than 100m depth (Real Decreto 1441-1999), captures only 11% of the *O. vulgaris* in Asturias, nevertheless, it is not the target species of the bottom trawling fishery, representing less than 1% of the captures of this fishery (Castro et al. 2011).

The OFMP in the Western Asturian waters (NW Spain) supports a fishery ranging from 50 to 300 tonnes per year for the period 2001-2019 (Fernández 2019a, **Figure 7.2.11**). However, despite of its importance in this area, to date, it was not afforded intensive elementary biological and ecological studies in this fishing ground (Cabranes et al., 2007). Whereas, *O. vulgaris* has been studied in detail in other areas (see Gonçalves, 1993 for reviews) and many papers have afforded different issues of the population biology and ecology of this species (i.e. Caverivière et al., 2002; Hernández–García et al., 2002; Silva et al., 2002; Oosthuizen and Smale, 2003; Rodríguez–Rúa et al., 2005).

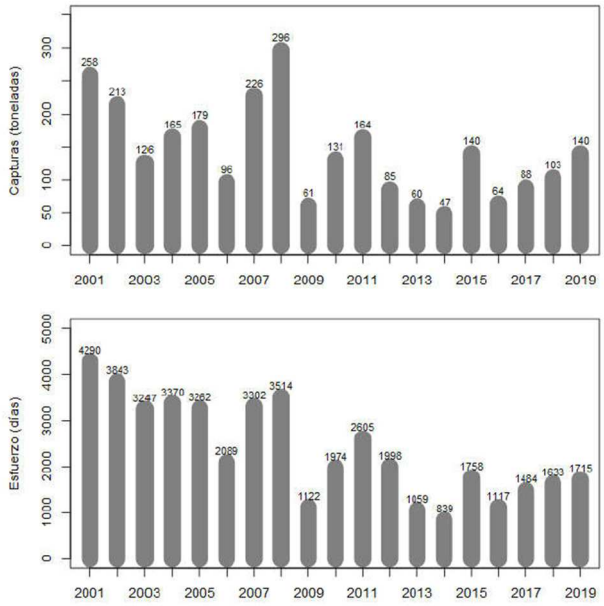


Figure 7.2.11. Annual catch and efforts of the 19 seasons with available data. Roa-Ureta, 2019

The fleet corresponding to the UoA is very homogenous and comprises 27 vessels with 2-3 crew members, all belonging to the Fishers' Guilds of Puerto de la Vega, Ortiguera, Viavélez and Tapia de Casariego. The length of boats varies between 5.7 and 12.6 m, and they have either wooden or polyester hulls. The typical octopus trap fishing boat has a wooden hull of 9.2 m in length, with a mechanical hauler on the bow, a gutter on one side along which the traps are moved, and a very high guard rail at the stern, which serves to fasten the stowed traps. Fishing consists in three basic operations: baiting, setting out and boarding the net, the last two forming what is known as a "haul".

The number of boats included in the OFMP fell from 90 to 40 between 2001 and 2019, and has remained relatively stable since then (Fernández 2019a). Boat ownership is predominantly individual and the owner usually participates directly in the fishing activity. The shipowner generally employs one or two additional crew members to assist in fishing activities.

The fishing gear used is octopus traps, a semi-passive type of gear that remains static on the seabed while attracting species using bait. Octopus traps, like other traps, basically consist in a frame or skeleton (metal, plastic or wood), an outer layer and other secondary structures, such as a funnel and a bait holder.

The traps used in the assessed fishery are baited with small pelagic species, artificial bait and even chicken (see section 7.3.1.1.2 for more details). Data collected by observers on board the UoA confirmed that up to 5 different pelagic species are being used as natural bait: mackerel, sardine, horse mackerel, bogue and garfish. Fishers are not allow to catch bait species, they purchase (frozen in blocks) all natural bait species. Artificial bait is also frequently used in this area, containing (among other components) flour and gelatine. It is more expensive but rather more efficient since this type of bait (in blocks) does not need any care on land during long periods of time.

Because of the coastal nature of common octopuses and the artisanal fishery that sustains them, data regarding these species in Spanish waters are largely administered by the competent regional governments, which are also responsible for establishing management measures.

In Asturias, fisheries information collected by the fleet is reported and analysed by the CEP, the local research fisheries body advising the competent management authority in Asturias, the DGPM (General Directorate of Maritime Fisheries).

All vessels included authorised by Regional Ministry of Rural Development and natural Resources (Consejería de Agroganadería y Recursos Autoctonos) to target octopus with traps are, in turn, included in the census or artisanal vessels. This is a multigear small-scale fishing fleet: each vessel has permits for a certain number of fishing gears (eg. octopus traps and 2 different types of set nets), so the vessel can change the fishing gear according to the season and the catchability of different target species. Those small-scale fishing vessels targeting octopus with traps in the Western Asturias (see figure 7.2.1.1) have to be included in the octopus fishery management plan (OFMP), while in the Eastern Asturias there is no management plan.

Thus, the assessed fishery is regulated through an annual management (OFMP) elaborated by the DGPM from Asturia's Government with the collaboration of the fishing guilds (Cofradías).

The fishery operates mainly in waters of the Cantabrian Sea. However, the activity of the fishers under assessment is undertaken within internal waters (< 12 nm). **Figure 7.2.12.**

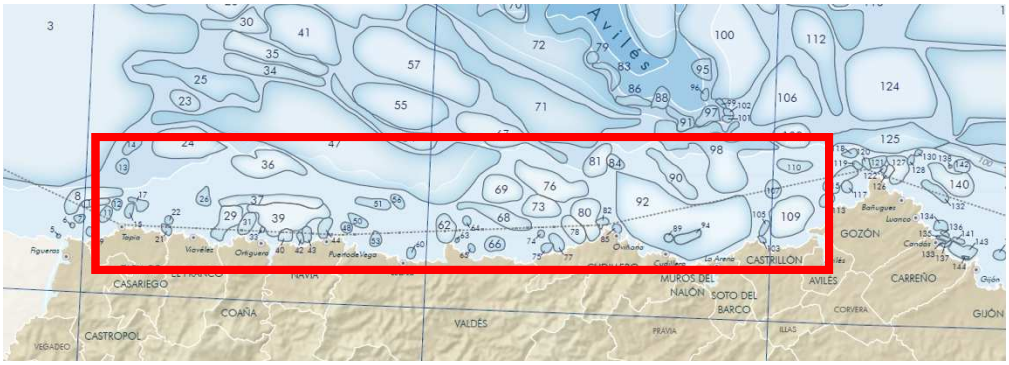


Figure 7.2.12. The area marked in red delimits the geopraphical scope where the assessed fleet operates, although the common octupus is also caught in operates also in eastwards of this area. The numbered areas are depicting the different fishing grounds identified in the Cantabrian Sea. Data Source: DGPM, Asturias Goverment

The management of the octopus trap fishery in the Western of Asturian waters has been carried out as a co-management experience since 2001 (see **section 7.4.1.4** for more details on the co-management arrangements). It includes, among other measures,the establishment of a closed season, a minimum capture weight of 1000 g and the limitation of traps as the only authorized fishing gear. The OFMP also includes specific details on the monitoring of the fishing activities (GPS track, on-board observer program…). See section 7.4.1.8 for a detailed account of the measures included in the OFMP.. The OFMP is annually reviewed and published in the Official Gazette of the Principality of Asturias (BOPA).

As previously mentioned, the effort made by the General Directorate of Fishery in Asturias allowed to establish a massive study gathering the information obtained during the last decade with the main aim of obtaining estimates of abundance, exploitation status, and population dynamics of the stock of octopus from Asturias for use in fisheries management (**Figure 7.2.13**). The results are presented in Roa-Ureta, 2019. This study uses a generalized depletion model to evaluate the abundance of spawning females emigrated, which is a derivation of the model developed for the eel fisheries in estuaries and applied to one of these fisheries in Taiwan in Lin et al., (2017). The data from each of the 19 available seasons were analyzed separately, applying the intra-annual version of the generalized depletion models. This is the recommended approach in stock assessment with generalized depletion models when data is recorded in very fast time scales, such as days or weeks.

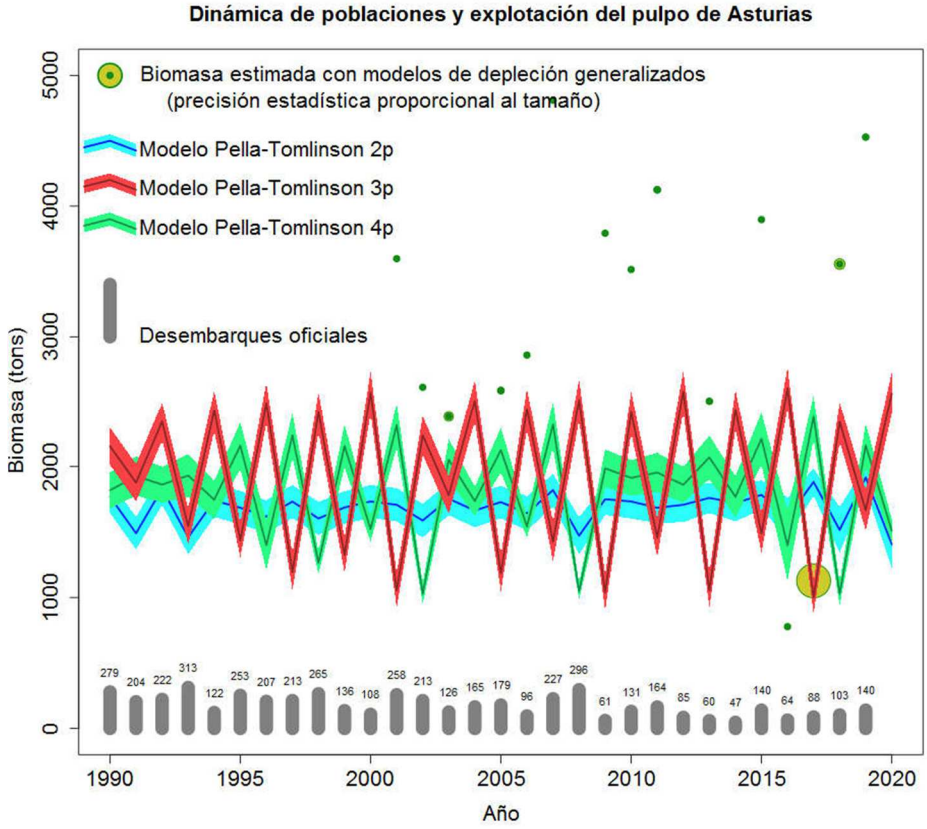


Figure 7.2.13. History of abundance and exploitation of the octopus of Asturias according to the results of the Pella-Tomlinson production model estimation (equation 2) with three formulations. The band around the biomass estimate corresponds to the estimate ± 6 standard deviations. Source: Roa-Ureta, 2019.

The most relevant results to the management of the resource shows that fishing mortality has not affected the abundance of spawners so ultimately, fishing has not impacted the capacity of the stock to be renewed. On the other hand, **Figure 7.2.14** shows that fishing mortality during each of the weeks in all seasons studied is well below natural mortality. For another aside the annual exploitation rate (percentage of the initial biomass captured by fishers during the season) has not exceeded 20%, and in most seasons it is even less than 10% and it is frequently less than 5%. It is apparent then that octopus fishing in Asturias exercises a low pressure on the stability and renewal capacity of the stock.

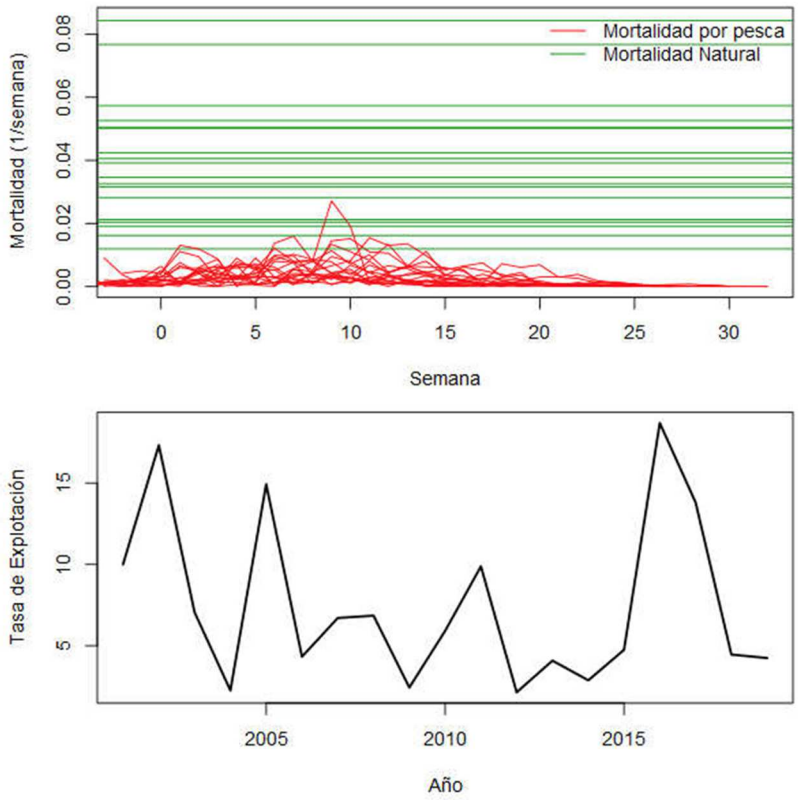


Figure 7.2.14. Intensity of fishing pressure on the octopus stock of Asturias. Top panel: weekly fishing mortality (variable lines) compared to natural mortality (straight lines) in each of the 19 fishing seasons. Lower panel: annual exploitation rate measured as the percentage of the biomass existing at the beginning of the season that was removed by fishing during all season. Roa-Ureta, 2019

The model most supported by the data is the Pella-Tomlinson 3p, with a large difference in favor in the Akaike information Criterion. Furthermore, the estimation of the parameters is statistically very accurate, with low standard errors in all of them. Finally, the Pella-Tomlinson 3p model predicts almost exactly the most accurate biomass estimate obtained from generalized depletion models (**Figure 7.2.14**).

The results of the study of Roa-Ureta (2019) indicates that Total latent productivity (net plus landings) is about 240 tonnes (and corresponds to the productive surplus that is biologically sustainable and that economically produces a maximum use of the resource). Considering productivity average net latent in the same period we obtain a figure of 87 tonnes, which corresponds to the average of economic waste during the period studied. The annual exploitation rates are low, ranging from 2 to 19 (see **figure 7.2.13**). However, due to the fluctuating nature of the stock, exploitation rates that are usually recommended as maximum and sustainable in fish, that is, 40% (Patterson, 1992) are not sustainable in this stock.

7.2.2 Catch profiles

The following data were retrieved from the latest annual report prepared by CEP on the monitoring of the OFMP (Fernández 2019a).

During the 2018/19 fishing season the total volume landed among all the fishers' guilds included in the Octopus Fishery Management Plan (OFMP) amounted to 140.365,65 kg, which is 36.914,34 more than in the previous fishing season. **Figure 7.2.15** shows the trend of the octopus catches since the OFMP was established.

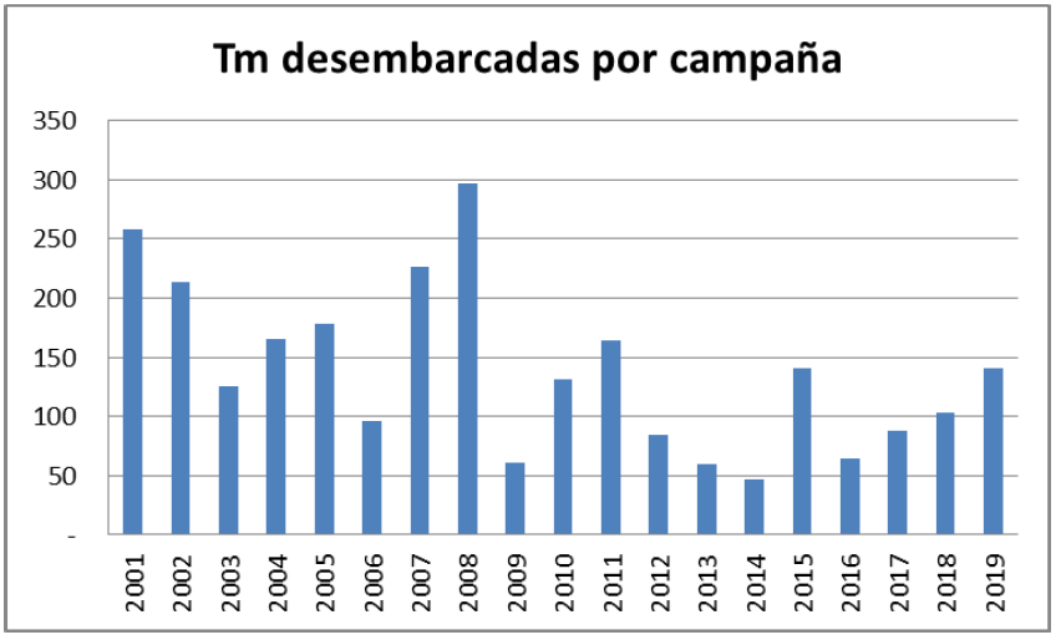


Figure 7.2.15. Historical trend of octopus landings (tonnes) within the OFMP. Source: Fernández, 2019.

Figure 7.2.16 shows the distribution of the landings among the different ports included in the OFMP. The vessels with base port in Luarca have been the ones that made the greatest landings, followed by those of Viavélez and Puerto de Vega. This is consistent with the trend of annual catches in each of the different ports included in the OFMP (see **figure 7.2.17**).

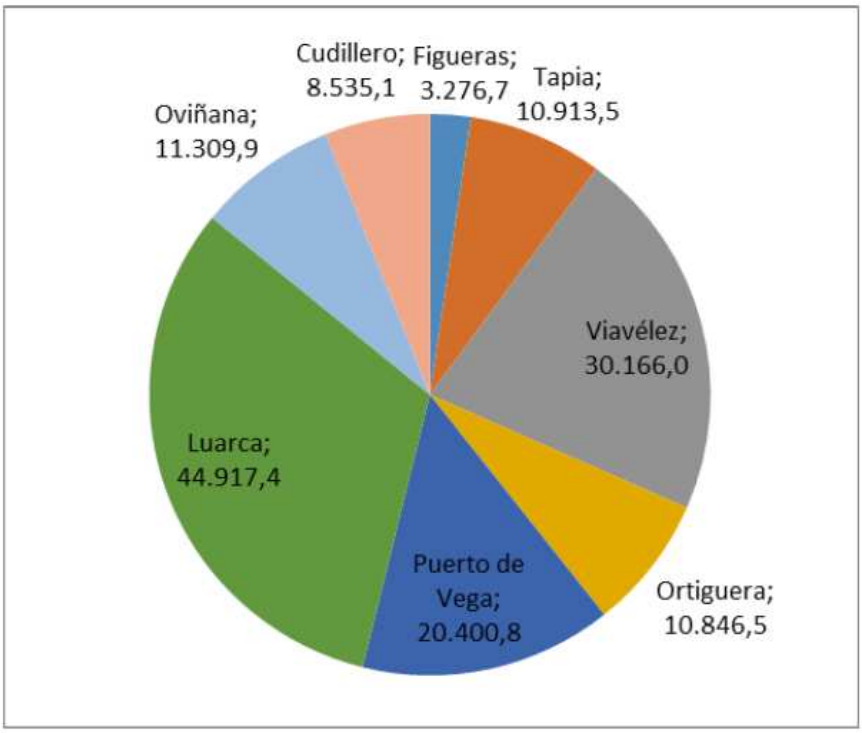


Figure 7.2.16. Octopus landings (kg) during 2018/19 fishing season in the different ports included in the OFMP. Source: Fernández, 2019.

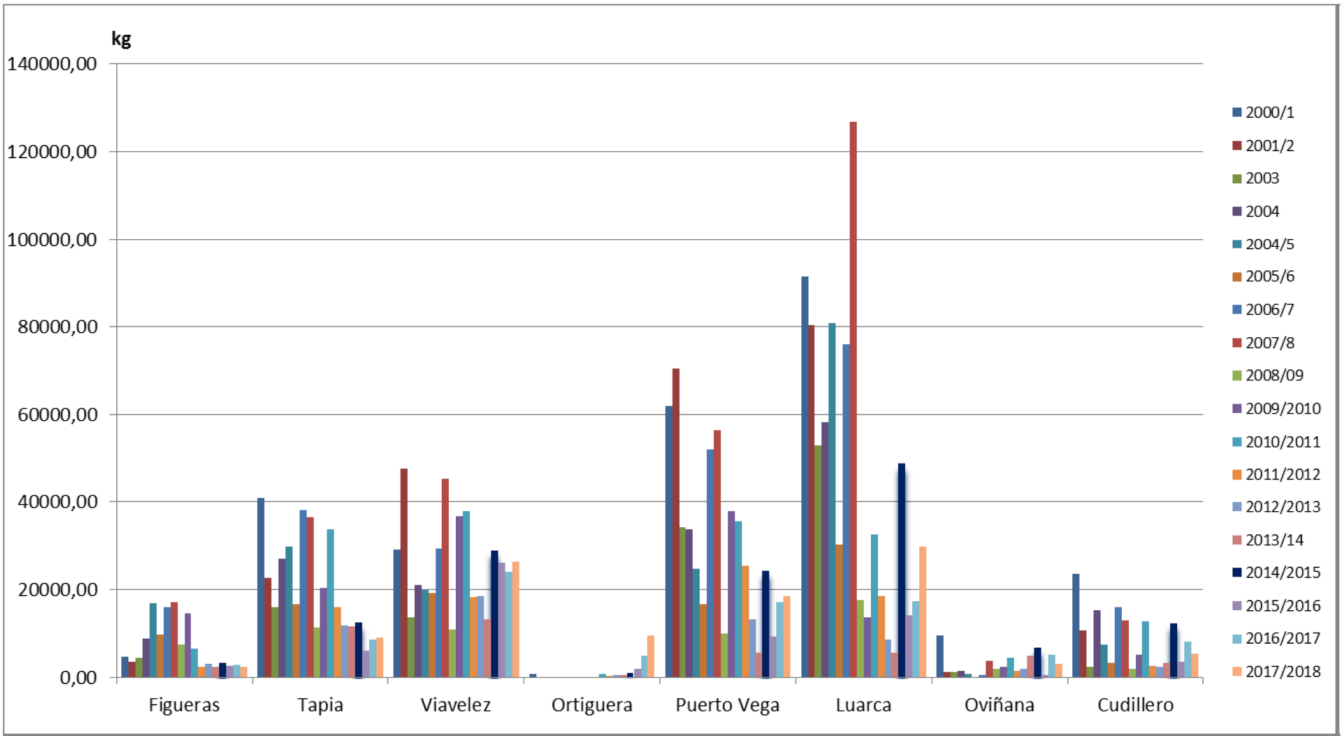


Figure 7.2.17. Octopus landings (kg) during previous fishing seasons in the different ports included in the OFMP (from 200/01 until 2017/18). Source: Fernández, 2018a.

Figure 7.2.18 shows data on landings and number of vessels during the 2018/19 fishing season broken down by month, and compared with the average of previous campaigns. Both monthly landings were lower in 2017/18 than the average of the previous years except for the months of December, January and February.

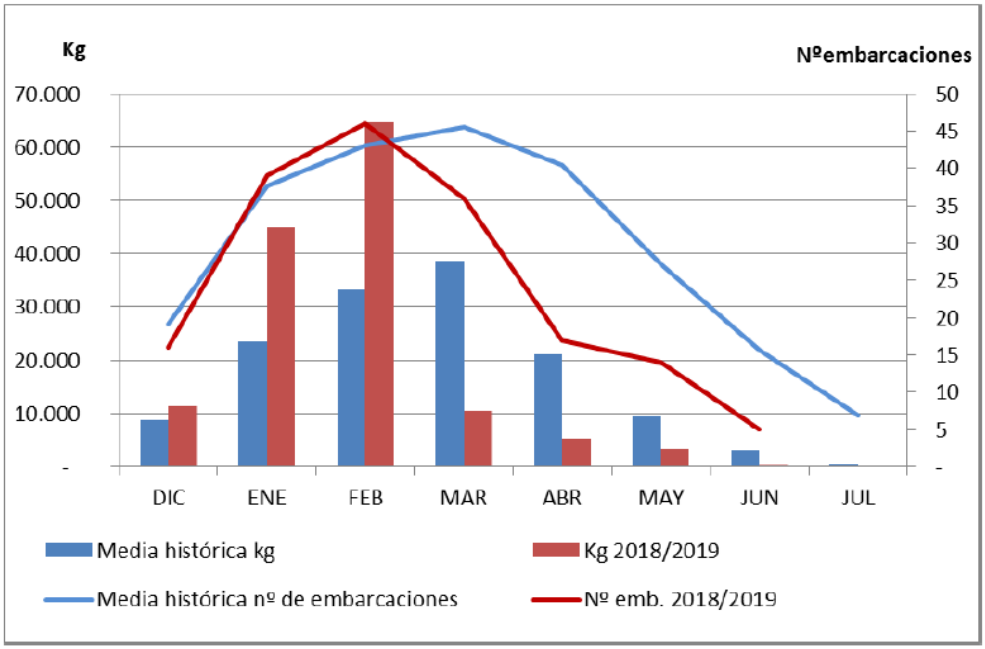


Figure 7.2.18. In red: Monthly landings (bars) and N vessels (line) during the 2018/19 fishing season. In Blue: Average monthly landings (bars) and N vessels (line) for all previous fishing seasons. Landing (Kg) are shown on the left axis, while N vessels are shown on the right axis. Source: Fernández, 2019.

Analysing the evolution of the catch data by months and port (**figure 7.2.19**), some differences are observed: the maximum catches were reached in January and February Luarca, and highest catches in all ports correspond to February.

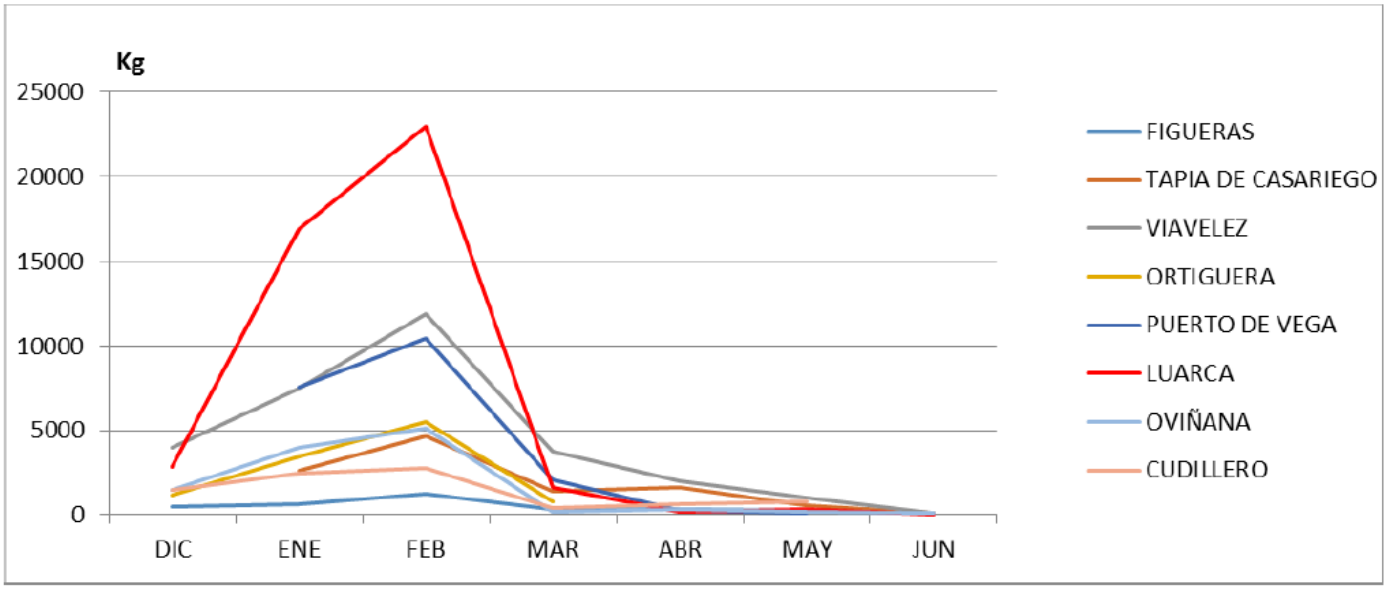


Figure 7.2.19. Monthly landings of octopus during the 2018/19 fishing season in each of the different ports included in the OFMP. Source: Fernández, 2019.

Figure 7.2.20 shows the number of fishing days per month during the 2018/19 fishing season and the average from previous years. The number of fishing days per month during the first three months was higher than in previous years, while since then the fishing effort was lower. Deviations compared to the average from previous years were found to be significant in February and March (Fernández 2019). The total fishing days in 2019/19 was 36.5, while the historical average is 42.1 fishing days per fishing season.

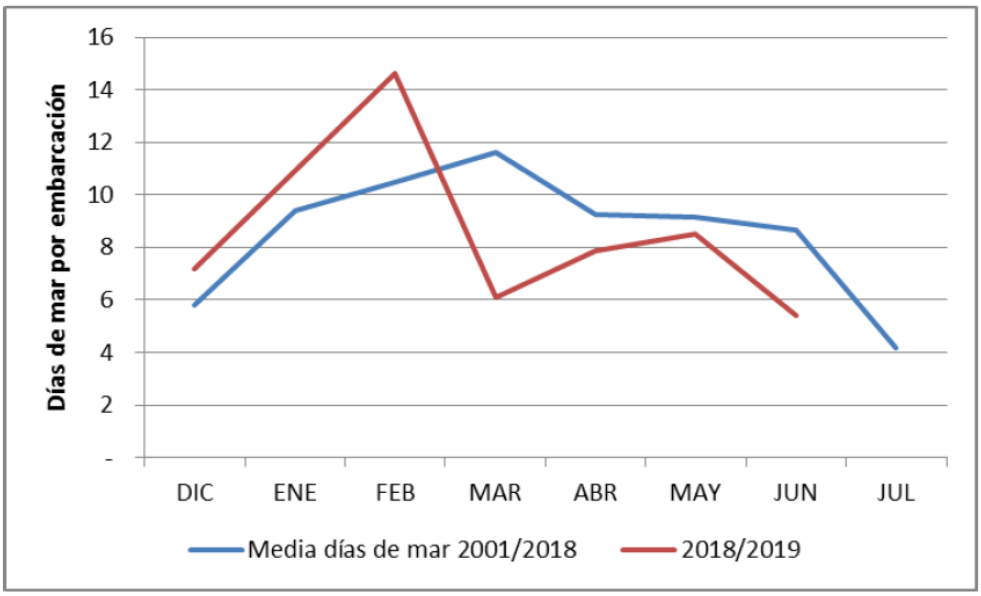


Figure 7.2.20. Monthly fishing days during the 2018/19 fishing season (red line) against the average from previous fishing seasons (blue line). Source: Fernández, 2019.

Figure 7.2.21 shows the trend of the CPUE (in kg of octopus per fishing day) since the octopus management plan was established in 2000/01. It is observed that CPUE achieved during the 2018/19 fishing season (81.8 kg) is the second highest record since the OFMP was established, and much higher than the average value of the entire historical series until 2017/18 (58.7 kg).

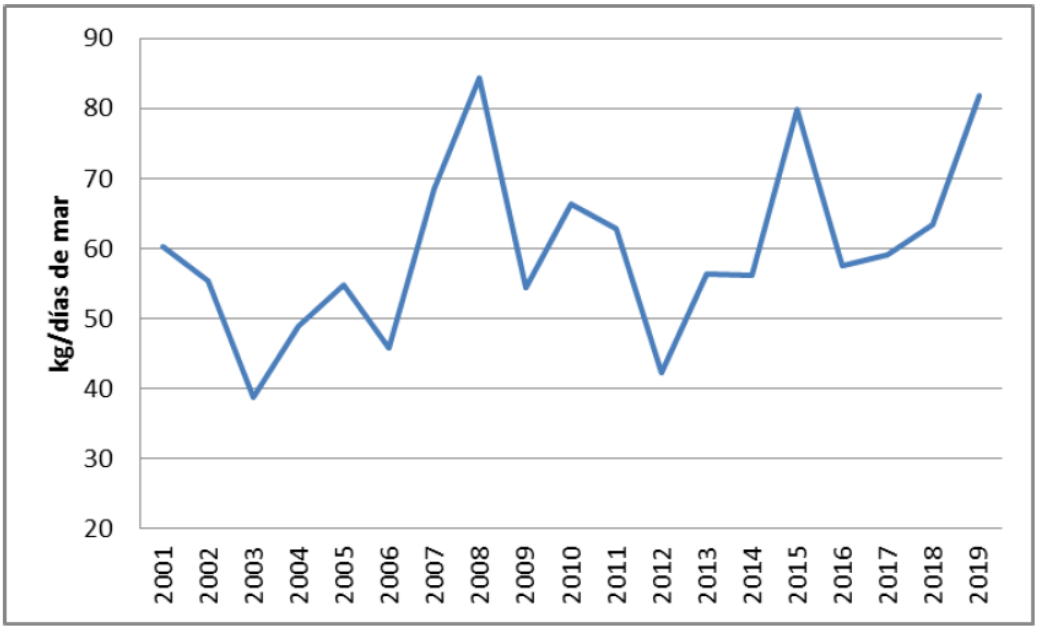


Figure 7.2.21. Average CPUE (in Kg/fishing day) between 2000/01 and 2018/19. Source: Fernández, 2019.

Finally, the analysis of the average CPUE per month during the 2018/19 fishing season (red bar in **figure 7.2.22**) shows very high CPUEs during December, January and February, and then ot gradually decreased over the months. The trend of previous years is also shown in this figure (blue bar). Winter months are always those with higher CPUEs in this fishery, which inevitably shows a decrease in the CPUE from March onwards.

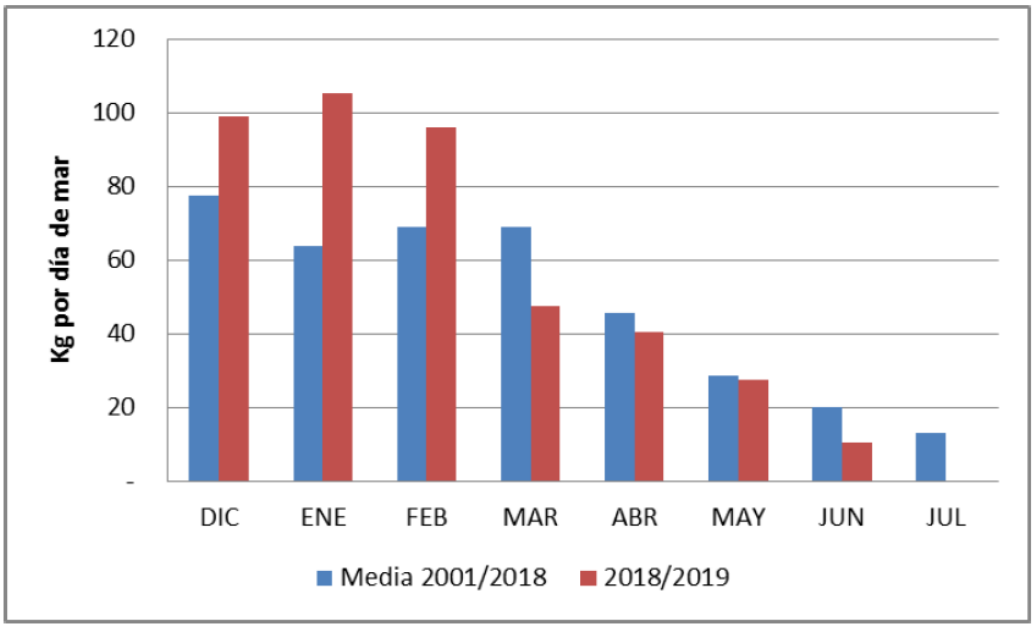


Figure 7.2.22 Average CPUE (in Kg/fishing day) during the 2018/19 fishing season (in red) against the average from previous years (in blue). Source: Fernández, 2019.

7.2.3 Total Allowable Catch (TAC) and catch data

No TAC is set for the octopus' fishery in Asturias but instead a maximum catch of 10 t is fixed per vessel and fishing season (see **Table 7.2.3**), regardless of the total number of vessels targeting octopus. Since the fishing season stretches from mid-December until mid-July, UoC landings from the latest fishing season (2018/19) were already available at the time of preparing the latest SA report (Macho & Rios, 2019).

Table 7.2.3 Total Allowable Catch (TAC) and catch data. Source: client and Fernández 2019a and

	Fishing season	Volume (tonnes)
TAC	**2018/19**	N/A
UoA share of TAC	**2018/19**	N/A
UoA share of total TAC	**2018/19**	N/A
Total green weight catch by the UoC	**2019/20**	**39.1**
Total green weight catch by the UoA	**2019/20**	**63.3**
Total green weight catch by UoA	**2018/19**	**140.4**
Total green weight catch by UoC	**2018/19**	**77.9**
Total green weight catch by UoA	**2017/18**	**103.5**
Total green weight catch by UoC	**2017/18**	**64.9**

Table 7.2.4 shows that although there was an increasing trend in the sales of MSC certified octopus caught by the UoC and sold in the authorised auction points since the certification of the fishery, the last fishing season has significantly diminished. According to data presented in Table 7.2., between 63 and 62% of the octopus caught within the Western Asturias OFMP was sold as MSC certified (in 2018/19 and 2019/20 respectively).

As a final note, pointing that 98.7% of the octopus sold at the authorised auction points included in current certificate is identified as MSC, only 1.3% was sold with the generalistic code (OCT, not MSC-OCT).

Table 7.2.4. Kilograms of MSC certified octopus sales in the different authorised auction points by the vessels included in the certificate (UoC).

Auction points	**Kg / fishing season**				
	2015/16	**2016/17**	**2017/18**	**2018/19**	**2019/2020**
Puerto de Vega	2 148	23 533	25 032	31 803	13 047
Tapia de Casariego	1 305	10 023	14 105	16 794	4 825
Viavélez	3 195	23 968	25 944	29 082	20 724
Ortiguera	*Catches sold at Puerto de Vega auction point*				
TOTAL	**6 309**	**57 523**	**65 081**	**77 679**	**39 091**

7.2.4 Principle 1 Performance Indicator scores and rationales

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			
	Guide 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**	**Yes**
Rationale				

There are three types of evidence that are relevant to this PI: the biology of the species, the nature of the fishery, and indicators of stock status. Until recently, no biomass estimations or other indicators such as MSY

were avialable for the Western Asturias octopus trap fishery since they are very difficult to produce for cephalopods in general and common octopus (*Octopus vulgaris*) in particular. This was basically due to the life strategy of these animals: semelparous reproductive strategy (a single ovarian cycle, they reproduce once and die soon afterwards), a short life expectancy (two years) and rapid growth. In addition, as meroplanktonic organisms, their larval phase in the first stages of growth is planktonic and affected by ocean currents. Populations are therefore renewed annually and are subject to variable climate conditions, which condition their survival (especially in the larval stages) and their subsequent abundance in the juvenile and adult phases. This climate influence is supported by analysis of the study by Otero et al. (2008), who found that the wind regime in spring-summer (prior to the peak of hatching for the common octopus), and in autumn-winter (during the planktonic phase) explains 85% of the interannual variability of subsequent adult catches. However, despite this bottom-up modulation, these authors have demonstrated density-dependent interaction, probably caused by cannibalism and competition for habitats, in addition to a downward trend produced by fishing. Besides wind-driven upwelling and other oceanographic processes shape genetic signatures of planktonic of the early life stages (Otero et al., 2016, Roura et al., 2019)

It is also important to stress that for octopods, it is impossible to estimate the age of the animals (a critical parameter used in many biomass estimation models) by means of conventional methods used for other cephalopods, such as statoliths. The age has to use other alternative and time consuming methods such as the increment readings in stylets (Hermosilla et al., 2010). **Section 7.2.1.2** provides a detailed explanation of the stock under assessment by considering the Asturias population as part of a metapopulation with moderate connectivity as stated in Table G2 in regards to stock structure from thAccording to he The model indicates that e MSC FCR.

During the firs cycle of certification of this fishery, an enormous effort was devoted to implement the HCR and to sign the pattern to study the fishery based on the inexistence of points of reference for the fishery. Considering then the constraints and the complexity of determining benchmarks in common octopus fishery in Asturias, the assessment team decided that it was appropriate to use the RBF tool for the stock status outcome of the target species. This involved applying both a Consequence Analysis (CA) as well as a Productivity Susceptibility analysis (PSA). Based on that analysis, it was underlined that during the series analysed, a gradual decrease in the size of the population was detected, but there was minimum impact on the variation of the structure of the sizes and no evident changes in the dynamics of the resource had been observed.

Actually, despite the dificulties for applying the stock assessement methods commonly applied in finfish populations, which have been proposed and established in some cephalopod stocks, and decribed herein (**Section 7.2.1.3**), many efforts have been made in Asturias to establish a wide sources of information to gather the data that allow them to improve the monitoring, HCR and management actions, Thus, a detailed information on catches and landings, CPUE of the vesssels, samplings on board of different parameters, survival rates, samplings on shore, and also the implemetaion of a GPS system to monitor all boats since the 2017-2018 season were implemented. The results of these measures leaded to the obtention of a model that allow them to apply a proper stock assessment in the fishery of the common octopus (Roa-Ureta, 2019). A stock assessment model and appropriate open source software have been developed for data collected from octopus fishing in Asturias and adapted to the fast population dynamics that characterizes these organisms. It is intended that this model is used from now, once it is established and implemented. From a biological point of view, it is interesting that the model reveals that weekly mortality rate, converted into annual, sustains that on average after one year and only by natural causes, 86% of the octopuses of the annual cohort die. In annual terms, the natural mortality rate varies between a minimum of 0.634 (47% mortality) in the 2009-2010 season to a maximum of 4,534 (99% mortality) in the 2013-2014 season (Roa-Ureta, 2019).From the application of the model Roa-Ureta (2019) is able to decscribe three biological patterns: a) the recruitment precedes migration of spawning females towards the coast. (b) the recruitment occurs in the middle of winter, January or February, and emigration of spawning females occurs in late winter; c) the decline in the stock is very strong after the emigration of the spawning females. This is consistent with a high natural mortality at the end of the fast life cycle. Catches continue after emigration, probably catching females and males that did not reproduce and are therefore still vulnerable to fishing.

The results relevant to the management of the resource by the administration are shown in **Figures PI 1.1.1.1.** and **PI 1.1.1.2**. **Fig. PI 1.1.1.1** shows that fishing mortality has not affected the abundance of spawners so ultimately, fishing has not impacted the capacity of the stock to renew. On the other hand, **Figure PI 1.1.1.2** indicates that fishing mortality during each of weeks in all seasons studied is well below natural mortality. On the other hand, the annual exploitation rate (percentage of the initial biomass captured by fishers during the season) has not exceeded 20%, and in most seasons it is even less than 10% and it is

frequently less than 5% (**Figure 7.2.13**). It is apparent then that octopus fishing in Asturias exercises a low pressure on the stability and renewal capacity of the stock. The model also indicates that the annual exploitation rate is low and this data are remarkably reduced especially since 2008 (Roa-Ureta, 2019).

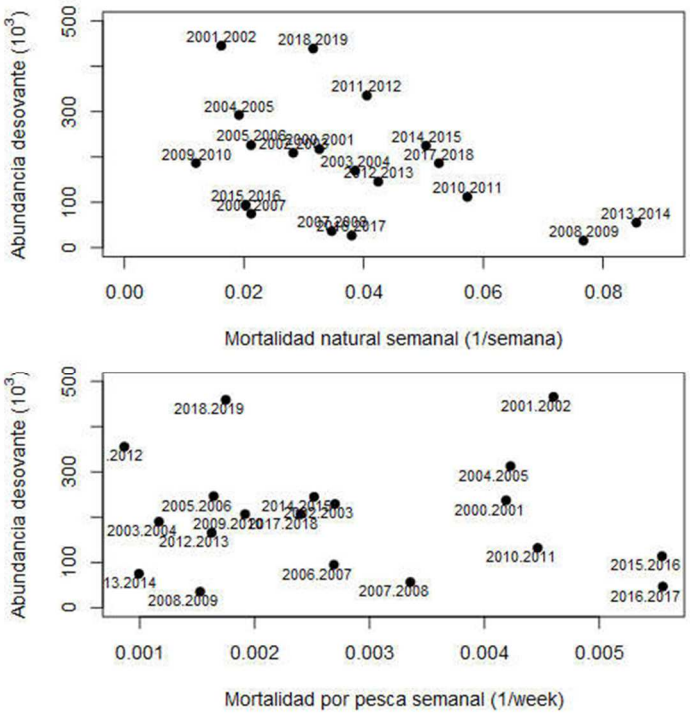


Figure PI1.1.1.1 Relationship between natural mortality and fishing mortality with the abundance of spawners in the octopus fishing seasons of Asturias.

Probably a relevant biological result is the relationship between abundance and spawning biomass for one season and recruitment for the following season. There is a clear relationship of the Ricker type (**Figure PI1.1.1.2**). This is consistent with what is expected of the life history of octopuses, a strong density-dependence for the need to occupy caves and shelters both during growth and spawning (Roa-Ureta, 2019).

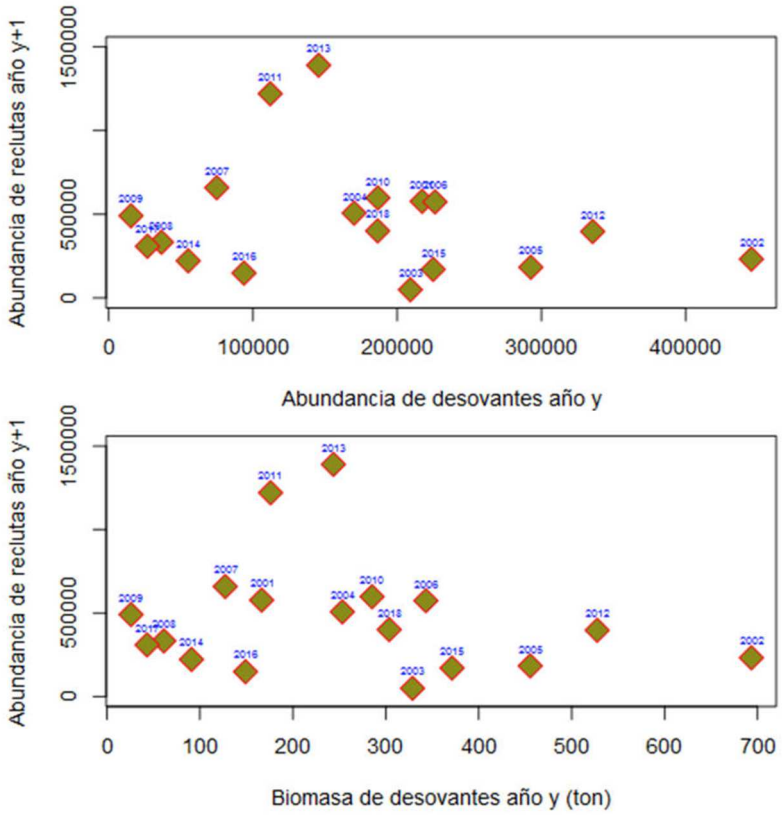


Figure PI 1.1.1.2. Relationship between abundance and biomass of spawners in a year and the abundance of recruits in the following year in the octopus fishing seasons of Asturias

Bearing in mind that the population oscilated between two equilibrium points of 2 500 and 1 500 tones in successive years, and that the B_{MSY} was not directly estimated, we take B_0 as refererence point. That represent a biomass of 2 156 applying the Pella-Tomlinson 3P (Roa-Ureta, 2019, Table PI 1.1.1.1.). According to GSA 2.2.3.1., the PRI would be estimated as 20% of the initial biomass of the common octopus according to the estimations made by Roa Ureta (2019). Thus, we considered a PRI of 431 tonnes, far from the 2 566 of latent biomass estimated for 2020 or the 1 666 tonnes for 2019. In fact, from 1990 onwards, the estimations were never close to the PRI for this fishery (Roa-Ureta, 2019).

The main conclusions of this new assessment of the octopus´ stock in Asturias, as stated in the report (Roa Ureta, 2019), are:

1. An appropriate stock assessment model and open source software have been developed for the octopus fishing in Asturias and adapted to the fast population dynamics that characterizes these organisms.

2. 19 fishing seasons have been evaluated from 2001 to 2019 and parameters of abundance and natural and fishing mortality in each of these seasons have been estimated, with good numerical quality, statistical accuracy and biological realism.

3. Recruitment, defined as the growth of the year's new juveniles to the minimum weight of capture [1 kg] occurs in the middle of winter and the escape of the spawned females to care for their eggs occurs later, also in winter.

4. A Pella-Tomlinson surplus production model has been estimated with widespread depletion models yielding results of good statistical quality and realism biological, which shows a stock that fluctuates between two equilibrium points [of 1,500 and 2,500 t] in alternate years (Fig. 2-7).

*5. **Fishing mortality of the stock is low** compared to natural mortality, exploitation rates are low, especially after 2008 and up to now (Fig. 2-8), and landings are significantly lower than the productive capacity of the stock, represented by the average total latent productivity [239 t], especially in recent years (Fig. 2-9).*

6. A Ricker-type spawning-recruitment model with good statistical quality and of great scientific interest has been estimated (Fig. 2-10).

*7. **Exploitation is biologically sustainable by a good margin** but the economic return is below the sustainable productive potential of the fishery.*

*8. The sustainable harvest control rule [**HCR**] obtained from the results of this study is that the **total catch per annual season is lower than the average total latent productivity, estimated at 239 tones**, with a statistical range of two standard deviations equal to [189, 289].*

According to the data presented, based on the models applied, there is 95% that the stock is above the PRI. Therefore, There is a high degree of certainty that the stock is above the PRI. This evidence is consistent in suggesting that there is a **high degree of certainty that the stock is above the PRI**. This meets the requirements of the **SG 60, SG 80 and SG 100**.

	Stock status in relation to achievement of Maximum Sustainable Yield (MSY)		
b	Guide 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**	**Yes**
Rationale			

Raw catch data in kg, effort in number of days, and mean weights in g, per week, are shown in **Figure PI 1.1.1.3.** For the whole period examined, there is a very sharp drop in catch in all seasons around week 15 (early April), followed by a sharp drop in effort a few weeks later. In the case of average weights, the pattern of fall towards the middle of the year is similar throughout years. This fact allows to use all the data to estimate an accessory model of change weekly weight and use that model to fill in the gaps in the database of average weights. The accumulated catches and efforts annually show a certain drop towards the present but this occurs in both variables so from this point of view there is no evidence of the existence of a marked decline in stock.

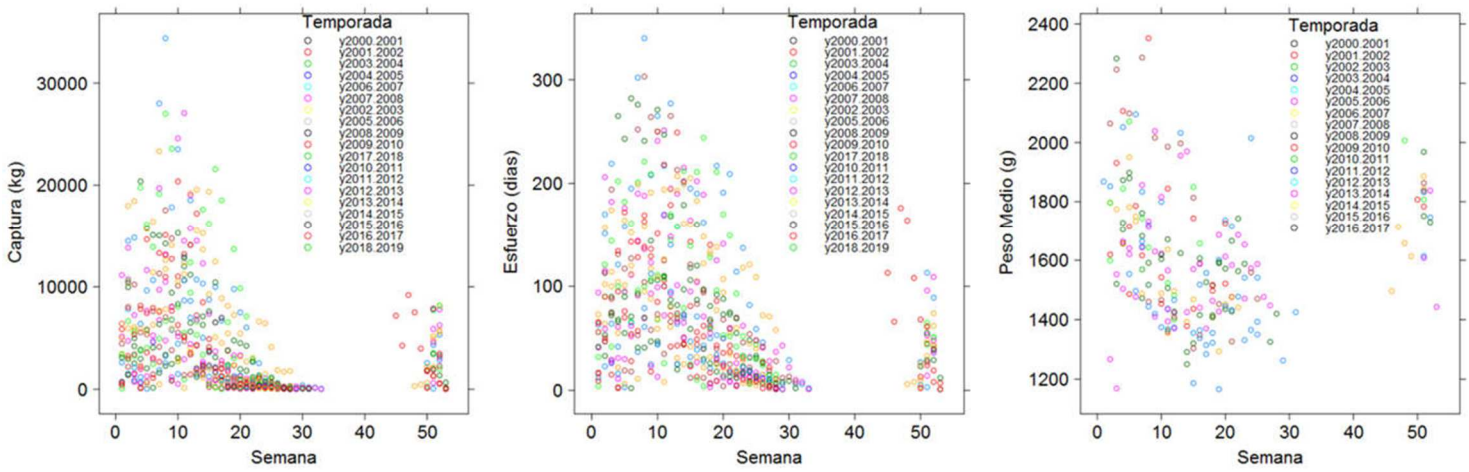


Figure PI 1.1.1.3. Raw data of catces, CPUE and average weeky weight from 2000 to 2019.

	Pella/Tomlinson 2p		**Pella-Tomlinson 3p**		Pella-Tomlinson 4p			**Pella-Tomlinson 3p**
Parámetro	Estimado	Error estándar	**Estimado**	**Error estándar**	Estimado	Error estándar	Desembarques (ton)	**Tasa de explotación (%)**
Criterio de información de Akaike	2816.36		**2282.58**		2705.72			
B_0 (Biomasa 1989) (tons)	1770	21	**2156**	**24**	1819	23		
K (tons)	1770	21	**2156**	**24**	1982	23		
r (1/año)	2.3206	0.0097	**2.4668**	**0.1133**	2.2857	0.0023		
p	2		**2.1329**	**0.0549**	2.1383	0.0003		
MRS (ton)	1027	10	**1448**	**355**	1237	63		
Biomasa que produce el MRS (ton)	885	10	**1105**	**19**	1017	12		
Productividad latente total promedio en toda la serie (ton)			**239**	**25**				
Biomasa 1990 (ton)	1770	21	**2156**	**24**	1819	23	279	**12.9**
Biomasa 1991 (ton)	1491	21	**1877**	**24**	1927	25	204	**10.9**
Biomasa 1992 (ton)	1832	21	**2345**	**24**	1862	23	222	**9.5**
Biomasa 1993 (ton)	1460	21	**1543**	**23**	1932	27	313	**20.3**
Biomasa 1994 (ton)	1740	21	**2430**	**26**	1746	24	122	**5.0**
Biomasa 1995 (ton)	1686	21	**1436**	**22**	2160	30	253	**17.6**
Biomasa 1996 (ton)	1618	21	**2490**	**26**	1398	31	207	**8.3**
Biomasa 1997 (ton)	1733	21	**1194**	**23**	2239	28	213	**17.8**
Biomasa 1998 (ton)	1604	21	**2418**	**26**	1265	14	265	**11.0**
Biomasa 1999 (ton)	1688	21	**1324**	**22**	2157	27	136	**10.3**
Biomasa 2000 (ton)	1733	21	**2574**	**27**	1523	16	108	**4.2**
Biomasa 2001 (ton)	1708	21	**1054**	**22**	2317	29	258	**24.5**
Biomasa 2002 (ton)	1588	21	**2239**	**25**	1029	13	213	**9.5**
Biomasa 2003 (ton)	1754	21	**1782**	**24**	2053	26	126	**7.1**
Biomasa 2004 (ton)	1665	21	**2508**	**26**	1736	18	165	**6.6**
Biomasa 2005 (ton)	1729	21	**1184**	**23**	2127	29	179	**15.1**
Biomasa 2006 (ton)	1642	22	**2444**	**26**	1542	14	96	**3.9**
Biomasa 2007 (ton)	1821	20	**1425**	**25**	2322	30	227	**15.9**
Biomasa 2008 (ton)	1472	23	**2514**	**26**	1047	10	296	**11.8**
Biomasa 2009 (ton)	1751	20	**1038**	**22**	1987	24	61	**5.9**
Biomasa 2010 (ton)	1733	22	**2419**	**26**	1913	23	131	**5.4**
Biomasa 2011 (ton)	1685	19	**1456**	**24**	1955	25	164	**11.3**
Biomasa 2012 (ton)	1708	22	**2581**	**26**	1861	23	85	**3.3**
Biomasa 2013 (ton)	1761	19	**1055**	**22**	2071	28	60	**5.7**
Biomasa 2014 (ton)	1721	23	**2439**	**26**	1769	26	47	**1.9**
Biomasa 2015 (ton)	1784	18	**1488**	**24**	2213	34	140	**9.4**
Biomasa 2016 (ton)	1611	25	**2607**	**27**	1397	45	64	**2.5**
Biomasa 2017 (ton)	1882	17	**998**	**20**	2382	28	88	**8.8**
Biomasa 2018 (ton)	1516	29	**2344**	**25**	1028	14	103	**4.4**
Biomasa 2019 (ton)	1917	16	**1666**	**26**	2161	28	140	**8.4**
Biomasa 2020 (ton)	1407	3	**2566**	**27**	1510	15		

Table PI 1.1.1.1. Estimates of the population dynamics and fishing productivity of the octopus stock of Asturias from the model of surplus production adjusted to the biomasses estimated by the generalized depletion models. The model best supported by the data is indicated in bold.

As mentioned herein, based on the analysis of the parameters of abundance, natural mortality and fishing operations in each of these seasons obtained in 19 fishing seasons, from 2001 to 2019, several issues have to be underlined:

1) Recruitment, defined as the growth of new juveniles of the year and the weight minimum catch, occurs in mid winter and the escapement of the spawned females to care for their eggs occurs later, but also in winter;

2) A Pella-Tomlinson surplus production model has been estimated with the results of the generalized depletion models yielding results of good statistical quality and biological meaning, showing a stock that fluctuates between two equilibrium points in alternate years;

3) The fishing mortality that is exerted on the stock is low compared to natural mortality, exploitation rates are low, especially after 2008 and up to date, and landings are much less than the productive capacity of the stock, represented by the average total latent productivity, especially in recent years;

4) A Ricker spawning and recruitment model has been also estimated;

5) The farm is biologically sustainable by a good margin but the economic return is below the sustainable productive potential of the fishery;

6) The sustainable harvest rule obtained from the results of this study is that the total catch per annual season is lower than the average total latent productivity, estimated at 239 (±50) tonnes.

According to the application of the surplus production model of Pella-Tomlinson (1969) the stock does not have an equilibrium size, instead, the stock fluctuates between two equilibrium points, one of high biomass of around 2 500 tonnes and another of low biomass of about 1 500 tonnes, in alternate years. As previously mentioned, according to GSA 2.2.3.1. in the case where neither B_{MSY} nor the PRI are analytically determined, the B_{MSY} (40%B_0) default reference points may be appropriate for measuring stock status. Since the vaue of B_0 is 2156 tonnes, the B_{MSY} estimated is 862 tonnnes. The annual data showed by the estimations of biomass for 1990-2020 (Table PI1.1.1.1.) that the biomass was always above, by large, of B_{MSY} estimated. There was only one year durig that period that the annual estimated biomass, although above, was relatively close of the B_{MSY}. That accounted in 2017 (990 tonnes). However, the special characteristics of the common octopus (short life span, rapid growth and high fecundity), allowed the biomass in 2018 raised rapidly until 2 344 tonnes (Roa-Ureta, 2019).

According to the numbers above mentioned, there is a high degree of certainty that the stock has been above a level consistent with the estimated B_{MSY} over recent years. Therefore, **SG 100 is met**.

References

Pella and Tomlinson, (1969); Hermosilla et al., 2010; Lourenço, 2015; Gonzalez et al., 2016;, Hermosilla et al., 2010, Lourenço 2015, Otero et al., 2008;, Otero et al., 2016;, Roura et al., 2019; Roa-Ureta, 2019.

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)	B_0 PRI = 20% B_0	B_0 = 2 156 t PRI = 431 t	2 566/431 = 5.95
Reference point used in scoring stock relative to MSY (SIb)	B_0 B_{MSY} = 40% B_0	B_0 = 2 156 t B_{MSY} = 862 t	2 566/862 = 2.97

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	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?	**NA**		**NA**
Rationale				

Teams shall only score this PI when Stock Status PI 1.1.1 does not achieve an 80 score (SA2.3.1). Since PI1.1.1 scored above 80 this PI is not assessed.

b	Rebuilding evaluation			
	Guide post	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?	**NA**	**NA**	**NA**
Rationale				

See above

References

MSC Fisheries Standard v2.01

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**NA**
Information gap indicator	

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA**
Condition number (if relevant)	**NA**

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			
	Guide post	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.
	Met?	**Yes**	**Yes**	**No**
Rationale				

MSC definition of harvest strategy "The combination of monitoring, stock assessment, HCR and management actions, which may include a Management Procedure or be tested by MSE".

The rapid growth, its short life cycle, high fecundity level and dependence on atmospheric and oceanographic factors during the planktonic larval stage of *Octopus vulgaris* makes it particularly complicated to assess and manage the species. However, the existence of mature animals throughout the year shows the existence of several overlapping microcohorts all year round. For some time now, the MSY based on establishing reference points has been used to assess the stocks of many teleost fish species, such as tunas and related species. For a mollusc such as the octopus, with a life expectancy of two years and recruitment that is highly sensitive to environmental fluctuations, so far, this is not applicable. However, there is some progress to monitor the Asturian small scale fishery for octopus using a depletion model implemented by Roa-Ureta (2019).

The OFMP sets out measures relating to numerous aspects regulating the fishery. The measures currently in place as for the 2019-20 fishing season (Resolución de 21 de noviembre de 2019) are:

- **Authorized vessels**: the census of fishing vessels included in the OFMP are all small-scale fishing boats that have authorisation from the Regional Ministry of Rural Development and Natural Resources to fish using "octopus traps". No other boats are allowed to use "octopus traps".
- **Fishing area**: from the Eo estuary to the San Esteban de Pravia estuary.
- **Fishing season**: the 2019-20 fishing season goes from December 2nd 2019 to July 15th 2020.
- **Fishing hours**: only allowed during daylight hours and vessels must be back in port before 17:00h in the evening. The activity is as well prohibited from 17:00h on Friday until 24:00h on Sunday. During the weekend fishing traps can be left baited underwater. The 17:00 h limit was first stablished in the 2017-18 OFMP.
- **Fishing gear**: the only gear authorised for octopus as objective species is octopus' traps. The maximum number of traps allowed is 125 traps per crew member employed and on board, up to a maximum of 350 per vessel for vessels of three or more crew members.
- **Marking of the line of traps** (new measure since the 2016-17 OFMP): in order to facilitate the fishing effort control, the lines of traps should be marked in accordance with the current regulation. The number of traps that are set in the line must be clearly indicated in the buoys. Failure to comply with the provisions of the previous clause may result in seizure of the fishing gear.
- **Octopus accessorial catch for other fishing gears different to the octopus' trap** (new measure since the 2015-16 OFMP): within the fishing area of the OFMP it is allowed a maximum of 15 kg of octopus per day per vessel, plus 5 kg more per crew member employed and on board, up to a maximum of 30 kg.
- **Individual annual quota**: the maximum catch allowed per vessels per fishing season is 10 000 kg, which is not transferable between vessels. The OFMP also opens the possibility to set daily or weekly quotas

per vessel, but, although discussed, so far this measure has never been implemented due to the opposition of the fishers. However, if we bearing in mind that there are 43 vessels operating (latest fishing season 2019-2020), if they would catch 10 tonnes each, the total catch of the fishery would be 430 tonnes. To date, this issue never happend but is important to be underlined for future revisions. Despite of this, it was an agreement in February, 2020 that established a TAC of 189 tonnes, but avoiding any change in the normative unless the landings approach to TAC threshold and after a meeting with the fleet.

- **Weight limit**: 1 kg. One single octopus between 900-1000 g is allowed every 25 kg of catches, although these specimens can not be commercialized and must be returned to the sea or donated to a charity centre (new measure since the 2018-19 OFMP).
- **Discards** (new measure since the 2019-20 OFMP): any individuals of any species that are caught alive and is going to be discarded should be released immediately and without causing damage.
- **Reproductive closed period**: from 16 July to 15 December 2020.
- **Landing ports**: weighing of daily catches must always be carried out within the territorial scope of the OFMP and in the Fishers' Guilds of the port of landing (Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras).
- **Data reporting**: the fishers´ guilds should report landings data weekly (before the OFMP 2019-20 this requirement was only monthly).
- **Mandatory tracking devices** (GPS/GPRS) (new measure since the 2014-15 fishing season): in order to determine the fishing areas and the fishing effort, a GPS / GPRS tracking device should be installed in all vessels that take part of the OFMP; the devices will be provided and installed by the CEP. The installation of tracking devices already started in the fishing season 2014-15 through a project commissioned to the consultancy firm SIGMA SL for characterizing the fishery. This measure has been included in the OFMP for the 2016/17 fishing season. In the 2017-18 fishing season this measure is mandatory for all vessels included in the OFMP.
- **On board observers** (new measure since the 2015-16 OFMP): all vessels within the OFMP should collaborate with the on board observers and CEP technicians for developing their work on the monitoring and assessment of the fishery with the aim of developing a report on the evolution of the fishery.
- **Early indicators** are indices of abundance and address reference points that are based on the previous years of fishery data. These early indicators are used to preconize control measures in the fishery for the remaining fishing period.

Finally, the OFMP has not established any MPA inside or outside the area of operation of the fihery for protecting the reproductive spawning grounds, recruitment areas or for any other purpouse. Nevertheless, the CEP in collaboration with the Universidad de Oviedo has just started a project in the western area of the OFMP in order to characterize habitat features especially relevant for octopus recruits and juveniles (CS, 2019).

The fishing effort has dropped since 2000, which certainly contributed to maintain the stock under acceptable exploitation levels (**Figure PI 1.2.1.1**). However, in Asturias, where a co-management system has been in place since 2001, a plausible approximation can be made based on the correlation between the biomass of the population, catches and captures by unit of effort. This co-management system helps to establish an appropriate capture strategy based on developing annual MPs that are agreed between fishers and the authorities, i.e. on fishing activity data, mainly on effort and catches, and wiighht and size structure. Since analytical points of reference cannot be established, for most molluscs, it is essential to define what approximation and limits of reference should be used to assess the stock. In this regard, the study by P. Fernández-Rueda and L. García-Flórez (Fisheries Research, 2007) on the suitability of the minimum size of capture as a means of management is a clear example. In accordance with the Resolution of December 1st, 2017, of the Ministry of Rural Development and Natural Resources, which regulates the fishing of common octopus during the 2017/2018 fishing campaign, the octopus management plan has as one of its main objectives to achieve the biological sustainability of the resource. Therefore, the possibility of making modifications to the current regulations is established, taking into account the evolution of the resource, with the aim of evaluating the situation of the resource early and deciding whether it is necessary to make modifications to the regulations that regulate fishing effort. For that purpose, the Fishery Experimentation Center (CEP) is conducting two types of monitoring: a) sampling is carried out on board professional vessels by onboard observers hired for this purpose. Sampling of this type has been undertaken since the 2014/2015 season; b) Furthermore, the fishing effort (number of vessels and fishing days per vessel) and the daily

landings of the entire fleet participating in the Plan are monitored from the information provided by the Fishers' Guilds. This type of monitoring is carried out from the beginning of the management plan, in the 2000/2001 campaign. These samplings are used to monitor the fishing season and, in case of mismatch data compared with other seasons and potential risks for the fishery, further measures can be implemented.

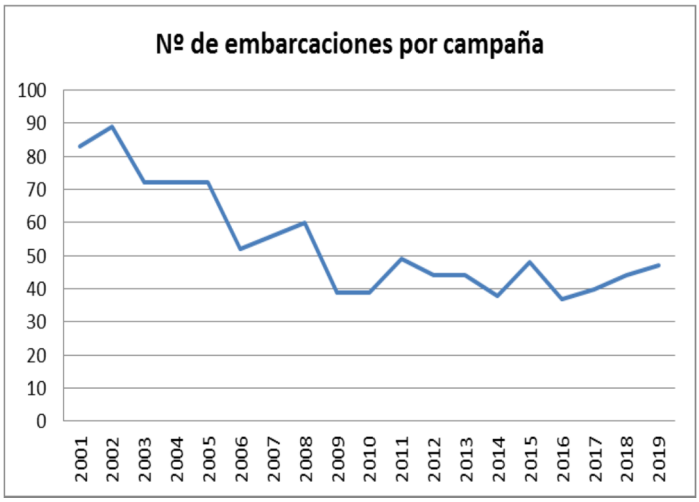


Figure PI 1.2.1.1. Number of boats from 2001 and 2019 (Fernández, 2019c)

Currently, the applicable elements governing the assessed fishery are: i) limited rights of access through licences; ii) three-month closed season; iii) minimum capture size for specimens of 1 000 g; iv) maximum quota per boat; v) fishing gear restrictions; Vi) effort limitation (max. number of traps per vessel depending on the number of crew members); vi) collection of early indicators at the beggining of the season. The aim of these measures is to ensure the protection of octopus recruitment and the survival of a suitable number of reproductive adults at the end of each fishing season. The OFMP also includes establishing how to monitor landings of octopus during the fishing season for biologists and managers, where coastguards are also in charge of registering the weights of specimens when they reach the acution points. Besides these measures, the boats were obligued to incorporate a GPS system that allow the monitoring of the fishing activities.

The trawling fishery (where octopus is caught as bycath) is banned in waters shallower than 100m, so it operates out of the fishing grounds where the artisanal trap fishery operates. These trawlers are targeting species subject to TACs (*Lophiidae spp, Trachurus spp, Merluccius merluccius, Lepidorhombus spp, Micromesistius poutassou, Nephrops norvegicus, Engraulis encrasicolus and Scomber scombrus*), and their activity is subjet to different effort and technical regulations (hours of activity, and fishing gear size and mesh size (Real Decreto 1441-1999, Orden AAA 2538-2015). It is mandatory to report all catches through the electronic logbook (Diario Electronico de Abordo, DEA). The common octopus is not a target species for the trawling fleet and its catches represents less than 1% of the captures of this fishery (Castro et al. 2011) and only 11% of the *O. vulgaris* landings of Asturias (see Fernández et al 2015c). The low catches of octopus in the trawling fishery are due to the fact that trawling on rocky areas, where common octopus mainly inhabits, is not allowed since the rockhopper trawlor any other trawl designed for rocky bottoms, are banned in Spain since 2001 (Orden de 1 de febrero de 2001, Orden AAA 2538-2015). The fact that no trawling occurs on rocky areas, together with the closed for trawling area off Llanes in Asturias (Orden AAA 2538-2015), restrict the impact of this fishery on the common octopus population.

Concerning the rasco net fishery, the measures in place are based on gear limits, mesh size, size limits of the species and time the nets can be casted under water (Real Decreto 410/2001, de 20 de abril, Orden AAA 2538-2015). However, common octopus is not a target species for this fishery and catches only represents less than 1% of the octopus catches in Asturias (see Fernández et al 2015c). The recreational fishery, as well as the rasco fishery, only accounts for less than1% of octopus catches in Asturias. Recreational sea fishing in Asturias is regulated by Decreto 25/2006 of 15 March; this decree sets out the fishing gear authorised and the quantities of octopus that can be caught according to the different fishing permits, both by hand and from boats. Octopus cannot be targeted by spearfishing.

The strategy undertaken (monitoring, stock assessment, HCR and management actions) during the last years allows the fishery to be responsive to the state of the stock and all the elements work together to achieve a sock management objectives indicated in PI1.1.1. 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 (**SG80 is met**). The elements above listed have

been specifically designed for the fishery and contribute directly but it is not proved that the harvest strategy is responsive to the state of the stock, and it would be necessary to have a precaucionary HCR in place. **SG 100 is not reached**.

b	Harvest strategy evaluation			
	Guide 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**
Rationale				

The experience of the improvement in management that has been implemented has served to establish a responsible strategy in Asturias, ensuring the local fishing industry remains in sustainable conditions and under reference limits. There are many historical indicators that prove a relatively stable catch per unit of effort for more than a decade and the stable average weight of the octopus catches (see Figs. 7.2.21; 7.2.22 of the background), representing a relative standardisation of capture strategies.

The stock assessment provides independent parameters that point to the effectiveness of management in limiting the exploitation rate, as demonstrated from 2000, where the catches were consistent, bearing in mind the interannual variability associated to the characteristics of these marine molluscs presented herein. The robust state of octopus stock provides evidence that the strategy is achieving its objectives. However, this has not been fully tested. Management measures are being put in place; however, the effectiveness of the management plan will need to be monitored accordingly and, in time, fully evaluated.

Taking into account the information previously presented, the harvest strategy evaluation can be considered to be robust and precautionary. The harvest strategy is revised on an annual basis and they may not have been fully tested but evidence exists that current management is achieving its objectives. This is supported by the fact that the CPUE and the average weight of the catches has remained stable at precautionary levels over the past 15 years (Figure 7.2.11 & 7.2.21), showing that, although the fishing strategy has not been completely tested, the above suggests that the objectives are being met. This means that the requirements of **SG 80 are met**. However, **SG 100 levels are not reached**, because the fishing strategy has not been completely tested.

c	Harvest strategy monitoring			
	Guide post	Monitoring is in place that is expected to determine whether the harvest strategy is working.		
	Met?	**Yes**		
Rationale				

The monitoring is extensive and collects all kind of fishery dependent and fishery independent information provided by the observers that undertake bimonthly samplings, which is analyzed and presented annually at the OFMP. Thus, the CEP undertakes an annual report that includes the captures, landings and CPUE, as well as the data obtained by the GPS poitioning system that is mandatory for all fishing boats. The information analysed by CEP is presented and discussed between all parts involved in the management commision (OFMC) in two occasion: before the fishery starts and at med season. All the modifications made from 2001 onwards, which come from the cofradías, are then analysed by the multi-stakehopled commission where the monitoring results are presented and discussed to establish recommendations between all parts to guarantee that the discrepancies are afforded and that the best measures are chosen. Thus, monitoring has enabled

major improvements that allowd to afford the variations in catches occurred since then. As has been verified, the CPUE has remained relatively constant since the OFMP was established, monitoring would suggest that it is effective for identifying and determining that the strategy is right and handling any potential changes. **SG 60 is therefore met.**

d	Harvest strategy review			
	Guide post			The harvest strategy is periodically reviewed and improved as necessary.
	Met?			**Yes**
Rationale				

The harvest strategy is reviewed on an annual basis and discussed with the technical officers responsible for the fishery, and taking into consideration the suggestions of the different stakeholders, which makes it possible to consider relevant aspects to take into account in subsequent years. An example of review took place in 2018 in relation to candidate HCR proposed by the OMA, based on the relationship between CPUE in December and total catch at the end of the fishing season (see Macho and Rios, 2018). These possible HCRs were explained and discussed in the March 2018 meeting of the OFMC. The debate was polarized between the fishing guilds more motivated to the establishment of a HCR (ARPESOS was in favor) and the rest of the UoA.

The OMA study also developed and applied some model to estimate annual reference points for the fishery. The OMA successfully tried depletion models on this fishery in collaboration with Rubén Roa-Ureta (2019), an independent consultant. On the whole, the harvest strategy has been periodically reviewed and improved as necessary through framework adjustments to management measures and amendments. Many changes were done in order to improve the management and adjust to the stock status. **The SG100 is met**.

e	Shark finning			
	Guide post	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?	**NA**	**NA**	**NA**
Rationale				

This Scoring Issue need not be scored since the target species is not a shark.

f	Review of alternative measures			
	Guide post	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 **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate.
	Met?	**Yes**	**No**	**No**
Rationale				

The CEP maintains a regular on-board observer programme which allows:

(i) monitoring the level of unwanted catches of the target species (individuals <1kg), and detecting any increase in this discarded fraction;

(ii) check the survival rates of discarded octopus when removed from the trap.

Also, the Surveillance & Control Unit of the DGPM performs inspections at ports and at sea to monitor that fishers are not landing octopus <1kg, and the 'guardapescas' also have to control fishers' compliance with minimum landing weight at the auction points. This project started in the 2014-15 fishing campaign and it is kept in place. A consultancy firm, SIGMA, S.L., is hired for sampling twice a month throughout the fishing season (initially the sampling frequency was 4 times/month, and it was lowered to current bimonthly samplings after the first year). Two biologists get on board for sampling, visiting each cofradía every 10 working days approximately. They collect information on fishing operations and sample octopus catches, other retained species and discards. Data collected by the CEP observers and by the Surveillance & Control Unit are annually reviewed by the CEP to assess if UoA related mortality of the unwanted catch of the target stock are being implemented as appropriate. This data are presented to the OFMC before the fishing season starts and they could also be reviewed during the fishing season, if necessary (since the OFMC meets at least once during the fishing season). Despite of all these, unwanted catch of the target stock (octopus individuals smaller than 1kg) are regularly caught on the fishing traps. Thus, we have to bear in mind the necessity of this fishery to minimize the mortality of the unwanted catch. There is a high proportion of octopuses with weights lower that 1 kg that enter into the creels, especially in April-June. Just to mention the June 2019 data of the on board monitoring, where 84% of the octopus individuals (63% in weight) were discarded (Fernández, 2019c). However, it was verified that the gear type and the fishing operation allows the vast majority of them to be were alive, with a very high survival rate (100% in weight). It would be necessary to locate and avoid recriutment áreas. To date, there was an approach in autumn (unpublished data) that addressed this issue, where the population is studied in the western Asturian waters to get data on recruitment hotspots between 18 and 110 m on different types of bottoms (rocks, sand, etc).

Due to the high levels of unwanted catch of the target stock in the fishery, mainly at the end of each season (April-June), determined on the on board observers program since the beginning of this monitoring, and the lack of measures to reduce it, the team cannot confirm that a regular review has been done and measures to minimize this impact were implemented. **Thus, SG80 is not met.**

References

Castro et al. 2011, CEP 2014, FIG A, Fernández 2019a, b, Fisheries Research, 2007, Orden AAA 2538-2015, Otero et al., 2016, Real Decreto 1441-1999, Roura et al., 2019, Macho and Rios 2018, Macho & Rios 2019

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information should be sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**	**No**	**No**
Rationale				

The HCR are measures already established, in relation with the resource, which has to be implemented and considered, when the population goes away from analytical reference points such as F_{MSY}, B_{MSY}, etc. Other approaches based on recent modelling implemented by Roa-Ureta (2019), such as B_0 are used to estimate reference points to PRI, B_{MSY}, etc. Twenty years ago, in the 2002-2003 season and when limited data did exist, the OFMP set quotas in the regulated area for the first time, randomly established (due to the lack of biomass estimates) at a quota of 10 000 kg per boat and season, and this has remained in place until recently. According to the meetings held previously with fishery managers, they all agreed that 10 000 kg/vessel and fishing season is a high limit that is rarely reached. Given the high variability in octopus biomass from one year to another, the decision was made to manage the resource by means of a minimum capture weight that is mindful of size at first maturity and a fairly long closed season (15 July to 14 December) that controls effort and protects the growth of the young.

The absence of modelling and yield estimation avoided the certainty of the approximation of reaching a minimum harvest point to bring an end to fishing. The experience, however, seemed to keep CPUE within acceptable limits, although the downward trend in the fishery will need to be monitored in the future.

Since then, an enormous effort was made by the CEP and some measures were approached to establish appropriate HCRs. So far, there were 3 initiatives in order to set in place a well defined HCR:

1) OMA study: **TAC proportional to $CPUE_{DEC}$**. The objectives of this study were directly related to the development of a HCR:

a) Gain understanding on the biology of octopus and its changes along time.
b) Describe and analyze the fishery statistics and its evolution along time.
c) Find forecasting variables that could be used as management tools.
d) Develop and propose a HCR incorporating the forecasting capacity of some of the variables analyzed, and propose reference points

This study found a relationship between the CPUE in December and the total catch during the following fishing campaign from December to July using data from the last fishing campaigns; 2009-10 to 2016-17 (**Figure PI 1.2.2.1,** left panel). Following this, a HCR was proposed (**Figure 1.2.2.1.,** right panel):

- If CPUEdec< 23 kg/day, then TAC=0 tonnes
- If 23 < CPUEdec≤ 130 kg/day, then TAC=21.7 + 1.1 x CPUEdec tonnes
- If CPUEdec> 130 kg/day, then TAC=164 tonnes

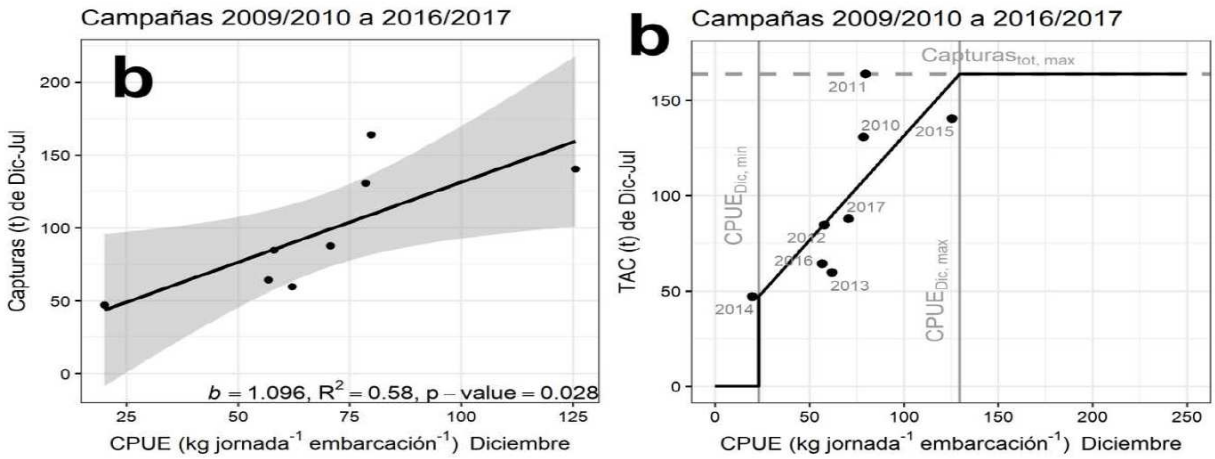


Figure PI 1.2.2.1. Relationship between the CPUE (catch per day per vessel) in December and the total catch during the following fishing campaign from December to July (right panel), and HCR proposed using the previous relationship (left panel). Source: OMA, 2017.

These possible HCRs were explained and discussed in the March 2018 meeting of the OFMC. The debate was polarized between the fishing guilds more motivated to the establishment of a HCR (ARPESOS was in favor) and the rest of the UoA. Finaly, this measure was not implemented.

2) CEP monitoring: **daily quotas after April if $CPUE_{DEC-JAN}$ is below historic level**. It was previously explained in PI 1.2.1. These are the HCRs that are currently being applied in the octopus fishery in Asturias. Under this option, effort reduction measures would be only implemented in April if the CPUE is below the minimum observed in the previous 5 years. The measures to reduce effort would be an early daily closure of the fishery at 16h (instead of at 17h) and a maximum daily quota of 60, 120 or 180kg for 1, 2 or >2 crew members respectively.

The CAB considers that the first option (OMA study) for a HCR is consistent with SI(a) SG80, since it seems to ensures that the exploitation rate is reduced as the PRI is approached, and it is expected to keep the stock fluctuating around a target level consistent with (or above) MSY. Nevertheless, we do not consider that option 2 for HCR (CEP monitoring) would actually reduce significantly the exploitation rate since it would only take place late in the season (April), when the number of boats and octopus landings are considerably reduced. Moreover, the daily quotas proposed (60, 120 or 180kg for 1, 2 or >2 crew members respectively) were set way over the observed CPUEAPR-JUL usually between 20-50 kg/boat (Fernández 2018a), so most probably no exploitation rate reduction would be expected if applied. Moreover, if this measure is applied only after April, most of the females have already laid the eggs and therefore its effectivity would be limited (José Luis Acuña, personal communication).

Both HCR options have been discussed in several meetings of the OFMC (CS 2018, 2019) and are included in the 2017-2018 fishing season report as possible measures to include (Fernández, 2018a). The second option for HCR was better accepted by the fleet and has been finally proposed to be included in the OFMP (Fernández 2018b). Despite its consideration in the previous policy documents, at the end none of the HCRs discussed were finally included in the OFMP for the 2018-19 fishing season (Resolución de 4 de Diciembre de 2018).

Finally, the first two initiatives to set a HCR were discarded and the fishery has been lately working on a third one based on the stock assessment model. See below.

3) Stock assessment depletion model. This is a very promising approach that was recently developed. It is expected that the reference points estimated by the models allow to establish adequate HCR in the near future. However, these HCRs are not defined yet. Actual, it has been implemented **a TAC of 189 tonnes fror the fishery**.

To date, the only one that is in place were the early indicators at the beginning of the season. An example of this methoodolgy is detailed. Thus, during the months of December and January, there have been sampling days on board vessels (for instance, 4 in the 2017-2018 season). To compare the current season with previous ones, the following data has been analyzed:

- Catches per pot by weight (total weight in grams of the octopus caught in the 4 days of fishing divided by the total number of pots raised during the samplings).
- Catches per trap in number (total number of octopus caught in the 4 days of fishing divided by the total number of creels raised during the samplings).
- Average weight of the catches (total weight in grams of all the octopuses fished in the 4 days of fishing divided by the total number of specimens).

For each of the three cases cited, on the one hand, the total catches were analyzed, on the other, only octopuses with economic value, which we will call "retained" (those with more than 1 kg), and on the other, only small octopuses, less than 1kg in weight, which we will call "discarded." To easily compare the results of the months of December and January of this campaign with the same period of the previous campaigns, the data will be represented in various graphs (**Figures PI 1.2.1.2. to 1.2.1.4**). In each of them, three bars are shown, showing the maximum, minimum and average value of the three previous campaigns. In addition, the value of the current campaign is shown with a yellow mark. It is intended to continue carrying out this type of analysis in the coming years with a larger series of data, but currently we do not have more information. Figure 1 shows that the catches by weight during this year have been below the maximum value of the previous 3 and above the average, whether all the octopuses or only those weighing more than 1 kg are taken into account. If only octopus discarded for weighing less than 1 kg are considered, the values for this season have been similar to the average for previous seasons.

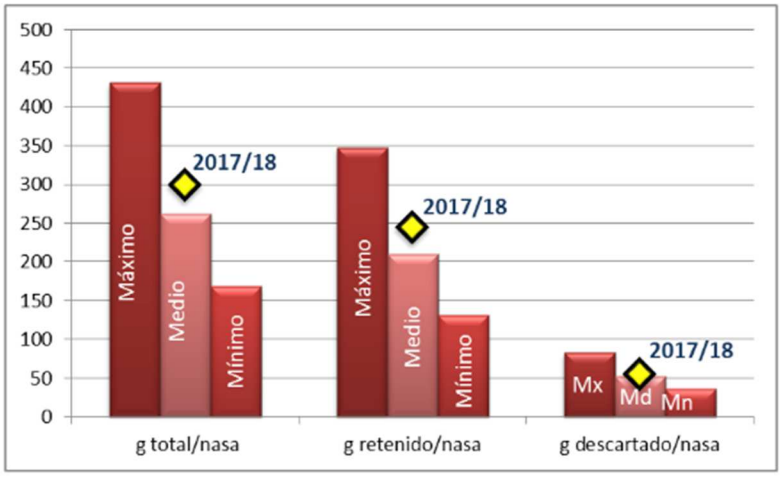


Figure P1.2.1.2. Comparison of the weight during the months of December and January of 2017/2018 season (yellow mark) and the maximum, average and minimum value during the three previous seasons (vertical bars). Data obtained from samplings with observers on board.

Figure P1.2.1.2 shows that the average weight of the octopus discarded during the current campaign is similar to the average value of the previous campaigns, but the retained octopuses have an average weight higher than maximum and that of all octopuses together similar to this.

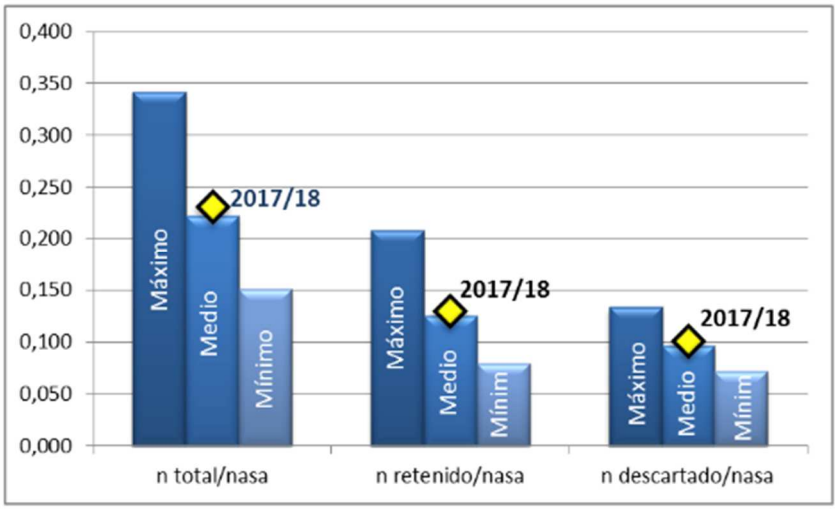


Figure P1.2.1.3. Comparison of the catches in number by pot during the months of December and January of this season (yellow mark) and the maximum, average and minimum value during the three previous seasons (vertical bars). Data obtained from samplings with observers on board.

Figure P1.2.1.3 indicates that the catches in number during this year have been lower than the maximum value of the previous 3 and similar to the average, both if all octopuses are taken into account, only those with more than 1 kg or **only those discarded.**

Finally, Figure P1.2.1.4 shows that the average weight of the octopus discarded during the current campaign is similar to the average value of the previous campaigns, but the retained octopuses have an average weight higher than maximum and that of all octopuses together similar to this.

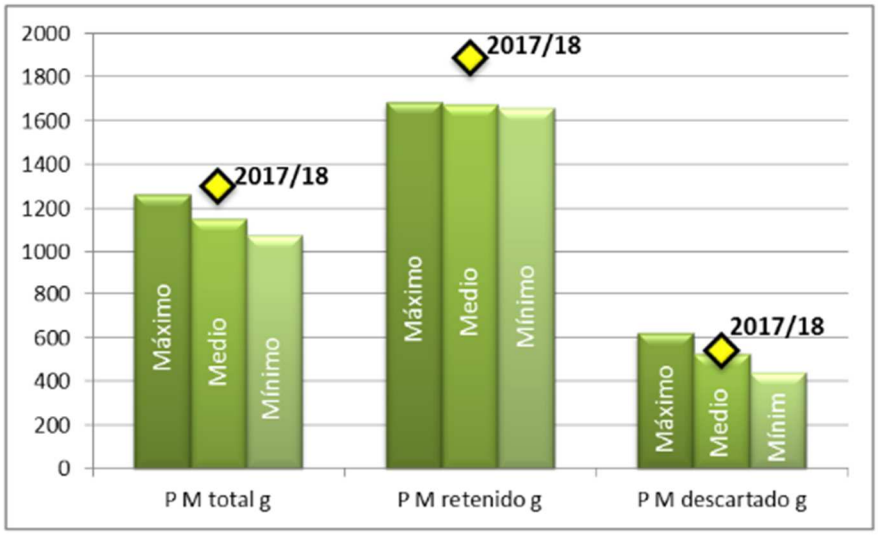


Figure P1.2.1.4 Comparison of the mean weights of the octopuses captured during the months of December and January of this season (yellow mark) and the maximum, average and minimum value during the three previous seasons (vertical bars). Data obtained from sampling with on-board observers.

From the data obtained from the samplings carried out on board the vessels, the following is therefore concluded: 1. That the catches per unit of effort corresponding to the first months of the current campaign show a similar or better situation than the average of In recent years, not exceeding the maximum value of that period. 2. That the average weight of the octopus caught in these first months of the campaign is similar to the maximum of the period analyzed and exceeds this if only retained octopuses are considered. According of the results obtained, measures will be implemented or not to reduce the effort of the fishery.

The fishery has implemented several actions to support the development of comprehensive HCRs (i.e. continuation of the fishery on board monitoring, tracking devices in almost all vessels, CEP analysis of the CPUE indicator, OMA study and a recent stock assessment model). Currently a preliminary HCR based on a TAC derived from a stock assessment model has been approved in the OFMC. But the OFMC is just a consultative body, and so far the HCR has not been endorsed by the DGPM and set in place in the fishery. Moreover, how this HCR will work is unknown, since what and when decisions will be set if the fishery gets close to this TAC, has not been established yet. The CEP confirmed during the 4SA off-site visit that they will formally recommend to include this HCR in the OFMP for the next 2020-21 fishing season, which will be drafted along October-November 2020.

In the case of octopus in Asturias, SG 60 is met because this HCRs available are generally understood but **SG 80 score would not be met, as they are not yet well defined (what and when decisions will be set if the fishery gets close to this TAC, has not been established yet) and are not yet in place (endorsed by the DGPM and implemented in the OFMP).** Due to this, the fishery still has an open condition which was found to be “behind target” in the last 4SA. Therefore a remedial action a new milestone has been set to be meet before the certificate expires on 9th August, 2021, in order to close the condition on time.

HCRs robustness to uncertainty

b	Guide post		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**
Rationale				

As mentioned above, there have been a great effort in the Asturias fshery of the common octopus during the last years. Many measues to increase the control and the managementof the fishery has been implementes, such as monitoring samplings, mandatoty rules to incorporate GPS on board of the boats and also different approaches to incorporate adequate HCRs. As presented in the previous SI, despite the three approaches made to establish HCR, there is only one being implemented, those related to the early indicators in a given fishery that will preconize control measures in the fishery for the remaining fishing period. The main uncertainties with the HCRs are its reliance only on these early indicators as an index of abundance and the choice of reference points that are based on the previous years of fishery data.

The relationship between CPUE and population has, however, been demonstrated to be efficient during the last decades and, with the improvements derived from the actual and expected HCRs, the team considered that the HCR is at least likely to be able to achieve its stated objectives and is therefore robust to this uncertainty. Thus, SG80 is met.

However, there are other uncertainties that need to be considered such as understanding and accounting for environmental atmospheric-oceanographic fators effects on catchability and recruitment of the common octopus resource in Asturias.

So it is not yet possible to say that a wide range of uncertainties have been taken into account with the HCRs. Thus, SG 100 level is not met.

Finally, we also consider that the future choice of reference points derived by the model of Roa-Ureta (2019) would be defensible as a first step and that even if they are not yet set at an optimal level, that the application of the HCR will ensure that the stock is not placed at undue risk before the performance of the harvest strategy is scheduled.

c	HCRs evaluation			
	Guide post	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**
Rationale				

As presented previously, the measures applied to the octopus fishery in the waters of the Principality of Asturias are appropriate to maintain acceptable CPUE levels. The management tools that are in use for this fishery and that will be used to implement any necessary changes in exploitation rates include the limits on the number of traps, limits on the numbers of licences, control of the catch, CPUE, geo-positioning of the boats, etc. The improving managing of the parameters related with the fishery, which finally ended in the recent development of a depletion model, verified that the fishing mortality is extremelly low in reference to the biomass estimated for the period from 2001 to 2019 (Roa-Ureta, 2019). That is part of the evidence that the HCRs, although susceptible of being improved, are working. However, the harvest strategy has only just been implemented and it is susceptible of improve in the near future. So the team has to be sensitive to the

preliminary nature of this management system and are not yet convinced that the evidence is clear that these tools will be effective. Thus, this meets the requirements of the SG 80 levels but not of the SG 100 level.

References

OMA (2017), Macho & Rios (2018), Fernández,(2018a, b), Roa-Ureta (2019), Resolución de 21 de noviembre de 2019, Macho & Rios (2019).

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information should be sought.**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**Not applicable at this stage**
Condition number (if relevant)	**Not applicable at this stage**

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			
	Guide 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 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.
	Met?	**Yes**	**Yes**	**No**
Rationale				

According to the regulations on common octopus fishing in Asturias, the fishing guilds are obliged to provide the DGPM with relative information on the weights of common octopus captures on a monthly basis. Similarly and while the Plan is in force, the vessels included in it must collaborate with the technical officers of the DGPM, who will carry out fishery control and monitoring activities in order to draw up a feasibility and evolution study for the plan. Besides, a regular on-board observer programme commenced in the season 2014-2015, incorporating this monitoring twice a month. More recently, the boats are obligued to incorporate a GPS system to compile all th e informrmation related with the fishing activities.

All the above information is managed and assessed by the CEP, which provides technical advice to DGPM in matters relating to the biology of marine species and the appropriate harvest measures. They also participate and collaborate with other public administrations and agencies in research projects, as well as universities, the Spanish Institute of Oceanography, etc.

According to Fernández-Rueda and García-Flórez (2007), close monitoring of octopus landings throughout the fishing season has been highly useful to find indicators that enable significant variations to be detected at the start of the spawning period, which enables administrators to vary the closed season, if necessary, with the aim of protecting the recruitment of a new generation.

Data collected by observers on board the UoC between December 2014 and July 2015 provided a comprehensive insight on the catch composition of this fishery (Fernández et al, 2016). Since 2016 all vessels included in the 2016/17 OFMP are bound to collaborate with this sampling (by getting a biologist on board) under CEP request. Therefore, this on board sampling has been extended to the whole UoA in the latest years. Results from samplings on board at least 9 different vessels (9 and 7 vessels in the 2016/17 and 2017/18 fishing campaigns respectively) from 5 different ports (Figueras, Tapia de Casariego, Ortiguera, Puerto de Vega and Cudillero) along 32 fishing trips (16 in each fishing campaign) between 2016 and 2018 presented information on catch, CPUE, discards, survival rates, etc. This information was extracted from the CEP (2018a) report. These results are similar with those presented in Fernández et al. (2016).

Fishing Guards by are recording daily landings by vessel. The information is sent weekly to the CEP, and the technical officers from the CEP take samples at the ports on size, sex and state of maturity, normally twice a month for the duration of the whole season (22 specimens per month). On the case of the OFMP, there is a section on the monitoring and control programme. The Subdirectorate-General for the coastguard co-ordinates the specific control activities for the OFMP collaboration with the cofradía guards and services contracted specifically for this purpose. The Fishing Guards Service works for the Cofradías and collaborate with fishery inspectors from the Control and Monitoring Unit. They appoint a co-ordinator for the plan to manage octopus trap fishing. The monitoring commission for the OFMP was created in 2016, and meet at twice every fishing season; the first meeting (October-November) is done before the OFMP is published (usually December), and it is intended to review the past fishing season and discuss management measures for the next management plan. The second meeting takes place in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going and decide wether any effort restriction should be taken.

As explained in previous sections, sufficient relevant information related to genetic studies, size structure, the make-up of each catch, the state of maturity of specimens taken from monthly sampling that records this information, and the weight of the animals, are quantified and monitored. The only parameters not taken into consideration are climatic elements, so the maximum level could not be given for this SG.

The team considers that the daily information reported by the boats and the observers, together with the information gathered at the landing ports is sufficient to provide support for the harvest strategy. Thus, **SG80 is met**. However, there is not a broad range of information on key factors (e.g. environmental) or a measure that provides a good representation of the resource status and evolution of the fishing season, which means SG 100 cannot be met.

b	Monitoring			
	Guide post	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**
Rationale				

With regard to stock abundance, until recently, there were no direct estimations of the size of the population or other relevant fishing parameters, such as maximum sustainable yield. That was due to the particular short life cycle of cephalopods, with numerous cohorts superimposing themselves in a single fishing station and because the whole population is replaced each year. This means that the stock is replaced entirely from one

year to the next. The positive aspect of the measures adopted since 2001 in the waters of Asturias, and even previously in adjacent waters, as is the case with Galicia, is that the planning measures were constatntly improved. Currently, within the OFMP, there are estimates of fishing effort per boat, a regular onboard sampling programme, the boats are monitorized by a GPS system and lately, the implementation of depletion odels are also able to establish reference points that can be used to apply HCRs. The information obtained during the fishing activities have a level of accuracy and consistent to apply the HCRs. However, the most important factor against the sustainability of this fishery is the inherent lack of knowledge of information on some uncertainties, which can be summed up by the failure to include climate-related factors in the planning measures.

UoA catches are being regularly monitored at a level of accuracy consistent with the HCR in place, and there is more than one parameter that is being monitored with sufficient regularity so that **SG 80 is met**. However, there is not a high certainty of understanding of the uncertainties, which means that **SG 100 is not met**.

	Comprehensiveness of information			
c	Guide post		There is good information on all other fishery removals from the stock.	
	Met?		**No**	
Rationale				

There is general knowledge of the catches made by other fisheries in the stock, although this information has not been updated since 2014. Firstly, mention should be made of the fishers' concern relating to artisanal fishing in the OFMP for Asturias, mainly with trawl fishing, and, to a lesser extent, with recreational fishing and other gears outside the OFMP.

In 2008, a proposal was made for characterising recreational sea fishing (Apilánez and Mortera, 2008). This document considered an integral study that would cover, among other proposals, the need to initiate works with a survey to estimate the pressure that recreational sea fishing from boats has on the resource, as the impact of this type of fishing in Asturias is not currently known. Experiences in other Spanish regions and in other nations have concluded that recreational fishing implies a high level of impact on fishing resources, so it would therefore be necessary to determine whether such a situation is occurring in Asturias. Octopus fishing from boats is no more than a token activity, with a percentage of 0.4% and 0.002 kg per fisherman and day.

With regard to rock fishing (recreational fishery), there are 80 000 permits to fish from land, but these are being reviewed, as there is no detailed and exhaustive control of these permits. The information provided is highly interesting, as veteran rock fishermen set the recruitment of animals to coastal areas at 100 to 200 g, from May to June (Xoan Xosé per. com.).

The average is 0.87 people fishing for seafood per rock site and day. Nevertheless, this figure reflects major variation, as in 76.9% of the rock sites visited there were no seafood gatherers, and in 90.8% of the sites no more than two fishers were present.

There are no statistically significant differences in the number of seafood gatherers per site and day between working days and holidays. In contrast, there was a relationship with the season of the year: in January, February and March, the number of gatherers per site was higher than in the rest of the year.

Statistically significant differences were observed in the number of recreational fishers per site and day depending on the different locations visited, but due to the lack of data, these locations cannot be identified. There is also a relationship with the level of the tide at low tide: the lower the tide at low tide, the higher the number of people fishing for seafood per site and per day, specifically for every metre that the tide receded by at low tide, the number of people increased by 2.85 people per site and per day.

Of the seafood-gatherers interviewed fishing for octopus, only 14.3% of them succeeded in catching a specimen. The fished yield of octopus is 0.23 kg per person and per day (Regional Government of Asturias, 2010).

Finally, trawl fishing would also interact with trap fishing, but as above it does not account for a relevant fraction of the whole. Firstly, common octopus is not the target species in trawl fishing, although every year specimens are caught in beach areas close to rocky sites, which the preferred habitat of the common octopus.

It can be seen that trawl fishing is the second most important fleet for catching octopus, with fluctuations from one year to the next, and accounting for an average of 10.9% of the total sales of the species. These figures coincide with the variability found in the data for trap-caught octopus.

As shown, detailed information is available on the extraction of a fraction of the stock with methods other than those used in the OFMP (**Figure PI 1.2.3.1**). Besides, in 2018, it is reflected that 98%of the auction sells belong to the small scale fishery in NW Cantabric Sea and this value increase uop to 99% if it is considered only the vessels based in Asturias.

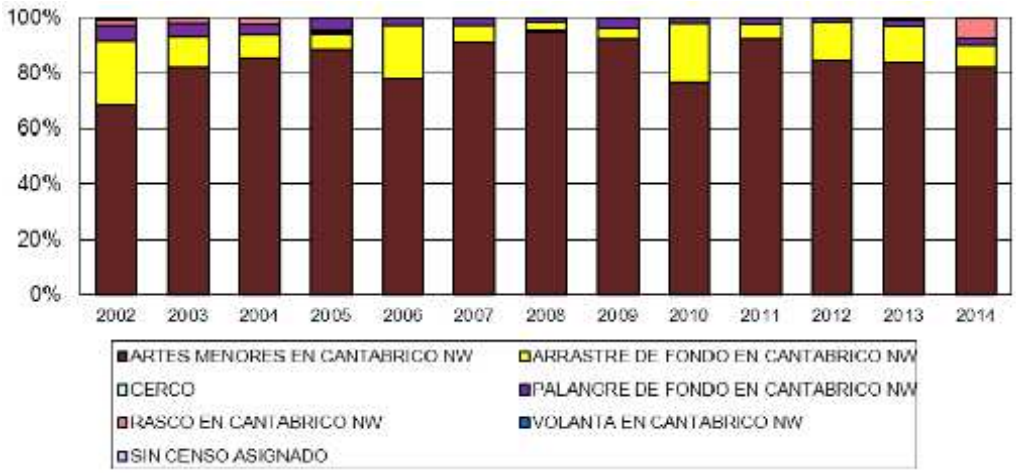


Figure PI 1.2.3.1. Detailed information of the fraction of the Asturian octopus stock captured by the fleet of the UoA ("Artes menores en Cantabrico NW") and by fleets using other fishing methods for the period 2012-1014. Source: CEP

The data present above is not updated since 2014. Therefore, there is not sufficient information to evaluate all other fishery removals outside of the UoA, **SG 80 is not met.**

References
Apilánez and Mortera (2008); Fernández et al. (2016); González et al. (2016), Regional Government of Asturias (2010); Fernández-Rueda and García-Flórez (2007); CEP (2018a).

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**Updated information sought on the detailed data about the different gears catching the common octopus in waters of Asturias**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**Not applicable at this stage**
Condition number (if relevant)	**Not applicable at this stage**

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			
Guide post		The assessment is appropriate for the stock and for the harvest control rule.	The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA.
Met?		**Yes**	**No**
Rationale			

It is important to underline the progress of the fishery during the last years, moving from being considered as a data-deficient fishery in relation to the target species to gather comprehensive information about the fishery (samplings onboard, catch, effort, positioning of the boats, etc). current level of information allows to enforce early biological indicators to monitor the trend of the target stock along the fishing season and adopt measures to reduce the fishing effort, if necessary.

The addition of the information collected from 2000 (catch, effort, langings, etc) permitted to apply assessment models that provide reference points. These depletion models are ready to be implemented and would give the necessary tools to define new HCRs in the fishery. Thus, the models permited to estimate crucial proxy fishery parameters such as B_0, spawning stock biomass, recruitment, natural mortality or fishing motality. This assessment is appropriate for the stock and for the HCR.

Thus, the current assessments (monitoring CPUE trend and the depletion model) are appropriate for the HCR, **SG80 is met**. Octopus are a short-lived species and their abundance may be expected to fluctuate temporally. This would expect to be captured by the reference points given by the models appplied, but in certain years could be subjected to consequences of particular climate envents, which, by the way, due to the low fishing pressure estimated, would not affect intensively the state of this population of it may not have been reflected in the choice of the reference points. These major features relative to the ecology of the species are not taken into account in the assessment and thus, the **SG100 is not met.**

b Assessment approach				
	Guide post	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**	
Rationale				

As the general case for cephalopods, the common octopus stock in Asturias does not have an equilibrium size, instead, the stock fluctuates between two equilibrium points, one of high biomass of around 2,500 tonnes and another of low biomass of about 1,500 tonnes, in alternate years. This population dynamics invalidates the use of the MSY and the biomass of the MSY as useful biological reference points for management. In fact, the MSY estimated is clearly excessive and the biomass produced by the MSY is too low (Roa-Ureta, 2019).

Average total latent productivity (net plus landings) for the whooe periods about 240 tonnes (Table PI 1.1.1.4) and corresponds to the productive surplus that is biologically sustainable and that economically it produces a maximum use of the resource (**Figure PI 1.2.4.1**).

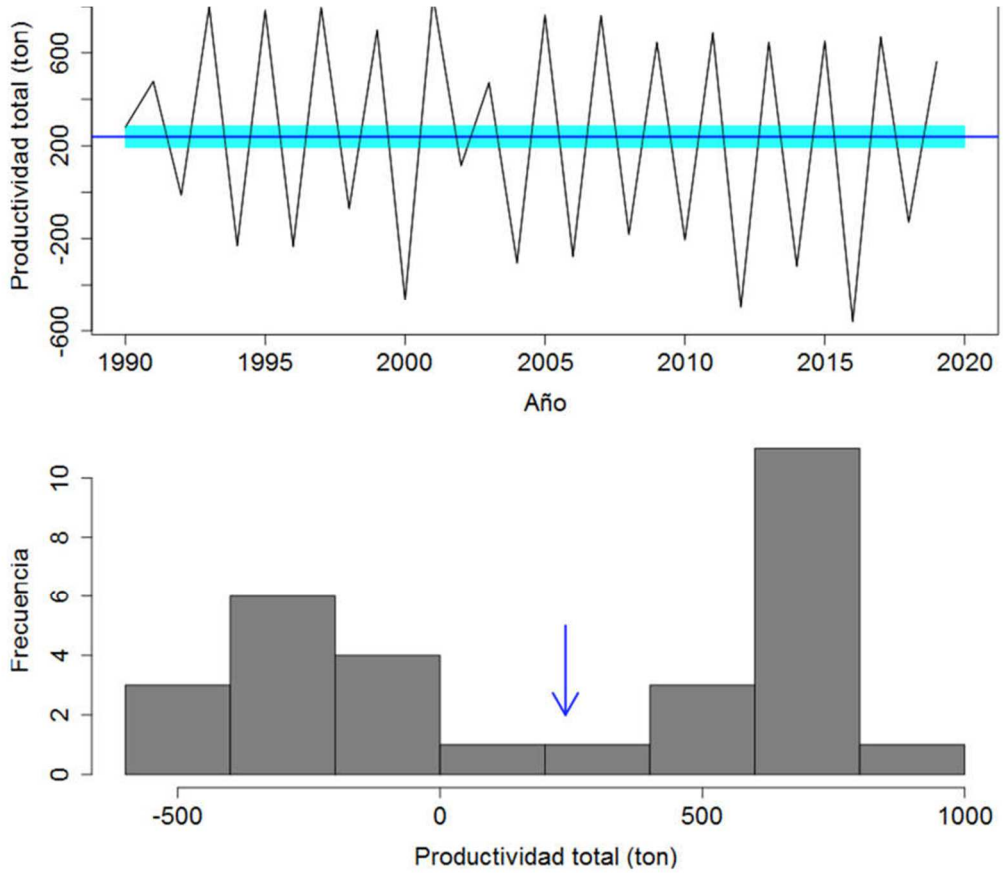


Figure PI 1.2.4.1. History of total latent productivity and its frequency distribution in the exploitation of the octopus of Asturias according to the results of the estimation of the production model Pella-Tomlinson 3p (equation 2). The blue line in the top panel is the average total productivity throughout the series with a band of ± 2 standard deviations. The arrow on the bottom panel also indicates the average total productivity value.

The annual exploitation rate (percentage of biomass at the beginning of each year that is captured by the fishers throughout the season), this time calculated with the biomass estimated by the Surplus production better supported by the data, they are low especially since 2008. However, due to the fluctuating nature of the stock, exploitation rates that are usually recommended as maximum and sustainable in fish, that is, 40% (Patterson, 1992) are not sustainable in this stock, since B_{MSY} were not calculated analitically. However, B_0 was approached , which permitted to estimate B_{MSY} based on this reference point. Besides, if all the total average latent productivity were used, the exploitation rate would reach a maximum of around 20% in low biomass years and around 9% in high biomass years, far below the critical points of sustainable exploitation. Thus, the team consider that the assessment **meets the requirements of the SG 60 and SG 80** levels or this PI.

C	Uncertainty in the assessment			
	Guide post	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**	**No**
Rationale				

As previously mentioned, the main uncertainty for the common octopus abundance is the recruitment variability, which is mainly due to the speciel characteristics of these semelparous and short-living species. That makes the stock to be completely renewed every one/two years. The plaktonic phase inherent to the species makes the oceographic and atmospheric factors, since these factors regulates the abundance, dispersion and also the availability of preys for the early stahes of development. These are some of the main parameters that make the recruitment so variable. However, bearing in mind these potential contingencies, the fishery considered some other uncertainities that were managed by introducing new measurements in the fishery (samplings on board, application of assessment models, geolocalization of boats, etc). That effort was sufficient to maintain the fishery under low and conservative exploitation rates. Thus, **SG60 and SG80 are met.** The assessment does not count with analytical approaches that include probabilistic confidence intervals. Besides, in the future, it would be necessary to consider the climatic factors as a source of uncertainty for the management of the fishery. **Therefore, SG 100 is not met**.

	Evaluation of assessment			
d	Guide post			The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored.
	Met?			**Yes**
Rationale				

Although the evaluation using depletion models was recently established, the data from each of the 19 available seasons were analyzed separately, applying the intra-annual version of the generalized depletion models. This is the recommended approach in stock assessment with generalized depletion models when data is recorded in very fast time scales, such as days or weeks. In each of the seasons, a minimum of 90 and a maximum of 408 models of depletion were adjusted, according to the combinations of probability distribution of the data, numerical method of optimization, week of recruitment, and week of emigration of spawning females. The application of the model designed for the common octopus fishery in Asturias should represent an inflexion point regarding management issues (Roa-Ureta, 2019)

The assessment has been tested using a systematic exploration of the interactions among different sets of assumptions. The final stock status estimate represents a synthesis from a maximum of 408 models. This confirms that alternative hypothesis and assessment approaches have been rigorously explored. Thus, **SG100 is met.**

	Peer review of assessment			
e	Guide post		The assessment of stock status is subject to peer review.	The assessment has been **internally and externally** peer reviewed.
	Met?		**No**	**No**
Rationale				

The main assessment results has been shared within the OFMC. But we are not aware of any internal or external review of the specific aspects of this stock assessment for *Octopus vulgaris*. At the moment of writing this report the team cannot conclude if the assessment of the stock is subject to peer review. **SG80 is not met.**

References

Roa-Ureta, 2019, Patterson, 1992

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**

Information gap indicator	**It is necessary more information, as indicated above in PI 1.2.4. SI e**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**Not applicable at this stage**
Condition number (if relevant)	**Not applicable at this stage**

7.3 Principle 2

7.3.1 Principle 2 background

7.3.1.1 Species assignment to MSC P2 categories

7.3.1.1.1 UoA catch composition based on on-board observer program data

Information on bycatch species from the Galician octopus trap fishery in the nearby region of the Cantabric coast (Bañón et al, 2007) was used during the initial assessment of this fishery (Gonzalez et al 2016). However, while the initial assessment was taking place, a monitoring programme on board vessels included in the UoC started and partial information from this monitoring was made available for the assessment team to be elaborate the PCR.

Based on this monitoring, a comprehensive report was published afterwards (Fernández et al, 2016) characterizing the trap octopus fishery in Asturias. This report provided new information related to the P2, based on sampling performed on board vessels included in the UoC from December 2014 to July 2015. Moreover, since December 2016 this sampling was extended to the whole UoA, and since the 2016/17 fishing season all vessels included in the OFMP are bound to collaborate with this sampling (by getting a biologist on board) under CEP request. Results for the 2014/15, 2016/17, 2017/18, 2018/19 and 2019/2020 fishing seasons are presented below.

Further, during the 3rd surveillance audit, the CEP informed that the octopus fishery was officially included within the observer program put in place by the DGPM in Asturias. This local observer program aims 4 observed fishing trips per month distributed among the different local fisheries in Asturias and, according to the objectives included in the OFMP 2 out of those 4 will always be allocated to the octopus' fishery. Taking into account previous nºfishing days/year, this would correspond to around 1% of observer coverage in this fishery. The tender to contract this services for 2020 was launched in 2019 (Macho & Rios, 2019). On-board observer program started in the 2014-15 fishing season and yearly reports are since then published, but this information has not been compiled together, so we will present the data by fishing season: 2014-15, 2016-17, 2017-18, 2018-19 and 2019-2020 (there is no data available for the season 2015-16):

a) Data collected by observers on board the UoC during the 2014/2015 fishing season

This study was performed by SIGMA (hired by the CEP) and took place between December 2014 and July 2015. A total of 13 different vessels included in the UoC decided to voluntarily participated in the sampling (out of a total of 20 vessels targeting octopus within the OFMP that year). The sampling accounted for a total of 20 observed days on board 10 different vessels from Ortigueira, Puerto de Vega and Tapia de Casariego.

Table 7.3.1. Retained captures (RET), discarded (DESC) and totals in number (N) and in weight in grams (Peso). Information from the sample on board from December 2014 to July 2015. Note the original table is in Spanish and

therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández et al, 2016.

NOMBRE CIENTÍFICO	NOMBRE COMUN	Nº RET.	Nº DESC.	Nº TOTAL	PESO RET.	PESO DESC.	PESO TOTAL	% N	% PESO
Octopus vulgaris	Pulpo	978	1.290	2.268	1.446.554	841.861	2.288.415	28,111%	90,327%
Marthasterias glacialis	Estrella de mar común	-	1.378	1.378	-	104.972	104.972	17,080%	4,143%
Polybius henslowii	Patexo	-	2.790	2.790	-	40.613	40.613	34,581%	1,603%
Serranus cabrilla	Cabrilla	-	558	558	-	26.348	26.348	6,916%	1,040%
Necora puber	Nécora	84	157	241	12.910	13.303	26.213	2,987%	1,035%
Conger conger	Congrio	-	27	27	-	22.319	22.319	0,335%	0,881%
Scyliorhinus canicula	Pintarroja	-	12	12	-	3.901	3.901	0,149%	0,154%
Labrus mixtus	Gallano	-	30	30	-	2.003	2.003	0,372%	0,079%
Galathea strigosa	Sastre	-	96	96	-	1.948	1.948	1,190%	0,077%
Gaidropsarus mediterraneus	Bertorella	-	33	33	-	1.815	1.815	0,409%	0,072%
Parablennius spp	Blenio	-	107	107	-	1.651	1.651	1,326%	0,065%
Gaidropsarus vulgaris	Lota	-	13	13	-	1.623	1.623	0,161%	0,064%
Charonia lampas	Caracola	-	5	5	-	1.515	1.515	0,062%	0,060%
Holothuria forskali	Holoturia negra	-	20	20	-	1.350	1.350	0,248%	0,053%
Cancer pagurus	Buey de mar	-	12	12	-	1.122	1.122	0,149%	0,044%
Ophioderma longicauda	Ofiura lisa	-	149	149	-	1.107	1.107	1,847%	0,044%
Homarus gammarus	Bogavante	-	7	7	-	1.070	1.070	0,087%	0,042%
Parablennius gattorugine	Cabruza	-	22	22	-	909	909	0,273%	0,036%
Scyllarus arctus	Santiaguín	2	9	11	150	644	794	0,136%	0,031%
Sphaerechinus granularis	Erizo violáceo	-	6	6	-	741	741	0,074%	0,029%
Maja squinado	Centollo	-	4	4	-	587	587	0,050%	0,023%
Inachus spp	--	-	120	120	-	539	539	1,487%	0,021%
Ctenolabrus rupestris	Tabernero	-	35	35	-	472	472	0,434%	0,019%
Coris julis	Julia	-	5	5	-	340	340	0,062%	0,013%
Palaemon serratus	Camarón, Quisquilla	44	24	68	220	120	340	0,843%	0,013%
Atelecyclus undecimdentatus	--	-	14	14	-	170	170	0,174%	0,007%
Scorpaena porcus	Rascacio	-	1	1	-	89	89	0,012%	0,004%
Symphodus melops	Porredana	-	1	1	-	84	84	0,012%	0,003%
Trisopterus minutus	Capellán	-	1	1	-	64	64	0,012%	0,003%
Liocarcinus corrugatus	Cangrejo de arrugas	-	6	6	-	61	61	0,074%	0,002%
Raniceps raninus	Pez rana	-	2	2	-	53	53	0,025%	0,002%
Paracentrotus lividus	Erizo de mar	-	2	2	-	45	45	0,025%	0,002%
Labrus bergylta	Maragota	-	1	1	-	32	32	0,012%	0,001%
Pagrus pagrus	Pargo	-	1	1	-	27	27	0,012%	0,001%
Centrolabrus exoletus	Farro	-	1	1	-	27	27	0,012%	0,001%
Gobius cobitus	Gobio gigante	-	1	1	-	23	23	0,012%	0,001%
Atelecyclus rotundatus	--	-	1	1	-	21	21	0,012%	0,001%
Gobius paganellus	Bobi	-	1	1	-	20	20	0,012%	0,001%
Trisopterus luscus	Faneca	-	1	1	-	16	16	0,012%	0,001%
Pisa armata	--	-	3	3	-	13	13	0,037%	0,001%
Echinaster sepositus	Estrella espinosa	-	4	4	-	12	12	0,050%	0,000%
Liocarcinus marmoreus	Cangrejo de arena	-	6	6	-	9	9	0,074%	0,000%
Bathynectes longipes	--	-	1	1	-	8	8	0,012%	0,000%
Asterina gibbosa	Estrella del capitán	-	1	1	-	3	3	0,012%	0,000%
Xaiva biguttata	Xaiva	-	1	1	-	2	2	0,012%	0,000%
Pisa tetraodon	--	-	1	1	-	2	2	0,012%	0,000%
Total		**1.108**	**6.960**	**8.068**	**1.459.834**	**1.073.654**	**2.533.488**	**100%**	**100%**

As shown in **Table 7.3.1**, a total of 44 species and 2 genera were found as bycatch of this fishery. This species composition expanded the bycatch list of species detailed in the initial PCR (Gonzalez et al 2016) and therefore the list of P2 species was revised during the 1st surveillance audit and relevant PIs (2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3) were re-scored (Macho & Rios, 2017). None of the species are considered out of the scope, and only one, *Charonia lampas,* is an ETP species. Five individuals of this vulnerable species were found in the traps and all of them were discarded alive. No re-scoring of ETP-related PIs was considered necessary at that stage.

None of the other species are managed with tools and measures intended to achieve stock management objectives reflected in either limit or target reference points, so, all of them are considered Secondary species, and "minor", since the percentage in weight related to the total catch is always below the 5% threshold. In the PCR, the velvet crab (*Necora puber*) was the only Secondary main species considered, nevertheless, in the Fernández et al (2016) report, this species only represents 1.03% of the total catch, so for future SA the velvet crab was considered as a minor secondary species. Most of the velvet crabs (51% in weight and 65%

in number) were discarded because of being below the size limit, carrying eggs or on the reproductive closure, and 88.5% were alive when discarded. Almost all the velvet crabs were captured from May to June.

Octopus accounts for 90.3% of the total catches in weight (including discards), but 99.1% of the retained catches in weight. The spiny starfish, Marthasterias glacialis, accounts for up to 4.14% of total weight, but all individuals were released back to the sea. Another non-commercial species, the swimming crab (*Polybius henslowii)* accounts for 1.6% of the total catch weight (all discarded). Then, accounting for around 1% of the total catch weight each, there are 3 commercial species: comber (*Serranus cabrilla*), velvet swimming crab (*Necora puber*) and Conger (*Conger conger*). However, the only retained species is the velvet swimming crab (about 49% in weight is retained), the other two species were released back to the sea. Only three species were retained during the observed period: octopus, velvet swimming crab and common prawn (*Palaemon serratus*), but the common prawn represented only 0.013% of total catch weight (35% in weigth is retained).

According to Fernández et al (2016), 42.4% of the catches (in weight) were discarded, and octopus accounted for 78.4% of those discards. The only reason for discarding octopus is because of catching individuals smaller than 1kg, while the reason for discarding most of the other species is because of lacking commercial interest. 97.8% of the individuals caught as bycatches were discardes (mainly because for not having a commercial value). Further, 98.6% of those discards were alive when they were released from the trap and thrown back to the sea.

b) Data collected by observers on board the UoC during 2016/17 and 2017/18 fishing seasons

Since 2016 all vessels included in the 2016/17 OFMP are bound to collaborate with this sampling (by getting a biologist on board) under CEP request, meaning that the scope of the on board sampling has been extended from the UoC to the whole UoA. Samplings took place in 9 and 7 different vessels in the 2016/17 and 2017/18 fishing campaigns, respectively. Vessel from 5 different ports participated in these samplings: Figueras, Tapia de Casariego, Ortiguera, Puerto de Vega and Cudillero. A total of 32 fishing trips were observed between 2016 and 2018 (16 in each fishing campaign). Results from these samplings were compiled in Fernández (2018b). In relation to catch composition **table 7.3.3** and **table 7.3.4** present the results for the 2017/18 and 2018/19 fishing seasons, respectively. These results are similar with those presented in Fernández et al (2016).

Octopus comprises between 86 and 88% of the total observed catches (in weight), but account for 98% of the retained catches. Apart from the octopus, the only significant commercial species being retained is the velvet crab (*Necora puber*), but it only accounts for 1.7% of the total observed catches. The other retained species during the two fishing seasons were: 21 individuals of slippery lobster (*Scyllarus arctus*) and 1 individual of white seabream (*Diplodus sargus*). Again, the only ETP species listed is the *Charonia lampas*, and all individuals were thrown back to the sea alive (**table 7.3.4 and table 7.3.5**). The spiny starfish (*Mathasterias glacialis*) accounted for percentages of the total catch that are slightly higher (between 7 and 8%) than reflected in Fernández et al (2016), but again 100% of the individuals are released back to the sea (all of them alive, see **table 7.3.4 and table 7.3.5**).

Octopus accounted for 70-72% of the total discards (in weight). This report also provides with survival rates per species at the moment of being released from the traps and thrown back to the sea, 99% of the discards were alive during the observed period (see **table 7.3.4 and table 7.3.5**). Most of the species presented a 100% survival rate at the time of discarding, and all the remaining species present rates above 83%. The only exception is the wrasse (*Labrus bergylta)*, since a single individual was caught and released dead, so the survival rate was zero.

Table 7.3.2. Catch composition recorded by observers on board the UoA during the 2016/17 fishing season. Retained (RET) and discarded (DESC) catches in number (N) and in weight in grams (Peso). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2018b.

2016/2017									
NOMBRE COMÚN	NOMBRE CIENTÍFICO	Nº RET	Nº DESC	Nº TOTAL	PESO RET	PESO DESC	PESO TOTAL	% N	% PESO
Alitán	*Scyliorhinus stellaris*	-	3	3	-	1.090	1.090	0,08%	0,09%
Atelecyclus	*Atelecyclus undecimdentatus*	-	18	18	-	83	83	0,46%	0,01%
Bertorella	*Gaidropsarus mediterraneus*	-	8	8	-	745	745	0,21%	0,06%
Blenio	*Parablennius pilicornis*	-	522	522	-	2.225	2.225	13,44%	0,19%
Bogavante	*Homarus gammarus*	-	6	6	-	680	680	0,15%	0,06%
Buey de mar	*Cancer pagurus*	-	2	2	-	216	216	0,05%	0,02%
Cabrilla	*Serranus cabrilla*		339	339	-	14.113	14.113	8,73%	1,21%
Cabruza	*Parablennius gattorugine*	-	54	54	-	1.547	1.547	1,39%	0,13%
Cangrejo de arrugas	*Liocarcinus corrugatus*	-	1	1	-	14	14	0,03%	0,00%
Caracola	*Charonia lampas*	-	7	7	-	3.747	3.747	0,18%	0,32%
Centollo	*Maja squinado*	-	5	5	-	330	330	0,13%	0,03%
Congrio	*Conger conger*	-	21	21	-	21.112	21.112	0,54%	1,82%
Erizo violáceo	*Sphaerechinus granularis*	-	4	4	-	988	988	0,10%	0,08%
Estrella de mar común	*Marthasterias glacialis*	-	1.174	1.174	-	91.988	91.988	30,23%	7,91%
Estrella del capitán	*Asterina gibbosa*	-	2	2	-	2	2	0,05%	0,00%
Estrella espinosa	*Echinaster sepositus*	-	3	3	-	37	37	0,08%	0,00%
Gallano	*Labrus mixtus*	-	11	11	-	1.094	1.094	0,28%	0,09%
Holoturia negra	*Holothuria forskali*	-	10	10	-	677	677	0,26%	0,06%
Inachus	*Inachus sp*	-	2	2	-	9	9	0,05%	0,00%
Inachus (placas)	*Inachus thoracicus*	-	28	28	-	165	165	0,72%	0,01%
Julia	*Coris julis*	-	13	13	-	674	674	0,33%	0,06%
Lota	*Gaidropsarus vulgaris*	-	5	5	-	283	283	0,13%	0,02%
Nécora	*Necora puber*	74	65	139	12.390	7.026	19.416	3,58%	1,67%
Ofiura lisa	*Ophioderma longicauda*	-	176	176	-	1.763	1.763	4,53%	0,15%
Ofiura negra	*Ophiocomina nigra*	-	4	4	-	8	8	0,10%	0,00%
Pargo	*Pagrus pagrus*	-	1	1	-	10	10	0,03%	0,00%
Patexo	*Polybius henslowii*	-	45	45	-	431	431	1,16%	0,04%
Pulpo	*Octopus vulgaris*	388	692	1.080	603.650	393.910	997.560	27,81%	85,77%
Santiaguín	*Scyllarus arctus*	5	5	10	371	180	551	0,26%	0,05%
Sastre	*Galathea strigosa*	-	141	141	-	1.025	1.025	3,63%	0,09%
Inachus sin determinar		-	1	1		2	2	0,03%	0,00%
Crustáceo sin determinar		-	1	1	-	3	3	0,03%	0,00%
Sin nombre común	*Xaiva biguttata*	-	1	1	-	3	3	0,03%	0,00%
Tabernero	*Ctenolabrus rupestris*	-	47	47	-	497	497	1,21%	0,04%
Total		467	3.417	3.884	616.411	546.677	1.163.088	100%	100%

Table 7.3.3 Catch composition recorded by observers on board the UoA during the 2017/18 fishing season. Retained (RET) and discarded (DESC) catches in number (N) and in weight in grams (Peso). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2018b

2017/2018									
NOMBRE COMÚN	NOMBRE CIENTÍFICO	Nº RET	Nº DESC	Nº TOTAL	PESO RET	PESO DESC	PESO TOTAL	% N	% PESO
Alitán	*Scyliorhinus stellaris*	-	8	8	-	5.088	5.088	0,30%	0,48%
Atelecyclus	*Atelecyclus undecimdentatus*	-	10	10	-	232	232	0,37%	0,02%
Atelecyclus pequeño	*Atelecyclus rotundatus*	-	2	2	-	45	45	0,07%	0,00%
Bertorella	*Gaidropsarus mediterraneus*	-	15	15	-	604	604	0,56%	0,06%
Blenio	*Parablennius pilicornis*	-	41	41	-	568	568	1,54%	0,05%
Blenio (sin determinar)	*Parablennius spp*	-	5	5	-	N/A	N/A	0,19%	N/A
Bogavante	*Homarus gammarus*	-	4	4	-	925	925	0,15%	0,09%
Buey de mar	*Cancer pagurus*	-	5	5	-	1.025	1.025	0,19%	0,10%
Cabracho	*Scorpaena sp*	-	1	1	-	20	20	0,04%	0,00%
Cabrilla	*Serranus cabrilla*	-	146	146	-	6.074	6.074	5,47%	0,58%
Cabruza	*Parablennius gattorugine*	-	20	20	-	528	528	0,75%	0,05%
Cangrejo de arena	*Liocarcinus marmoreus*	-	3	3	-	7	7	0,11%	0,00%
Cangrejo de arrugas	*Liocarcinus corrugatus*	-	1	1	-	9	9	0,04%	0,00%
Capellán	*Trisopterus Minutus*	-	1	1	-	60	60	0,04%	0,01%
Caracola	*Charonia lampas*	-	2	2	-	528	528	0,07%	0,05%
Centollo	*Maja squinado*	-	7	7	-	923	923	0,26%	0,09%
Congrio	*Conger conger*	-	10	10	-	15.138	15.138	0,37%	1,43%
Erizo violáceo	*Sphaerechinus granularis*	-	2	2	-	339	339	0,07%	0,03%
Estrella de mar común	*Marthasterias glacialis*	-	901	901	-	68.506	68.506	33,75%	6,49%
Estrella espinosa	*Echinaster sepositus*	-	1	1	-	18	18	0,04%	0,00%
Farro	*Centrolabrus exoletus*	-	4	4	-	115	115	0,15%	0,01%
Fusta	*Entelerus aequoreus*	-	2	2	-	9	9	0,07%	0,00%
Gallano	*Labrus mixtus*	-	3	3	-	457	457	0,11%	0,04%
Holoturia negra	*Holothuria forskali*	-	16	16	-	1.775	1.775	0,60%	0,17%
Inachus	*Inachus leptochirus*	-	3	3	-	5	5	0,11%	0,00%
Inachus	*Inachus sp*	-	18	18	-	102	102	0,67%	0,01%
Inachus	*Incahus phalangium*	-	1	1	-	2	2	0,04%	0,00%
Inachus (placas)	*Inachus thoracicus*	-	89	89	-	486	486	3,33%	0,05%
Julia	*Coris julis*	-	7	7	-	-	-	0,26%	0,00%
Lota	*Gaidropsarus vulgaris*	-	7	7	-	-	-	0,26%	0,00%
Maragota	*Labrus bergylta*	-	1	1	-	228	228	0,04%	0,02%
Nécora	*Necora puber*	75	46	121	13.180	4.711	17.891	4,53%	1,69%
Ofiura	*Ophiura ophiura*	-	1	1	-	18	18	0,04%	0,00%
Ofiura lisa	*Ophioderma longicauda*	-	113	113	-	1.100	1.100	4,23%	0,10%
Ofiura negra	*Ophiocomina nigra*	-	2	2	-	4	4	0,07%	0,00%
Patexo	*Polybius henslowii*	-	90	90	-	580	580	3,37%	0,05%
Pintarroja	*Scyliorhinus canicula*	-	1	1	-	545	545	0,04%	0,05%
Pisa armata	*Pisa armata*	-	3	3	-	12	12	0,11%	0,00%
Pulpo	*Octopus vulgaris*	408	497	905	658.562	269.488	928.050	33,90%	87,92%
Quisquilla	*Palaemon serratus*	-	11	11	-	74	74	0,41%	0,01%
Santiaguín	*Scyllarus arctus*	16	5	21	1.270	236	1.506	0,79%	0,14%
Sargo común	*Diplodus sargus*	1	-	1	415	-	415	0,04%	0,04%
Sastre	*Galathea strigosa*	-	45	45		1.250	1.250	1,69%	0,12%
Tabernero	*Ctenolabrus rupestris*	-	20	20	-	323	323	0,75%	0,03%
Total		500	2.170	2.670	673.427	382.157	1.055.584	100%	100%

Table 7.3.4. Species discarded in sampling on board made during the 2016/2017 fishing season. For each species total number of discarded specimens in number and weight (g) is indicated, as well as the total discards that were alive (vivo) at the time of extracting from the traps (absolute value and %). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2018b

2016/2017							
NOMBRE COMÚN	NOMBRE CIENTÍFICO	Nº DESC	PESO DESC	Nº VIVO	PESO VIVO	% VIVO (Nº)	% VIVO (PESO)
Alitán	*Scyliorhinus stellaris*	3	1.090	3	1090	100%	100%
Atelecyclus	*Atelecyclus undecimdentatus*	18	83	18	83,1	100%	100%
Bertorella	*Gaidropsarus mediterraneus*	8	745	8	745	100%	100%
Blenio	*Parablennius pilicornis*	522	2.225	519	2183	99%	98%
Bogavante	*Homarus gammarus*	6	680	6	680	100%	100%
Buey de mar	*Cancer pagurus*	2	216	2	216	100%	100%
Cabrilla	*Serranus cabrilla*	339	14.113	329	13948	97%	99%
Cabruza	*Parablennius gattorugine*	54	1.547	54	1547	100%	100%
Cangrejo de arrugas	*Liocarcinus corrugatus*	1	14	1	14	100%	100%
Caracola	*Charonia lampas*	7	3.747	7	3747	100%	100%
Centollo	*Maja squinado*	5	330	5	330	100%	100%
Congrio	*Conger conger*	21	21.112	21	21112	100%	100%
Erizo violáceo	*Sphaerechinus granularis*	4	988	4	988	100%	100%
Estrella de mar común	*Marthasterias glacialis*	1.174	91.988	1174	91998	100%	100%
Estrella del capitán	*Asterina gibbosa*	2	2	2	2	100%	100%
Estrella espinosa	*Echinaster sepositus*	3	37	3	37	100%	100%
Gallano	*Labrus mixtus*	11	1.094	9	964	82%	88%
Holoturia negra	*Holothuria forskali*	10	677	10	677	100%	100%
Inachus	*Inachus sp*	2	9	2	9	100%	100%
Inachus (placas)	*Inachus thoracicus*	28	165	28	165	100%	100%
Julia	*Coris julis*	13	674	12	674	92%	100%
Lota	*Gaidropsarus vulgaris*	5	283	5	283	100%	100%
Nécora	*Necora puber*	65	7.026	58	6095	89%	87%
Ofiura lisa	*Ophioderma longicauda*	176	1.763	176	1763	100%	100%
Ofiura negra	*Ophiocomina nigra*	4	8	4	8	100%	100%
Pargo	*Pagrus pagrus*	1	10	1	10	100%	100%
Patexo	*Polybius henslowii*	45	431	45	431	100%	100%
Pulpo	*Octopus vulgaris*	692	393.910	684	390351	99%	99%
Santiaguín	*Scyllarus arctus*	5	180	5	180	100%	100%
Sastre	*Galathea strigosa*	141	1.025	141	1025	100%	100%
Inachus sin determinar		1	2	1	2	100%	100%
Crustáceo sin determinar		1	3	1	3	100%	100%
Sin nombre común	*Xaiva biguttata*	1	3	1	3	100%	100%
Tabernero	*Ctenolabrus rupestris*	47	497	47	497	100%	100%
Total		3.417	546.677	3.386	541.860	99%	99%

Table 7.3.5. Species discarded in sampling on board made during the 2017/2018 fishing season. For each species total number of discarded specimens in number and weight (g) is indicated, as well as the total discards that were alive (vivo) at the time of extracting from the traps (absolute value and %). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2018b

2017/2018							
NOMBRE COMÚN	NOMBRE CIENTÍFICO	Nº DESC	PESO DESC	Nº VIVO	PESO VIVO	% VIVO (Nº)	% VIVO (PESO)
Alitán	*Scyliorhinus stellaris*	8	5.088	8	5.088	100%	100%
Atelecyclus	*Atelecyclus undecimdentatus*	10	232	10	232	100%	100%
Atelecyclus pequeño	*Atelecyclus rotundatus*	2	45	2	45	100%	100%
Bertorella	*Gaidropsarus mediterraneus*	15	604	14	570	93%	94%
Blenio	*Parablennius pilicornis*	41	568	40	558	98%	98%
Blenio (sin determinar)	*Parablennius spp*	5		5		100%	100%
Bogavante	*Homarus gammarus*	4	925	4	925	100%	100%
Buey de mar	*Cancer pagurus*	5	1.025	5	1.025	100%	100%
Cabracho	*Scorpaena sp*	1	20	1	20	100%	100%
Cabrilla	*Serranus cabrilla*	146	6.074	143	5.910	98%	97%
Cabruza	*Parablennius gattorugine*	20	528	18	459	90%	87%
Cangrejo de arena	*Liocarcinus marmoreus*	3	7	3	7	100%	100%
Cangrejo de arrugas	*Liocarcinus corrugatus*	1	9	1	9	100%	100%
Capellán	*Trisopterus Minutus*	1	60	1	60	100%	100%
Caracola	*Charonia lampas*	2	528	2	528	100%	100%
Centollo	*Maja squinado*	7	923	7	923	100%	100%
Congrio	*Conger conger*	10	15.138	10	15.138	100%	100%
Erizo violáceo	*Sphaerechinus granularis*	2	339	2	339	100%	100%
Estrella de mar común	*Marthasterias glacialis*	901	68.506	901	68.506	100%	100%
Estrella espinosa	*Echinaster sepositus*	1	18	1	18	100%	100%
Farro	*Centrolabrus exoletus*	4	115	4	115	100%	100%
Fusta	*Entelerus aequoreus*	2	9	2	9	100%	100%
Gallano	*Labrus mixtus*	3	457	3	457	100%	100%
Holoturia negra	*Holothuria forskali*	16	1.775	16	1.775	100%	100%
Inachus	*Inachus leptochirus*	3	5	3	5	100%	100%
Inachus	*Inachus sp*	18	102	18	102	100%	100%
Inachus	*Incahus phalangium*	1	2	1	2	100%	100%
Inachus (placas)	*Inachus thoracicus*	89	486	89	468	100%	96%
Julia	*Coris julis*	7	413	5	412	71%	100%
Lota	*Gaidropsarus vulgaris*	7	665	6	664	86%	100%
Maragota	*Labrus bergylta*	1	228	-	-	0%	0%
Nécora	*Necora puber*	46	4.711	40	3.930	87%	83%
Ofiura	*Ophiura ophiura*	1	18	1	18	100%	100%
Ofiura lisa	*Ophioderma longicauda*	113	1.100	113	1.100	100%	100%
Ofiura negra	*Ophiocomina nigra*	2	4	2	4	100%	100%
Patexo	*Polybius henslowii*	90	580	90	580	100%	100%
Pintarroja	*Scyliorhinus canicula*	1	545	1	545	100%	100%
Pisa armata	*Pisa armata*	3	12	3	12	100%	100%
Pulpo	*Octopus vulgaris*	497	269.488	493	268.312	99%	100%
Quisquilla	*Palaemon serratus*	11	74	11	74	100%	100%
Santiaguín	*Scyllarus arctus*	5	236	5	236	100%	100%
Sastre	*Galathea strigosa*	45	1.250	43	1.153	96%	92%
Tabernero	*Ctenolabrus rupestris*	20	323	19	318	95%	98%
Total		2.170	383.235	2.146	380.651	99%	99%

c) Data collected by observers on board the UoC during the 2018/19 and 2019/20 fishing season

Results collected during the fishing 2018/19 and 2019/20 by the observers on board fleet operating within the OFMP and also by the biologists working at the CEP were compiled and analysed at Fernández 2019b and Fernández 2019c. This report also reports data from biological sampling performed by CEP biologists at ports. These monthly samplings were started in 200/01 and involve weights, sex ratio and maturity. This data is being used for the depletion model. The information collected by the observers related to catch composition, discarding and bait used is presented below was extracted from Fernández 2019b and Fernández 2019c. This information is aligned with the information presented above for previous fishing seasons.

Catch composition was observed and recorded in 10 different vessels from 6 different ports (Figueras, Tapia de Casariego, Viavélez, Ortiguera, Puerto de Vega and Luarca) along 14 fishing trips between December 2018 and July 2019. Results are similar with those presented in previous years (**table 7.3.6 and table 7.3.8**). Octopus comprised between 91.18% in 2018-2019 while 81.18% in 2019-2020 of the total catches, and 99.17%in 2018-2019 while 89.1% in 2019-2020 of the retained catches (in weight). Apart from the octopus, the only commercial species being retained are the velvet crab (*Necora puber*) and slipper lobster (*Scyllarus arctus*), but they accounted for 0.96% (2018-2019) and 6.49% (2019-2010) and 0.06% and 0.31% respectively of the total catches. The only ETP species listed is the *Charonia lampas*, and 100% of the catches are discarded alive (**Table 7.3.7**).

Discarding affects up to 37.04% (2018-2019) and 54.07% (2019-2020) of the total catches in weight (78.29% and 80.88% respectively in number of individuals), either because of not having commercial interest or because of not reaching the minimum commercials size/weight (in the case of the octopus and slipper lobster). Observers also recorded whether the catches were alive or dead at the moment of being removed from the traps, and 99% of those discards were alive (**Table 7.3.7**). The lowest % of survival are for two small fish: *Coris julis* (71.6%) and *Labrus mixtus* (80.6%), while for most of the species survival rates is 100%.

Table 7.3.6 Catch composition recorded by observers on board the UoA during the 2018/19 fishing season. Retained (RET) and discarded (DESC) catches in number (N) and in weight (Peso). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2019b

Nombre Comun	Nombre Cientifico	Nº RET	Nº DESC	Nº TOTAL	Peso RET	Peso DESC	PESO TOTAL	% N	% PESO
Bertorella	Gaidropsarus mediterraneus	-	5	5	-	298	298	0,19%	0,03%
Blenio	Parablennius pilicornis	-	26	26	-	297	297	1,01%	0,02%
Buey de mar	Cancer pagurus	-	5	5	-	915	915	0,19%	0,08%
Cabrilla	Serranus cabrilla	-	235	235	-	16.008	16.008	9,09%	1,35%
Cabruza	Parablennius gattorugine	-	12	12	-	601	601	0,46%	0,05%
Cangrejo de arena	Liocarcinus marmoreus	-	1	1	-	1	1	0,04%	0,00%
Caracola	Charonia lampas	-	13	13	-	4.784	4.784	0,50%	0,40%
Centollo	Maja squinado	-	4	4	-	320	320	0,15%	0,03%
Congrio	Conger conger	-	10	10	-	10.970	10.970	0,39%	0,92%
Erizo de mar común	Paracentrotus lividus	-	2	2	-	125	125	0,08%	0,01%
Erizo violáceo	Sphaerechinus granularis	-	13	13	-	2.331	2.331	0,50%	0,20%
Estrella de mar común	Marthasterias glacialis	-	676	676	-	48.784	48.784	26,16%	4,10%
Estrella espinosa	Echinaster sepositus	-	4	4	-	44	44	0,15%	0,00%
Farro	Centrolabrus exoletus	-	1	1	-	25	25	0,04%	0,00%
Gallano	Labrus mixtus	-	11	11	-	1.008	1.008	0,43%	0,08%
Holoturia negra	Holothuria forskali	-	7	7	-	557	557	0,27%	0,05%
Holoturia	*Holoturia spp*	-	14	14	-	760	760	0,54%	0,06%
Inachus	Inachus thoracicus	-	14	14	-	68	68	0,54%	0,01%
Julia	Coris julis	-	8	8	-	619	619	0,31%	0,05%
Lota	Gaidropsarus vulgaris	-	2	2	-	329	329	0,08%	0,03%
Nécora	Necora puber	64	76	140	5.585	5.875	11.460	5,42%	0,96%
Negrita	Spondyliosoma cantharus	-	1	1	-	365	365	0,04%	0,03%
Ofiura	Ophiura ophiura	-	1	1	-	N/A	N/A	0,04%	N/A
Ofiura lisa	Ophioderma longicauda	-	94	94	-	1.119	1.119	3,64%	0,09%
Patexo	Polybius henslowii	-	128	128	-	1.394	1.394	4,95%	0,12%
Pulpo	Octopus vulgaris	491	616	1.107	742.400	341.748	1.084.148	42,84%	91,18%
Quisquilla	Palaemon serratus	-	2	2	-	8	8	0,08%	0,00%
Santiaguín	Scyllarus arctus	6	3	9	625	145	770	0,35%	0,06%
Sastre	Galathea strigosa	-	11	11	-	328	328	0,43%	0,03%
Tabernero	Ctenolabrus rupestris	-	28	28	-	531	531	1,08%	0,04%
Total		561	2.023	2.584	748.610	440.357	1.188.967	100%	100%

Table 7.3.7 Species discarded in sampling on board made during the 2018/2019 fishing season. For each species total number of discarded specimens in number and weight (g) is indicated, as well as the total discards that were alive (vivo) at the time of extracting from the traps (absolute value and %). Note the original table is in Spanish and therefore the

decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández 2019b.

Nombre Comun	Nombre Cientifico	Nº DESC	Peso DESC	Nº Vivo	Peso Vivo	% Vivo (Nº)	% Vivo (peso)
Bertorella	Gaidropsarus mediterraneus	5	298,00	5	298,00	100,0%	100,0%
Blenio	Parablennius pilicornis	26	297,00	26	297,00	100,0%	100,0%
Buey de mar	Cancer pagurus	5	915,00	5	915,00	100,0%	100,0%
Cabrilla	Serranus cabrilla	235	16.008,00	225	15.617,00	95,7%	97,6%
Cabruza	Parablennius gattorugine	12	601,00	11	586,00	91,7%	97,5%
Cangrejo de arena	Liocarcinus marmoreus	1	1,00	1	1,00	100,0%	100,0%
Caracola	Charonia lampas	13	4.784,00	13	4.784,00	100,0%	100,0%
Centollo	Maja squinado	4	320,00	3	306,00	75,0%	95,6%
Congrio	Conger conger	10	10.970,00	10	10.970,00	100,0%	100,0%
Erizo de mar común	Paracentrotus lividus	2	125,00	2	125,00	100,0%	100,0%
Erizo violáceo	Sphaerechinus granularis	13	2.331,00	13	2.331,00	100,0%	100,0%
Estrella de mar común	Marthasterias glacialis	676	48.784,00	676	48.784,00	100,0%	100,0%
Estrella espinosa	Echinaster sepositus	4	44,00	4	44,00	100,0%	100,0%
Farro	Centrolabrus exoletus	1	25,00	1	25,00	100,0%	100,0%
Gallano	Labrus mixtus	11	1.008,00	9	812,00	81,8%	80,6%
Holoturia negra	Holothuria forskali	7	557,00	7	557,00	100,0%	100,0%
Holoturia negra sin det	*Holoturia spp*	14	760,00	14	760,00	100,0%	100,0%
Inachus (placas)	Inachus thoracicus	14	68,00	14	68,00	100,0%	100,0%
Julia	Coris julis	8	619,00	5	443,00	62,5%	71,6%
Lota	Gaidropsarus vulgaris	2	329,00	2	329,00	100,0%	100,0%
Nécora	Necora puber	76	5.875,00	76	5.875,00	100,0%	100,0%
Negrita	Spondyliosoma cantharus	1	365,00	0	0,00	0,0%	0,0%
Ofiura	Ophiura ophiura	1	N/A	1	N/A	100,0%	N/A
Ofiura lisa	Ophioderma longicauda	94	1.119,00	94	1.119,00	100,0%	100,0%
Patexo	Polybius henslowii	128	1.394,00	128	1.394,00	100,0%	100,0%
Pulpo	Octopus vulgaris	616	341.748,00	613	340.800,00	99,5%	99,7%
Quisquilla	Palaemon serratus	2	8,00	2	8,00	100,0%	100,0%
Santiaguín	Scyllarus arctus	3	145,00	3	145,00	100,0%	100,0%
Sastre	Galathea strigosa	11	328,00	11	328,00	100,0%	100,0%
Tabernero	Ctenolabrus rupestris	28	531,00	28	531,00	100,0%	100,0%
Total		2.023	440.357	2.002	438.252,00	99,0%	99,5%

Table 7.3.8 Catch composition recorded by observers on board the UoA during the 2019/20 fishing season. Retained (RET) and discarded (DESC) catches in number (N) and in weight (Peso). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández, MP. 2020b

Nombre Comun	Nombre Cientifico	Nº RET	Nº DESC	Nº TOTAL	PESO RET	PESO DESC	PESO TOTAL	%N	% PESO
Alitán	*Scyliorhinus stellaris*	0	4	4	0	1516	1516	0,20%	0,24%
Anémona	*Anemonia sulcata*	0	1	1	0	129	129	0,05%	0,02%
Atelecyclus	*Atelecyclus undecimdentatus*	0	4	4	0	77	77	0,20%	0,01%
Atelecyclus pequeño	*Atelecyclus rotundatus*	0	1	1	0	25	25	0,05%	0,00%
Bertorella	*Gaidropsarus mediterraneus*	0	9	9	0	668	668	0,45%	0,11%
Blenio	*Parablennius pilicornis*	0	21	21	0	284	284	1,04%	0,05%
Blenio portugués	*Parablennius ruber*	0	2	2	0	52	52	0,10%	0,01%
Bogavante	*Homarus gammarus*	0	1	1	0	190	190	0,05%	0,03%
Buey de mar	*Cancer pagurus*	0	6	6	0	1070	1070	0,30%	0,17%
Cabrilla	*Serranus cabrilla*	0	159	159	0	9857	9857	7,89%	1,59%
Cabruza	*Parablennius gattorugine*	0	43	43	0	1927	1927	2,14%	0,31%
Cangrejo de arena	*Liocarcinus marmoreus*	0	1	1	0	2	2	0,05%	0,00%
Cangrejo de arena	*Liocarcinus vernalis*	0	1	1	0	13	13	0,05%	0,00%
Capellán	*Trisopterus minutus*	0	1	1	0	52	52	0,05%	0,01%
Caracola	*Charonia lampas*	0	3	3	0	1075	1075	0,15%	0,17%
Centollo	*Maja squinado*	0	1	1	0	90	90	0,05%	0,01%
Chínfanu (sin determinar)	*Sygnathus sp*	0	1	1	0	1	1	0,05%	0,00%
Congrio	*Conger conger*	0	16	16	0	13341	13341	0,79%	2,15%
Erizo de corazón púrpura	*Spatangus purpureus*	0	1	1	0	6	6	0,05%	0,00%
Erizo de mar común	*Paracentrotus lividus*	0	1	1	0	48	48	0,05%	0,01%
Erizo violáceo	*Sphaerechinus granularis*	0	7	7	0	1034	1034	0,35%	0,17%
Estrella de mar común	*Marthasterias glacialis*	0	445	445	0	32674	32674	22,10%	5,27%
Estrella de siete brazos	*Luidia ciliaris*	0	7	7	0	740	740	0,35%	0,12%
Estrella espinosa	*Echinaster sepositus*	0	3	3	0	74	74	0,15%	0,01%
Farro	*Centrolabrus exoletus*	0	1	1	0	21	21	0,05%	0,00%
Gallano	*Labrus mixtus*	0	7	7	0	894	894	0,35%	0,14%
Gobio	*Gobius cobitis*	0	1	1	0	14	14	0,05%	0,00%
Holoturia negra	*Holothuria forskali*	0	9	9	0	559	559	0,45%	0,09%
Holoturia negra sin determinar	*Holoturia spp*	0	1	1	0	58	58	0,05%	0,01%
Holoturia tubulosa	*Holothuria tubulosa*	0	6	6	0	591	591	0,30%	0,10%
Inachus	*Inachus sp*	0	2	2	0	4	4	0,10%	0,00%
Inachus (placas)	*Inachus thoracicus*	0	32	32	0	171	171	1,59%	0,03%
Julia	*Coris julis*	0	10	10	0	814	814	0,50%	0,13%
Lota	*Gaidropsarus vulgaris*	0	7	7	0	1562	1562	0,35%	0,25%
Morena del Mediterráneo	*Muraena helena*	0	1	1	0	2244	2244	0,05%	0,36%
Nécora	*Necora puber*	189	123	312	29465	10733	40198	15,49%	6,49%
Ofiura lisa	*Ophioderma longicauda*	0	58	58	0	622	622	2,88%	0,10%
Patexo	*Polybius henslowii*	0	136	136	0	539	539	6,75%	0,09%
Pintarroja	*Scyliorhinus canicula*	0	1	1	0	282	282	0,05%	0,05%
Pulpo	*Octopus vulgaris*	174	403	577	253350	249624	502974	28,65%	81,18%
Quisquilla	*Palaemon serratus*	0	43	43	0	269	269	2,14%	0,04%
Santiaguín	Scyllarus arctus	22	6	28	1680	235,5	1915,5	1,39%	0,31%
Sastre	*Galathea strigosa*	0	12	12	0	366	366	0,60%	0,06%
Tabernero	*Ctenolabrus rupestris*	0	31	31	0	568	568	1,54%	0,09%
TOTAL		385	1.629	2.014	284.495	335.116	619.611	100,00%	100,00%

Table 7.3.9 Species discarded in sampling on board made during the 2019/2020 fishing season. For each species total number of discarded specimens in number and weight (g) is indicated, as well as the total discards that were alive (vivo) at the time of extracting from the traps (absolute value and %). Note the original table is in Spanish and therefore the decimal separator symbol used is a comma (,) and the 3-digit group separator used is a point (.). Source: Fernández, MP. 2020b.

Nombre Comun	Nombre Cientifico	Nº DESC	PESO DESC	Nº VIVO	PESO VIVO	%VIVO (N)	% VIVO (W)
Alitán	*Scyliorhinus stellaris*	4	1516	4	1516	100%	100%
Anémona	*Anemonia sulcata*	1	129	1	129	100%	100%
Atelecyclus	*Atelecyclus undecimdentatus*	4	77	4	77	100%	100%
Atelecyclus pequeño	*Atelecyclus rotundatus*	1	25	1	25	100%	100%
Bertorella	*Gaidropsarus mediterraneus*	9	668	8	598	89%	90%
Blenio	*Parablennius pilicornis*	21	284	21	284	100%	100%
Blenio portugués	*Parablennius ruber*	2	52	2	52	100%	100%
Bogavante	*Homarus gammarus*	1	190	1	190	100%	100%
Buey de mar	*Cancer pagurus*	6	1070	6	1070	100%	100%
Cabrilla	*Serranus cabrilla*	159	9857	153	9505	96%	96%
Cabruza	*Parablennius gattorugine*	43	1927	43	1927	100%	100%
Cangrejo de arena	*Liocarcinus marmoreus*	1	2	1	2	100%	100%
Cangrejo de arena	*Liocarcinus vernalis*	1	13	1	13	100%	100%
Capellán	*Trisopterus minutus*	1	52	1	52	100%	100%
Caracola	*Charonia lampas*	3	1075	3	1075	100%	100%
Centollo	*Maja squinado*	1	90	1	90	100%	100%
Chínfanu (sin determinar)	*Sygnathus sp*	1	1	1	1	100%	100%
Congrio	*Conger conger*	16	13341	16	13341	100%	100%
Erizo de corazón púrpura	*Spatangus purpureus*	1	6	1	6	100%	100%
Erizo de mar común	*Paracentrotus lividus*	1	48	1	48	100%	100%
Erizo violáceo	*Sphaerechinus granularis*	7	1034	7	1034	100%	100%
Estrella de mar común	*Marthasterias glacialis*	445	32674	444	32523	100%	100%
Estrella de siete brazos	*Luidia ciliaris*	7	740	7	740	100%	100%
Estrella espinosa	*Echinaster sepositus*	3	74	3	74	100%	100%
Farro	*Centrolabrus exoletus*	1	21	1	21	100%	100%
Gallano	*Labrus mixtus*	7	894	7	894	100%	100%
Gobio	*Gobius cobitis*	1	14	1	14	100%	100%
Holoturia negra	*Holothuria forskali*	9	559	9	559	100%	100%
Holoturia negra sin determinar	*Holoturia spp*	1	58	1	58	100%	100%
Holoturia tubulosa	*Holothuria tubulosa*	6	591	6	591	100%	100%
Inachus	*Inachus sp*	2	4	2	4	100%	100%
Inachus (placas)	*Inachus thoracicus*	32	171	32	171	100%	100%
Julia	*Coris julis*	10	814	9	728	90%	89%
Lota	*Gaidropsarus vulgaris*	7	1562	7	1562	100%	100%
Morena del Mediterráneo	*Muraena helena*	1	2244	1	2244	100%	100%
Nécora	*Necora puber*	123	10733	108	9210	88%	86%
Ofiura lisa	*Ophioderma longicauda*	58	622	58	622	100%	100%
Patexo	*Polybius henslowii*	136	539	136	539	100%	100%
Pintarroja	*Scyliorhinus canicula*	1	282	1	282	100%	100%
Pulpo	*Octopus vulgaris*	403	249624	401	249355,2	100%	100%
Quisquilla	*Palaemon serratus*	43	269	43	269	100%	100%
Santiaguín	Scyllarus arctus	6	235,5	6	235,5	100%	100%
Sastre	*Galathea strigosa*	12	366	12	366	100%	100%
Tabernero	*Ctenolabrus rupestris*	31	568	29	542	94%	95%
TOTAL		1.629	335.116	1.601	332.639	98%	99%

7.3.1.1.2 Bait species

During the initial assessment, the team concluded this fishery was using artificial bait only. This information was provided by the fishers interviewed during the site visit. As a result, no bait species were assessed in the initial assessment. This artificial bait is made out of biodegrable materials. The company commercialising this product is Arombait and the characteristics of this bait can be consulted on this website cited herein; http://www.arombait.com/arombait_fish_bait.pdf. The Fernández et al (2016) handed to the team during the first surveillance audit confirmed that artificial bait is widely used by the UoA, in particular in certain ports. However, the report also highlighted that pelagic species are also used as bait. This lead to include 3 bait species (mackerel, horse mackerel and sardine) in the assessment and re-score the relevant PIs (2.1.1, 2.1.2 and 2.1.3).

The observers on board the fishing vessels included in the OFMP recorded the type of bait (or mixture of baits) used in each trap. The results are presented in percentage of type of bait per fishing port and fishing season (see **Figure 7.3.1**, **Figure 7.3.2** and **Figure 7.3.3** for 2014/15, 2016/17 and 2017/18 fishing season respectively), or number of traps per fishing port (**Table 7.3.10** for fishing season 2018/19). Data accumulated throughout these years clearly show that the vessels included in the UoA regularly use different types of bait: artificial bait, chicken, and up to 5 different pelagic species (i.e. mackerel –*Scomber scombrus*-, sardine –*Sardina pilchardus*-, bogue –*Boops boops*-, horse mackerel –*Trachurus trachurus*-, and occasionally also garfish –*Bellone bellone*-). Pelagic bait species are bought in frozen blocks by the fishers.

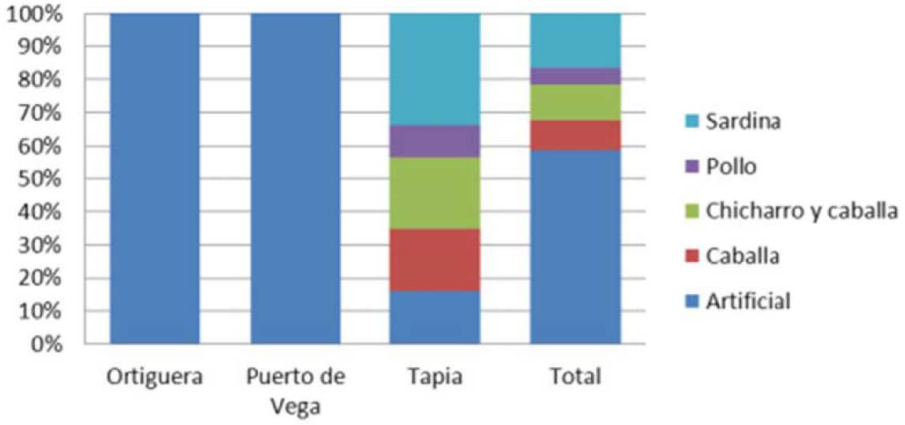


Figure 7.3.1. Percentage of traps using different types of bait in the different ports sampled during the fishing 2014/15 (No information available for Viavélez and the rest of the UoA) (Note on the leyend: Sardina is *Sardina pilchardus*, Chicharro is *Trachurus trachurus*, Caballa is *Scomber scombrus*, and Pollo is chicken). Source: Fernández et al, 2016.

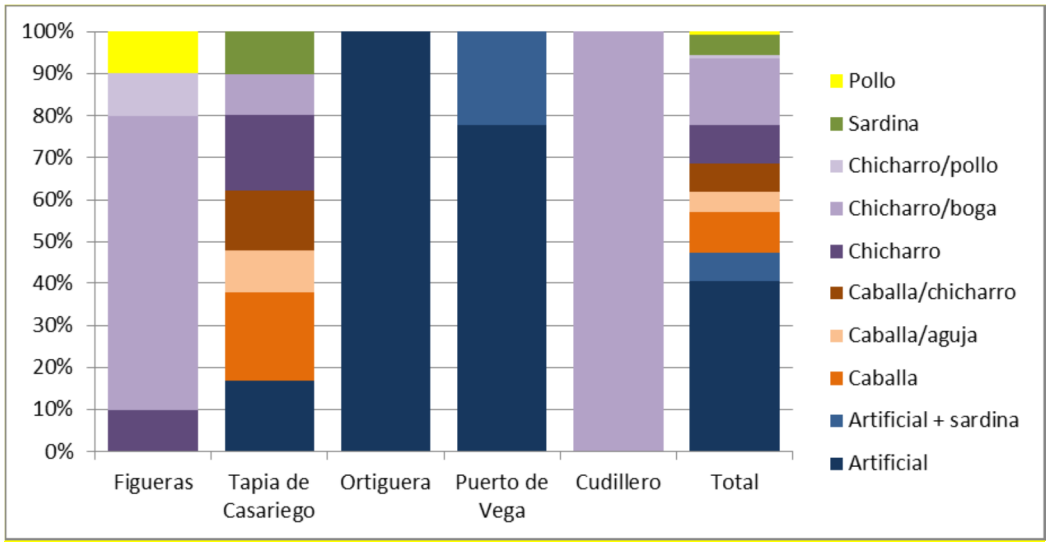


Figure 7.3.2. Percentage of traps using different types of bait in the different ports sampled during 2016/17 fishing season (No information available for Viavélez) (Note on the legend: 'Pollo' is chicken, Sardina is *Sardina pilchardus*, Chicharro is *Trachurus trachurus*, Caballa is *Scomber scombrus*, Boga is *Boops boops*, Aguja is *Bellone bellone*). Source: Fernández 2018b.

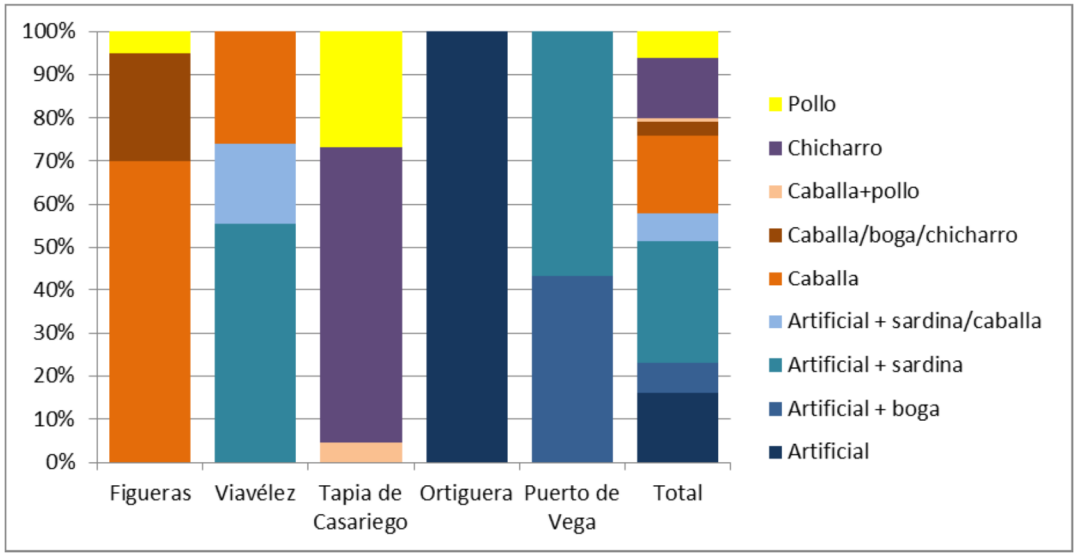


Figure 7.3.3. Percentage of traps using different types of bait in the different ports sampled during 2017/18 fishing season (Note on the legend: 'Pollo' is chicken, Sardina is *Sardina pilchardus*, Chicharro is *Trachurus trachurus*, Caballa is *Scomber scombrus*, Boga is *Boops boops*). Source: Fernández 2018b.

2019/2020		
Puerto	Nº de nasas	Cebo
Figueras	125	Pollo
Tapia de Casariego	371	Pollo
Tapia de Casariego	120	Sardina
Tapia de Casariego	502	Pollo y sardina
Tapia de Casariego	499	Boga
Viavélez	284	Pollo, sardina y artificial
Viavélez	495	Boga y artificial
Viavélez	250	Pollo y caballa
Ortiguera	184	Sardina y artificial
Puerto de Vega	570	Sardina y Artificial

Table 7.3.10. N of observed traps (Nº de nasas) and bait type used during the 2019/20 fishing season. season (Note on the legend: 'Pollo' is chicken, Sardina is *Sardina pilchardus*, Caballa is *Scomber scombrus*, Boga is *Boops boops*). Source: Fernández, MP. 2020b

Results show that, apart from Ortigueira (where all sampled vessels used solely artificial bait), pelagic species and chicken are used in different proportions. There is no consistent pattern in relation to bait type for any of the other ports, and it looks like the decision on the type of bait to be used is mainly opportunistic. However, it seems that artificial bait is widely used in Puerto de Vega, Viavelez and Luarfca (although Luarca samplings in Luarca are restricted to the latest fishing season, 2018/19), while fishers from Tapia de Casariego do not use artificial bait. According to the available data, the use of chicken as bait is restricted to Tapia de Casariego and Figueras.

However, data collected by observers do not provide the volumes of bait used. In order to fulfil this gap, during the first surveillance audit, the client provided to the assessment team an estimation of the quantities of bait used in the traps by the UoA. According to estimations provided by the client, the volume of bait used in the whole UoA is reduced when compared to octopus catches; roughly 1,300 kg of mackerel, 600 kg of sardine and 150 kg of Atlantic horse mackerel that represents 1.5%, 0.7% and 0.2% respectively, of the total catch of octopus in the UoA for the fishing season 2016-17 (87.8 t as reported by the CEP in Fernández 2017[1]). Based on these percentages the assessment team decided to consider these three pelagic species as minor primary species. Even the total volume of bait purchased for that fishing season (2 050kg) accounts for 2.34% of the total UoA catches. Therefore, despite the variations in bait species compostion between ports and years, the team assumes that no single bait species will accounts for ≥5% of the total UoA catches, and therefore they will be assigned as Minor subcomponents of the Primary (sardine, mackerel and horse

mackerel) and secondary (bogue and garfish). However, a recommendation was set to to improve the estimations of volumes as well as origin (stock/s) of bait species used in the UoA. No progress was made on this issue during the first certification cycle and no more information has been collected., but this is clearly a weakness to be solved in the future.

7.3.1.1.3 P2 species scoring elements

In summary, data collected by observers on board shows that the UoA's catch composition comprises up to 54 different species and 2 genera (latest data 44), apart from the target species (octopus). Further, the UoA purchases up to 5 different pelagic species to be used as bait: mackerel (*Scomber scombrus*), sardine (*Sardina pilchardus*), bogue (*Boops boops*), horse mackerel (*Trachurus trachurus*), and more occasionally garfish (*Bellone bellone*). Thus, a total of 61 P2 species scoring elements were identified by team. **Table 7.3.11** lists all P2 species impacted by the UoA was assigned to a particular P2-species component (primary/secondary/ETP) and subcomponent (main/minor). More details in section below.

For habitats and ecosystem scoring elements please see **Section 7.3.1.5**.

Table 7.3.11. P2-species scoring elements. List of all P2 species impacted by the UoA and (based on data collected by the on-board observer program from 2014-15 to 2018-19 fishing seasons) assigned to MSC P2-components and subcomponents in accordance with FCP SA3.1.3-3.1.5, SA3.4.2.-3.4.5, SA3.7.1. Data deficient column was assessed against FCR7.7.6 in order to determine whether the fishery may be data-deficient with respect to each species and if the use of RBF methods would therefore be necessary. Common name in Spanish was copied from the CEP reports, while English common names were retrieved from: http://www.marinespecies.org/index.php

#	Scoring elements			Component	Subcomponent	Data-deficient
Invertebrates						
1	*Charonia lampas*	Pink lady/Knobbed triton	Caracola	ETP	NA	NO
2	*Marthasterias glacialis*	Spiny starfish	Estrella de mar	Secondary	Minor	YES
3	*Asterina gibbosa*	Starlet	Estrella de capitán	Secondary	Minor	Minor
4	*Echinaster sepositus*	Red starfish	Estrella Espinosa	Secondary	Minor	YES
5	*Ophioderma longicaudum*	Smooth brittle-star	Ofiura lisa	Secondary	Minor	YES
6	*Ophiocomina nigra*	Black brittle star	Ofiura negra	Secondary	Minor	YES
7	*Ophiura ophiura*	Serpent star	Ofiura	Secondary	Minor	YES
8	*Polybius henslowii*	Henslow's swimming crab	Patexo	Secondary	Minor	YES
9	*Liocarcinus corrugatus*	Wrinkled swimming crab	Cangrejo de arrugas	Secondary	Minor	YES
10	*Liocarcinus marmoreus*	Marbled swimming crab	Cangrejo de arena	Secondary	Minor	YES
11	*Necora puber*	Velvet swimming crab	Nécora	Secondary	Minor	YES
12	*Bathynectes longipes*	(crab)-	(cangrejo)-	Secondary	Minor	YES
13	*Xaiva biguttata*	(crab)-	(cangrejo)-	Secondary	Minor	YES
14	*Atelecyclus undecimdentatus*	(crab)-	(cangrejo)-	Secondary	Minor	YES
15	*Atelecyclus rotundatus*	Old-man's face crab	(cangrejo)-	Secondary	Minor	YES
16	*Cancer pagurus*	Edible crab	Buey de mar	Secondary	Minor	YES
17	*Maja squinado*	Thorn-back spider crab	Centollo	Secondary	Minor	YES
18	*Pisa armata*	Gibb's spider crab	-	Secondary	Minor	YES
19	*Pisa tetraodon*	Four-horned spider crab		Secondary	Minor	YES
20	*Galathea strigosa*	Spinous squad lobster	Sastre	Secondary	Minor	YES
21	*Inachus spp.*	(spider)-	(araña de mar)-	Secondary	Minor	YES
22	*Inachus leptochirus*	(spider)-	(araña de mar)-	Secondary	Minor	YES

23	*Inachus phalangium*	(spider)-	(araña de mar)-	Secondary	Minor	YES
24	*Inachus thoracicus*	(spider)	(araña de mar)-	Secondary	Minor	YES
25	*Homarus gammarus*	European clawed lobster	Bogavante	Secondary	Minor	YES
26	*Scyllarus arctus*	Slippery lobster	Santiaguin	Secondary	Minor	YES
27	*Palaemon serratus*	Common prawn	Camarón, quisquilla	Secondary	Minor	YES
28	*Holothuria (Panningothruia) forskali*	Black sea cucumber	Holoturia negra	Secondary	Minor	YES
29	*Sphaerechinus granularis*	Violet sea urchin	Erizo violáceo	Secondary	Minor	YES
30	*Paracentrotus lividus*	Sea urchin	Erizo de mar	Secondary	Minor	YES
Teleosts						
31	*Serranus cabrilla*	Comber	Cabrilla	Secondary	Minor	YES
32	*Conger conger*	Conger	Congrio	Secondary	Minor	YES
33	*Coris julis*	Rainbow wrasse	Julia	Secondary	Minor	YES
34	*Labrus mixtus*	Cucko wrasse	Gallano	Secondary	Minor	YES
35	*Labrus bergylta*	Wrasse	Maragota	Secondary	Minor	YES
36	*Symphodus melops*	Corwing wrasse	Porredana	Secondary	Minor	YES
37	*Centrolabrus exoletus*	Small-mouthed wrasse	Farro	Secondary	Minor	YES
38	*Ctenolabrus rupestris*	Goldsinny	Tabernero	Secondary	Minor	YES
39	*Gaidropsarus mediterraneus*	Shore rockling	Bertorella	Secondary	Minor	YES
40	*Gaidropsarus vulgaris*	Rockling	Lota	Secondary	Minor	YES
41	*Parablennius gattorugine*	Tompot blenny	Blenio	Secondary	Minor	YES
42	*Parablennius pilicornis*	Blenny	Blenio	Secondary	Minor	YES
43	*Parablennius spp*	Blenny	Cabruza	Secondary	Minor	YES
44	*Gobius cobitis*	Giant goby	Gobio gigante	Secondary	Minor	YES
45	*Gobius paganelus*	Rock goby	Bobi	Secondary	Minor	YES
46	*Scopaena spp*	Scorpionfish	Cabracho	Secondary	Minor	YES
47	*Scorpaena porcus*	Black scorpionfish	Rascacio	Secondary	Minor	YES
48	*Trisopterus minutus*	Poor cod	Capellán	Secondary	Minor	YES
49	*Trisopterus luscus*	Whiting pout	Faneca	Secondary	Minor	YES
50	*Raniceps raninus*	Tadpole fish	Pez rana	Secondary	Minor	YES
51	*Pagrus pagrus*	Red progy	Pargo	Secondary	Minor	YES
52	*Diplodus sargus*	White seabream	Sargo común	Secondary	Minor	YES
53	*Spondyliosoma cantharus*	Black seabream	Negrita	Secondary	Minor	YES
54	*Entelurus aequorus*	Snake pipefish	Fusta	Secondary	Minor	YES
Bait species						
55	*Sardina pilchardus*	Sardine	Sardina	Primary	Minor	NO
56	*Scomber scombrus*	Mackerel	Caballa	Primary	Minor	NO
57	*Trachurus trachurus*	Horse mackerel	Chicharro	Primary	Minor	NO
58	*Boops boops*	Bogue	Boga	Secondary	Minor	YES
59	*Bellone bellone*	Garfish	Aguja	Secondary	Minor	YES

Sharks						
60	*Scyliorhinus canicula*	Lesser spotted dogfish	Pintarroja	Secondary	Minor	YES
61	*Scyliorhynus stellaris*	Nursehound /greater spotted-dogfish	Alitán	Secondary	Minor	YES

7.3.1.2 Primary species

Primary species are defined as those species in the catch within the scope of the MSC program but are not covered under P1 because they are not included in the UoA, and that are managed with tools and measures intended to achieve stock management objectives reflected in either limit or target reference points (SA 3.1.3).

7.3.1.2.1 Primary species caught by the UoA

None of the species listed in **tables 7.3.1, 7.3.2, 7.3.6 and 7.3.8** and caught by the UoA are managed to achieve objectives reflected in either limit or target reference points. Therefore, based on the UoA catch composition there is no impact on Primary species.

7.3.1.2.2 Primary bait species

The vessels targeting octopus with traps are not allowed or even prepared to catch pelagic species, so they buy the bait species instead. However, the team shall consider in the assessment species used as bait in the UoA, whether they were caught by the UoA or purchased from elsewhere (SA3.1.7).

Out of the 5 different species used as bait by fishers, according to data recorded by the observers, only 3 of them can be assigned as 'Primary': sardine, mackerel and horse mackerel, since they are management tools and measures in place, intended to achieve stock management objectives reflected in either limit or target reference points, according to ICES advice. Therefore, the three species are considered as Primary species for P2 purposes in this assessment.

The small quantities of bait used in the UoA (around 1,300 kg of mackerel, 600 kg of sardine and 150 kg of horse mackerel), according to the client information, only represents 1.5%, 0.7% and 0.2% of the total catch of octopus of the UoA for the fishing season 2016-17 (nearly 88 t). Based on these percentages the assessment team decided to consider these three pelagic species as minor primary species, while no main primary species has been identified in this fishery.

Horse mackerel (*Trachurus trachurus*) in the Northeast Atlantic (Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k) is caught by many different European countries and fishing gears. According to ICES 2019a), total estimated catches in 2018 amounted up to 101 682t. Pelagic trawl accounts for most of the catches (at least 40% and probably much more reported as unspecific gear), followed by purse seine (20%), otter trawls (3%) and other unspecific gears. The discarded fraction was estimated as less than 3% of the total catches. Total landings amounted to 99 072 tonnes. The stock and the fishery are very dependent on occasional high recruitments.

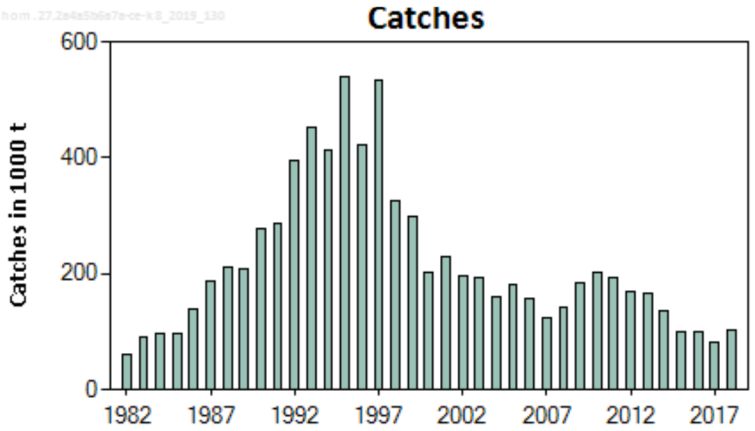


Figure 7.3.4. Historical catches (kt) for Horse mackerel in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k. Source: ICES 2019a

ICES is not aware of any precautionary management plan for horse mackerel in this area, and its advice is based on MSY approach. According to the latest advice (ICES 2019a), catches in 2020 should be no more than 83 954 tonnes. Catch advice for 2020 is 42% lower than that for 2019d.

ICES assesses that fishing pressure on the stock is above FMSY, between Fpa and Flim; spawning stock size is below MSY Btrigger, between Bpa and Blim (see **Table 7.3.9**). The stock is just above its historical low and this year's advice is for a decrease in catches compared to last year. The main reasons are the downward revision of the biomass estimates and the update of reference points in the recent inter-benchmark (ICES, 2019a). Given the recent above-average recruitments, the stock is predicted to increase in 2020.

For more details on current stock status see scoring table PI 1.1.1(b).

Table 7.3.12. Horse mackerel in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k. State of the stock and fishery relative to reference points. Source: ICES, 2019a.

	Fishing pressure					Stock size				
		2016	2017	2018			2017	2018	2019	
Maximum sustainable yield	F_{MSY}	⊗	⊗	⊗	Above	MSY $B_{trigger}$	⊗	⊗	⊗	Below trigger
Precautionary approach	F_{pa},F_{lim}	o	o	o	Increased risk	B_{pa},B_{lim}	⊗	⊗	o	Increased risk
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	–	–	–	Not applicable

Mackerel (*Scomber scombrus*) Subareas 1-7 and 14, and Division 9a (Northeast Atlantic and adjacent areas) is considered by ICES as single stock which its distribution area has been expanded in the first decade of current century both south and north. ICES estimates that total catches in 2018 amounted to 1 026 437t (ICES 2019b), involving all Atlantic coast EU Countries. Pelagic trawl accounting the majority of the catches (83%), followed by purse-seine (17%). The discarded fraction estimated by ICES account accounts for just 0.3% of total landings, but it is recognized that it could quantified only in part of the fisheries.

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 922 064 tonnes (see **figure 7.3.5** for the historical trend of catches).

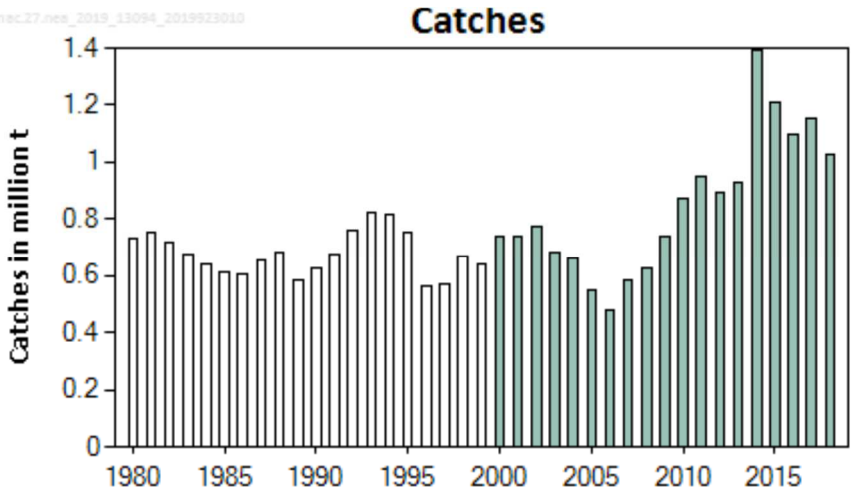


Figure 7.3.5. Historical catches (kt) for mackerel in Subareas 1-8 and 14. The unshaded catches prior to 2000 are the ones that have been down-weighted in the assessment because of the considerable underreporting suspected to have taken place in this period. Source: ICES 2019b

ICES evaluated a management strategy for mackerel in 2017 (ICES 2019b). Since the interbenchmark in 2019, the fishing mortality reference points have been changed and FMSY is now estimated to be higher than the target F in the management strategy (FMSY = 0.23; FMGT = 0.21) (ICES 2019b). ICES has been requested by EU, Norway, and Faroe Islands to advise on the long-term management strategy for mackerel.

ICES assesses that fishing pressure on the stock is above FMSY and below Fpa and Flim; the spawning-stock size is above MSY Btrigger, Bpa, and Blim (see **Table 7.3.10**). For more details on current stock status see scoring table PI 1.1.1(b).

Table 7.3.13. Mackerel in subareas 1–8 and 14, and in Division 9.a. State of the stock and fishery relative to reference points. Source: ICES, 2019b.

		Fishing pressure					Stock size			
		2016	2017	2018			2017	2018	2019	
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above	MSY $B_{trigger}$	✓	✓	✓	Above trigger
Precautionary approach	F_{pa},F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa},B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	–	–	–	Not applicable

In the case of the **sardine (*Sardina pilchardus*)**, because of the geograpchical proximity, there are two candidate stocks to be purchased by the UoA as bait:

Sardine (*Sardina pilchardus*) in divisions 8.a–b and 8.d (Bay of Biscay) is caught by up to 8 different EU countries (Spain, Portugal, France, Netherlands, Ireland, Belgium, Denmark, Lithuania) and the UK. ICES estimated that total catches in 2018 amounted up to 32299 t, mainly caught with purse seiners (75%) and followed by pelagic trawl (25%). Discards are considered negligible.

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 34 905 tonnes (ICES 2019c) (see **figure 7.3.5** for the historical trend of catches).

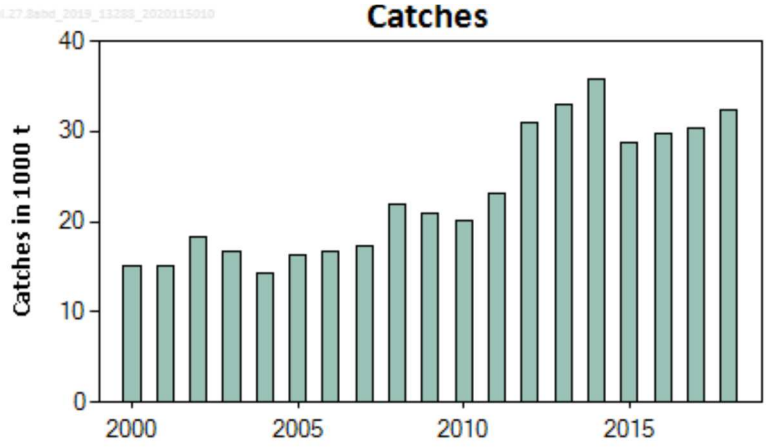


Figure 7.3.6. Historical catches (kt) for mackerel in Subareas 1-8 and 14. Sardine in divisions 8.a–b and 8.d. Source: 2019c

Prior to 2017, sardine in this area was assessed as a single stock combining Subarea 7 (English Channel and Celtic Sea) and divisions 8.a–b and 8.d (Bay of Biscay). The change in advice is due to the revised assessment methodology adopted in the 2019 interbenchmark, and the associated biological reference points. Reference points have been updated in 2019.

ICES assesses that fishing pressure on the stock is above FMSY and below Fpa and Flim; spawning-stock size is above MSY Btrigger, Bpa, and Blim. (see **Table 7.3.11**). For more details on current stock status see scoring table PI 1.1.1(b).

Table 7.3.14. Sardine in divisions 8.a–b and 8.d. State of the stock and fishery relative to reference points. Source: ICES. 2019c.

		Fishing pressure					Stock size			
		2016	2017	2018			2017	2018	2019	
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above	MSY $B_{trigger}$	✓	✓	✓	Above trigger
Precautionary approach	F_{pa},F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa},B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	–	–	–	Not applicable

Sardine (*Sardina pilchardus*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters) is caught by Portugal and Spain. Total catches in 2018 were estimated to amount to 15062 tonnes, 99% caught using purse seine, and the remaining 1% caught with other (unspecified) fishing gears ICES 2019d). Discarding and bycatch are considered negligible and not included in the assessment.

ICES advises that when the MSY approach is applied, catches in 2020 should be no more than 4142 tonnes (see **figure 7.3.6** for the historical trend of catches)..

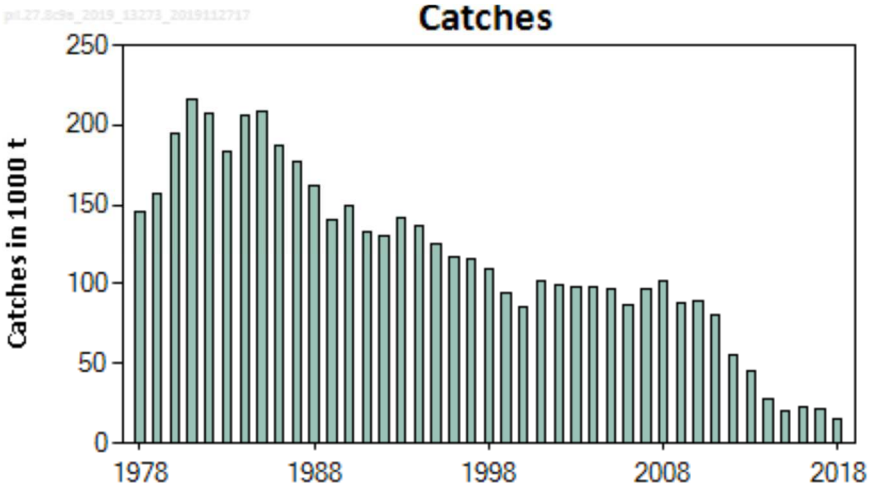


Figure 7.3.6. Historical catches (kt) for mackerel in Subareas 1-8 and 14. Sardine in divisions 8.c and 9.a. Source: ICES, 2019d.

According to ICES 2019d and references cited therein, the sardine management plan of 2013 was re-evaluated in 2017 and found not to be precautionary. New harvest control rules have been evaluated by ICES. ICES latest assessment (ICES 2019d) indicates that fishing pressure on the stock is above FMSY, below Fpa, and below Flim. Biomass 1+ is below MSY Btrigger, Bpa, and Blim Blim (see **Table 7.3.12**). For more details on current stock status see scoring table PI 1.1.1(b).

Table 7.3.15 Sardine (Sardina pilchardus) in divisions 8.c and 9.a. State of the stock and fishery relative to reference points. Source: ICES, 2019d.

	Fishing pressure					Stock size				
		2016	2017	2018			2017	2018	2019	
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above	MSY $B_{trigger}$	✗	✗	✗	Below trigger
Precautionary approach	F_{pa},F_{lim}	✗	○	✓	Harvested sustainably	B_{pa},B_{lim}	✗	✗	✗	Reduced reproductive capacity
Management plan	F_{MGT}	–	–	–	Not applicable	B_{MGT}	–	–	–	Not applicable

7.3.1.3 Secondary species

Secondary species are defined as those species catch within the scope of MSC program but are not covered under P1 because they are not included in the UoA, and that cannot be considered neither primary nor ETP.

7.3.1.3.1 Secondary species caught by the UoA

With the only exception of the pink lady (*Charonia lampas*), which is an ETP species, all the other species and genera caught by the UoA (29 invertebrates, 23 teleosts and 2 sharks, see **tables 7.3.1, 7.3.2, 7.3.6 and 7.3.8)** are considered as Secondary species for P2 purposes in this assessment.

Apart from the spiny starfish (which normally accounts for 4% of total catch in weigh but occasionally might rise up to almost 6.5%). Considering the catch composition over the last 5 years (from 2015 to 2020), none of the remaining species and genera caught by the UoA account for 2% of the total UoA catch in weight. Actually, only the comber (*Serranus cabrilla*), conger (*Conger conger*), velvet swimming crab (*Necora puber*) and the Henslow's swimming crab (*Polybius henslowii*) may account more than 1% of the catch in weight,

and only in certain years. Indeed, the velvet swimming crab resulted in a 6.49% of the total weight in the last fishing season (2019-2020). All the remaining species are consistently below 1%. Further, in the case of the spiny starfish (*Marthasterias glacialis*) observers on board the UoA reported that all individuals are returned to the sea alive (see **table 7.3.4, 7.3.5, 7.3.7 and 7.3.9**). This species (as most of starfish) are well known for its resilience, they can easily survive to mutilations and due to their size and the hardness of their skin they are not in danger of being preyed while sinking in the water column after being released from the trap. Therefore, in accordance with SA3.4.3 this species shall not contribute to the definition of 'main', and it will also be assigned to the 'minor' subcomponent of secondary species, the same as for all the other secondary scoring elements identified.

There are no biologically based limits available, derived either from analytical stock assessment or using empirical approaches, for any of these secondary species and genera. Thus, these secondary scoring elements are considered as Data Deficient and the team should use Annex PF (RBF) for the assessment of data-deficient PI 2.2.1 (SA 7.7.3). However, the team elected to skip conducting a PSA when evaluating PI 2.2.1 for minor species, in accordance with PF4.1.4, and adjust downward the final PI score in accordance with clause PF5.3.2.

7.3.1.3.2 Secondary bait species

Among the 5 different bait species purchased by the UoA, only bogue (*Boops boops*) and garfish (*Bellone bellone*) are secondary species since they are not managed based on biological reference points.

Based on the estimation provided by the client on the total volume of bait species purchased by the UoA during the 2016/17 fishing season (2 500kg), the team considers that all bait species are 'minor', since that volume only accounts for only 2.34% of the total octopus landings of the UoA during that fishing season (87.8t as reported by CEP in Fernández, 2017). The team considers that this is approach is precautionary despite the existing differences in bait species composition purchased between ports and years (see **Figures 7.3.1-3 and Table 7.3.10 in section 7.3.3.1.2**).

As it was the case of the secondary species caught by the UoA, there are no biologically based limits available (derived either from analytical stock assessment or using empirical approaches) for any of these two secondary bait species. Thus, these secondary scoring elements are also considered as Data Deficient and the team should use Annex PF (RBF) for the assessment of data-deficient PI 2.2.1 (SA 7.7.3). However, the team elected to skip conducting a PSA when evaluating PI 2.2.1 for minor species, in accordance with PF4.1.4, and adjust downward the final PI score in accordance with clause PF5.3.2.

7.3.1.4 ETP species

MSC defines Endangered, Threatened or Protected species (ETP) as those species incidentally caught by the UoA that are (SA3.1.5):

i. *Recognised by the national ETP legislation (the EU, Spanish and Asturian legislations in this case)*
ii. *Species listed in the following binding international agreements given: (a) Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered; (b) Binding agreements concluded under the Convention on Migratory Species (CMS*
iii. *Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).*

Among the 61 different scoring elements identified by the team to be assessed as P2-species components (**table 7.3.11**), there is only one that fits the ETP definition, and that scoring element is the pink lady (*Charonia lampas*). This species is classified as being of special interest in an uncertain situation at the autonomous level, vulnerable at the State level, and included in the Bern Convention (Annex II) at the international level (Anadón-Álvarez et al., 2007). At national level, the Real Decreto 139-2011 lists this species in both the List of Wildlife Species under Special Protection (LESRPE) and the Spanish Catalogue of Endangered Species (CEEA). *Charonia lampas* is classified as Vulnerable both on the LESRPE and also on the CEEA (there are only two categories: 1- in danger of extinction; and 2- vulnerable). In accordance with Article 54 of Ley 42/2007, this means that it is forbidden to catch, kill, harm, possess or sell this species. In addition, a conservation plan must be adopted within five years (but a recovery plan is not required, being compulsory only for species in danger of extinction).

This species is found in temperate seas throughout the world. Various subspecies exist, including *C. lampas*, which is the one found in the waters where the fishery operates. This subspecies is present throughout the

Western Mediterranean and the Eastern Atlantic. In the Cantabrian Sea and the Atlantic Ocean, it is relatively scarce and dispersed. Its populations could have declined, but its trend has not been studied and no data is available, given that it is a non-target species.

According to Anadón-Álvarez et al. (2007), in Asturias this species can be regurlarly found among the discarded species caught by trawlers, and it usually appears in all ports. There are practically no published citations, although it is known that this species is caught by trawlers based in Gijón, Avilés, Cudillero, Oviñana, etc. It is probably distributed throughout the Asturian coast.

At the time of the initial assessment there was no data on the impact of the fishery on this species and PI 2.3.1 was assessed using RBF. However, as a result of the monitoring implemented by the CEP, observers on board the UoA have been recording incidental catches during the observed fishing trips in 4 different fishing seasons between 2014 and 2020 (see **tables 7.3.1, 7.3.2, 7.3.3, 7.3.6 and 7.3.8**). The number of individuals caught by vessel and fishing trip varies from 0.13 in 20117/18 to 0.93 in 2018/19 and 0.21 in 2019/2020 while the average of all the observations made up to date is 0.41 individuals of *C. lampas* caught by vessel and fishing trip (**Table 7.3.16)**. Taking into account the N of vessels targeting octopus during each fishing season, and the average fishing days per vessel and fishing season, it can be inferred that an average of 632.83 individuals of pink lady were caught and released back to the sea every year during the observed period, ranging between a minimum of 444 individuals in 2014/15 and a maximum of 1 595.4 individuals in 2017/18. The average individual weight of the *C. lampas* caught is 365.72 g/ind (**table 7.3.17**).

Table 7.3.16. Number of observed trips and number of individuals of *C. lampas* caught by vessel and observed fishing trip. Data elaborated by the team based on observers data presented in previous tables in this section, and annual report on the octopus fishery elaborated by the CEP (Fernández 2015a, Fernández 2017, Fernández 2018 and Fernández 2019b, Fernández 2019c, Fernández, MP. 2020b)

	2014/15	2016/17	2017/18	2018/19	2019/20	AVERAGE
N observed trips	20	16	16	14	14	16
N ind *C. lampasvessel/fishing trip**	0.25	0.44	0.13	0.93	0.21	0.39
N vessels targeting OCT	48	40	44	47	43	44.75
Average N fishing days/vessel	37	37	37	36.5	29	35.3
Total *C. lampas* caught per year	**444**	**651.2**	**211.64**	**1 595.42**	**261.87**	**632.83**

Table 7.3.17. Number of individuals and total weight of *C. lampas* recorded by the observers. Data elaborated by the team based on observers data presented in previous tables in this section

	N ind	Weight (g)	g/ind
2014/15	5	1515	303.0
2016/17	7	3747	535.3
2017/18	2	528	264.0
2018/19	13	4 784	368.0
2019/20	3	1 075	358.3
TOTAL	***27***	***11 649***	***365.72***

As shown in **Table 7.3.4, Table 7.3.5, Table 7.3.7 and Table 7.3.9** all individuals of *C. lampas* caught were returned to the sea, and 100% of them were alive at the time of being released. Althoug there is no in depth studies on thee post-capture mortality for this species, it is supposed to be a highly resilient species. In 2014, the CEP performed an experiment the test the post-capture survival rate of this species, since they found that in the set net fishery (miños), *C. lampas* accounted for up to 1,53% of the total catches in weight. They took 13 individuals caught during the observed fishing trip and kept them in the lab during 15 days. After that period of time all the individuals still alive and in good conditions and were released back to the sea (Fernández 2015b[2]).

Taking into account the information presented above, the team considers that the impact of the assessed fishery on the *C. lampas* can be analytically determined, so the default Performance Indicator Scoring Guideposts within default assessment tree will be used to score PI 2.3.1.

[2].

There are no records of interactions between the octopus trap fishery and out-of-scope species (seabirds, marine mammals and sea turtles).

7.3.1.5 Marine habitats and ecosystems

7.3.1.5.1 Habitats where the octopus trap fishery operates

In 2011, as part of an European project called 'Prespo', the CEP mapped all fishing grounds in the Asturian waters (it can be retrieved here: https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf). This map includes all fishing grounds within the waters off the Principality of Asturias, from the coastline to a distance of 46 nautical miles, covering all waters situated between 43º 23' and 44º 15' and 7º 33' West. The fishing ground were mapped and described (depth, seabottom, target species, fishing gears used) based on information gathered by the CEP through interviews performed to the fishers, a total of 226 fishing grounds covering an area of 984 938 Ha were identified. **Figure 7.3.7** shows the fishing grounds identified in the Western Asturian waters (the geographical scope of the OFMP), and highlights in red those where octopus is targeted with traps.

All the different seabottom types identified in the Asturian fishing grounds are listed below:

- **Rock**: compact rocky substrate
- **Petón**: a rocky zone that rises from the bottom but never emerges above the sea surface
- **Cascajo**: substrate formed by boulders of variable size
- **Sand**: substrate formed of sands of variable size
- **Mud**: muddy bottoms
- **Embarre**: flotsam (sunken boat hull)
- **Coral**: substrate mainly covered by hard coral communities
- **Rateado**: heterogeneous bottom in which sandy areas coexist, ridges and rocky bottoms.

Table 7.3.11 details the different bottom types found in the fishing grounds where octopus is targeted with traps.

MSC determines that the team shall determine and justify which habitats are commonly encountered, vulnerable marine ecosystems (VMEs), and minor (i.e. all other habitats) (SA3.1.3.3). A commonly encountered habitat shall be defined as a habitat that regularly comes into contact with a gear used by the UoA, considering the spatial (geographical) overlap of fishing effort with the habitat's range within the management area covered by the governance body relevant to the UoA.

Information presented in table 7.3.11 makes clear that compact rocky substrates (rock and 'petón') are the commonly encountered habitats for the octopus trap fishery in the Western Asturias waters, while 'cascajo', sand, mud and 'embarre' are the minor habitats. No corals or any other VME has been identified to occur in the are where the fishery takes place.

This is consistent with the fact that octopus habitats are usually rocky seabeds. The highly mimetic behaviour of this species enables it to protect itself from enemies, going as far as camouflaging itself against the rocks surrounding it. However, the preference of the common octopus on rocky habitats does not prevent them to adapt to other sedimentary bottoms, such as sand, maerl, etc. (Guerra A., Hernández-Urcera J., Garci M.E., Sestelo M., Regueira M., González A.F., Cabanellas-Reboredo M., Calvo-Manazza M., Morales-Nin B. 2014. Dwellers in dens on sandy bottoms: Ecological and behavioural traits of *Octopus vulgaris*. Sci. Mar. 78(3): 405-414. doi: http://dx.doi.org/10.3989/scimar.04071.28F)

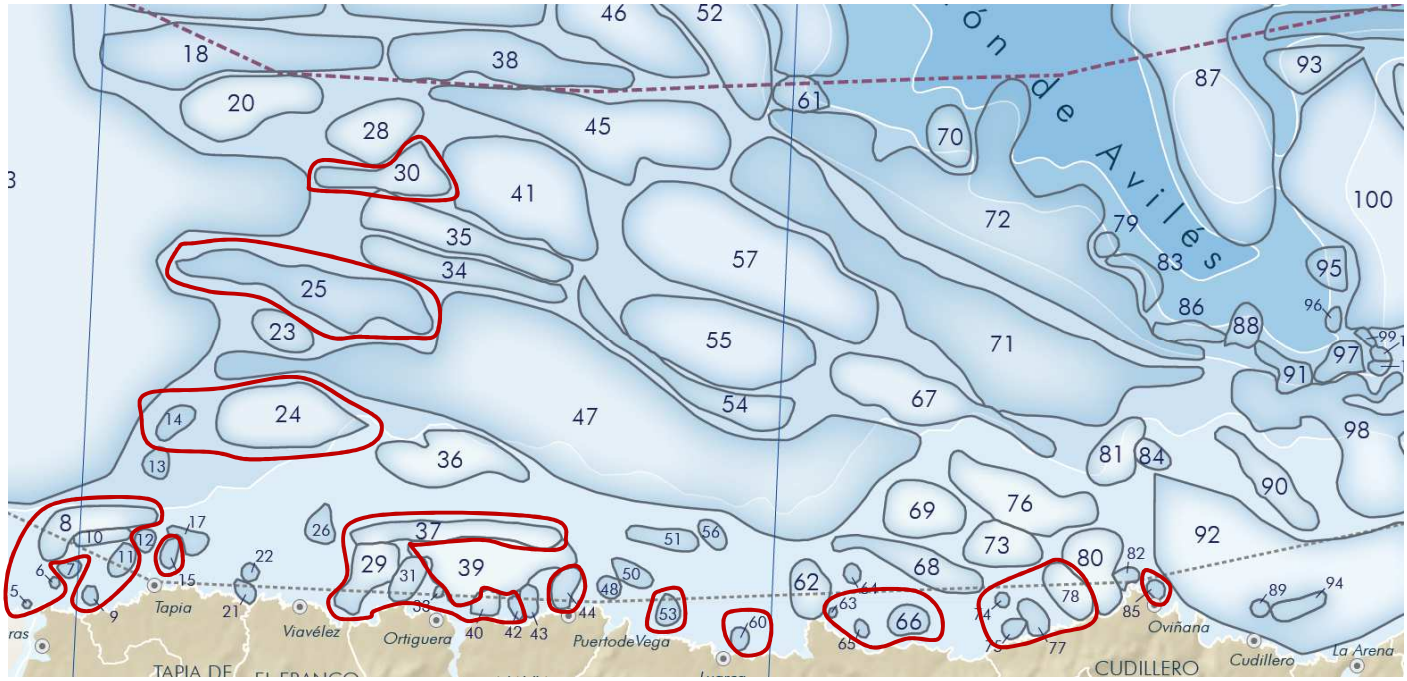


Figure 7.3.7. All fishing ground identified in the Western Asturias waters by the CEP in 2011. Fishing grounds where octopus is targeted using traps were highlighted in red by the assessment team. Source: https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

Table 7.3.11. Types of seabottom in the fishing ground used for targeting octopus with traps. Source: https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

#	Fishing ground	Rock	Petón	Cascajo	Sand	Mud	Embarre
5	El Arredo		x				
6	El Molino		x				
8	Mar del Ramo	x					
9	Las Molas	x					
10	El Cañigote	x					
11	El Cantu de Tapia				x	x	
14	Piedras del Zalamero		x				
15	El Coitelo y Dondel	x	x				
24	Los Picos de Salave		x	x			
25	La Cerdeira de Tierra	x	x	x			x
29	Las Conchas				x		
30	La Cerdeira de Fuera	x	x				
31	Llamosa y Valladón	x					
33	Petón de Ortigueira		x				
35	Los Fuminos		x				
40	Canto de Fuera	x					
42	Canto Fabal	x					
44	Canto Sobreisla	x					
53	Petón del Castaño		x				
60	Bajo la Mina	x					
63	Petón de El Salto		x				
65	Petón de la Osa						
66	La Chuar		x				
74	Castañeras		x				
75	Sierra Palomar		x				
77	Petón del silencio		x				
78	Los Negros		x				
85	El Santín	x					
	TOTAL	***12***	***16***	***2***	***2***	***1***	***1***

Further, in 2016, the CEP started to install GPS position devices in some of the vessels included in the OFMP. The programme started as voluntarily at that stage and only 5 vessels participated during the 2016/17 fishing season (Fernández 2017). However, since 2017 it is mandatory that all vessels included in the OFMP shall have a GPS position device installed on board. This means that comprehensive information on the geographical effort of the assessed fleet is available since the 2017/18 fishing season (see **figure 7.3.8 and figure 7.3.9**). These data are being used by the CEP to determine the duration of the fishing trips, the maximum distance that the vessels sail, and the specific areas where the vessels set the traps. To find out the areas used for setting the nets, the CEP filters all records by speed (when speed falls below 3 knots, then it is considered that the vessel is fishing). Maps of the fishing effort obtained for the 2017/18 and 2017/18 fishing seasons are presented in **figure 7.3.8** and **figure 7.3.9** respectively. This data complements information on the octopus fishing grounds as described by the CEP in 2011 (**figure 7.3.7**).

Figure 7.3.8. Fishing effort of the fleet targetin octopus within the OFMP in the Western Asturian waters during the 2017/18 fishing season (red for high fishing effort, yellow for medium, and green for low). Data from 43 different vessels were used. The blue line shows the 50m isobaths. Fishing grounds identified by the CEP in 2011 are demarked by white lines. Source: Fernández, 2018

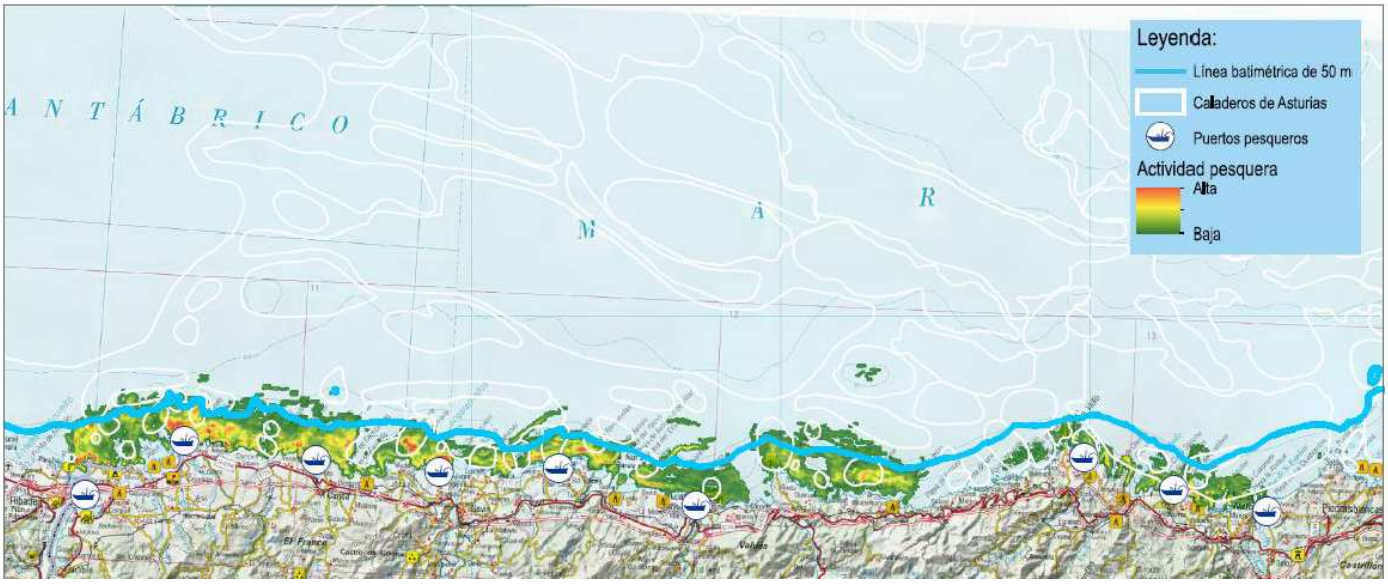


Figure 7.3.9. Fishing effort of the fleet targetin octopus within the OFMP in the Western Asturian waters during the 2018/19 fishing season (red for high fishing effort, yellow for medium, and green for low). Data from 40 different vessels were used (1380 fishng days). The blue line shows the 50m isobaths. Fishing grounds identified by the CEP in 2011 are demarked by white lines. Source: Fernández, 2019a

The depth range of the fishing operations for the 2017/18 and 2018/19 fishing seasons are presented in figure below. It is observed that the activity pattern as a function of depth is very similar for both fishing seasons, about 95% of the fishing operations take place above 50m depth.

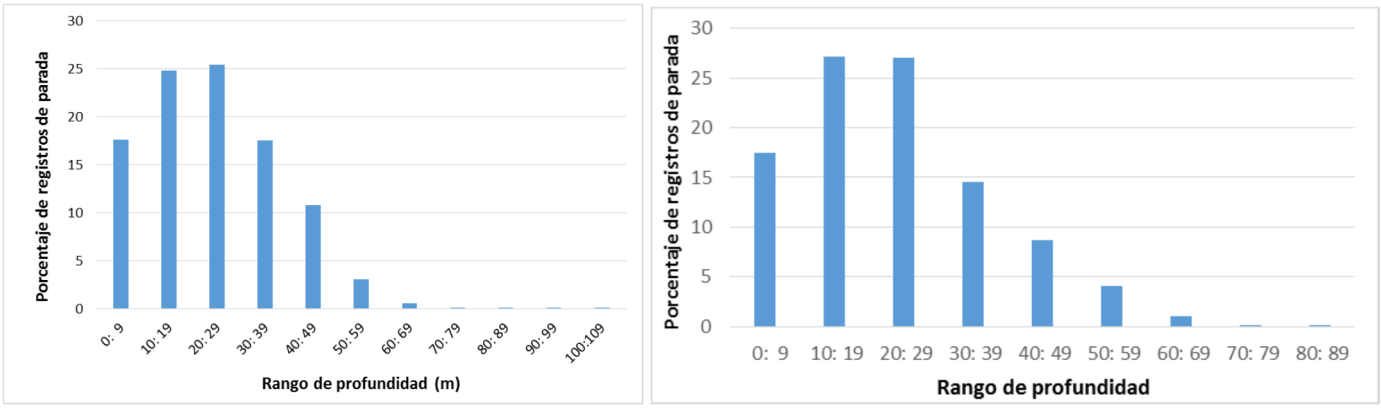
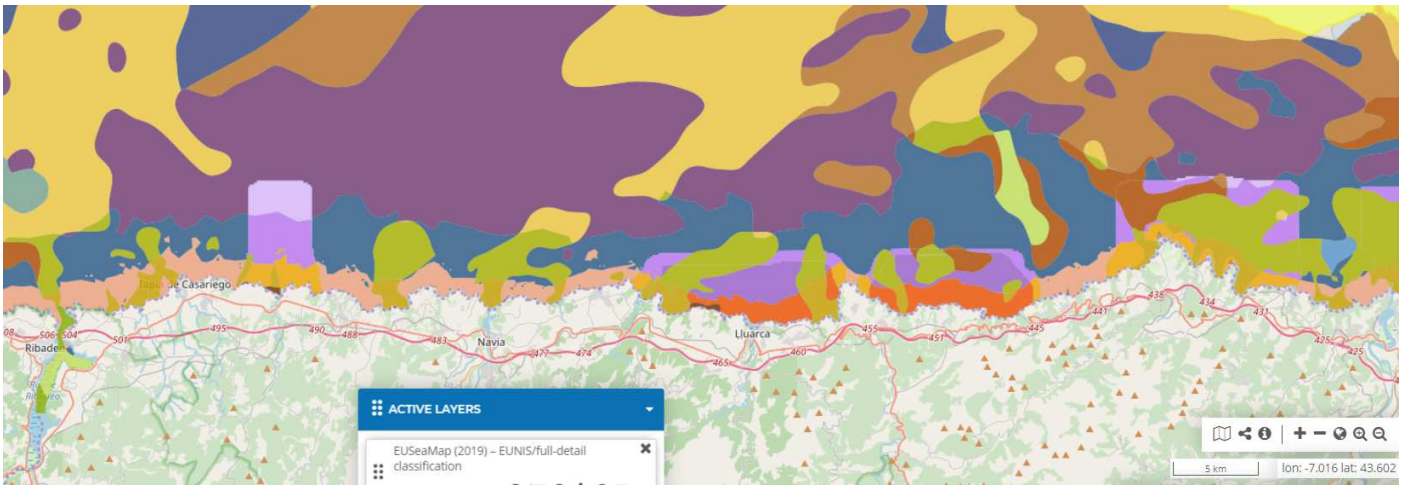


Figure 7.3.10. Percentage of speed records below 3 knots presented by depth range (m). Left: 2017/18, Right: 2018/19. Source. Fernández 2018 and Fernández, 2019

Finally, output of the 2019 EUSeaMap broad-scale predictive model produced by EMODnet Seabed Habitats is available at the EMODnet website (https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/). The extent of the mapped area includes the Mediterranean Sea, Black Sea, Baltic Sea, and areas of the North Eastern Atlantic extending from the Canary Islands in the south to the Barents Sea in the north. **Figure 7.3.11** presents the outputs of this model for the area where the assessed fleet operates.

The map was produced using a "top-down" modelling approach using classified habitat descriptors to determine a final output habitat (habitat descriptors differ per region but include: Biological zone, Energy class, Oxygen regime, Salinity regime, Seabed substrate and Riverine input. Habitat descriptors (excepting Substrate) are calculated using underlying physical data and thresholds derived from statistical analyses or expert judgement on known conditions. The model was created using raster input layers with a cell size of 0.00104dd (roughly 100 metres). The model includes the sublittoral zone only; due to the high variability of the littoral zone, a lack of detailed substrate data and the resolution of the model, it is difficult to predict littoral habitats at this scale. This map follows the EUNIS 2007-11 classification system where it is appropriate. It has also been classified according to MSFD Benthic Broad Habitat types. Results from this map confirms that the area is mostly covered by rocky substrates, followed by sandy and muddy substrates.



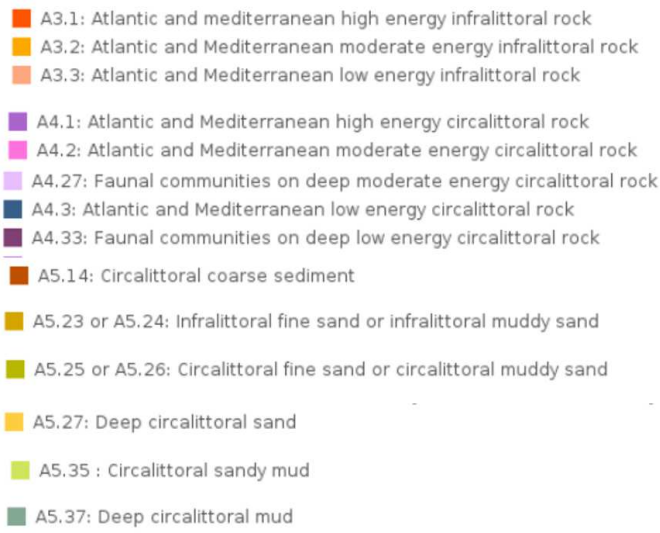


Figure 7.3.11. Output of the 2019 EUSeaMap broad-scale predictive model produced by EMODnet Seabed Habitats for the area where the assessed fleet operates. This map follows the EUNIS 2007-11 classification system (see legend). Source: https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/

None of the above mentioned habitats are included in the list of threatened and declining habitats in the Bay of Biscay and Iberian Coast ecoregion according to OSPAR, as shown in **table 7.3.12**. Therefore, there are no VME (Vulnerable Marine Ecosystem) in the geographical area where the UoA operates.

Table 7.3.12. Threatened and declining habitats in the Bay of Biscay and Iberian Coast ecoregion. Source: ICES 2019e

Habitats
Coral gardens
Cymodocea meadows
Deep-sea sponge aggregations
Intertidal mudflats
Lophelia pertura reefs
Modiolus modiolus beds
Seamounts
Zostera beds

7.3.1.5.2 Permanent and temporary area closures

The following permanent closures are in force within the area where the assessed fleet operates (see **figure 7.3.12**):

- Set net fisheries are forbidden in the mouth of the rivers
- 'Rasco' (particular type of set net) banned in waters shallower than 50m depth
- Bottom trawl banned in waters shallower than 100m depth
- Area where both 'rasco' and 'volanta' (another type of set net) are banned

There are another two permanent closed areas in the Asturian waters but out of the geographical scope of the OFMP: (i) the marine MPA 'El Cachucho' designated to protect a seamount, and (ii) and area where only hand lines and artisanal longlines can be used 'El Resueste'.

Figure 7.3.12. Permanent area closures within the geographical scope of the OFMP. See legend in the text above. Source: https//tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

No temporary area closures are defined within the geographical scope of the OFMP. However, there are several temporary area closures within the Asturian waters, as showed in **Figure 7.3.13**.

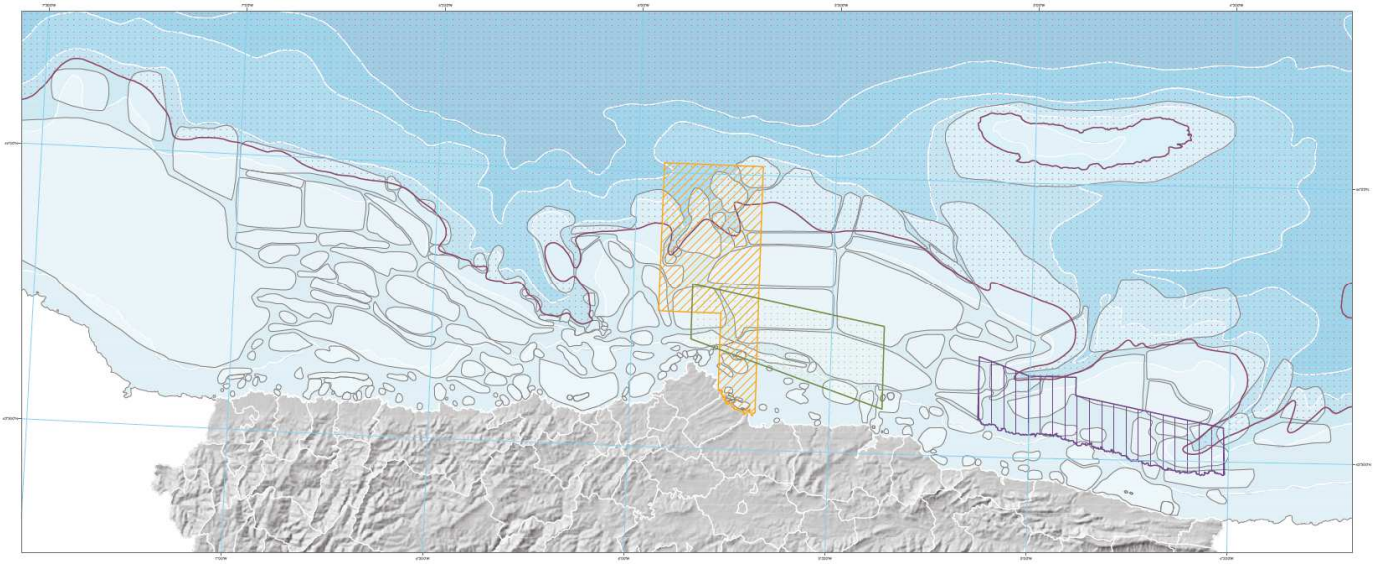


Figure 7.3.13. Temporary area closures in the Asturian waters, none of them fall within the geographical scope of the OFMP. See legend in the text above. - Bottom trawl and set net banned from 01/09 to 01/03; - Set nets banned from 01/10/2010 to 30/06/2011; - set nets banned from 01/01 to 31/05; - 'Rasco' and 'Volanta' banned from 01/11 to 31/05. Source: https//tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

7.3.1.5.3 Trophic ecology of the common octopus

All cephalopods actively catch and eat live prey. Dietary analysis in these marine molluks is hampered by several problems that arise from the anatomy, physiology and mode of ingestion (Rodhouse and Nigmatullin 1996) of these organisms (Roura et al., 2012). The oesophagus diameter is limited physically as it passes through the brain, so the cephalopod beak bites small pieces of tissue to swallow. Rapid digestion rates in the stomach shorten the residence time (two to six hours) making the prey remains visually unidentifiable. The mode of ingestion can be internal, biting with the beak, or external, where salivary enzymes paralyse and digest the flesh followed by the ingestion of the liquefied content (Nixon 1984; Guerra and Nixon 1987). This specialised feeding strategy, that largely avoid ingestion of hard skeletal material, together with external digestion, tend to bias data on prey species and size when morphological analysis are used.

A recent publication by Lourenço et al. (2015) using nitrogen istopoes estimated that the trophic level of this species ranged from 4.40 and 4.66, in two Atlantic poulations of the Iberian Peninsula. Thus, the common octopus *O. vulgaris* is not considered as a key Low Trophic Level species (LTL).

The diet of *Octopus vulgaris* evidenced that it is a generalist predator as an adult or juvenile, feeding upon a variety of organisms mainly within the class Crustacea, but also Gastropoda, Lamellibranchiata, Osteichthyes, Ophiuroidea, Polychaeta and Cephalopoda (Roura et al., 2012). Its diet was mainly composed

by bony fishes, crustaceans, cephalopods, bivalves and polychaeta. Cannibalism has been observed. During the last few years, molecular analyses permitted to untanngler the prey of a crucial part of the life cycle of the species: the planktonioc paralarvae. This was a clear bottleneck to shed ligh over a period where the mortlity suprpasses the 99%.

The industrial rearing of this species is hampered by the high mortality during the pelagic stage, in spite of the broad range of experimental diets assayed throughout the past sixty years (reviewed in Iglesias et al. 2007). Although some authors have hypothesised that *O. vulgaris* prey upon crustaceans during its planktonic stage (Mangold and Boletzky 1973; Nixon 1985; Rodhouse and Nigmatullin 1996; Villanueva and Norman 2008), the feeding habits of wild O. vulgaris, until recently, paralarvae were still unsolved. However, the study of Roura et al. (2012) evedenced that while previous work on cephalopod paralarvae diet found that paralarvae are generalist predators, prey species detected in early hatchlings of *Octopus vulgaris* suggest that they are actually specialist predators according. Among the crustaceans, the group that primarily contribute to the total abundance of zooplankton are krill. By contrast, all the paralarvae analysed ate some Decapoda, which include crabs, shrimps, hermit crabs and mud shrimps. In fact, the trophic selection is quite evident for shrimps, which were the most abundant prey present in 14 out of 18 O. vulgaris paralarvae, but whose contribution to the total zooplankton abundance was only 0.28% (Roura et al. 2012). The specialist trophic strategy during the first days in the pelagic ecosystem could be a consequence of a lack of skills to capture fast moving and more abundant prey, as proved in paralarvae of Loligo opalescens (Chen et al. 1996). As it occurs in the former species, an ontogenic switch into a generalist predation strategy would be expected as the Octopus vulgaris paralarvae grow and gain experience, but further research is needed to test this hypothesis. On the other hand, if paralarvae were truly specialists throughout the planktonic phase, this might explain the high mortality of *O. vulgaris* hatchlings both under culture and in the wild, due to prolonged starvation periods (Vecchione 1991).

Juvenile and adult octopuses are carnivorous predators and prefer to feed on a variety of live prey species (Fiorito and Gherardi 1999). Although octopuses cannot see colors, they are able to identify their prey by movement, shape, features, and scent (Fiorito and Gherardi 1999). One method they use during hunting is known as ‘groping’ in which they use their arms to search along rocks, sediment, and holes for potential food (Fiorito and Gherardi 1999). In another method they use their web for covering prey when pouncing on top of them (Hanlon and Messenger 1996). A third tactic involves the siphon in which they blast sediment with water to reveal buried prey (Hanlon and Messenger 1996). A number of other hunting modes are ambushing, stalking, and luring (Hanlon and Messenger 1996). There are varying studies which report on the amount of time dedicated to feeding by octopuses. In Bermuda specifically, Mather and O’Dor (1991) found that O. vulgaris spent a relatively short amount of time doing this, on average twelve percent of their day. This is a sharp contrast to what is normally seen in octopuses, who are generally known to spend up to sixty five percent of the day foraging (Hanlon and Messenger 1996). They are known to feed particularly on crabs, bivalves, and gastropods (Fiorito and Gherardi 1999). *O. vulgaris* have also been found to feast on polychaetes, other crustaceans, cephalopods, and various species of bony fishes (Hanlon and Messenger 1996). Their radulas are extremely efficient tools for aiding eating of these organisms, especially for penetrating a thick mollusk shell or arthropod skeleton. The octopus will grasp the organism and drill a tiny hole with their radula and using their salivary papilla insert a paralyzing toxin which relaxes the organism allowing their shell or exoskeleton to be penetrated (Fiorito and Gherardi 1999). Bivalve mollusks are pried apart using the octopus’s arms and suckers, but can also be drilled if this fails. However, pulling open bivalves has a much higher energy cost than drilling alone. Once they are done feeding, the mollusk shells are scattered around their den area in piles known as ‘middens’ (Fiorito and Cherardi 1999).

It is interesting that *O. vulgaris* are diurnal and nocturnal since shallow water cephalopods are largely influenced by light cues (Miesel et al. 2006). However, even this can be debated as they are more often day and night active in the Atlantic and Caribbean, while *O. vulgaris* in the Mediterranean have been speculated to be exclusively nocturnal. However, Meisel et al. (2006) disproved this speculation when they found that even Mediterranean *O. vulgaris* species showed a preference to daytime activity. In addition, the common octopus does have the ability to switch its activity profile if necessary depending on the changing needs of the organism. It is theorized that one reason for a flexible activity period is as an adaptation to fish predation (Pierce & Wood, 2015).

Despite their ferocity as invertebrate predators of the oceans, numerous dominant carnivores prey upon octopuses. The species has many predators, sharks, bony-fishes, sea birds and marine mammals (Hanlon and Messenger, 1998). Marine mammals include common dolphin (*Delphinus delphis*; López, 2002; Santos et al., 2004b), bottlenose dolphin (*Tursiops truncatus*; Blanco et al., 2001) and Risso’s dolphin (*Grampus griseus*), long-finned pilot whale (*Globicephala melas*; López, 2002). Fish predators of adults and juveniles

include conger eel (*Conger conger*) and Mediterranean moray eel (*Muraena helena*), whereas Mediterranean dusky grouper (*Epinephelus marginatus*), serranid fish (*Serranus sp.*) and the sand smelt (*Atherina presbyter*) prey on hatchlings (Villanueva and Norman, 2008).

Pinnipeds in oceans around the world feed on cephalopods; with thirty-one of the thirty three species present including them in their diets (Klages 1996). Seals are a threat to the octopus because they are fast swimmers and easily tire octopuses who cannot keep up fast swimming speeds for an extended period of time (Klages 1996). However, there are no seals in the area where the assessed fishery operates. Large predatory fish, such as the Barracuda, are also a threat to *O. vulgaris.* Eels are also especially dangerous to Octopuses, and are thought to use developed smell senses to locate them (Hanlon and Messenger 1996).

Octopuses have two types of defense against their predators, primary and secondary (Hanlon and Messenger 1996). Primary defense includes using 'crypsis,' also known mainly as camouflage or color changing to match their environment (Hanlon and Messenger 1996). Secondary defenses are only used when the primary response fails, and the octopus is seen by its predator (Hanlon and Messenger 1996). These responses include flight and inking, deimatic behavior, defensive postures, and deflective markings (Hanlon and Messenger 1996).

The Octopus's ability to camouflage is nothing short of astounding. It is theorized that this ability was developed as an adaptation for protection from predation due to the evolutionary loss of an external shell (Ferguson and Messenger 1991). Octopuses achieve color change in part by chromatophores, iridophores, and leucophores; all structures of the skin in increasing depth (Froesch and Messenger 1978). Chromatophores are generally known as elastic pigment sacs with muscle fibers attached letting them expand and contract (Ferguson and Messenger 1991). The leucophores are important because they allow for the reflection of white light and consequently allow the skin to reflect wavelengths of light which are prevalent in their habitat and produce disruptive patterns (Froesch and Messenger 1978). The other aspect to cephalopod camouflage is the brain which contains nerves coated in chromatophore fibers, controlling coloration patterning (Froesch 1973).

Deimatic behavior includes threatening or bluffing actions in order to cause the predator to hesitate (Hanlon and Messenger 1996). Sometimes this behavior will scare away the predator or give the octopus enough time to flee in a jet of ink. Specific deimatic coloration patterns and body postures in O. vulgaris are a paling of the skin, darkening of suckers and area around eyes, arms and web spread widely, and a jetting of water (Hanlon and Messenger 1996). They are also known to threaten the predator by throwing out their arms towards the attacker (Hanlon and Messenger 1996).

7.3.1.5.4 Ghost fishing

A problem associated with many fishing gears is their ability to continue to capture animals after the gears have been lost, a process called "ghost fishing" (Hubert, 1996). When traditional clay pots are lost, they not only become a refuge for the octopus but also provide a substrate for a variety of other organisms. Thus, they are one of the most "environmentally friendly" fishing gears. Even broken, they continue to serve as substrata for the establishment of a variety of organisms, thus playing an important role in the local trophic chain, especially in an area such as the Eastern Algarve, which lacks natural hard bottoms. More recently, however, the traditional clay pot has been replaced by plastic pots of different forms. Studies are being carried out to determine the environmental effects of plastic pots, as well as their economic feasibility (Pierce et al., 2010).

The Asturian trap fishery does not use clay or plastic pots. This fishery uses traps consisting of a metal structure covered by a net of hard plastic, with an entrance consisting of a short plastic tube (see **figure 7.3.14**). The bait in placed in a plastic pocket inside the trap. Although this type of trap is not as environmentally friendly as tradicional clay pots, they are not supposed to have too high a capacity to continue fishing after being lost, since the attractive effect of the bait is temporary. Further, all vessels included in the OFMP shall identify their lines of traps. However, as far as the team is aware there are not reports on the number of lost traps per year.

Figure 7.3.14. Traps used by the assessed fleet. Source: the client

7.3.1.5.5 Bay of Biscay and the Iberian Coast Ecoregion

The following information was retrieved from the ICES Ecosystem Overviews, Bay of Biscay and the Iberian Coast ecoregion (ICES, 2019e)

The ICES Bay of Biscay and the Iberian Coast ecoregion covers the southwestern shelf seas and adjacent deeper eastern Atlantic Ocean waters of the EU. The oceanography in this ecoregion is characterized by marked seasonal mixing and stratification of water masses typical of temperate seas. This general pattern is modified over the shelf by wind-driven upwelling, river outflow, and tidal-related processes increasing the productivity of the system with large variation across the region. Habitats further offshore are shaped by the influence of Atlantic waters in the Bay of Biscay and western Iberia.

The ecoregion includes waters from Brittany to the Gulf of Cadiz; four key areas constitute the ecoregion:

- the Bay of Biscay, characterized by a wide shelf extending west of France. Upwelling events occur in summer, off southern Brittany, and low-salinity water lenses are associated with the river outflows of the Landes coastline;
- the Cantabrian Sea (northern Iberian shelf), characterized by a narrow shelf with intermittent summer upwelling events west of Cape Peñes and a winter slope undercurrent, the Iberian Poleward Current;
- the western Iberian Shelf, characterized by a narrow shelf with upwelling events in summer and the Iberian Poleward Current in winter. Off Galicia (at its northern limit) the input of freshwater from rivers and estuaries form the Western Iberian Buoyant Plume, which is an important shaping event under downwelling-favourable winds; and
- the Gulf of Cadiz, characterized by a wide shelf strongly influenced by river inputs, zonal currents, wind patterns, and the deep inflow from the Mediterranean water.

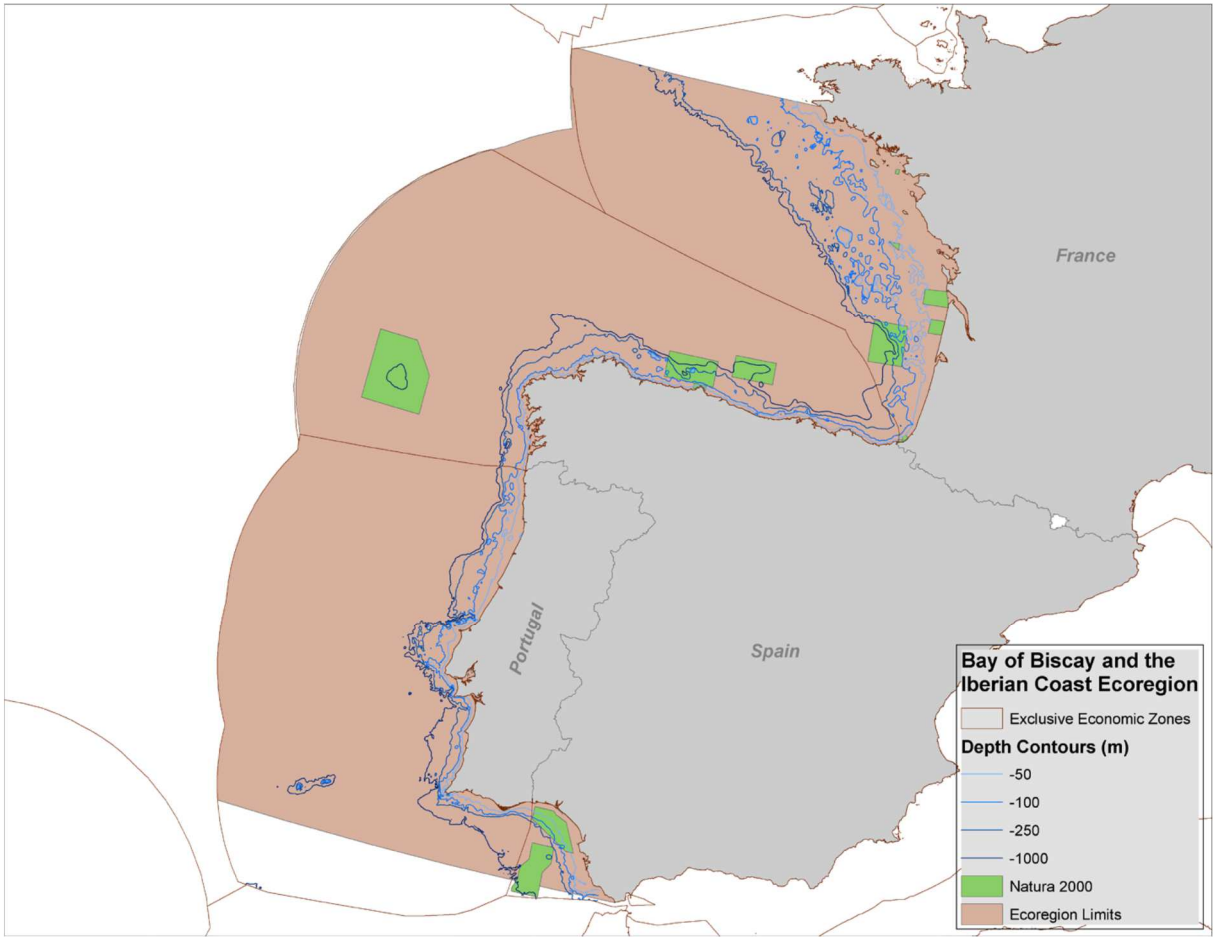


Figure 7.3.15. The Bay of Biscay and the Iberian Coast ecoregion, showing EEZs and larger offshore Natura 2000 sites. Source: ICES, 2019e.

Key signals within the environment and the ecosystem:

- The general ecoregion pattern of marked seasonal mixing and stratification is modified over the shelf by wind-driven upwelling, river outflow and tidal related processes increasing the productivity of the system with large variation across the region.
- Large-scale meteorological pressure differences over the North Atlantic cause winter anomalous upwelling events (windspeed and direction), which in turn can influence the recruitment of commercially important species such as anchovy *Engraulis encrasicolus* and sardine *Sardina pilchardus*, southern hake *Merluccius merluccius*, Norway lobster *Nephrops norvegicus*, and horse mackerel *Trachurus trachurus*.

The five most important pressures in the Bay of Biscay and Iberian Coast ecoregion are the selective extraction of species, abrasion, nutrient and organic enrichment, smothering, and substrate loss. These pressures are mainly linked to the following human activities: fishing, shipping, tourism and recreation, land-based industry, and agriculture (**Figure 7.3.16**). Other pressures include the introduction of contaminating compounds, the introduction of non-indigenous species, noise, and marine litter. The main pressures described below are defined in the ICES Technical Guidelines.

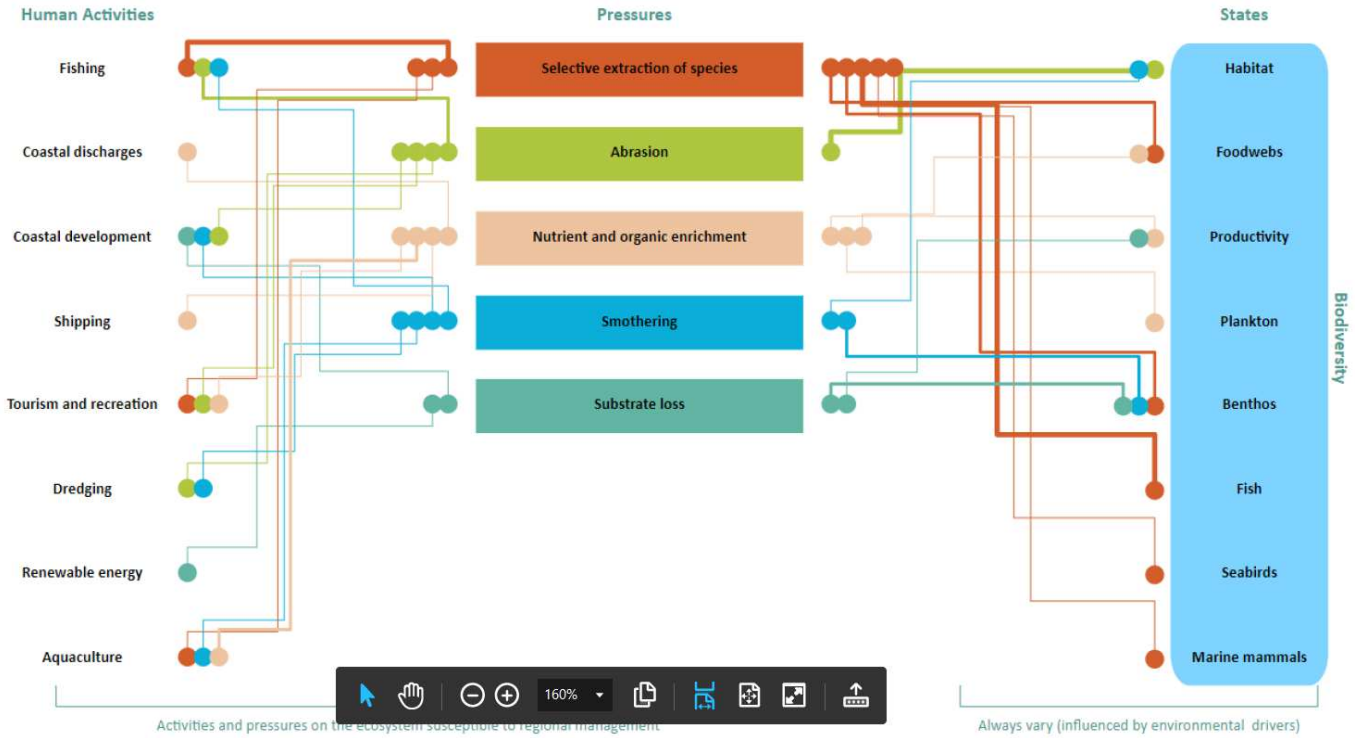


Figure 7.3.16. Bay of Biscay and Iberian Waters ecoregion overview with the major regional pressures, human activities, and ecosystem state components. The width of lines indicates the relative importance of main individual links (the scaled strength of pressures should be understood as a relevant strength between the human activities listed, not as an assessment of the actual pressure on the ecosystem). Climate change affects human activities, the intensity of the pressures, and some aspects of state, as well as the links between these. Source: ICES, 2019e

Selective extraction of species

Fishing, and to a lesser extent tourism and recreation, are the main activities contributing to pressure in this ecoregion. Both demersal and pelagic commercial fisheries occur in most parts of the ecoregion. Recreational fishery in coastal areas is becoming a relatively important activity, and is in some cases taken into consideration for the management of marine fisheries.

Figure 4 shows the historical evolution of fishing mortality relative to reference points by fish guild in the Bay of Biscay and the Iberian Coast ecoregion. A general decrease in fishing effort in the region (in many cases because of a reduction in the fleet) has contributed to an overall decline in the fishing mortality (F) of commercial fish stocks since 1988. The mean F is now closer to the level that produces maximum sustainable yield (MSY).

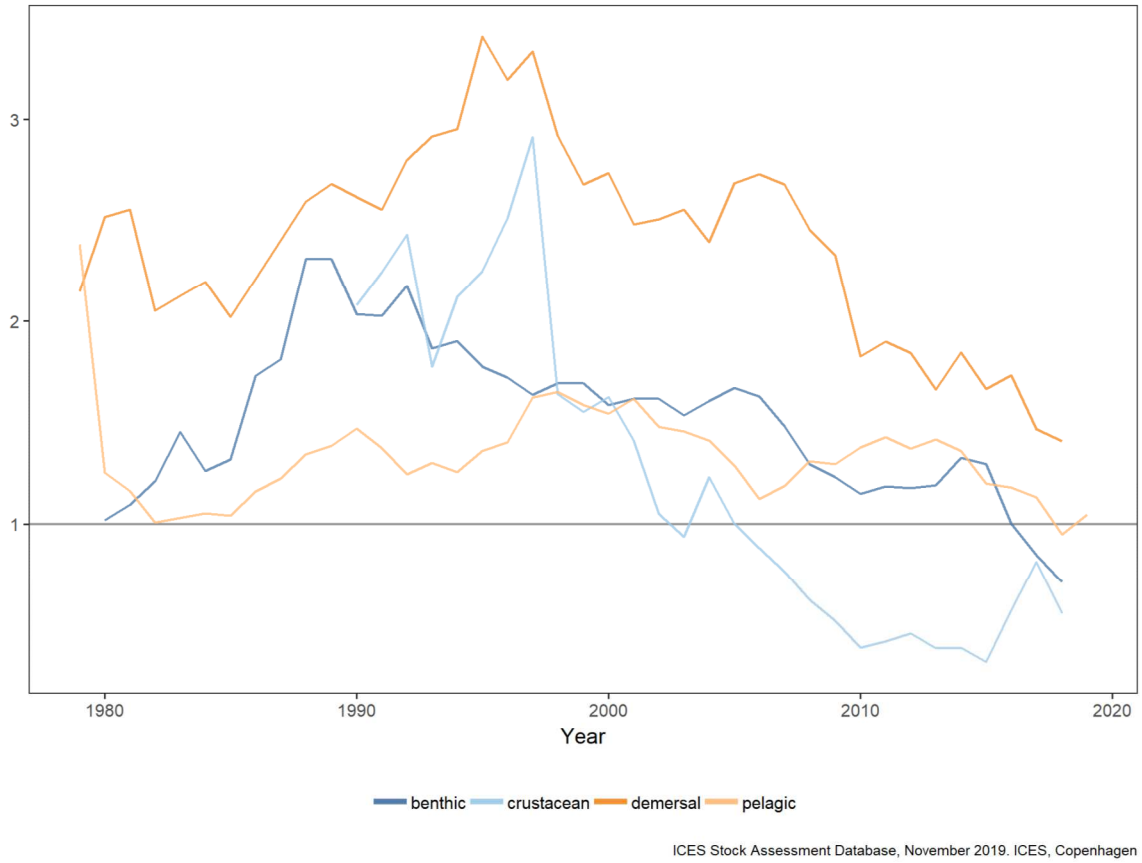


Figure 7.3.17. Time-series of annual relative fishing mortality (F to FMSY ratio) by fisheries guild for benthic, demersal, crustaceans, and pelagic stocks. Table A1 in the Annex details which species belong to each fish category. Source: ICES, 2019e.

Stocks of several fish species have been adversely affected by fishing and are now on the OSPAR list of threatened and declining species (see full list below). These include the sturgeon *Acipenser sturi*, European eel *Anguilla anguilla*, gulper shark *Centrophorus granulosus*, skates and rays like *Dipturus batis*, *Raja montagui*, and *Rostroraja alba*, spurdog *Squalus acanthias*, and salmon *Salmo salar*. Although there are no TACs for these species and some are prohibited to be landed under EU law, several species are vulnerable to existing fisheries. The Common skate, and less often spurdogs, are caught as bycatch in demersal trawl fisheries while deep-water sharks are caught in the mixed deep-water trawl fishery. None of these species is affected by the assessed fishery.

Indicators like the large fish indicator (LFI) index (describing the proportion – by weight – of the demersal fish community on survey catch larger than regional length thresholds) can be used to monitor changes in the fish populations and foodwebs. In the Bay of Biscay, the LFI index has shown a positive temporal trend since the year 2000 (see **figure 7.3.18** left). However, there is no trend in the LFI in Portuguese waters, and the index shows high interannual variability (see **figure 7.3.18** right).

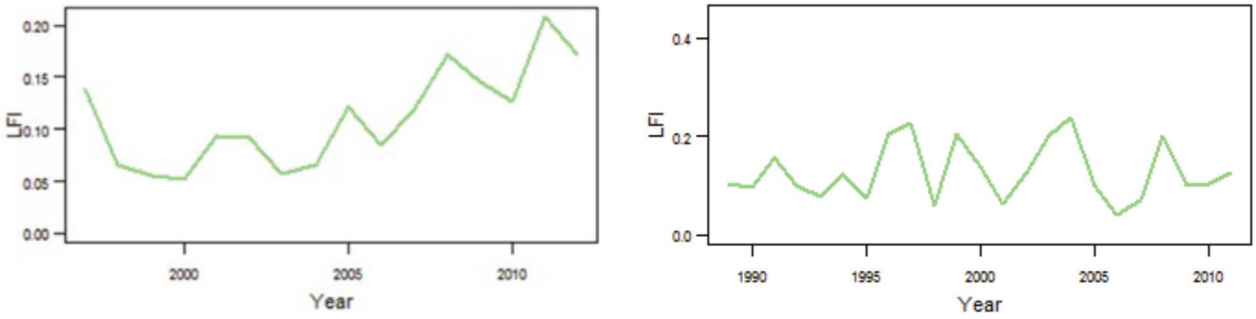


Figure 7.3.18. Time-series of the large fish indicator (LFI) in the Bay of Biscay (left) and Portuguese waters (right). Source: ICES, 2019e.

Abrasion

This pressure principally affects the seabed habitats and it is associated with bottom-contacting mobile fishing gear, in particular beam trawling, otter trawling, and local activities like dredging or those linked to tourism such as anchoring.

Using vessel monitoring system (VMS) and logbook data, ICES estimates that mobile bottom trawls used by commercial fisheries in the 12 m+ vessel category have been deployed over approximately 144 300 km2 of the ecoregion in 2018; this corresponds to ca. 19.1% of the ecoregion's spatial extent.

Nutrient and organic enrichiment

The input of nutrients is a relatively important pressure in coastal areas, particularly off areas of intensive agriculture and certain industries. Rivers account for most waterborne inputs of nitrogen and phosphorous. There is no clear trend in nitrate inputs in this region, in contrast to the decreasing trends in other EU waters. Shipping, aquaculture, and increasing tourism and recreation along the coast also contribute to this pressure.

Eutrophication is mainly limited to coastal areas such as bays and estuaries with restricted circulation

Smothering

Smothering is caused by several human activities in this ecoregion: extraction of aggregates (sand and gravel), disposal of materials on the seabed, and navigational dredging for shipping as well as bottom trawling in soft sediment areas. The main dredging sites are found in France in the harbours and estuaries of the Loire (Nantes), Gironde (Bordeaux), and Adour (Bayonne), and in Spain in the harbours of Avilés, Vilagarcía, Huelva, and the estuary of the Guadalquivir River.

Substrate loss

Coastal construction and renewable energy devices contribute to substrate loss.

Marine and coastal habitats have been lost in recent decades to land claim for port, industry, residential development and agriculture, coastal defences (including dykes, seawalls, and beach nourishment schemes), aquaculture infrastructure, roads, piers, marinas, and wastewater treatment facilities.

Other pressures

Other relevant pressures in this ecoregion are:

- *Underwater noise*, caused by activities such as shipping, tourism and recreation, and renewable energy installations, which may affect marine mammals, fish, and other organisms using sound or pressure senses.
- *Introduction of non-indigenous species* happens primarily through shipping and aquaculture and has affected the benthic community and foodwebs.
- *Introduction of contaminating compounds*, due primarily to coastal discharges and maritime transport (shipping). This pressure can affect all ecosystem components but may accumulate in the foodweb, having an effect in particular on higher trophic levels (mammals and birds). Some of these compounds may be very stable and remain in the ecosystem for many decades after their introduction.
- *Marine litter*, including microplastics and plastic waste derived from many human activities. Larger items can entangle larger organisms while smaller items, including microplastics, can be ingested by many organisms.

Climate change has already influenced the Bay of Biscay and Iberian Coast ecoregion. Studies have shown that sea surface temperatures have increased.

The timing of the mackerel fishery has changed, showing an earlier peak of landings in the Cantabrian Sea. This could reflect a change in the timing of migration in response to climate change effects on upwelling patterns.

A marked decrease in the physical condition of several small pelagic fish, including anchovy and sardine, has been noted in the Bay of Biscay since the mid-2000s. Studies are being conducted to assess the respective roles of density-dependence, fishing, and climate change in this weakening of condition.

An increase in the richness of the demersal fish community, together with a western shift in the distribution of many species has been reported in the Cantabrian Sea and Galicia over the last three decades, along with a northwards distributional change of species previously distributed further south. New occurrences and distributional changes of fish in the Bay of Biscay are attributed to increasing temperatures. Examples include changes in the nursery areas of some flatfish and the increased occurrence of deep-water species previously found further south.

At the global level, current greenhouse gas emissions are most closely following the IPCC Regional Concentration Pathway (RCP) 8.5 scenario. Within the Bay of Biscay and Iberian Coast ecoregion, this scenario projects a 1.5°C to 3.0°C warming above mean conditions for the years 2050–2099. Positive anomalies are forecasted everywhere in the region, and are most pronounced in the shelf areas (**figure 7.3.19**).

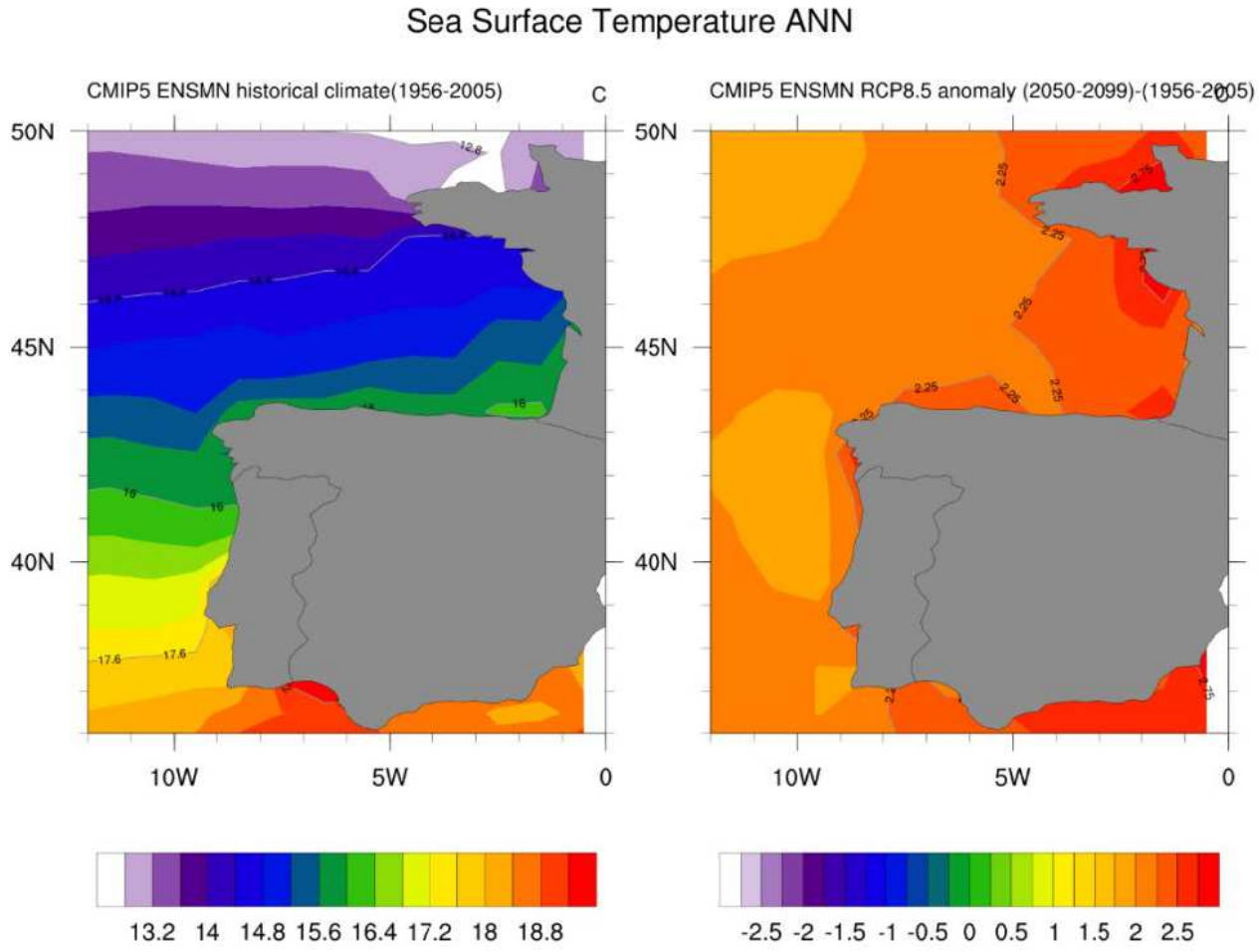


Figure 7.3.19. Ensemble mean sea surface temperature (SST) from the 5th Coupled Model Intercomparison Project (CMIP5), interpolated on a 1 × 1 grid for the entire year in the Bay of Biscay and Iberian Coast ecoregion. (Left) historical SST for the 1956–2005. (Right) difference in the mean climate in the future time period (RCP8.5: 2050–2099) compared to the historical reference period. Source: ICES, 2019e.

7.3.2 Principle 2 Performance Indicator scores and rationales

PI 2.1.1 – Primary species outcome

PI 2.1.1		The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI		
Scoring Issue		SG 60	SG 80	SG 100
	Main primary species stock status			
a	Guide post	Main primary species are **likely** to be above the PRI. OR If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding.	Main primary species are **highly likely** to be above the PRI. OR If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY.
	Met?	**Not relevant**	**Not revelant**	**Not relevant**
Rationale				

A comprehensive list of species caught by the UoA is presented in **table 7.3.11**, based on data on species catch composition collected by observers hired by the CEP (see 7.3.1, 7.3.2, 7.3.6 and 7.3.8). A total of 56 different species and taxa were identified during the observed trips between 2014 and 2019. None of these species caught by the UoA are managed to achieve objectives reflected in either limit or target reference points. However, the UoA purchased small pelagic species to be used as bait.

The observers hired by the CEP also recorded the type of bait (or mixture of baits) used in the trap. This information is presented in section 7.3.1.1.2. Three out of the five bait species purchased by the UoA are Primary (mackerel, sardine and horse mackerel).

The Fernández et al (2016) report only shows relative information (% of each type of bait used in each fishing port; artificial and/or fish species) on the bait used by the UoC. To complement this information, during the first surveillance audit of the first certification cycle, the client provided a quantitative estimation of the volume of bait purchased by the UoA during a fishing season. The volume of bait used by the UoA is very small when compared to octopus catches: roughly 1,300 kg of **mackerel**, 600 kg of **sardine** and 150 kg of **Atlantic horse mackerel** that represents **1.5%, 0.7% and 0.2%** respectively, of the total catch of octopus in the UoA for the fishing season 2016-17 (nearly 88 t). Based on these percentages the assessment team decided to consider these three pelagic species as minor primary species.

Based on the above information there is evidence that there is no impact of the UoA on any main primary species, therefore **this SI is not relevant (NR)**.

	Minor primary species stock status

b	Guide post			Minor primary species are highly likely to be above the PRI. OR If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species.
	Met?			**Horse mackerel: NO** **Mackerel: YES** **Sardine 8a-b, 8d: YES** **Sardine 8c, 9a: NO**
Rationale				

As commented in the SI above, and based on information provided by the CEP and the quantitative estimation made by the client, sardine (*Sardina pilchardus*), Atlantic horse mackerel (*Trachurus trachurus*) and mackerel (*Scomber scombrus*) are considered minor primary bait species in this fishery. See section 7.3.1.1.2 for more details on how the UoA makes use of different bait types.

A resume of the stock status and reference points for the 3 minor primary species is presented below:

Horse mackerel (*T. trachurus*)

The stock reference points were revised in August 2019 (ICES, 2019a and references cited therein), from 911 587 to 1 168 272 tonnes for MSY Btrigger and 0.108 to 0.074 for FMSY. The biomass reference points were derived from the lowest biomass estimate (SSB in 2003) from the stable period where there was no indication of reduced recruitment.

SSB has been declining since 2006 and has been around Blim since 2015. Fishing mortality has decreased since 2013, but remains above FMSY (see **figure 2.1.1.2**).

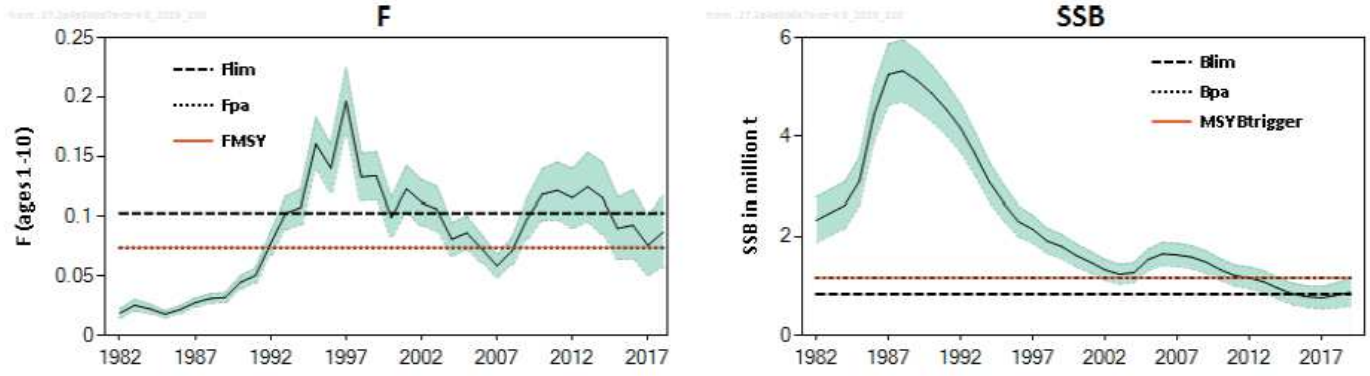


Figure PI 2.1.1.1 Horse mackerel in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k. Summary of the stock assessment. Plots show 95% confidence intervals (shaded area). Assumed recruitment value for 2019 is unshaded. Source: ICES 2019a

Outputs from the latest ICES assessment clearly show that it is not highly likely (>80%ile) that the stock is above the Blim (equivalent to PRI). Nevertheless, the volume used as bait in the octopus's fishery (around 2t/year, with horse mackerel accounting 150 kg during the fishing season 2016-17) is negligible compared to the ICES advised catch for 2020: 83 954t. However, the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data. Thus, based on the precautionary approach the team considers that **SG100 is not met for the horse mackerel.**

Mackerel (*S. scombrus*)

The spawning-stock biomass (SSB) is estimated to have increased since 2007, reaching a maximum in 2014, and has been declining since then. It has, however, remained above MSY Btrigger since 2008. The fishing mortality (F) has declined since 2003, but is estimated to have remained above FMSY (see **figure 2.1.1.2**).

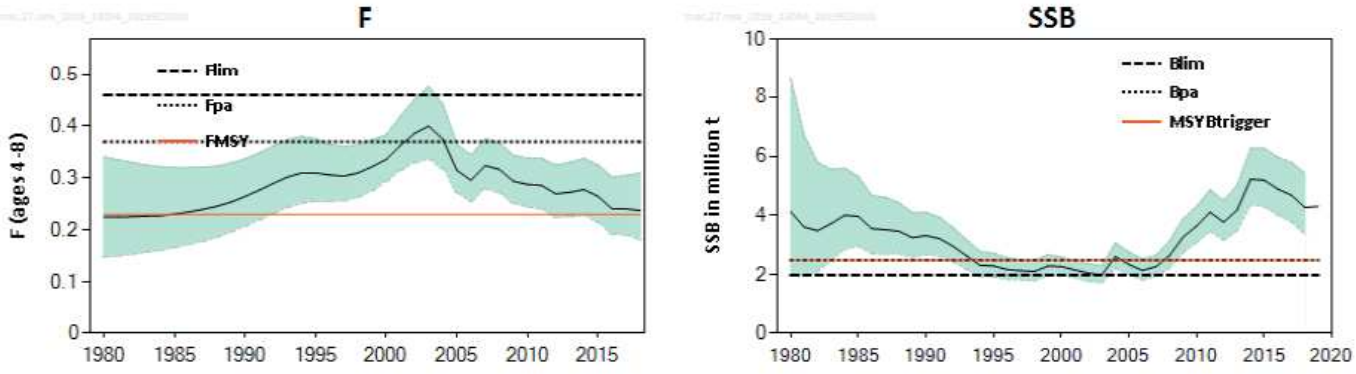


Figure PI 2.1.1.2. Mackerel in subareas 1–8 and 14, and in Division 9.a. Summary of the stock assessment. Confidence intervals (95%) are included in the fishing mortality, and spawning-stock biomass plots. Source: ICES 2019b

Outputs from the latest ICES assessment clearly show that the stock (SSB_{2019} 4 390 kt) is well above Blim (1 990 kt). Therefore, is highly likely (>80%ile) that current SSB is above PRI (Blim). **SG100 is met for the mackerel.**

Sardine (*Sardina pilchardus*) in divisions 8.a–b and 8.d (Bay of Biscay)

ICES assesses that fishing pressure on the stock is above FMSY and below Fpa and Flim; spawning-stock size is above MSY Btrigger, Bpa, and Blim (see figure below).

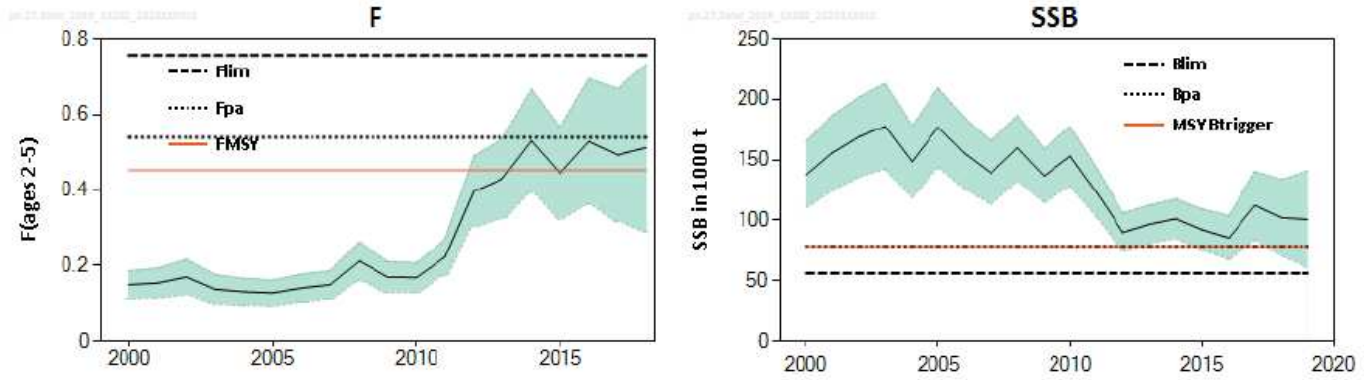


Figure PI 2.1.1.3. Sardine in divisions 8.a–b and 8.d. Summary of the stock assessment. Fishing mortality, and biomass are shown with 95% confidence intervals. Source: ICES 2019c

Outputs from the latest ICES assessment (ICES 2019c) clearly show that SSB_{2019} (100 828tt) is well above PRI (Blim=56 300t). The lower range of the 97,5%ile (60 828t) is still above Blim. Thus, **SG100 is met for the sardine in the Bay of Biscay.**

Sardine (*Sardina pilchardus*) in divisions 8.c and 9.a (Cantabrian Sea and Atlantic Iberian waters)

The advice for 2020 is based on biological reference points corresponding to a low stock productivity dynamic (ICES, 2019b). The biomass of 1+ fish has been below Blim since 2011, and thus recruitment is considered to be impaired. Recruitment has been at its lowest historical level since 2006.

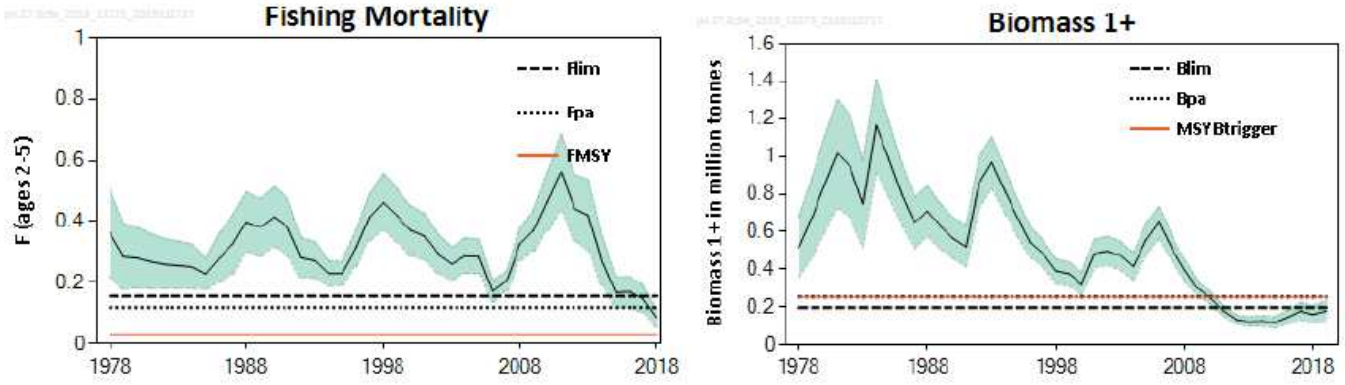


Figure PI 2.1.1.4. Sardine in divisions 8.c and 9.a. Summary of the stock assessment. Fishing mortality, and biomass are shown with 95% confidence intervals. Source: ICES 2019d

In 2019, Portugal and Spain requested advice on HCRs for a management and recovery plan for this stock. ICES provided advice in May 2019 (see references cited in ICES 2019d). Based on these evaluations, some HCRs (HCR3 and HCR4) were found to be precautionary and the probability of B1+ falling below Blim was estimated to be 1% in the long term. Besides, in December 2019, ICES provided advice on another precautionary HCR (HCR12) with a 5% probability of B1+ falling below Blim in the long term while providing high long-term yield. This information is summarized in the latest advice provided by ICES on this stock (ICES 2019d).

Outputs from the latest ICES assessment show that the Biomass 1+ (0,184 kt) is below PRI (Blim=0,196 kt). Nevertheless, the volume used as bait in the octopus's fishery (around 2 t/year, with sarding accounting approximately 600 kg during the fishing season 2016-17) is negligible compared to the ICES advised catch for 2020: 83 954t. However, the estimation of bait species purchased by the UoA was based on single query performed in 2017 among the fishers. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data. Thus, based on the precautionary approach the team considers that **SG100 is not met for the sardine in the Cantabrian Sea and Atlantic Iberian waters.**

References

Fernández et al. 2016, Fernández 2017, 2018b, 2019b, ICES 2019a, 2019b, 2019c, 2019d

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**Observer data on bait species should be provided in a consistent manner for the whole observed period. More important, the client shall provide an update estimation of the total volume of bait species and stocks used by the UoA.**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	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 PRI.	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 PRI.	There is a **strategy** in place for the UoA for managing main and minor primary species.
	Met?	**Yes**	**Yes**	**No**
Rationale				

Since there are no impacts on main primary species. **SG60 and SG80 are met by default.**

Since the UoA does not catch any primary species, the only minor primary species impacted by the UoA are the bait species purchased: mackerel, horse mackerel and sardine (2 different stocks). These four stocks are managed by the UE through TACs (based on the ICES advice) and quota allocation to Member States, landing obligation, technical measures, and different effort limitations.

The CEP collects some qualitative information about the types of bait used in the observed traps (see section 7.3.1.1.2 for more details), and these results confirmed that the use of artificial bait is widespread among the UoA, in particular in some ports. This preference is based on the fact that some fishers consider artificial bait as more efficient compared to frozen fish since the artificial bait (in blocks) does not need any care on land during long periods of time and lasts more time under seawater. The use of artificial bait helps to reduce the need to purchase bait species.

According to the estimates provided by the client, the UoA purchased around 1.30 tonnes of mackerel, 0.60 tonnes of sardines and 0.15 kg of horse mackerel during the 2016/17 fishing season (data provided by the client). When those volumes are compared against the total catches estimated by ICES during 2018 (1,026,437 tonnes of mackerel, 32,299 tonnes of sardine in the Bay of Biscay, 15,062 tonnes of sardine in the Cantabrian Sea and Iberian Waters, and 101,682 tonnes of horse mackerel) it can be inferred that the impact of the UoA on these stocks is negligible.

However, the monitoring on the bait species fails to provide volumes by species and stocks used by the UoA. The OFMP does not include any measure in relation to bait. The estimation of bait used by the UoA (species composition and volumens) is based on single query performed in 2017 among the fishers (see **section 7.3.1.1.2**). Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

Based on the above, the assessment team considers that **SG100 is not met**.

b	Management strategy evaluation			
	Guide 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 the	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly

		comparison with similar fisheries/species).	fishery and/or species involved.	about the fishery and/or species involved.
	Met?	**Yes**	**No**	**No**
Rationale				

The use of artificial bait reduces the need to purchase small pelagic species to be used as bait. The use of artificial bait is widespread among the Western Asturian ports included in the OFMP. This measure is likely to reduce the pressure on bait species. **SG60 is met**.

Data collected by observers hired by CEP confirm the use of artificial bait and ensures a regular monitoring on this topic.

According to the estimates provided by the client, the UoA purchased around 1.30 tonnes of mackerel, 0.60 tonnes of sardines and 0.15 tonnes of horse mackerel during the 2016/17 fishing season (data provided by the client). When those volumes are compared against the total catches estimated by ICES during 2018 (1,026,437 tonnes of mackerel, 32,299 tonnes of sardine in the Bay of Biscay, 15,062 tonnes of sardine in the Cantabrian Sea and Iberian Waters, and 101,682 tonnes of horse mackerel) it can be concluded that the impact of the UoA on these stocks is negligible.

However, the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Further, there is uncertainty about the origin (stock) of the sardines being used as bait. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data. Currently, there is no regulation and/or code of conduct detailing how to record and report bait species and stocks used by the UoA. **SG80 is not met.**

c	Management strategy implementation			
	Guide 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 overall objective as set out in scoring issue (a).**
	Met?		**No**	**No**
Rationale				

The use of artificial bait helps to reduce the need to purchase bait species. Data on bait types provided by the observer hired by the CEP confirm that artificial bait is widely used, in particular in some ports. According to the estimates provided by the client, the UoA purchases around 2 tonnes/year and might use up to 5 different bait species (only 3 of them are primary). But, observers data also confirm that the UoA is using bait from two overfished stocks according to ICES latest advice (ICES, 2019a, 2019d): Atlantic horse mackerel (*T. trachurus* in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c, and 7.e–k) and Sardine (*S. pilchardus* that might come from divisions 8.c and 9.a).

Moreover, there is no good monitoring on the bait species and volumes purchased by the UoA. The estimation of bait used by the UoA (species composition and volumens) is based on single query performed in 2017 among the fishers (see **section 7.3.1.1.2**). Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

We are not aware that measures/partial strategy for avoiding bait from not healthy stocks is being implemented successfully, therefore, **SG80 and SG100 are not met.**

d	Shark finning			
	Guide post	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?	**NA**	**NA**	**NA**
Rationale				

The only two shark species incidentally caught by the UoA during the observed period are the lesser spotted dogfish (*Scyliorhinus canicula*) and the greater spotter dogfish (*S.stellaris*) (Reference). None of them are primary species.

Therefore, there is no need to score this Scoring Issue.

e	Review of alternative measures			
	Guide post	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?	**NA**	**NA**	**NA**
Rationale				

The UoA catches are detailed in **section 7.3.1.1** based on the data provided by the observer program in place since 2014. The UoA does not catch any primary species. Thus, there is no need to score this Scoring Issue.

References

Fernández et al. 2016, Fernández 2018b, 2019b, ICES 2019a, 2019b, 2019c, ICES 2019d, Resolucion 21 de Noviembre 2019 de la Consejería de Desarrollo Rural, Agroganadería y Pesca, por la que se regula la pesca del pulpo comun durante la campaña 2019/20.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**Observer data on bait species should be provided in a consistent manner for the whole observed period. More important, the client shall provide an update estimation of the total volume of bait species and stocks used by the UoA.**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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 primary species			
	Guide post	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**
Rationale				

The geographical scope, depth range and characteristics of the fishing gear used (high survival rates of the discarded fraction), coupled with results from observers data provide adequate quantitative information to assess that no 'main' primary species are being caught by the UoA. Further, these results are also consistent with other studies on the catch composition of another artisanal octopus trap fishery held in the neighbouring region of Galicia (Bañón et al 2007), where no primary species were identified in the catches during the studied period (2009-2014).

In relation to bait species purchased by the UoA, the on-board observers hired by the CEP provide information on the type of bait specie used, while fishers provided an estimation of the volume of bait species purchased by the UoA during the 2016/17 fishing season (see **section 7.3.1.1.2** for more details). Results showed that up to 5 different bait species are being purchased (only 3 of them are primary: mackerel, horse mackerel and sardine), and the total volume of the different bait species accounts for only 2.5% of the UoA octopus catches during fishing season.

Thus, adequate information (qualitative and some quantitative information) is available to assess that the UoA does not impact on any main primary species. **SG60 and SG80 are met.**

However, the coverage of the observer program is not sufficien to ensure that the UoA catch composition is known with a high degree of certainty.

On the other hand, the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Further, there is uncertainty about the origin (stock) of the sardines being used as bait. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

Thus, the team considers that **SG100 is not met**.

Information adequacy for assessment of impact on minor primary species

b	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status.
	Met?			**Yes**
Rationale				

The observer programme run by the CEP provides comprehensive quantitative information on the catch composition of the UoA (see **section 7.3.1.1.1** for more details). Data from the observers confirm that no primary species is being caught the UoA.

In relation to bait species purchased by the UoA, the on-board observers hired by the CEP provide information on the type of bait specie used, while the fishers provided an estimation of the volume of the different minor primary bait species purchased during the 2016/17 fishing season (see **section 7.3.1.1.2** for more details). Results showed that reduced volumes are purchased of mackerel, horse mackerel and sardine. ICES performes regular stock assessment and advice of these species (see scoring table for PI 2.1.1 (b) and section 7.3.1.2.2 for more details).

Based on the above, the team considers that SG100 is met.

c	Information adequacy for management strategy			
	Guide post	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**
Rationale				

As the UoA catches no main primary species (see PI 2.1.1 table), SG60 and SG80 are met by default.

The observer programme run by the CEP provides comprehensive information on the catch composition of the UoA, including retained and discarded fractions and fate of the discarded species (see **section 7.3.1.1.1** for more details). The continuity of this observer programme is ensured, and the minimum coverage is stated at the OFMP (*"to perform at least 2 samplings on board per month to assess the impact on bycatches"*).

As stated in SI(a), the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Further, there is uncertainty about the origin (stock) of the sardines being used as bait. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data. Thus, **SG100 is not met**.

References

Fernández et al. 2016, Fernández 2017, 2018b, 2019b, ICES 2019a, 2019b, 2019c, 2019d, Resolucion 21 de Noviembre 2019 de la Consejería de Desarrollo Rural, Agroganadería y Pesca, por la que se regula la pesca del pulpo comun durante la campaña 2019/20.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Observer data on bait species should be provided in a consistent manner for the whole observed period. More important, the client**

	shall provide an update estimation of the total volume of bait species and stocks used by the UoA

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

PI 2.2.1 – Secondary species outcome

PI 2.2.1		The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit		
Scoring Issue		SG 60	SG 80	SG 100
a	Main secondary species stock status			
	Guide post	Main secondary species are **likely** to be above biologically based limits. OR If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding.	Main secondary species are **highly likely** to be above biologically based limits. OR If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding. 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 have considerable catches of the species**, to ensure that they collectively do not hinder recovery and rebuilding.	There is a **high degree of certainty** that main secondary species are above biologically based limits.
	Met?	**Not relevant**	**Not relevant**	**Not relevant**
Rationale				

With the only exception of the pink lady (*Charonia lampas*), which is an ETP species, all the other species and genera caught by the UoA (29 invertebrates, 23 teleosts and 2 sharks, see tables 7.3.1, 7.3.2 and 7.3.6) are considered as Secondary species for P2 purposes in this assessment.

Apart from the spiny starfish (which normally accounts for 4% of total catch in weigh but occasionally might rise up to almost 7%), none of the remaining species and genera caught by the UoA account for 2% of the total UoA catch in weight. Actually, only the comber (*Serranus cabrilla*), conger (*Conger conger*), velvet swimming crab (*Necora puber*) and the Henslow's swimming crab (*Polybius henslowii*) may account more than 1% of the catch in weight, and only in certain years. All the remaining species are consistently below 1%. Further, in the case of the spiny starfish (*Marthasterias glacialis*) observers on board the UoA reported that all individuals are returned to the sea alive (see table 7.3.4, 7.3.5 and 7.3.7). This species (as most of starfish) are well known for its resilience, they can easily survive to mutilations and due to their size and the hardness of their skin they are not in danger of being preyed while sinking in the water column after being released from the trap. Therefore, in accordance with SA3.4.3 this species shall not contribute to the definition of 'main', and it will also be assigned to the 'minor' subcomponent of secondary species, the same as for all the other secondary scoring elements identified.

Among the 5 different bait species purchased by the UoA, bogue (*Boops boops*) and garfish (*Bellone bellone*). Based on the estimation of volume of bait species purchased by the UoA done during the first surveillance audit, the team considers that these species are 'minor'.

According to the information presented above, the UoA does not impact on main secondary species. Therefore, this SI is not relevant.

	Minor secondary species stock status			
b	Guide post			Minor secondary species are highly likely to be above biologically based limits. OR If below biologically based limits', there is evidence that the UoA does not hinder the recovery and rebuilding of secondary species
	Met?			**Not assessed (PF4.1.4)**
Rationale				

Apart from the octopus, only 3 species are retained by the UoA (velvet crab –*Necora puber*-, slippery lobster -*Scyllarus arctus*-, and common prawn –*Palaemon serratus*-). This means that, for instance in 2014/15, 97.8% of the individuals captured were discarded because of not having commercial interest or because of being below its size limit (see **table 7.3.1**), and 98.6% of these discards were alive when removed from the trap (Fernández et al, 2016). Due to this fact, coupled with the low catches for those species recorded in the 12,562 observed traps during that fishing season (catches of 41 out of the 46 species and genera fall below 2kg), the assessment team considers that the impact of the UoA on the secondary species caught is likely to be negligible.

In relation to the bait species, the estimation of the total volume of bait species purchased by the UoA during a fishing season (around 2t/year to be divided into 3-5 different species, depending on the year) allow to consider that the impact of the UoA on the two minor secondary bait species identified (bogue and garfish) is also negligible.

However, there are no biologically based limits available (derived either from analytical stock assessment or using empirical approaches) for any of the minor secondary species, either caught by the UoA or purchased as bait species. Thus, all secondary scoring elements impacted by the UoA are considered as Data Deficient and the team should use Annex PF (RBF) for the assessment of data-deficient PI 2.2.1 (SA 7.7.3). However, the team elected to skip conducting a PSA when evaluating PI 2.2.1 for minor species, in accordance with PF4.1.4, and adjust downward the final PI score in accordance with clause PF5.3.2.

References

Fernández et al. 2016, Fernández 2018b, 2019.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**80 (as a result of applying PF4.1.4 & PF5.3.2)**
Information gap indicator	**More information sought / Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**Not applicable at this stage**
Condition number (if relevant)	**Not applicable at this stage**

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			
	Guide 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 above 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 above 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**
Rationale				

Since there are no impacts on main secondary species. **SG60 and SG80 are met by default.**

Despite the high selectivity of the fishery (octopus accounts for more than 90% of the total landings), this fishery involves a great deal of discarding alive bycatches (see section 7.3.1.1.1 for more details). The OFMP establishes the following objectives in relation to non-target species:

- Carry out at least two samplings per month with on-board observers to assess the impact of the fishery on bycatch (non-target) species.
- Keep the mortality of discarded individuals below 5%

Results from the observer program implemented by the CEP since 2014, makes clear that the only retained species (apart from the octopus) are: swimming velvet crab, slippery lobster, common prawn and white seabream. However, the retained volumes (or N individuals) of these species are very low. In relation to the discarded fraction, observers data show that 99% of the discarded individuals are alive when removed from the traps.

Further, the DGPM performs regular inspections at sea, ports (offloading) and auction points to ensure fishers comply with the regulations in relation to size limits of the non-target commercial species. However, most of the non-target catches are comprised by non-commercial species meaning that there is little incentive for the fishers to avoid returning these species alive to the sea (98% of the individuals caught as bycatch are returned to the sea).

The management of the fishery involves the regular analysis of all data collected to be presented to the Octopus Fishery Monitoring Committee (OFMC) before the fishing season starts, and an evaluation of the performance of the fishery by mid-fishing season. Data from the on-board observer program is regularly shared with all stakeholders within the OFMC (personel from SIGMA usually attends the committee), and results are discussed and analysed. Neverhteless, the reports made by CEP based on these data are not delivered to stakeholders.

The elements described above ensure the there is a strategy in place for the UoA for managing all secondary species caught by the UoA.

However, the UoA also purchases bait species. The observers hired by the CEP also collect some qualitative information about the types of bait used in the observed traps (see **section 7.3.1.1.2** for more details), and these results confirmed that two secondary species (bogue and garfish) are used as bait in this fishery.

According to an estimation offered by the client, the UoA consumes a total of around 2 tonnes of bait per fishing season (split between 3 or 5 species, depending on the year). So, it can be inferred that the impact of the UoA on these stocks is negligible.

However, the monitoring on the bait species fail to provide total volumes by species and stocks used by the UoA. The OFMP does not include any measure in relation to bait. The estimation of bait used by the UoA (species composition and volumens) is based on single query performed in 2017 among the fishers (see **section 7.3.1.1.2**). Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

Based on the above, the assessment team considers that **SG100 is not met**.

	Management strategy evaluation			
b	Guide post	The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species).	There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved.	**Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved.
	Met?	**Yes**	**No**	**No**
Rationale				

The implementation of an observer programme, coupled with the analysis of the CEP and the discussion and review performed by other stakeholders during the OFMC is considered likely to work based on the characteristics of this fishery and the fishing gear used. Most of the non-target catches are likely to be alive when hauled on board and released back to the sea.

The use of artificial bait reduces the need to purchase small pelagic species to be used as bait. The use of artificial bait is widespread among the Western Asturian ports included in the OFMP. This measure is likely to reduce the pressure on bait species. **SG60 is met**.

Data from observers show that more than 90% of the landed volume is comprised by the target species, and just a few of other species are retained (mainly swimming velvet crab and more occasionally slippery lobster and common prawn). 98% of the individuals caught as bycatch are returned to the sea, and 99% of them are alive when removed from the trap.

Data collected by observers hired by CEP confirm the use of artificial bait and ensures a regular monitoring on this topic. It was estimated by the client that the total volume of bait purchased by the client is about 2 tonnes/year, and this amount includes between 3 and 5 different species depending on the year (see **section 7.3.1.1.2** for more details). Thus, it can be inferred that the impact of the UoA on the two minor secondary bait species (bogue and garfish) is negligible.

However, the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Further, there is uncertainty about the origin (stock) of the sardines being used as bait. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.**SG80 is not met.**

	Management strategy implementation			
c	Guide 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?		**No**	**No**
Rationale				

The observer programme is being implemented by the CEP regularly since 2016 and the commitment to ensure this programme and ensure a minimum coverage (2 on board samplings per month) is detailed in the OFMP (see SIa). The team had access to all reports based prepared by CEP and SIGMA (the consultancy hired by the CEP to implement the programme) on observers' data.

The OFMC is meeting regularly according to what is indicated in the OFMP, and results from sampling on board are presented and discussed with the fishers and other stakeholders. The team had access to all minutes from the meetings.

The use of artificial bait helps to reduce the need to purchase bait species. Data on bait types provided by the observer hired by the CEP confirm that artificial bait is widely used, in particular in some ports. According to the estimates provided by the client, the UoA purchases around 2 tonnes/year and might use up to 5 different bait species (only 2 of them are secondary). But, observers data also confirm that the UoA is using bait from two stocks, bogue (*Boops boops*) and garfish (*Bellone bellone*) whose stock status are unknown. These two species are not managed based on biological reference points, and there are no biologically based limits available (derived either from analytical stock assessment or using empirical approaches) for any of these two, thus, they are both considered as Data Deficient.

Moreover, there is no good monitoring on the bait species and volumes purchased by the UoA. The estimation of bait used by the UoA (species composition and volumens) is based on single query performed in 2017 among the fishers (see **section 7.3.1.1.2**). Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

Outputs from the observers' data provide clear evidence that mortality of discarded individuals is kept well below 5%, but this is not enough for reaching SG80.

We are not aware that measures/partial strategy for avoiding bait from not healthy stocks, or undetermined stock status, is being implemented successfully, therefore, **SG80 and SG100 are not met.**

	Shark finning			
d	Guide post	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?	**Yes**	**Yes**	**Yes**
Rationale				

The Council Regulation (EC) No 1185/2003 amended by Regulation (EU) No 605/2013 prohibits to remove remove shark fins on board vessels and to retain on board, transhipor land shark fins.

Observers on board the UoA identified that two only sharks species can get incidentally caught in the traps: *Scyliorhinus canicula* (lesser spotted dogfish) and *S.stellaris* (greater spotted dogfish). A total of 13 individuals of the lesser spotted dogfish and 11 individuals of the greater spotter dogfish were recorded during the studied period. Despite the report does not include the size of these individuals, they should be juveniles, taking into account the size and design of the fishing gear. In all cases the individuals were alive when removed from the trap and released to the sea.

No sharks are retained in this fishery, therefore we can confirm with a high degree of certainty that shark finning is not taking place. SG100 is met.

	Review of alternative measures to minimise mortality of unwanted catch			
e	Guide post	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	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,

			species and they are implemented as appropriate.	and they are implemented, as appropriate.
	Met?	**Yes**	**Yes**	**Yes**

Rationale

The UoA catches are detailed in **section 7.3.1.1** based on the data provided by the observer program in place since 2014. Apart from the octopus, only the swimming velvet crab, the slippery lobster, common prawn and the white seabream were retained during the observed period.

Non-target species (other than octopus) account for less than 10% of the catches and 98% of those individuals are discarded (99% of them alive when removed from the traps).

The CEP maintains a regular on-board observer program which allows: (i) monitoring catches of non-target species and detecting any increase in the catches of a particular species; (ii) check the percentage of discards and their survival rates when removed from the trap. These data are annually reviewed by the CEP to assess if the objective of keeping the mortality of the discarded specimens below 5% is achieved. These data are presented to the OFMC before the fishing season starts and they could also be reviewed during the fishing season, if necessary (since the OFMC meets at least once during the fishing season). These mechanisms ensure that there is, at least, an annual 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. **SG60, SG80 and SG100 are met.**

References

List any references here, including hyperlinks to publicly-available documents.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**Observer data on bait species should be provided in a consistent manner for the whole observed period. More important, the client shall provide an update estimation of the total volume of bait species and stocks used by the UoA**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	Qualitative information is **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.	Some quantitative 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.	Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The characteristics of the fishing gears used (highly selective and high survival rates of the discarded fraction), coupled with results from the current observer coverage provide adequate quantitative information to assess that no 'main' secondary species are being caught by the UoA (this result detail retained and discarded individuals and weights, and the fate of the discarded species). Further, these results are also consistent with other studies on catch composition from another artisanal octopus trap fishery held in the neighbouring region of Galicia (Bañón et al 2007), where the only species accounting ≥5% of the total catch volume during the studied period (2009-2014) was the swimming velvet crab (*Necora puber*). However, in the case of the Asturian octopus fishery the contribution of this species to the UoA catch volume was kept consistently below 5% during the studied period (2016-2019, see **section 7.3.1.1.1** for more details).

In relation to bait species purchased by the UoA, the on-board observers hired by the CEP provide information on the type of bait specie used, while fishers provided an estimation of the volume of bait species purchased by the UoA during the 2016/17 fishing season (see **section 7.3.1.1.2** for more details). Results showed that up to 5 different bait species are being purchased (only 2 of them are secondary: bogue and garfish), and the total volume of the different bait species accounts for only 2.5% of the UoA octopus catches during fishing season.

Thus, adequate information (qualitative and some quantitative information) is available to assess that the UoA does not impact on any main secondary species. **SG60 and SG80 are met.**

However, the coverage of the observer program is insufficient to ensure that the UoA catch composition is known with a high degree of certainty.

On the other hand, the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data.

Finally, there are no biologically based limits available for any of the minor secondary species, either caught by the UoA or purchased as bait species. Thus, all secondary scoring elements impacted by the UoA were considered as Data Deficient. The status of these species is unknown.

Thus, the team considers that **SG100 is not met**.

	Information adequacy for assessment of impacts on minor secondary species			
b	Guide post			Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status.
	Met?			**No**
Rationale				

The observer programme run by the CEP provides comprehensive quantitative information on the catch composition of the UoA (see **section 7.3.1.1.1** for more details). Data from the observers confirm that only minor secondary species are caught the UoA.

Apart from octopus, only the swimming velvet crab, slippery lobster, common prawn and white seabream (1 individual) were retained during the studied period. Further, observer data has proved that post-capture survival at the moment of being released from the traps is know to be very high (99% of the discards were returned to the sea alive, according to CEP (2018a) and Fernández (2019b)).

However, there are no biologically based limits available, derived either from analytical stock assessment or using empirical approaches, for any of the secondary species and genera caught by the UoA. The status of these species is unknown

In relation to bait species purchased by the UoA, the on-board observers hired by the CEP provide information on the type of bait specie used, while the fishers provided an estimation of the volume of the different minor primary bait species purchased during the 2016/17 fishing season (see **section 7.3.1.1.2** for more details). Results showed that the UoA purchases about 2t of bait species per year, which is a reduced volume taking into account that they might using up to 5 different bait species. However, there are no biologically based limits available, derived either from analytical stock assessment or using empirical approaches, for any of the secondary species and genera caught by the UoA.

Based on the fact that there is little or even no information on the status of most of the secondary species caught by the UoA or used as bait, together with the uncertainty in relation to the volume of secondary bait species purchased by the UoA, the team considers that **SG100 is not met**.

	Information adequacy for management strategy			
c	Guide post	Information is adequate to support **measures** to manage **main** secondary species.	Information is adequate to support a **partial strategy** to manage **main** secondary species.	Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**.
	Met?	**Yes**	**Yes**	**No**
Rationale				

As the UoA catches no main secondary species (see PI 2.2.1 table), SG60 and SG80 are met by default.

The observer programme run by the CEP provides comprehensive information on the catch composition of the UoA, including retained and discarded fractions and fate of the discarded species (see **section 7.3.1.1.1** for more details). The continuity of this observer programme is ensured, and the minimum coverage is stated at the OFMP (*"to perform at least 2 samplings on board per month to assess the impact on bycatches"*).

The OFMP includes among its objective to ensure that the mortality among the discarded fraction is maintained below 5%. Results from the current observer program are adequate to support a strategy to manage all secondary species and evaluate it. However, the coverage of the observer program is insufficient to ensure that the strategy is being evaluated with a high degree of certainty.

As stated in SI(a), the estimation of bait species purchased by the UoA was based on a single query performed in 2017 among the fishers. Despite a recommendation was set to improve data availability on this topic, the fleet did not collect further and more complete data. Thus, **SG100 is not met**.

References

Fernández et al. 2016, Fernández 2018b, 2019b, Resolucion 21 de Noviembre 2019 de la Consejería de Desarrollo Rural, Agroganadería y Pesca, por la que se regula la pesca del pulpo comun durante la campaña 2019/20

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Observer data on bait species should be provided in a consistent manner for the whole observed period. More important, the client shall provide an update estimation of the total volume of bait species and stocks used by the UoA**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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?	**NA**	**NA**	**NA**
Rationale				

Among the 61 different scoring elements identified by the team to be assessed as P2-species components (**table 7.3.8** in **section 7.3.1.1**), the pink lady (*Charonia lampas lampas*) is the only species impacted by the UoA that fits the ETP definition.

There are no national or international requirements that set limits for this species. Thus, this SI is not applicable.

b	Direct effects			
	Guide post	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.
	Met?	**Yes**	**Yes**	**No**
Rationale				

There are no records of interactions between the octopus trap fishery and out-of-scope species (seabirds, marine mammals and sea turtles).

As detailed in **section 7.3.1.4**, observers on board the UoA have been collecting comprehensive data on catch species composition. The only ETP species impacted by the UoA is the pink lady (*C. lampas*). **Table 7.3.16** shows that the number of individuals caught by vessel and fishing trip varies from 0.13 in 20117/18 to 0.93 in 2018/19 and 0.21 in 2019/2020, while the average of all the observations made up to date is 0.39 individuals of *C. lampas* caught by vessel and fishing trip. Taking into account the number of vessels targeting octopus during each fishing season, and the average fishing days per vessel and fishing season, it can be inferred that an average of 632.83 individuals of pink lady were caught and released back to the sea every year during the observed period, ranging between a minimum of 444 individuals in 2014/15 and a maximum of 1,595.4 individuals in 2017/18.

The observers recoded that all individuals of *C. lampas* caught were returned to the sea, and 100% of them were alive at the time of being removed from the traps (**Table 7.3.4, Table 7.3.5, and Table 7.3.7**).

Based on the information presented above the team considers that direct effects of the UoA are highly likely to not hinder recovery of ETP species, and therefore, **SG60 and SG80 are met.**

Nevertheless, there are no studies on the abundance of *C. lampas* in Asturias and its conservation status and trend is completely unknown. Moreover, the only study done of post-capture mortality of *C. lampas* was done with individuals captured by set nets (100% survival), but no study has been done so far with octopus traps. Based on this, the team considers that there is not a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species, and therefore, **SG 100 is not met**.

	Indirect effects			
c	Guide post		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.
	Met?		**Yes**	**Yes**
Rationale				

Although there is no in depth studies on thee post-capture mortality for the *C. lampas*, this is supposed to be a highly resilient species.

In 2014, the CEP performed an experiment the test the post-capture survival rate of this species, since they found that in the set net fishery (miños), *C. lampas* accounted for up to 1,53% of the total catches in weight. They took 13 individuals caught during the observed fishing trip and kept them in the lab during 15 days. After that period of time all the individuals still alive and in good conditions and were released back to the sea.

Based on the information presented above the team considers that there is a high degree of certainty (>90%ile) that there are no significant detrimental indirect effects of the UoA on the pink lady. **SG80 and SG100 are met.**

References

Fernández 2015a, 2015b, 2017, 2018, 2019a, 2019b, Fernández et al. 2016, CEP 2018a

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**It would be helpful to find out if there are new studies on the abundance and status of *C. lampas* in the western Asturias coast, or a neighgouring area**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

PI 2.3.2 – ETP species management strategy

PI 2.3.2	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. Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species		
Scoring Issue	SG 60	SG 80	SG 100
a Management strategy in place (national and international requirements)			
Guide 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?	**NA**	**NA**	**NA**
Rationale			

The UoA is not impacting any ETP species subject national or international requirements that set limits. Thus, this SI is not applicable.

b Management strategy in place (alternative)			
Guide 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?	**Yes**	**Yes**	**No**
Rationale			

Despite the high selectivity of the fishery (octopus accounts for more than 90% of the total landings), this fishery involves a great deal of discarding alive bycatches (see **section 7.3.1.1.1** for more details). The OFMP establishes the following objectives in relation to non-target species, including ETP species:

- Carry out at least two samplings per month with on-board observers to assess the impact of the fishery on bycatch (non-target) species.
- Keep the mortality of discarded individuals below 5%

Results from the observer program implemented by the CEP since 2014, makes clear that the only ETP species impacted by the UoA is the pink lady (*C. lampas*). As explained in PI 2.3.1, all individuals are returned to the sea and 100% of them were alive when removed from the traps.

Further, the DGPM performs regular inspections at sea, ports (offloading) and auction points to ensure fishers comply with the applicable regulations.

The management of the fishery involves the regular analysis of all data collected to be presented to the Octopus Fishery Monitoring Committee (OFMC) before the fishing season starts, and an evaluation of the performance of the fishery by mid-fishing season. Data from the on-board observer program is regularly shared with all stakeholders within the OFMC (personel from SIGMA usually attends the committee), and results are discussed and analysed. Neverhteless, the reports made by CEP based on these data are not delivered to stakeholders

In relation to the *C. lampas*, the authorities have implemented awareness-raising campaigns aimed at fishers and divers alike, not to collect live specimens of these large gastropods. Fishers have instructions to immediately return all captured specimens to the sea once located in the traps.

The elements described above ensure the there is a strategy in place that is expected to ensure the UoA does not hinder the recovery of the pink lady. The team considers that this strategy is appropriate to the scale, intensity an cultural context of the fishery in assessment. **SG60 and SG80 are met.**

However, a "comprehensive strategy" is defined by MSC as a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses. The team considers that the existing strategy does not meet these requirements. **SG100 is not met.**

	Management strategy evaluation			
c	Guide 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**
Rationale				

Although this species is relatively scarce and dispersed throughout the Cantabrian Sea and the Atlantic Ocean, some sources of information indicate that the species can be found all along the Asturian coast (Anadón-Álvarez et al 2007).

All individuals of *C. lampas* caught by the UoA are returned to the sea straight after being hauled on board. Observers on board the UoA reported that 100% were alive when removed from the trap. Limited experiment on post-capture survival rates for this species performed by the CEP found that all studied individuals were still alive 15 days after being released from gillnet.

There is an objective basis for confindence that the strategy described in SI(a) will work. **SG60 and SG80 are met.**

However, the status of the *C. lampas* in the Western Asturias coast (or in the Cantabrian Sea) is unknown. It cannot be considered that a quantitative analysis supports high confidence that the strategy will work. **SG100 is met.**

	Management strategy implementation			
d	Guide 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**	**No**
Rationale				

The observer programme is being implemented by the CEP regularly since 2016 and the commitment to ensure this programme and ensure a minimum coverage (2 on board samplings per month) is detailed in the OFMP (see SIa). The team had access to all reports based prepared by CEP and SIGMA (the consultancy hired by the CEP to implement the programme) on observers' data.

The OFMC is meeting regularly according to what is indicated in the OFMP, and results from sampling on board are presented and discussed with the fishers and other stakeholders. The team had access to all minutes from the meetings.

Data reported by observers confirm that 100% of the indivuals of *C. lampas* caught by the UoA are returned alive to the sea. The experiment run by the CEP on the post-capture survival rate for this species found that 100% of the individuals were still alive 15 days after being caught and released from a set net.

Based on all the information presented above, **SG80 is met** and likely SG100 but will need to be confirmed in later stages of the assessment

	Review of alternative measures to minimize mortality of ETP species			
e	Guide post	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**	**Yes**

Rationale

According to data provided by the observers, there is no UoA-related mortality of *C. lampas* or any other ETP species.

The CEP maintains a regular on-board observer program which allows: (i) monitoring catches of non-target species and detecting any increase in the catches of a particular species; (ii) check the percentage of discards and their survival rates when removed from the trap. This data are annually reviewed by the CEP to assess if the objective of keeping the mortality of the discarded specimens below 5% is achieved. This data are presented to the OFMC before the fishing season starts and they could also be reviewed during the fishing season, if necessary (since the OFMC meets at least once during the fishing season). This mechanism ensures that there is, at least, an annual 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. **SG60, SG80 and SG100 are met.**

References

Fernández 2015a, 2015b, 2017, 2018, 2019a, 2019b, Fernández et al. 2016, CEP 2018a

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought. It would be helpful to find out if there are new studies on the abundance and status of *C. lampas* in the western Asturias coast, or a neighgouring area.**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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: - Information for the development of the management strategy; - Information to assess the effectiveness of the management strategy; and - Information to determine the outcome status of ETP species		
Scoring Issue		SG 60	SG 80	SG 100
a	Information adequacy for assessment of impacts			
	Guide post	Qualitative information is **adequate to estimate** the UoA related mortality on ETP species. **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.	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. **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.	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.
	Met?	**Yes**	**Yes**	**No**
Rationale				

The CEP maintains a regular on-board observer program which allows: (i) monitoring catches of non-target species and detecting any increase in the catches of a particular species; (ii) check the percentage of discards and their survival rates when removed from the trap. Results are presented in **section 7.3.1.1.1.**

Further, the CEP performed a limited study on the post-capture survival rate for the *C. lampas* and found that all specimens remained alive 15 days after being released from a set net.

Thus, adequate quantitative information is available to assess the UoA-related mortality and impact and to determine that the UoA does not pose a threat to protection and recovery of the *C. lampas* or any other ETP species. **SG60 and SG80 are met.**

However, the coverage of the observer program is insufficient to assess with a high degree of certainty the magnitude of UoA-related impacts, mortalities and injuries caused to *C. lampas.*

Further, information on the status of this species in the Cantabrian Sea is scarce and its current status remains unknown

Thus, the team considers that **SG100 is not met**.

	Information adequacy for management strategy			
b	Guide 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**	**No**

Rationale

The available information (observer programme and study on post-capture survival rate for the *C. lampas*) is considered adequate to measure trends and support a strategy (as described in PI2.3.2a) to manage impacts on *C. lampas* and any other ETP species. **SG60 and SG80 are met.**

However, it is not considered that a comprehensive strategy is in place to manage impacts on ETP species. The status of the only ETP species impacted by the UoA remains unknown. **SG100 is not met.**

References

Fernández 2015a, 2015b, 2017, 2018, 2019a, 2019b, Fernández et al. 2016, CEP 2018a

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**It would be helpful to find out if there are new studies on the abundance and status of *C. lampas* in the western Asturias coast, or a neighgouring area**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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 covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates		
Scoring Issue		SG 60	SG 80	SG 100
a	Commonly encountered habitat status			
	Guide 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**
Rationale				

As explained in **section 7.3.1.5.1** the UoA fishing effort is being tracked since the 2017/18 fishing season. It is observed that the vessels operate mostly in waters shallower than 50 m depth and UoA fishing effort maps are available.

The seabottom type of the most commonly used fishing grounds in the Asturian waters is available on-line (https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf). This information confirms that rocky bottoms (rock and 'petón') are the commonly encountered habitats for the UoA. This is also confirmed by the habitat map produced EMODnet (see section 7.3.1.5.1).

Most of the studies on the impact of fishing gears on ecountered habitats are focused on bottom-contacting mobile fishing gears (e.g. bottom trawling) and dredging. Traps are bottom-contacting fixed gears, so their impact on the seabed do not raise concern and there are no many studies regarding this issue. Besides, the fishing season last from mid-December until mid-July, so there are 5 months per year that there are no impact of the UoA on the seabottom.

Since the traps are fixed gears and the closed season encompases about 5 months per year, the team considers that it is highly unlikely that the UoA reduces structure and function of the commonly encountered habitats (rocky substrates) to a point where there would be serious or irreversible harm. **SG60 and SG80 are met likely met.**

b	VME habitat status			
	Guide 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?	**NA**	**NA**	**NA**
Rationale				

The fishery does not take place on areas with VMEs or with habitats listed in the threatened and declining habitats in the ecoregion according to OSPAR (see **section 7.3.1.5.1**). Therefore, this SI is not applicable.

	Minor habitat status			
c	Guide 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?			**No**
Rationale				

As explained in **section 7.3.1.5.1** the UoA fishing effort is being tracked since the 2017/18 fishing season. It is observed that the vessels operate mostly in waters shallower than 50 m depth and UoA fishing effort maps are available.

The seabottom type of the most commonly used fishing grounds in the Asturian waters is available on-line (https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf). This information confirms that 'cascajo' (substrate formed by boulders of variable size), together with sandy and muddy bottoms are minor habitats for the UoA. This is also confirmed by the habitat map produced EMODnet (see **section 7.3.1.5.1**).

Most of the studies on the impact of fishing gears on ecountered habitats are focused on bottom-contacting mobile fishing gears (e.g. bottom trawling) and dredging. Traps are bottom-contacting fixed gears, so their impact on the seabed do not raise concern and there are no many studies regarding this issue.

Besides, the fishing season last from mid-December until mid-July, so there are 5 months without any impact of the UoA on the seabottom.

Since minor encountered habitats are mainly soft seabottoms (sand and mud), traps are fixed gears and the closed season encompases about 5 months per year, the team considers that it is highly unlikely that the UoA reduces structure and function of the minor habitats to a point where there would be serious or irreversible harm. However, there are no evidence supporting this conclusion and **SG100 is not met.**

References

Fernández 2018, 2019, ICES 2019e

https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought on the impact of traps on the seabottom**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**
Rationale				

The Spanish and Asturian Governments have several regulations restricting certain fishing operations in several areas, either permantly or temporarily (See **section 7.3.1.5.2**); but none of those restrictions are referred to the octopus trap fishery. However, the assessed fishery is also subject to a closed season, since the fishery is open from mid-December to mid-July. This closure is related to the biology and catchability of the species, the fleet moves onto different fishing gears and target different species during summer. This means that the fishery is closed 5 months per year.

As explained in PI2.4.1, traps are bottom-contacting gears, but since they are fixed, their impact on the seabed do not raise concern. Each lines of traps shall be identified (to improve monitoring and avoid IUU fishing). Further, the DGPM performs regular inspections at sea, ports (offloading) and auction points to ensure fishers comply with the regulations in relation to number of traps on board.

Since 2017 it is mandatory for all vessels included in the OFMP to have a GPS device installed and report their positions to the CEP. This data allows to have comprehensive information on the geographicl distribution of the fishing effort performed by the UoA.

The management of the fishery involves the regular analysis of all data collected (including observers on board about incidences with habitat-forming species that may form VMEs and may be indicative of the occurrence of VMEs) to be presented to the Octopus Fishery Monitoring Committee (OFMC) before the fishing season starts, and an evaluation of the performance of the fishery by mid-fishing season

The team considers that the measures indicated above constitute a partial strategy in place that is expected to achieve the Habitat Outcome 80 level of performance or above. **SG60 and SG80 are met**.

However, these measures were not designed to manage impact on the habitat component specifically, so it cannot be considered that they constitute a strategy. **SG100 is not met.**

b	Management strategy evaluation			
	Guide post	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**
Rationale				

The fishing gear type (fixed gear) and the bottom types overlapping with the assessed fishery (both commonly encountered and minor habitats) are considered measures likely to work, since abrasion (one of the pressures on the ecoregion identified by ICES, ICES 2019e) is minimal in the case of traps. ICES (2019a) has not identified these fhishing gears (traps) are a concern for the marine habitats. Further, the fishery is closed from mid-July until mid-December. **SG60 is met.**

Reporting GPS data while targeting octopus is mandatory to be included in the OFMP. This data is compiled and analysed by the CEP, so measures could be adopted in the case of detecting any compliance of concern related to marine habitat conservation. Results from 2017/18 and 2018/19 fishing seasons confirm that the fleet is operating normally. On observers on board the UoA have never reported about any incidence related with habitat-forming species that may form VMEs (corals) or may be indicative of the occurrence of VMEs (*Zostera spp.*). **SG80 is met**. However, the information of the impact of this type of fishing gear on habitats encountered is poor, and more detailed analysis of the GPS data against the available habitat data layers could help to test with high degree of confidence whether the partial strategy will work. **SG100 is not met.**

	Management strategy implementation			
c	Guide post		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**
Rationale				

All vessels are now reporting their GPS data to the CEP. Every year, the OFMP establishes the closed season for this fishery and no concerns on compliance have been raised by any stakeholder during the first certificacion period. This closure is integrated in the standard fishing operations of the small scale vessels (they move from one fishing gear to another throughout the year, depending on catchability, regulations and price).

The observer programme is being implemented by the CEP regularly since 2016 and the commitment to ensure this programme and ensure a minimum coverage (2 on board samplings per month) is detailed in the OFMP (see SIa). The team had access to all reports based prepared by CEP and SIGMA (the consultancy hired by the CEP to implement the programme) on observers' data.

The OFMC is meeting regularly according to what is indicated in the OFMP, and results from sampling on board are presented and discussed with the fishers and other stakeholders. The team had access to all minutes from the meetings.

SG80 is met.

The CEP reports and minutes of the CM provide clear quantitative evidence that the partial strategy is being implemented successfully. However, until the information of the impact of this fishing gear on habitats encountered is improved and detailed analysis of the GPS data against the available habitat layers are available, it is not possible to ensure that the partial strategy is achieving its objective as outlined in SI(a), **SG100 is not met.**

	Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs			
d	Guide post	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?	**NA**	**NA**	**NA**
Rationale				

The fishery does not operate on VMEs. Thus, this scoring issue need not be scored.

References

Fernández 2018, 2019, CS 2019, 2020, ICES 2019e

https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/

https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**More information to be sought about studies on the impact of traps on the seabottom Analysis of the GPS data against available habitat data layers**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	The types and distribution of the main habitats are **broadly understood**. **OR** **If CSA is used to score PI 2.4.1 for the UoA:** Qualitative information is adequate to estimate the types and distribution of the main habitats.	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. **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 types and distribution of the main habitats.	The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats.
	Met?	**Yes**	**Yes**	**No**
Rationale				

Both the CEP mapping of the fishing ground and the habitat map developed by EMODnet provide enough information about the nature, distribution and vulnerability of the main habitats in the UoA area, in particular in relation to the scale and intensity of the UoA. This is a small scale fishery carried out with small vessels and light gears which stops for, at least, 5 months per year. **SG60 and SG80 are met.**

The CEP mapping of the fishing grounds does not deal with the distribution of all habitats over their entire range, while the map provided by EMODnet is a broad-scale predictive model, but it might not pay particular attention to the occurrence of VME, and in this case in particular to Zostera beds. **SG100 is not met.**

b	Information adequacy for assessment of impacts			
	Guide post	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	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:**	The physical impacts of the gear on all habitats have been quantified fully.

		consequence and spatial attributes of the main habitats.	Some quantitative information is available and is adequate to estimate the consequence and spatial attributes of the main habitats.	
	Met?	**Yes**	**Yes**	**No**

Rationale

Despite there is little information about the impacts of this type of gear on hard habitats (rock and 'petons'), the geographical information provided by the fleet to the CEP allows to identify the spatial extent of interaction and timing and location of use of the fishing gear, as explained in **section 7.3.1.5.1.** Moreover, pots-traps are considered to have a minimal impact upon the environment, apart from the potential for ghost fishing, and are also considered a responsive fishing gears in terms of habitat impact (scoring 1.3-1.7 in a scale from 0 to 2, where 2 are the fishing gears most responsive with habitat impacts, like pole and line and diving) (Gieve et al. 2014). These authors considered that the effect of a trap on the seabed will be determined by its weight and structure, as well as how far and fast it moves before ascending, since traps often drag over the bottom for some distance, which may cause seabed damage, specially when hauling. Octopus traps used in the UoA are small (39 x 30 x 26 cm) and light (5.2 kg), and are most usually deployed in lines of 35 traps together (Fernández et al. 2016). Taking into account that octopus traps are not raising any particular concern about their impact on the marine habitat, **SG60 and SG80 are met.**

However, it cannot be considered that impacts of the gear on all habitats have been fully quantified. **SG100 is not met.**

	Monitoring			
c	Guide post		Adequate information continues to be collected to detect any increase in risk to the main habitats.	Changes in all habitat distributions over time are measured.
	Met?		**Yes**	**No**

Rationale

The information collected by the fleet (GPS positions), the observers records, and the available habitat mappings (in particular the EMODnet habitat mapping which is being regularly updated, latest update in 2019) ensures that **the fishery meets SG80**.

Despite the EMODnet is being regularly updated, the team considers that **SG100 is not met.**

References

Gieve et al. 2014, Fernández et al. 2016, Fernández 2018, 2019, CS 2019, 2020, ICES 2019e

https://tematico.asturias.es/dgpesca/doc/mapa_caladeros_web.pdf

https://www.emodnet-seabedhabitats.eu/access-data/launch-map-viewer/

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**

Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**
Rationale				

Serious or irreversible harm to "structure or function" means changes caused by the UoA that fundamentally alter the capacity of the ecosystem to maintain its structure and function. For the ecosystem component, this is the reduction of key features most crucial to maintaining the integrity of its structure and functions and ensuring that ecosystem resilience and productivity is not adversely impacted. This includes, but is not limited to, permanent changes in the biological diversity of the ecological community and the ecosystem's capacity to deliver ecosystem services

Serious or irreversible harm in relation to the capacity of the ecosystem to deliver ecosystem services could include:

- Trophic cascade (i.e., significantly increased abundance, and especially decreased diversity, of species low in the food web) caused by depletion of predators and especially 'keystone' predators;
- Depletion of top predators and trophic cascade through lower trophic levels caused by depletion of key prey species in 'wasp-waist' food webs;
- Severely truncated size composition of the ecological community (e.g., greatly elevated intercept and steepened gradient in the community size spectrum) to the extent that recovery would be very slow due to the increased predation of intermediate-sized predators;
- Gross changes in the species diversity of the ecological community (e.g., loss of species, major changes in species evenness and dominance) caused by direct or indirect effects of fishing (e.g., discarding which provides food for scavenging species);
- Change in genetic diversity of species caused by selective fishing and resulting in genetically determined change in demographic parameters (e.g., growth, reproductive output).

Due to the scale of the fishery (small scale and closed at least 5 months per year), the biology and ecology of the target species (see section 7.2.1.1 and section 7.3.1.5.3). The observer programme in place provides comprehensive information on the catches of the fishery, including post-capture survival rate when the individuals are being removed from the traps. This allow to assess that indirect effects of the fishery on key ecosystem elements such as biodiversity and trophic structure are negligible since almost all non-target species are released back to the sea alive.

In a larger scope, ICES does not include the small scale fisheries among the relevant pressures on the bay of Biscay and Iberian coast ecoregion. A general decrease in fishing effort in the region (in many cases because of a reduction in the fleet) has contributed to an overall decline in the fishing mortality (F) of commercial fish stocks since 1988. The mean F is now closer to the level that produces maximum sustainable yield (MSY), see **figure 7.3.17** in **section 7.3.1.5.4**. Indicators like the large fish indicator (LFI) index (describing the proportion – by weight – of the demersal fish community on survey catch larger than regional length thresholds) can be used to monitor changes in the fish populations and foodwebs. In the Bay of Biscay, the LFI index has shown a positive temporal trend since the year 2000. However, there is no trend in the LFI in Portuguese waters, and the index shows high interannual variability. (see figure 7.3.18). Another index to

be used is the Marine Trophic Index (MTI), which tracks the mean trophic level of fishery catches from an ecosystem, adequately tracks changes in mean trophic level of an ensemble of exploited species in response to fishing pressure. However, one of the disadvantages of this indicator is that declines in trophic level can be masked by geographic expansion and/or the development of offshore fisheries, where higher trophic levels of newly accessed resources can overwhelm fishing-down effects closer inshore. Sea AroundUs (http://www.seaaroundus.org/data/#/eez/963/marine-trophic-index) show that the MTI should not be used without accounting for changes in the spatial and bathymetric reach of the fishing fleet, and they develop a new index that accounts for the potential geographic expansion of fisheries, called the region-based MTI (RMTI). To calculate the RMTI, the potential catch that can be obtained given the observed trophic structure of the actual catch is used to assess the fisheries in an initial (usually coastal) region. Actual catch exceeding potential catch, indicates exploitation of a new fishing region. The MTI of the new region can then be calculated and subsequent regions are determined in a sequential manner. This method improves upon the use of the Fishing-in-Balance (FiB) index in conjunction with the original MTI calculated over the whole time series because assumptions of fleet and stock stationarity over the entire time series and geographic area are removed. Figure below presents the RMTI of the catches in the waters of Spain (Northwest), showing and stable pattern in recent decades.

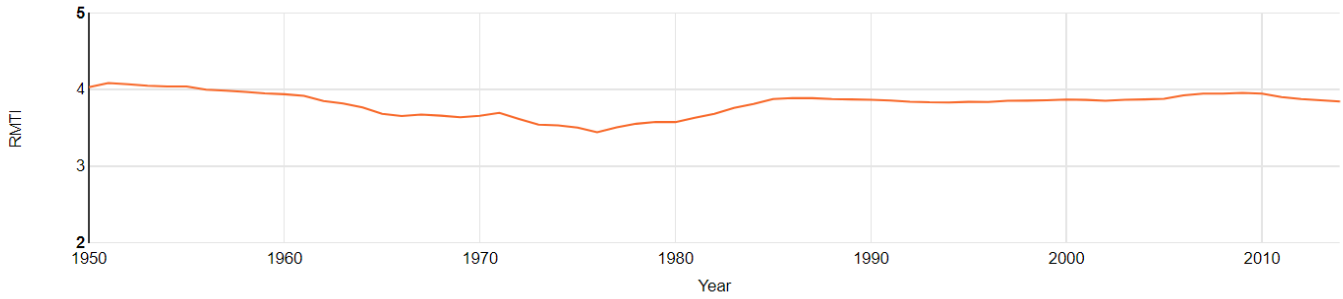


Figure PI 2.5.1.1.1. Region-based Marine Trophic Index of the catch in the waters of Spain (Northwest). Source: http://www.seaaroundus.org/data/#/eez/963/marine-trophic-index

Based on the information (negligible impact of the fishery on biodiversity and trophic structure, dercreasing F in the ecoregion, stable RMTI) presented above, **SG60, SG80 and SG100 are met.**

References

ICES 2019e

http://www.seaaroundus.org/data/#/eez/963/marine-trophic-index

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA 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**
Rationale				

We consider the measures contained in the OFMP (observer programme, GPS, analysis by the CEP, multi-stakeholder review at the OFMC) make up a partial strategy that allow assessing the indirect impact of the UoA on ecosystem elements (biodiversity and trophic structure). The OFMP includes among its objectives a minimum observer coverage and to ensure that mortality of non-target species is kept below 5% (in number of individuals). The objective of keeping the mortality of non-target species below that threshold has been achieved. **SG60 and SG80 are met.**

However, these measures were not designed to manage impact on the ecosystem component specifically, so it cannot be considered that they constitute a strategy. **SG100 is not met.**

b	Management strategy evaluation			
	Guide post	The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ 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**
Rationale				

The characteristics of this fishery (small scale, fixed gear, negligible mortality in the discarded fraction, closed 5 months per year) and its target species (octopus is a short life span species with a high trophic level, but it cannot be considered as not a top predator) provides that the partial strategy in place (as described in the SIa above) are likely to work. **SG60 is met.**

The OFMP establishes that vessels' participation in the observer programme and GPS data reporting is mandatory. This data is compiled and analysed by the CEP, so measures could be adopted in the case of detecting any compliance of concern related to mortality of non-target species and/or habitats. Results from confirm that the fleet is operating normally and non-target mortality is below the threshold established at the OFMP. **SG80 is met**. However, no testing supports high confidence that the partial strategy will work. **SG100 is not met**

	Management strategy implementation			
C	Guide 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**

Rationale

Data on non-target species collected by the observers on board the UoA are being reported and analysed. All vessels are now reporting their GPS data to the CEP. Every year, the OFMP establishes the closed season for this fishery and no concerns on compliance have been raised by any stakeholder during the first certificacion period. This closure is integrated in the standard fishing operations of the small scale vessels (they move from one fishing gear to another throughout the year, depending on catchability, regulations and price).

The observer programme is being implemented by the CEP regularly since 2016 and the commitment to ensure this programme and ensure a minimum coverage (2 on board samplings per month) is detailed in the OFMP (see SIa). The team had access to all reports based prepared by CEP and SIGMA (the consultancy hired by the CEP to implement the programme) on observers' data.

The OFMC is meeting regularly according to what is indicated in the OFMP, and results from sampling on board are presented and discussed with the fishers and other stakeholders. The team had access to all minutes from the meetings.

SG80 is met.

The CEP reports and minutes of the CM provide clear quantitative evidence that the partial strategy is being implemented successfully. However, until the information of the impact of this fishing gear on habitats encountered is improved and detailed analysis of the GPS data against the available habitat layers are available, it is not possible to ensure that the partial strategy is achieving its objective as outlined in SI(a), **SG100 is not met.**

References

ICES 2019e

http://www.seaaroundus.org/data/#/eez/963/marine-trophic-index

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**Information sufficient to score PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	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**	
Rationale				

Information collected by the assessed fleet (observer's data, GPS data, fishery data), together with the analysis performed by the CEP, data on habitat types (EMODnet), data collected and analysed by ICES and other Institutions (e.g. Sea Around Us) at ecoregion level is considered adequate to broadly understand the key elements of the ecosystem. **SG60 and SG80 are met.**

b	Investigation of UoA impacts			
	Guide post	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**
Rationale				

The impacts of the management or advisory unit can be inferred based on data obtained on catch species composition, community distribution, and trophic structure. The issue of the post-capture mortality of non-target species has been investigated. **SG60 an SG 80 are met**. However, **SG100 is not met.**

c	Understanding of component functions			
	Guide post		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**
Rationale				

The fleet provides comprehensive information on the catch composition, see **section 7.3.1.1.1**. All species impacted by the UoA (**table 7.3.8**) are coastal and shallow water species which functions are known at a ecosystemic level. **SG80 is met. However, SG100 is not met** since it cannot be inferred that the main funcions of these components in the ecosystem are understood.

d	Information relevance			
	Guide post		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**
Rationale				

Observer's data on catch composition and fate of the discarded fraction, GPS data and all the fishery-related data (catches, N vessels, etc) provide adequate information on the impacts of the UoA on primary/secondary/ETP and habitats to allow some of the main consequences for the ecosystem to be inferred. **SG80 is met.** However, this is not true for all of the species and habitat components. More information on medium term post-capture mortality (after being released) and on the impacts of this type of gears on the affected habitats would be required to score 100. **SG100 is not met.**

e	Monitoring			
	Guide post		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**
Rationale				

The information collected by the fleet (GPS positions), the observers records, and the available habitat mappings (in particular the EMODnet habitat mapping which is being regularly updated, latest update in 2019) ensures that **the fishery meets SG80**.

As explained in PI2.4.1a, the measures in place were not designed to manage impacts on the specific ecosystem component, so it cannot be considered that a strategy is in place. **SG100 is not met.**

References

ICES 2019e

http://www.seaaroundus.org/data/#/eez/963/marine-trophic-index

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information on the medium term post-capture mortality and also on the impacts of this type of gears on the affected habitats**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

7.4 Principle 3

7.4.1 Principle 3 background

7.4.1.1 Area of operation of the fishery

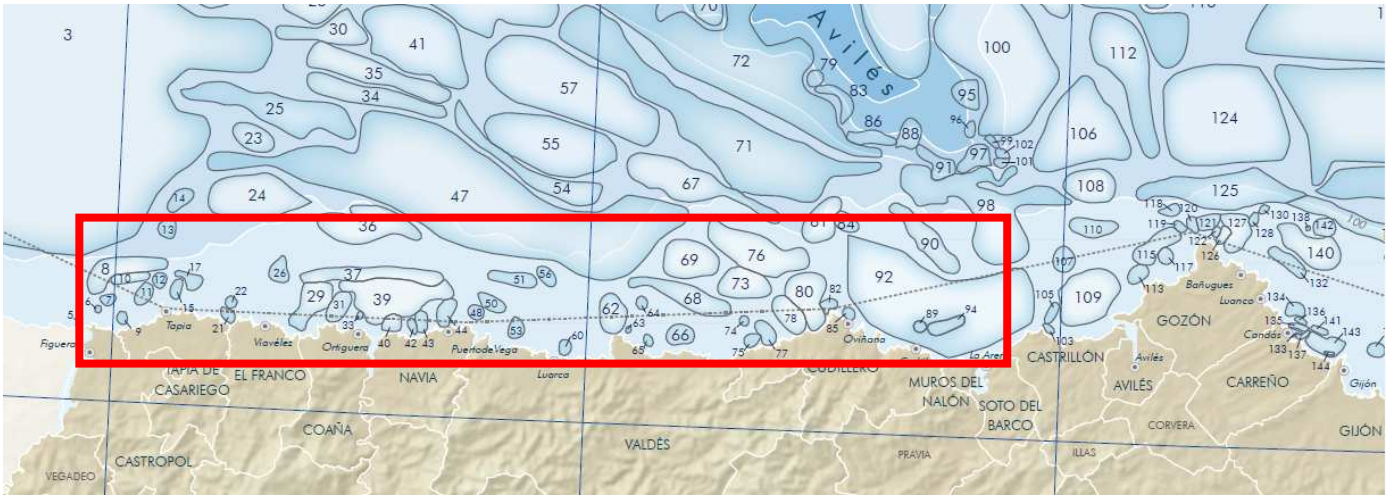
The Asturian stock of octopus is distributed all along the Asturian coast, although it is more abundant in the western part. In the eastern part (from San Esteban de Pravia estuary to Cantabria), octopus are fished by the small scale fleet mainly using octopus traps, although this fishery does not have a management plan and is mainly regulated by a closure period of 3 months (February-April), weight limit (1 kg) and fishing gear regulations. On the contrary, in the western area, where the UoA operates, the octopus traps fishery is regulated by a comprehensive management plan.

The UoA operates in waters of the Cantabrian Sea off the coast of the Principality of Asturias (ICES sub area VIIIc), from the Eo estuary to the San Esteban de Pravia estuary (western Asturias), in accordance with the scope of application of the OFMP for the common octopus (*Octopus vulgaris*) (Resolución de 21 de Noviembre de 2019). The fishing activity is mainly concentrated from coastline to 50m deep, where around 90% of the fishing is done (Fernández, 2019a); it can take place deeper, but always less than 100m depth. Although there is legally no maximum depth limiting the activity of this fleet, it never operates deeper than the 100m isobath due to operational limitations. **Figure7.4.1**.

Fishing is carried out both in the internal waters of the Principality of Asturias and outside of these waters, in Spanish territorial waters (<12 nautical miles). The fleet operates in numerous fishing grounds within these waters, including: El Cantu de Tapia (11), Mar Bello (12), El Coitelo y Dondel (15), Las Furadas (17), El Petón de Viavélez (22), Las Conchas (29), Llamosa y Valladón (31), Petón de Ortiguera (33), Playa de Navia (39), Andes (40), Canto Fabal (42), Playa de Frexulfe (43), Canto Sobreisla (44), Petón del Castaño (53), Bajo La Mina (60), Cabo Busto (62), La Conchona y Vidio (80), El Llozano (82), Piedra del Cantu (89), La Playa de Cudillero (92) and La Carretera de Cudillero (94) (see **Table 7.3.11** for a whole list of octopus fishing grounds).

The ports of landing and Fishers' Guilds, within the territorial scope of the OFMP, are: Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras.

a)



b)

Figure 7.4.1. *a) The red rectangle is the fishing area for the UoA, b) map of the octopus fleet fishing grounds monitored by GPS during the season 20184-20195 (red: high fishing activity, green: low fishing activity. The blue line is the 50 m*

isobaths. The ports, marked in the map with a boat symbol, are, from left to right: Figueras, Tapia de Casariego, Viavélez, Ortiguera, Puerto de Vega, Luarca, Oviñana, Cudillero and San Esteban de Pravia). The Eo estuary, where the port of Figueras is located, and the San Esteban de Pravia estuary are the east and west limits respectively of the OFMP. Data (Source: Fernández, 2019a)

7.4.1.2 Jurisdiction of the fishery

Competence for octopus fishing in these waters lies with the Principality of Asturias, since Article 148.1.11.a of the Spanish Constitution provides for the exclusive competence of the Autonomous Communities for fisheries in internal waters, shellfish harvesting and aquaculture. In accordance with the Constitution, Article10.1.13 of the Statute of Autonomy of the Principality of Asturias confers exclusive competence to the Principality of Asturias for fisheries in internal waters and shellfish harvesting. Although part of the fishing activity takes places outside the internal waters of the Principality of Asturias in Spanish territorial waters, since octopus fishery with traps is only done by artisanal vessels, the whole management competences are under the regional jurisdiction of the Principality of Asturias.

The Principality of Asturias is an autonomous community of Spain, an EU member country since January 1986. Consequently, fisheries policy in Asturias must be governed by the broader legal framework for political management of Spain and the EU. The Ministry of Agriculture, Fisheries and Food (MAPA, Spanish acronym) is responsible for managing fishing activity in Spain. The General Secretariat for Fishing (SGP, Spanish acronym) is part of this ministry and is responsible for carrying out this task. At the national level, Ley 3/2001, of 26 March, on National Sea Fisheries, establishes the legal parameters for fishing activities, essentially covering the contents of European regulation. The EU fish management system is governed by the European Commission (EC) and, after Treaty of Lisbon, Parliament and Council are also involved in government with more powerful. The Commission, through the Directorate-General for Maritime Affairs and Fisheries (DGMARE) is responsible for proposing, approving, and applying EU fishing regulations throughout the European Union (EU). The Common Fisheries Policy (CFP) is the current EU management framework, which was recently reformed and took effect through Regulation (EU) n° 1380/2013 of the European Parliament and of the Council of 11 December 2013. This new policy includes measures to protect endangered stocks, and the ending of discards. The 2013 reform led to a greater role for the European Parliament, involving the convening of a trilateral dialogue between the European Council (where the ministres of fisheries of each country are present), European Commission (DG Mare) and the Parliament (voted members).

In accordance with the Spanish Constitution and the Statute of Autonomy of the Principality of Asturias, the scope of competence of Asturias for fisheries focuses on the internal waters of the Asturian coast and on all activities defined as “shellfish harvesting” taking place in both internal waters and Spanish territorial waters (up to 12 nautical miles). Exercising that power, Asturias adopted Ley 2/1993 of 29 October (slightly amended by Law 15/2002) on sea fisheries in internal waters and the use of marine resources, which provides that competence for matters governed by this law lies with the Regional Ministry of Rural Affairs and Fisheries of the Principality of Asturias, now called the Regional Ministry of Rural Development and Natural Resources. The Asturian fisheries law covers all functions, instruments and mechanisms for the development of the management system, and is structured around 10 headings: heading I, general provisions governing the spatial scope of the law, mentions the specific activities covered by this law and establishes the basic principles of fishing activities; heading II, marine fish farming; heading III, shellfish harvesting by hand; heading IV, eel fishing; heading V, seaweed harvesting and extraction: heading VI, recreational sea fishing; heading VII, marketing of fishery products; heading VIII, inspection and monitoring; heading IX, violations and sanctions; and heading X, advice, information and professional training.

The current Ley 2/93 on Asturian Fisheries only defines “shellfish harvesting by hand” in the shoreline area as an extractive activity aimed at gathering molluscs, crustaceans and shellfish in general, when carried out in the intertidal zone. However, it does not define shellfish harvesting from boats in the maritime zone. Nor does Ley 3/2001 of 26 March on National Sea Fisheries give any definition of shellfish harvesting. In the European Fisheries Fund National Strategic Plan update 2007-2013, shellfish harvesting is defined as fishing consisting in extractive activities aimed at gathering invertebrate animals. According to the Resolution of 10 March 2004 of the Regional Ministry of Rural Affairs and Fisheries of the Principality of Asturias approving the Shellfish Exploitation Plan, the capture of decapod crustaceans (spider crabs, brown crabs, velvet crabs, homarus, lobsters, carideans and slipper lobsters) using traps is considered to be a shellfish harvesting activity. In spite of the lack of legal clarity for octopuses, we believe that octopus fishing in Asturias using traps is an activity that can be classified as well as “shellfish harvesting”.

Article 7 of Ley 2/93 on Asturian Fisheries establishes the possibility of producing yearly plans that would set the extractive capacity according to the evolution of resources, after consulting with professionals through

their representatives. On the basis of this article, the DGPM as part of the Regional Ministry of Rural Affairs and Fisheries works in collaboration with the fishers' guilds of Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras to produce a yearly OFMP for the common octopus (*Octopus vulgaris*), which extends from the Eo estuary to the San Esteban de Pravia estuary.

The OFMP for the 2019-2020 fishing season is set out in the Resolucion de 21 de Noviembre 2019 of the Regional Ministry of Rural Development and Natural Resources regulating common octopus (*Octopus vulgaris*) fishing during the 2019-2020 season (from 15 December 2019 to 14 July 2020). In addition, every year the DGPM approves a number of measures that govern octopus fishing outside the scope of application of the OFMP, although these regulations do not affect the UoA subject to certification.

On the other hand, recreational sea fishing in Asturias is regulated by Decreto 25/2006 of 15 March. This decree sets out the fishing gear authorised and the quantities of octopus that can be caught according to the different fishing permits, both by hand and from boats, with underwater octopus fishing being forbidden.

7.4.1.3 Particulars of the recognised groups with interests in the UoA

The groups recognised as having direct interests in the fishery fit into the classification of groups belonging to the Regional Government, the National Administration and private groups and natural persons with economic and social interests in the fishery. All of the organisations, institutions and individuals participating in the fishery are easily identifiable and are explicitly defined.

- Regional Government: Principality of Asturias

The DGPM from the Regional Ministry of Rural Development and Natural Resources is the body responsible for the functions of management and development of competencies in the management and protection of fishery, shellfish and marine culture resources, their inspection and surveillance, the functions entrusted in relation to nautical-fishing training, and research and experimental fishing, all within the scope of the powers provided for in the Statute of Autonomy of the Principality of Asturias (Decreto 85/2019). Likewise, it will carry out the functions of management and development of competences in the area of infrastructure for the fishing sector, both extractive and marketer and transformer, management and coordination of the European Maritime and Fisheries Fund (EMFF), development of sector diversification programs and support to the promotion and commercialization of fishery and aquaculture products. It will also promote those works for the improvement of fishing port infrastructures financed by the EMFF, within the framework of general planning in port matters that is the responsibility of the Ministry of Infrastructure, Environment and Climate Change and in which said Ministry will carry out coordination and technical assistance (Decreto 85/2019). The DGPM has two departments: 1) The Fisheries Structures Department that performs duties pertaining to sectoral infrastructure provision programmes, the renovation, modernisation and restructuring of the fishing fleet, industries and aquaculture, and the improvement of marketing and enhancement of quality and of markets; and 2) the Fisheries Management Department, which is responsible for the management of fisheries, shellfish harvesting and marine fish farming, the protection of marine resources, inspection and monitoring of catches (Fisheries Inspection and Monitoring), transport, marketing and centres of consumption, non-university maritime training and education, and fisheries research and experimentation.

One branch of the Servicio de Fisheries Management Department is the Fisheries Experimentation Centre (CEP, Spanish acronym), which was set up in 1980 under the name Centro de Investigaciones Acuáticas de Asturias (Asturian Aquatic Research Centre). In 1987, the name was changed and the centre was tasked with "developing the different plans pertaining to the enhancement of fishery resources and conducting appropriate research to use scientific criteria to regulate closed seasons, minimum landing sizes, closed areas or prohibited species, and the most suitable fishing methods in each case". The CEP is also responsible for providing technical expertise to the DGPM on issues relating to the biology of marine species and their exploitation, and to the monitoring of management plans. In particular, in the case of the octopus fishery, it publishes an annual report on monitoring of the fishing season.

Another branch of the Fisheries Management Department is the Resource Protection Division, whose Fisheries Surveillance and Control Unit is aimed at ensuring compliance with measures relating to the activities regulated by Law 2/1993 on Asturian Fisheries.

- National Administration: The Government of Spain

At the national level, several organisations are responsible for supplementing efforts made by the Principality of Asturias. As it was mentioned above, the General Secretariat for Fishing (SGP) belonging to the Ministry

of Agriculture, Fisheries and Food (MAPA) is responsible for the broader legal framework for managing the fishing activity in Spain, transposing the European regulations. Maritime Rescue from the Ministry of Public Works is responsible for search and rescue services, and the prevention and control of marine pollution. The Maritime Captanies from the General for Merchant Shipping, Ministry of Public Works are in charge of safety at sea, the prevention and control of marine pollution, maritime inspections and the clearance and registration of marine traffic. Another state organisation that contributes to monitoring in terms of food safety, poaching and coastal and marine environmental impacts is SEPRONA (Nature Protection Service), which is part of the Civil Guard (Ministry of the Interior).

In addition, other institutions and public organisations exist, especially those connected with research, for example the Universidad de Oviedo and a state centre for marine research, such as the Oceanographic Centre of Gijón belonging to the Instituto Español de Oceanografía (IEO). The Universidad de Oviedo through the Asturian Marine Observatory (OMA) is specially involved within this fishery in several actions mostly related to the status of the octopus' stock.

- Fisheries sector

The sectoral part identifies Fishers´ Guilds, the *guardapescas* (coastguards) responsible for the local monitoring (working at the Fishers´ Guilds), and the fishers themselves.

The fishers guilds included in the OFMP are: Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras. One of the duties of these associations is to look after their members and also to ensure the sustainability of the fishery, with the goal of supporting decent jobs. The associations manage the first sale of fishery products through the first auction markets. In turn, they are represented at a regional level by the Federación de Cofradías de Pescadores del Principado de Asturias, with autonomous jurisdiction, which is itself represented at a Spanish level by the Federación Nacional de Cofradías de Pescadores (National Federation of Fishers´ Guilds). In this sense, the associations, through their different representations, watch over the interests of the fisheries sector at the local, provincial, regional and national levels.

The *guardapescas* (Decree 23/1995) are employed by the fishers´guilds, and this position was created with the development of the Fishery Resources Exploitation Plans. Duties include: a) ensuring compliance with the regulations governing the activities of existing management plans in their association; b) collaborating with the Internal Waters Monitoring body of the Principality of Asturias to monitor compliance with fisheries legislation in the internal waters; and c) reporting regularly on the state of fishery resources. Although this organisation is fundamentally geared towards monitoring, it also carries out a wide range of other duties that vary from one fish market to another (administrative tasks, weighing, stowing, etc.). Its efforts are divided between all of the association's exploitation plans, concentrating mainly on the goose barnacle Exploitation Plan, and to a lesser extent on the OFMP.

Fishing boat skippers (fishing permits are issued in the name of the vessel) and the crew members serving on board are the productive and social part of the fishery. The skippers are linked to the respective associations included in the OFMP.

Without prejudice to the above, the vessel owners included in the UoC promoted in 2016 the creation of a working group (Certified Octopus Fishery Working Group, COFWG) which brought together all the vessel owners included in the UoC plus representatives from CEDER, CEP and DGPM. The COFWG become in the working environment for addressing the issues related to the MSC certification. The COFWG addressed the actions needed to comply with the conditions established to the fishery in the first assessment and to ensure the maintenance of the MSC certificate. As a result of the first COFWG meeting emerged the need to create a new association which could bring together all vessel owners included in the UoC. This association was created on March 1, 2017, and it was called ARPESOS ('Asociación de armadores de la pesquería de pulpo con certificados de sostenibilidad' which in english would result as 'Certified octopus ship owners' association'). ARPESOS is constituted exclusively by vessel owners included in the UoC, and its statutes regulate the members' requirements, rights and obligations. Further, the statutes detail the governing and representing bodies, their nature and scope, and all the necessary details and mechanisms needed for the proper functioning of the association. The final aim of this association is to guarantee the continuity of the certification establishing the necessary conditions to fulfil the requirements of sustainability of MSC. The specific goals are details as follow:

- Comply with and ensure compliance with codes of good practice that ensure the sustainability of inshore fishing activity in this territory, especially the octopus trap fishery.

- Collaborate actively with scientific, public and private institutions in the study of the octopus' fishery and, incidentally, other species of the area.

- Extend, promote and control the implementation of responsible fishing practices with the conservation of the marine environment and the sustainability of fishery resources among professionals in the sector.

- Guide, support and promote proposals for conservation that have application and validity in the management of the octopus' fishery, by its inclusion in the fishery specific management plan or legislative regulation that exists in this regard.

- Promote research related to the fishing sector, especially research affecting the octopus' fishery, and improve fisher's knowledge.

- To contribute to the exchange of experiences and knowledge relating to the biology of marine species, stock status, fisheries management, processing, marketing and promotion or conservation measures.

- Maintain a permanent relationship with the administration in the application of measures of protection of the environment and sustainability of resources.

- Participate in the different networks or multidisciplinary working groups that are created with the objective of analyzing the fishing activity from its different biological, economic, environmental, legislative and social aspects, in order to elaborate proposal and establish lines of action that guarantee the sustainability of Professional coastal fishing, with special reference to the octopus' fishery.

- Promote consumption habits of sustainable fishery products.

- Represent the interests of its members before the different administrative, legal and political

- To be a basis for improving the training and professional relationships of the associates

- To contribute to the conservation of the natural, cultural and historical heritage linked to the fishing activity.

Other stakeholder with interest in the fishery since 2014 is SIGMA, a private consulting in charge of carrying out the on-board observers' program, the GPS tracking of vessels and in situ octopus tagging experiences in closed collaboration with CEP. Other recognised groups with interests in the UoA are NGOs and recreative fishers. WWF Spain is an active stakeholder of the fishery that regularly participates in the Octopus Fishery Monitoring Commission (OFMC), an advisory forum where different stakeholders can present and discuss information relevant to the fishery and propose management measures and regulations. The recreative fishers, who has some right for access to the octopus' resource, are organized in associations like *Volver al Pedrero* which participate in the fishery my making proposals regarding the recreational fishing regulations, although they are not engaged in the consultation process taking part within the OFMC for the professional activity.

7.4.1.4 Consultations, decision-making process or processes and recognised participant

The need for the government to consult the fisheries sector on standards pertaining to the management of fishery activities is set out in Law 2/1993 on Asturian Fisheries. In accordance with Article 7 of this law, the Regional Ministry of Rural Affairs and Fisheries can draw up yearly plans according to the evolution of resources, as well as of the socio-economic conditions of the sector. This article also provides that the government must consult with fisheries professionals through their different representatives, in order to subsequently set the extractive capacity by category and by zone, and must also develop experimental plans to improve the development of the sector. Article 8 of this law also provides that the Regional Ministry of Rural Affairs and Fisheries must consult with fishery professionals in order to regulate the characteristics, usage and working zones for gear used for fishing and extractive activities. Moreover, the OFMP states that one aim of the management plan is to establish a co-management system that involves all the actors related to it, in order that the biological sustainability of the resource is associated with social and economic improvements in the fishing sector.

In this context, the DGPM works in collaboration with the Fishers´ Guilds and other stakeholders to draw up a yearly common octopus (*Octopus vulgaris*) management plan that extends from the Eo estuary to the San Esteban de Pravia estuary. The OFMP for the 2019-2020 season is defined in the Resolución de 21 de noviembre de 2019, of the Regional Ministry of Agriculture, Livestock and Fishing, the preamble of which emphasises that it has been produced in collaboration with the Fishers´ Guilds of Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras, with the goal of protecting resources and improving their marketing in the geographical area of these associations.

The consultation and decision-making process for developing the OFMP annually is a complex process that takes part in several steps along the whole year in wich several stakeholders are involved. The main participants are the Head of Fisheries Management Service and the Managing Director (from DGPM), the Fisheries Surveillance and Control Unit (from DGPM), the Centro de Experimentación Pesquera (CEP) (from DGPM), and the Fishers´ Guilds of Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras. Other participants along the consultation process are ARPESOS (Asociación de armadores de la pesquería de pulpo con certificados de sostenibilidad), WWF-Spain and OMA-Universidad de Oviedo, which usually participates through the Octopus Fishery Monitoring Commission (OFMC).

The OFMC was created in the 2016/17 OFMP (Resolución de 7 de diciembre de 2016) and commenced its activity in February 2017. As described in the OFMP, the Commission should function as an advisory forum where different stakeholders can present and discuss information relevant to the fishery, in order to improve and achieve the objectives of the fishery. The members of the OFMC are the CEP Head of Section, the CEP responsible of the following up of the OFMP, the responsible for the MCS of the western area of Asturias, and one delegate of the octopus' fishers from each of the fishers´ guilds that are part of the OFMP (currently 8 fishers´ guilds). Several representatives of the fishers´guilds are as well representatives of ARPESOS, although when assisting the OFMC they are representing their fishers´guild. The OFMP states that other invited members could also participate in the OFMC, and in the past years WWF-Spain and OMA (Universidad de Oviedo) have regularly attendend the meetings. The Head of Fisheries Management Service and the Managing Director, from the DGPM, do not assist to the OFMC. The roles of the OFMC are:

a) Exchange of information and knowledge between stakeholders. This is the main purpouse of the comitte and this role has been so far extremely well achieved, with all stakeholder regularly participating in the two fishing season meetings, sharing results and discussing the information showed as well as new proposal for managing the fishery.

b) Inform or propose changes in the management measures. Until the 2019-20 fishing season the OFMC was only discussing regarding possible changes in the management measures but no proposal for the DGPM was coming out from this comitte since no consensus was achieved. In February 2020, for the first time, the OFMC achieved unanimously three relevant agreements: 1) stablish a 2019-20 fishing season TAC of 189 tonnes (a sustainable level coming out from the stock assessment depletion model), 2) introduce a change in the decision-making protocol for all allegations to be answered in a written format explaining why decisions were taken, and 3) ask the DGPM for increasing the control and surveillance in the fishery (CS, 2020).

c) Promote and facilitate scientific studies and technical monitoring. Gaps of information and future projects to addressed it has been effectively discussed in the OFMC and results from those studies has been shared (e.g. octopus marking experience, estudies on possible HCR associated to CPUE, stock assessment model, identification of special recruit-juvenile habitats, …). The implication of the fishing sector along with the CEP, SIGMA and the OMA (Universidad de Oviedo) has been material for successfully developing this role.

d) To do a follow up of the degree of execution of the objectives of the plan. This last role was added in the OFMP 2018-19 and it was done for the first time in the OFMC meeting in October 2019 (CS, 2019). The individual objectives of the management plan have been assessed and difficulties or weak points identified.

The scope of the OFMC are all the vessels and fishing grounds included in the OFMP (it had varied between 40-50 vessels in the last 5 years) and not only the ones of the UoC (currently 31 vessels), and its role is just as a consultative body. Nevertheless, the UoC vessel owners consulted would like, and expect, that in the future the OFMC proposals become binding. How decision and proposals should be taken inside the OFMC has not been regulated so far.

The OFMC has worked in the past year as a forum for debating different proposals between stakeholders around the octopus' fishery. CEP and ARPESOS are the most active members proposing measures for the fishery and usually provide written documents in advance explaining the proposals. CEP and ARPESOS also send their proposals directly to the DGPM in charge of the decision making. During the meetings other proposals by other members are debated. Proposals are nevertheless just debated, but not voted. The meeting minutes of the OFMC just reflect the debate and opinions of the different stakeholders around the topics discussed, but no formal agreements were taken to be transferred to the DGPM, which has the powers for taking any final decision in the management plan. Based on stakeholders' comments, the fishing sector in the OFMP seems polarized between two groups, the MSC fishing guilds organized under ARPESOS, and the rest of the non-MSC fishing guilds. The different interest and commitment between both groups with the MSC certification have apparently impeded reaching consensus.

The OFMC meet at least twice in each fishing season, the first meeting (October-November) is done before the OFMP is published (usually December), and it is intended to review the past fishing season (the CEP provides in advance a report on the status of the fishery) and discuss management measures for the next management plan (nevertheless, final decision has to be taken by the Fisheries Management Service and the Managing Director, from the DGPM). The second meeting takes place in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going and decide wether any effort restriction should be taken (so far no restrictions have been implemented after this second OFMC meeting). Extraordinary meetings can be set up if the mayority of the OFMC considers so.

In the past years a decision-making protocol has been discussed within the OFMC. A final Decision-making process protocol (DGPM, 2020a) is now available specific for the OFMP where the steps in the consultation and decision-making are clearly define as follows:

1- **Proposals to consider (within the OFMC)**: any participant within the OFMC can raise and propose and issue to discuss, that has to be explained and motivated. The proposal has to be send to the CEP which will disseminate the proposal and get heir opinion. If a OFMC meeting will happen soon, the proposal will be included in the OFMC agenda, and if not an extraordinary meeting can be set up if the mayority of the OFMC participants considers so.

2- **Collection and dissemination of information (within the OFMC)**: the CEP is the body in charge of compilling all relevant information and monitoring the fishery which will disseminate with the OFMC participants before the meetings takes place. The CEP is also in charge of convene the OFMC meetings.

3- **Evaluation of the information (within the OFMC)**: within the OFMC the CEP will show and explain the information related the fishery monitoring. The information will be analysed in common and different management options will be debated. The CEP is in charge of writing down the meeting minutes and pass it afterwards to all participants with all the topics discussed and agreements, if any.

4- **Analysis of the different options and proposed regulations for fisheries management (outside the OFMC)**: this phase occurs outside the OFMC and is under the responsibility of the Head of Fisheries Management Service - Jefe de Servicio de Ordenación Pesquera (from the DGPM), who after considering the meeting minutes from the OFMC will make a proposal for the next OFMP (DGPM, 2019a), or could also propose a change in the current fishing season. Its decision will be communicated to all fishers´ guilds and onther concerned entities. The DGPM can ask for advice to the CEP before taking any decision.

5- **Allegations of the interested stakeholders (outside the OFMC)**: under this administrative process outside the OFMC the stakeholders have the opportunity to present formal written allegations to the draft OFMP of the changes in the current fishing season.

6- **Decision making and management application (final OFMP) (outside the OFMC)**: the Head of Fisheries Management Service and the Managing Director – Director General (from the DGPM) will review and answer all the allegations and will approve a final measure, either for the current fishing season or the next OFMP. The DGPM can ask for advice to the CEP before taking any decision. The final OFMP will be sent by the Managing Director for publishing in the BOPA, the Official Gazette of the Principality of Asturias.

7- **Evaluation of the effectiveness of decisions**: the new management measures and changes in the regulation will be assessed in order to inform the next decisions to be taken in the OFMP. It is not clear yet who will be the responsible at this stage and how this assessment will be made.

The basic information used to determine the state of the octopus' fishery for informing the decision-making process is the annual report produced by the CEP on the monitoring of the fishing season. This report is made available to the stakeholers participating in the OFMC. The CEP report contains data from the previous fishing year and also provides a historical overview of the fishery. The report includes sales, fishing effort (vessels, days), catches, catches per unit effort (kg/day), weight distribution, and price (€/kg), per monthly and yearly periods and per association (with regard to the previous fishing year). Results from the on-board observer program are also included.

7.4.1.5 Details of other non-MSC fishery users or activities, which could affect the UoA, and arrangements for liaison and co-ordination

There are other groups (recreational fishing, other fishing gears but octopus´ traps, fishing outside the OFMP area, and trawling) which, are fishing the same octopus Asturian stock as the UoA.

Recreational fishing: the right to recreational octopus fishing from boats or by hand (intertidal zone) is legally recognised in Asturias (Decree 25/2006 of 15 March, regulating recreational sea fishing in the Principality of

Asturias). Although thousands of recreational fishing permits have been issued, surveys have shown octopus catches in the intertidal zone by recreational fishers to be very small (0.23 kg per fisherman per day), while from boats they are considered to be negligible (report by Apilánez y Morteram 2010, 2011 for DGPM). Fishers´ Guilds are consulted by the DGPM when recreational fishing groups (such as Volver al Pedrero) make a proposal regarding recreational fishing regulations.

Artisanal octopus´ fishing within the OFMP area with gears different than octopus´ traps: other vessels with fishing gears different to octopus´traps are allowed to catch within the area of the OFMP a maximum of 30 kg/day of octopus.

Artisanal octopus´ fishing in Asturias but outside the OFMP area:

Trawling: on the continental shelf off the coast of Asturias and at depths of more than 100 m, octopuses are occasionally caught by trawling. Given that this fishing activity takes place outside internal waters, the fishery is regulated by the Secretaría General de Pesca (from MAPA). The Asturian trap fishing sector complains that although trawling makes substantial octopus catches, is not obliged to comply with the closed period they themselves must observe, and sporadically operates in prohibited waters of <100 m. A CEP study (Fernñandez, 2015) nevertheless indicates that trawler catches do not represent a substantial quantity (between 2002 and 2014, an average of 11% of all octopus sold in Asturian fish markets, fluctuating between 3 and 21%) compared to catches made with traps (85%, fluctuating between 70 and 95%). However, this study is incomplete, since it gives no information on catches by Galician trawlers in Asturian waters.

In its first additional provision, Law 3/2001 of 26 March on National Sea Fisheries provides for the creation of two coordination and consultation bodies between the Spanish Government, the Autonomous Communities and the fisheries sector, to address issues of common interest. The National Fisheries Council is the coordinating body between the MAPA and the Autonomous Communities, and represents the SGP, the Directors-General of the General Secretariat for Sea Fisheries and one representative of each of the Autonomous Communities. The other body is the Advisory Committee for Fisheries, which provide expertise and consultancy services, and includes representatives of key organisations and associations from the fisheries sector, including the National Federation of Fishers´ Guilds.

7.4.1.6 Objectives for the fishery: Resource, Environmental, Biodiversity and ecological, Technological, Social and Economic

In its Preamble, Ley 2/1993 on Fisheries stipulates that it is the responsibility of the Principality of Asturias to protect the ecosystems in which fishing activities take place, and also sets out the powers of the managing body, the Regional Ministry of Rural Affairs and Fisheries, in all matters concerning action to protect the marine environment and the species living in it. Octopus fishing with traps has a very low environmental impact, since it involves highly selective fishing gear that has no impact on the physical environment. In addition, the species caught, the bycatch and ETP species, are alive and unharmed and have demonstrated high rates of survival when returned to the sea (Fernández, 2019b).

Article 9 of Ley 2/1993 on Fisheries stipulates that the Government of the Principality of Asturias shall improve the productive structures of the fisheries sector and, in particular, boost the renovation and modernisation of fishing vessels in order to increase productivity, safety and hygiene at work and to ensure higher quality of products handled, taking into account the necessary adaptation of fishing efforts to the state of resources and gear selectivity.

In order to achieve these objectives, especially those concerned with resources and improving the fishery, the DGPM has a division, the CEP, that carries out studies geared towards increasing the scientific knowledge applied to the fishery with the goal of improving significant aspects of this fishery. The good relationship between the CEP and the fisheries sector acts as a positive incentive that can contribute to improving the fishery's sustainability goals. The role of CEP and its relationship with the fishers´ guilds have made possible to set in place explicit objectives in this fishery that were not present when the first assessment report was published in 2016.

The 2017-18 OFMP (Resolución de 1 de diciembre de 2017) introduced for the first time some specific objectives for this fishery, although they were limited. For the next fishing season, 2018-19, explicit and specific objectives were set (Resolución de 4 de diciembre de 2018) covering aspect related to the sustainability of the stock (P1), the impact of the fishery on other species (P2) and as well others related with socioeconomic interests (not covered by the MSC stamdard). The objectives currently in place in the OFMP are:

1- The main objective of the management plan for the 2018/2019 fishing campaign is to maintain the balance between the fishing effort and the abundance of the resource, which until now has guaranteed the sustainability of the fishery. For this, and given the risk that changes in socioeconomic conditions may alter the described equilibrium situation, it is considered appropriate to maintain the general rules of previous fishing campaigns and also establish the following specific objective:

• Determine if there is a risk of overfishing based on early indicators of the state of the stock and limit the fishing effort in the event that such risk is detected.

2- Although the data from the monitoring of the octopus' fishery with traps in previous fishing campaigns demonstrates its low impact on the ecosystem, it is intended to ensure that this situation is maintained during this fishing campaign, or even it is improved as far as possible, by establishing the following specific objectives:

• Conduct at least two samplings per month with observers on board to assess the impact of the fishery on the accessory species.

• Maintain the mortality of discarded specimens below 5%.

It is the responsibility of the OFMC to do a follow up of the degree of execution of the objectives of the plan. This last role was added in the OFMP 2018-19 and it was done for the first time in the OFMC meeting in October 2019. Currently in the OFMC it is under debate the possibility of stablishing a long term objective in order to keep the octopus stock at a level around MSY (CS, 2019).

7.4.1.7 Individuals or groups granted rights of access to the fishery and particulars of the nature of those rights.

Rights of access to the fishery are explicit and legally reinforced by the legal codification system (indefinite permits and permits that are renewed on a yearly basis), and regulate formal access to the fishery. Being an activity in which rights of access to the fishery have been regulated since the creation of the official census of the fishing fleet of the Principality of Asturias (Resolución de 18 de junio de 1998) by a well-defined legal framework, there are no customary rights for other potential users requesting access to the fishery. Conflicts of this kind do not exist for the fishery in question.

The DGPM sets criteria for the issuance of permits. The OFMP includes all recorded small-scale fishing boats that have authorisation from the Regional Ministry of Rural Development and Natural Resources to fish using "octopus traps".

There is no limit to the number of vessels included in the OFMP, as any other Asturian vessel requesting this permit and changing its home port to that of one of the eight Fishers´ Guilds included in the plan will be authorised to fish for octopus within the OFMP. However, such a request is unlikely, since all octopus fishing boats in Asturias have already been recorded as belonging to one of these eight associations. Ultimately, Article 4 of Ley 2/1993 on Asturian Fisheries provides that the competent Regional Ministry can limit the number of fishing vessels operating in a given zone for each category of activity, for which purpose the corresponding censuses were produced according to fishing gear and speciality.

Fishing permits are issued in the name of the vessel and can only be transferred via the sale of the vessel. Annual catch quotas for the vessel are non-transferable, and cannot therefore be assigned to other vessels.

7.4.1.8 Description of the measures agreed upon for the regulation of fishing in order to meet the objectives within a specified period

The OFMP sets out measures relating to numerous aspects regulating the fishery. The measures currently in place as for the 2019-20 fishing season (Resolución de 21 de noviembre de 2019) are:

- **Authorized vessels**: the census of fishing vessels included in the OFMP are all small-scale fishing boats that have authorisation from the Regional Ministry of Rural Development and Natural Resources to fish using "octopus traps". No other boats are allowed to use "octopus traps".
- **Fishing area**: from the Eo estuary to the San Esteban de Pravia estuary.
- **Fishing season**: the 2019-20 fishing season goes from December 2nd 2019 to July 15th 2020.
- **Fishing hours**: only allowed during daylight hours and vessels must be back in port before 17:00h in the evening. The activity is as well prohibited from 17:00h on Friday until 24:00h on Sunday. During the

weekend fishing traps can be left baited underwater. The 17:00 h limit was first stablished in the 2017-18 OFMP.

- **Fishing gear**: the only gear authorised for octopus as objective species is octopus' traps. The maximum number of traps allowed is 125 traps per crew member employed and on board, up to a maximum of 350 per vessel for vessels of three or more crew members.
- **Marking of the line of traps** (new measure since the 2016-17 OFMP): in order to facilitate the fishing effort control, the lines of traps should be marked in accordance with the current regulation. The number of traps that are set in the line must be clearly indicated in the buoys. Failure to comply with the provisions of the previous clause may result in seizure of the fishing gear.
- **Octopus accessorial catch for other fishing gears different to the octopus' trap** (new measure since the 2015-16 OFMP): within the fishing area of the OFMP it is allowed a maximum of 15 kg of octopus per day per vessel, plus 5 kg more per crew member employed and on board, up to a maximum of 30 kg.
- **Individual annual quota**: the maximum catch allowed per vessels per fishing season is 10 000 kg, which is not transferable between vessels. The OFMP also opens the possibility to set daily or weekly quotas per vessel, but, although discussed, so far this measure has never been implemented due to the opposition of the fishers. However, if we bearing in mind that there are 43 vessels operating, if they would catch 10 tonnes each, the total catch of the fishery would be 430 tonnes. To date, this issue never happend but is important to be underlined for future revisions. Despite of this, it was an agreement in February, 2020 that established a TAC of 189 tonnes, but avoiding any change in the normative unless the landings approach to TAC threshold and after a meeting with the fleet.
- **Weight limit**: 1 kg. One single octopus between 900-1000 g is allowed every 25 kg of catches, although these specimens can not be commercialized and must be returned to the sea or donated to a charity centre (new measure since the 2018-19 OFMP).
- **Discards** (new measure since the 2019-20 OFMP): any individuals of any species that are caught alive and is going to be discarded should be released immediately and without causing damage.
- **Reproductive closed period**: from 16 July to 15 December 2020.
- **Landing ports**: weighing of daily catches must always be carried out within the territorial scope of the OFMP and in the Fishers' Guilds of the port of landing (Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras).
- **Data reporting**: the fishers´ guilds should report landings data weekly (before the OFMP 2019-20 this requirement was only monthly).
- **Mandatory tracking devices** (GPS/GPRS) (new measure since the 2014-15 fishing season): in order to determine the fishing areas and the fishing effort, a GPS / GPRS tracking device should be installed in all vessels that take part of the OFMP; the devices will be provided and installed by the CEP. The installation of tracking devices already started in the fishing season 2014-15 through a project commissioned to the consultancy firm SIGMA SL for characterizing the fishery. This measure has been included in the OFMP for the 2016/17 fishing season. In the 2017-18 fishing season this measure is mandatory for all vessels included in the OFMP.
- **On board observers** (new measure since the 2015-16 OFMP): all vessels within the OFMP should collaborate with the on board observers and CEP technicians for developing their work on the monitoring and assessment of the fishery with the aim of developing a report on the evolution of the fishery.

Besides all the measures above concerning the harvest strategy, the OFMP has clarified the role of the figure of the *Guardapescas* (coastaguards) and it has created a Monitoring Commission for the OFMP. Here we will just resume both initiatives since they have been extensively treated in sections 7.4.1.10 and 7.4.1.4 respectively.

- **Roles and responsibilities of the Coastguards-Guardapescas** (new measure since the 2019-20 OFMP): the duties of the Guardapesca assigned to each fishing guild will be to check the weighing of landings, the quotas and admissible catch, when applicable, and the compliance with the minimum weight (see section 7.4.1.10 for more details).

- **Consultative Monitoring Commission** (new measure since the 2016-17 OFMP): the OFMC is a consultative body for following-up the OFMP in order to improve and achieve the objectives of the fishery (see section 7.4.1.4 for more details)**.**

Finally, the OFMP has not established any MPA inside or outside the area of operation of the fihery for protecting the reproductive spawning grounds, recruitment areas or for any other purpouse. Nevertheless, the CEP in collaboration with the Universidad de Oviedo has just started a project in the western area of the OFMP in order to characterize habitat features especially relevant for octopus recruits and juveniles (CS, 2019).

7.4.1.9 Particulars of arrangements and responsibilities for monitoring, control and surveillance and enforcement

As explained above, it is mandatory for all vessels included in the OFMP to have a tracking device in order to determine the fishing areas and the fishing effort. GPS / GPRS tracking devices have been provided and installed by the CEP. This initiative started as a pilor program in the fishing season 2014-15 and it was included in the OFMP for the 2016/17 fishing season. Since the 2017-18 fishing season this measure is mandatory for all vessels.

The monitoring and inspection system (Title VIII) along with violations and sanctions (Title IX) are set out in Ley 2/1993 on Asturian Fisheries. Within the DGPM the Surveillance and Control Unit (from the Resource Protection Division a branch of the Fisheries Management Department) bears primary responsibility for ensuring compliance with the measures regulating this activity. This unit has by law the faculty to get access to the vessels, first auction markets, marine farming facilities, processing, marketing and consumption facilities of marine products (Ley 2/1993). The Surveillance and Control Unit has four teams (one for the east coast, two for the central coast and one for the west coast) with three or four agents per team who supervise all fishing activities, from catch to sale. The DGPM has the capacity to carry out inspections and monitoring at sea. In addition, the DGPM cooperates with the SGP as part of the MAPA on monitoring issues. Regarding this fishery, the most important role of the SGP on the MCS system is the monitoring of trawlers fishing closed to the 100 m isobath which can not cross. An old claim of the artisanal sector is that sometimes trawlers enter waters or less than 100 m deep for fishing, but this has been repetealy denied by the competent authorities. Regarding the MCS at sea, currently the Surveillance and Control Unit has no vessel with the ability to seize and remove lines of traps at sea. It is expected that a vessel with this capacity will be operational by 2021.

The surveillance capacity in the octopus fishery has been recently reduced due to a decrease in the number of enforcement officers of the Surveillance and Control Unit. Of the 16 inspectors of the unit in Asturias (12 inspectors full time and 4 part time), currently 2 full time inspectors openings are still pending to be filled. Nevertheless, the octopus' fishery is a priority for the unit so the number of inspections compromised in the fishery, according to the minimum approved by the Surveillance and Control Unit (DGPM, 2017), has been fulfilled in the current fishing season 2019-20. Some of the staff retired could not be replaced in time due to the long administrative process, but would be done along next fishing season according to the head of the unit. Due to the enforcement capacity reduction in the 2018-19 fishing season, the implementation of a protocol for marking the line of traps (buoys at the beginning and ending of the line of traps) was postponed. The Surveillance and Control Unit has just started the implementation of the marking protocol for the line of traps in the current 2019-20 fishing season in collaboration with the *guardapescas* from the fishers´ guilds. The implementation has started in just part of the OFMP fleet and so far this management measure is not in place for the whole UoA (CS, 2020).

The Surveillance and Control Unit (from DGPM) also coordinates the *guardapescas* who are directly employed by the fishers´ guilds. There is a good relationship between these two bodies, which work together. The *guardapescas* have no sanctioning powers; rather, should he believe that a violation is taking place he must inform the competent authority (Civil Guard or the Surveillance and Control Unit from DGPM). The *guardapescas* are guild staff and their functions are regulated by Decree 23/1995 of 2 March, which created the figure of the coastgurds. Each of the guilds in Puerto de Vega, Ortiguera, Viavélez and Tapia de Casariego has a coastguard. Their functions are: 1) Ensure compliance with the rules governing the exploitation plans (mainly barnacle and octopus); 2) Collaborate with the DGPM Surveillance and Control Unit in the enforcement of fishing laws and 3) Report periodically on the state of fish stocks in their area.

Without prejudice to the Decree 23/1995, the roles and responsabilities of the *guardapescas* specifically in the OFMP are defined in the Resolución de 21 de noviembre de 2019; "The duties of the guardapesca assigned to each fishing guild will be to check the weighing of landings, the quotas and admissible catch,

when applicable, and the compliance with the minimum weight". The Fishers´ Guilds are obliged to provide the DGPM with specific information on the weighing of octopus catches on a weekly basis. Inspection of this weighing is carried out by the *Guardapescas* in their own associations, when fishers take their catches to fish markets, noting the quantity landed and weighing samples to verify the minimum weight.

Moreover, in May 2019 a meeting was held by the DGPM with the CEP and all the guardapescas in Asturias to check their roles and difficulties for developing those tasks and to clarify doubts. As a result of this meeting a *Operating Procedure of the Guardapescas in the OFMP* (DGPM, 2020b) was delivered in February 2020. In this last document a a detailed protocol on all the roles the *guardapescas* should take regarding the monitoring of the landings and the control and surveillance of the professional octopus fishery as well as the recreational fishing occurring in their areas. Regarding the **landings monitoring** the protocol establishes that the *guardapescas* shall control and follow up the daily activity of all vessels in their fishers´guild, register and weight the landings, check for individuals below the 1kg weight limit and send all this information to the CEP, as well as collaborating with them in their monitoring of the fishery. Regarding the **control and surveillance**, the *guardapescas* shall check for compliance on weight limit, control que quotas (daily, weekly annually) if established in the OFMP, collaborate with the DGPM Surveillance and Control Unit on the control of the maximum number of fishing traps and with the implementation and development of the marking system for the line of traps, and check for compliance in any other measure of the fishery, including the closed periods. The protocol also establishes the possibility that the *guardapescas* can take action on control and surveillance at sea, although the reality is that they do not have the resources for doing it (*i.e.* a vessel). Moreover, the *guardapescas* shall also control the recreative fishing in their areas. The *guardapescas* does not carry out inspections or monitoring of catches at sea and have never imposed any sanctions for any violation on any vessels/fishers included in the OFMP. They have, however, imposed sanctions on recreational fishers, for which they often request assistance from the Civil Guard (SEPRONA) because of their proximity and rapid response.

The *Operating Procedure of the Guardapescas in the OFMP* contains the following sections (DGPM, 2020b):

1- Introduction: legislation and regulations relevant to the guardapescas are indicated.

2- Need for an Operating Procedure: stablishes the reasons for developing this protocol.

3- Objectives: details the four main objectives of the protocol; I) Define the scope of action of the guardapescas in the OFMP, II) Describe the main monitoring and control tasks in the octopus fishery, III) Establish priorities in cases of incompatibility between different functions, and IV) Provide for the possibility of delegation of tasks in cases where this is necessary.

4- Scope of action: stablishes that; I) Actions related to the surveillance and control in the OFMP will be mainly done in the fishing port and cofradía where the guardapesca is hired, II) The Guardapescas could perform actions at sea according to their material resources and in collaboration with other law enforcement authorities, and III) Surveillance and control of recreational octopus catches in the intertidal rocks will be done when the guardapescas are involved in other fisheries like the gooseneck barnacle.

5- Landings checking: establishes that in order to have an updated monitoring of the landings, the guardapescas should made a daily monitoring of the boats involved in the fishery, register the daily landings checking for individual below the weight limit, send landings data to CEP, collaborate with the CEP for implementing any monitoring in the fishery, and communicate any other relevant aspect regarding the fishery.

6- Surveillance and Control activities: highlights the specific roles and duties of the guardapescas in the professional (e.g. weight limit control, lines of trap marking system, maximum number of traps allowed, quota limitations, closure period, …) and recreational fishery.

7- Infractions and sanctions: clarifies how to proceed and coordinate with the Surveillance and Control Unit in case and infringement is detected.

8- Priorities: establish the priorities and what actions can be delegated, specifically the checking on landings.

9- Material and economic resources: determines the contractual relationship between the guardapescas and the cofradías and the subsidies given for hiring them by the DGPM using European Maritime and Fisheries Fund. It also stablishes the possibility of providing material resources to carry out their work (e.g. vehicles, …).

The fishery also has a voluntary logbook program in place. Skippers of vessels fill in fishing logbooks manually, which are then sent to CEP, which is the organisation responsible for data processing. Although this measure has been in place for several years, so far the data has not been analysed and published.

7.4.1.10 Planned education and training for interest groups

There are a number of training courses instigated by the DGPM aimed primarily at fishers. Some of these courses are compulsory for those wishing to carry out fishing activities. The subjects covered include rescue, fires on board and first aid, among others. These courses are free of charge for fishers.

7.4.1.11 Date of next review and audit of the OFMP

The fishery has regular opportunities and/or forums for decision-makers to receive internal feedback on the management system, and there are also exchanges of information between the fishing community and the management institution. The OFMP is revised every year between the DGPM and the Fishers' Guilds. The main forum for sharing results on the monitoring of the fishery, new projects an iniciatives from other institutions (universities, consultancies, …) and for discussion on new measures to implement is the consultative Octopus Fishery Monitoting Comission (OFMC) which meet at least twice in each fishing season. The first meeting (October-November) is done before the OFMP is published (usually December), and it is intended to review the past fishing season (the CEP provides in advance a report on the status of the fishery) and discuss management measures for the next management plan (nevertheless, final decision has to be taken by the Fisheries Management Service and the Managing Director, from the DGPM). The second meeting takes place in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going and decide wether any effort restriction should be taken (so far no restrictions have been implemented after this second OFMC meeting). The next meeting for reviewing the management plan will take place in October-November 2020 to prepare the 2020-21 management plan.

Only occasionally the fishery-specific management system is subject to external review like the Coordination Cantabrian Comite and other forums with regional fishing agencies. In 2014 a forum with fishers, scientists and managers from Galicia, Asturias, Cataluña, Islas Canarias y Portugal around common octopus fisheries was held in Santiago de Compostela organized by WWF.

7.4.2 Principle 3 Performance Indicator scores and rationales

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:** - **Is capable of delivering sustainability in the UoA(s);** - **Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and** - **Incorporates an appropriate dispute resolution framework**		
Scoring Issue		SG 60	SG 80	SG 100
a	Compatibility of laws or standards with effective management			
	Guide post	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**
Rationale				

Spain has ratified in 1997 the United Nations Convention on the Law of the Sea (UNCLOS) (UN General Assembly, 1982) and also forms part of the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR). The EU is also a contracting party of these two conventions. Spain has also adopted the FAO Code of Conduct for Responsible Fisheries in 1995 and is a member state of the FAO Committee on Fisheries (COFI) which has recently endorsed (June 2014) the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines).

The European fishing fleets are managed within the EU Common Fisheries Policy (CFP) (last reform took effect on 1 January 2014). Based on the general framework of the CFP, the EU establishes suitable management and control measures for the fisheries operating in their waters, or implies the participation of boats with the European flag, or even EU citizens in fisheries in non-European waters. It must be considered that the CFP is in accordance with the objectives of MSC principles 1 and 2.

The EC receives advice from various scientific organizations and has several scientific advisory bodies: The Scientific, Technical and Economic Committee for Fisheries (STECF), the International Council for the Exploration of the Sea (ICES) and the Scientific Advisory Committee of the General Fisheries Commission for the Mediterranean (GFCM). In Spain, the Instituto Español de Oceanografía (IEO), mainly and the Consejo Superior de Investigaciones Científicas (CSIC), as well as a range of universities and other regional research centres undertake the research projects that form essential aspects of fisheries management.

The Spanish Government, through the Secretaría General de Pesca (SGP), part of the MAGRAMA MAPA is responsible for applying the management measures to the national fisheries sector. The 2001 Spanish Fishing Law covers the directives of the CFP, adaptings them to the specific circumstances of Spanish fishing sector.

In the Spanish legal system, the Spanish constitution establishes the exclusive jurisdiction of the autonomous regions in matters of inland coastal fishing, shellfish harvesting and aquaculture (Constitución Española, 1978). Article 10.1.13 of the Statute of Autonomy of the Principality of Asturias (Estatuto de Autonomía del Principado de Asturias, 1982), grants exclusive jurisdiction to the Principality of Asturias in matters of inland fishing within the internal waters and shellfish harvesting. Based on the foregoing, Fisheries Act 2/1993 of the principality of Asturias was enacted.

Based on the above, it is considered that 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. Therefore, this **SG reaches SG80 and SG100**.

b	Resolution of disputes			
	Guide post	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**
Rationale				

The Court of Justice of the European Union (CJEU) is the institution of the EU that encompasses the whole judiciary and it is the highest court in the EU legal system. The Court constitutes the judicial authority of the EU and, in cooperation with the courts and tribunals of the Member States, it ensures the uniform application and interpretation of EU law.

At a national level, the Spanish legal system is used as the main mechanism to resolve legal disputes. When it comes to fishing infractions, the disciplinary procedures will invariably be open as a result of the resolution adopted to that effect by the Delegate of the Regional Government in the Spanish Autonomous Region in question, in this case the Principality of Asturias.

The management system is subject by law to apply a transparent mechanism for resolving legal disputes: the sea fishing disciplinary procedures will be undertaken in accordance with the principle of transparency in the procedures. To those effects, the interested parties will have the right to receive updated data on the current status of their procedures, to get access to the relevant documents, and prior to the hearing, the interested parties could present allegations and provide documents they consider relevant.

With the aim of ensuring a completely transparent procedure and the efficacy of the government itself, and to also ensure the due defence of the accused and the interests of all the other parties that may be affected, each initiated disciplinary procedure will follow a systematic course, successively incorporating all the documents, statements, acts, administrative applications, notifications, and other appropriate procedures in the correct order. A procedure initiated as such will be completed and will continue to be the responsibility of the competent body throughout. The fishers or industry representatives can use the complete legal process. The management system has transparent and explicit mechanisms for dispute resolution and which are appropriate to the fishery's context. This mechanism has been tested and shown to be effective since no relevant conflicts were observed in the fishery.

Based on the above, it is considered that the management system incorporates an effective and transparent mechanism for the resolution of legal disputes in a manner consistent with MSC Principles 1 and 2. Therefore, this SG reaches **SG80 and SG100**.

	Respect for rights			
c	Guide post	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**
Rationale				

The rights of fishers are explicit and legally shielded by the legal coding system (indefinite licences renewed annually) which regulates formal access to the fishing industry. In 1998, the, at that time, Department of Agriculture, created the official census of the principality of Asturias's fishing fleet (Resolución de 18 de junio de 1998) in which access was given to all thosevessels that had any fishery activity in the previous two years. In addition, the right to the recreational fishing of octopus from a boat and on foot is legally recognised by a 2006 Decree that regulates the recreational sea fishing in the Principality of Asturias (Decreto 25/2006, de 15 de marzo).

The operational framework used to regulate the fishing industry is consistent with laws and legal frameworks at the local, regional, national and international levels. In this regard, no tension or conflict between fishers and/or between fishers and the Administration regarding fishing rights has been observed. SG80 is met.

Moreover, via the Common Fisheries Policy (CFP), the EU management system creates, respects, and ensures legal rights, which are expressly created or established for the practices of users dependent on fishing in a manner consistent with the sustainable use of the resources while minimizing the environmental impact. The implementation of the CFP by Spain, as a member country of the EU, ensures that these legal rights are taken into account in the national context of the fishery.

Based on the above, it is considered that the management system has a mechanism to formally commit to the legal rights of people dependent on fishing for food and livelihood in a manner consistent with MSC Principles 1 and 2. Therefore, this SI **reaches SG100**.

References

- Constitución Española. 1978. Cortes Generales. Boletín Oficial del Estado, 29 de diciembre de 1978, núm 311.

- Decreto 25/2006, de 15 de marzo, por el que se regula la pesca marítima de recreo en el Principado de Asturias. BOPA, núm. 81, 7 de abril de 2006.

- Estatuto de Autonomía del Principado de Asturias. 1982. Ley Orgánica 7/1981, de 30 de diciembre. Boletín Oficial del Estado, núm. 9, 11 de enero de 1982.

- Resolución de 18 de junio de 1998, de la Consejería de Agricultura, por la que se crea el censo oficial de la flota pesquera del Principado de Asturias. BOPA, 11 de julio e 1998.

- UN General Assembly. 1982. Convention on the Law of the Sea (UNCLOS), 10 December 1982.

Draft scoring range	**≥80**
Information gap indicator	**The information available is sufficient to score this PI**
Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**
Rationale				

All organisations, institutions and individuals involved in the management system are easily identifiable and explicitly defined in the legislation (see section 7.4.1.3 Particulars of the recognised groups with interests in the UoA).

Jurisdictions in matters of fisheries management are clearly defined between Spain's government and the autonomous regions through the Spanish constitution and each region's autonomy statutes. The clear legal framework and good relationship between national and regional institutions make it possible for there to be no problems in this regard. Actually, although the octopus fishery takes places inside internal waters (Asturias jurisdiction) and outside (Spanish jurisdiction), the SGP, in practice, declines jurisdiction in favour of the Dirección General de Pesca Marítima (DGPM) of the Asturias Government, in order to avoid double regulation and for a simple and more effective management of the fishery.

The Office of Fisheries Management within the DGPM of the Principality of Asturias is vested with the functions of fisheries management, the protection of marine resources, the inspection and monitoring of extraction (Surveillance and Control Unit), transport, marketing and consumption centres, functions in matters of non-university maritime education and training, and fishery research and experimentation (CEP). The role of CEP is fundamental in the fishery; its responsabiliy is "developing the different plans pertaining to the enhancement of fishery resources and conducting appropriate research to use scientific criteria to regulate closed seasons, minimum landing sizes, closed areas or prohibited species, and the most suitable fishing methods in each case". In general terms the CEP provides technical expertise to the DGPM on issues relating to the biology of marine species and their exploitation, and monitors the management plans. But, besides its legal roles, the CEP is at the end the connecting centre between all stakeholders, not only for giving a technical advice, but also for engaging stakeholders, organice the OFMC meeting and deliverables, developing protocols for the decision making and delivering all kind of information and reports related to the MSC certification.

At the national level, Maritime Rescue and the Office of the Harbour Master are responsible for matters relating to occupational safety and fishing boats. In addition to the CEP, The Universidad de Oviedo and the Gijón Oceanographic Centre belonging to the IEO also carry out research on this fishery and resource.

Fishers who are part of the OFMP are integrated into one of the eight fishing guilds (Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego y Figueras). The fishing guilds – which are also responsible for managing the wholesale fish markets – are represented in the Federation of Fishers' Guilds of the Principality of Asturias, which has regional jurisdiction and which is, in turn, represented in the National Federation of Fishers´ Guilds.

Also affiliated with the guild is the figure of *Guardapescas-Coastguards*, whose roles and responsibilities are clearly defined by Decree 23/1995 of 2 March (1. Ensure compliance with the rules and regulations governing fishery; 2. Collaborate with monitoring of Principality of Asturias' Coastal Waters Surveillance in monitoring compliance with the legislation on fisheries; and 3. Report regularly on the state of fishery resources), the current OFMP ("The duties of the guardapesca assigned to each fishing guild will be to check the weighing of landings, the quotas and admissible catch, when applicable, and the compliance with the minimum weight") and a very recent Action Protocol specifically delivered for this octopus fishery (for more details see section 7.4.1.10 Particulars of arrangements and responsibilities for monitoring, control and surveillance and enforcement). The *guardapescas* has no power to impose a sanction; rather, should he believe that a violation is taking place he must inform the competent authority (Civil Guard or the Office of Fisheries Inspection and Surveillance of the DGPM.

Based on the above, it can be concluded that the roles and functions of all areas of responsibility and interaction involved in fisheries are clear, well defined, and understood by all parties. Therefore, this **SI gets 80 and 100 score**.

b	Consultation processes			
	Guide post	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**	**No**
Rationale				

The need for the government to consult the fisheries sector on standards pertaining to the management of fishery activities is set out in Law 2/1993 on Asturian Fisheries. Following this and as it is stated in the Resolución de 21 de noviembre de 2019, the DGPM developed an OFMP in collaboration with the Fishers´ Guilds. The DGPM (the Head of Fisheries Management Service, the Surveillance and Control Unit and the CEP) and the fishers´ guilds are the main actors taking part in the consultation process for yearly developing the OFMP. Other stakeholders are ARPESOS (Association of the vessel owners included in the UoC), SIGMA s.l. (private consulting in charge of carrying out the on-board observers' program, the GPS tracking of vessels and in situ octopus tagging experiences in closed collaboration with CEP), OMA (Observatorio Marino de Asturias belonging to the Universidad de Oviedo) and WWF Spain (conservation NGO). All of them takes part in the consultaction processes within the fishery in several steps, but since the creation of the OFMC all those efforts were focused in this comittee.

Through this process, relevant scientific and technical information is obtained on the biology of the resource and the status of the fishery, and the local knowledge of fishers is also collected and expressed mainly at the OFMC, but also during the administrative process for approving the OFMP in the form of formal allegations presented by the fishers´ guilds. The climate of dialogue is good and collaborative and the outcome is an absence of conflicts between the parties mentioned. Probably the only exception to this is the two groups that has been created in the octopus fishery since the start of the MSC certification between, on one hand the fishers´ guilds included in the UoC associated under ARPESOS (*i.e.* Tapia de Casariego, Viavélez, Ortiguera and Puerto de Vega) and on the other hand the rest of the guilds non part of the UoC but included in the OFMP (*i.e.* Cudillero, Oviñana, Luarca, and Figueras). The two groups have different interests and timing.

The management system demonstrates that it has taken into consideration the information obtained; in the various meetings held within the OFMC to prepare the OFMP and during the follow-up of the fishing season, the CEP shared reports on the fishery before the meetings and during the meeting the information is explained and contrasted with stakeholders. The opinion of all stakeholders is expressed and collected in

formal writing notes and there is the opportunity to subsequently send the changes requested in writing to the DGPM via formal allegations under the administrative procedure for the approval of the OFMP.

Until this current fishing season, although all information was shared and discussed with stakeholders in the OFMC, the end use of the information was not clearly explained nor were the reasons for taking certain decisions (e.g., changing the closed season) given in writing. This disruption was because the OFMC it is only a consultative body without capacity for taking decisions (and so far even to make proposals), and moreover, the DGPM persons responsible for taking those final decisions (Head of Service and Managing Director of the DGPM) do not participate in the OFMC. WWF has formally raised this issue in the OFMC making a proposal for changing this when the decision making-protocol for the fishery was in its draft version, but this proposal was finally not taken into consideration.

As a new measure in the current fishing season, already reflected in the decision-making protocol (DGPM, 2020a) the Head of Fisheries Management Service and the Managing Director (from the DGPM) will review and answer all the allegations received from the fishers´ guilds, the only stakeholders in the system allowed to make allegations at this point of the consultation process. For the 2019-20 OFMP several allegations were received and formally answered. Before this fishing season allegation were not answered, so how information was used was not explained.

The fishers´ guilds are as well consulted by the DGPM when management measures for the recreational fishery are being drafted.

It is not yet clear if the DGPM is consulted by the SGP when setting the management measures for the trawlling fleet regarding commun issues, like the closed season for octopus, wich is mandatory for the small scale fleet fishing in internal waters, but not for the trawl fleet fishing deeper than the 100 m isobath. An old claim of the artisanal sector is that they have to stop fishing octopus for several months a year (usually mid July to mid December) when the trawllers can keep fishing octopus. A 2015 report from CEP found that in average 10.9% of *O. vulgaris* catches in Asturias was made by the trawl fleet during the period 2002-14, with maximums of ~20% (years 2002, 2006 and 2010) and minimums <5% (years 2008 and 2009) (Fernández, 2015c).

Based on the above, it can be concluded that the management system regularly seeks and accept relevant information and demonstrates consideration of it, therefore this SI gets at least SG 80. To confirm if SG100 is met, more information need to be sought at the site visit.

	Participation			
c	Guide post		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**
Rationale				

There are consultation processes that allow all interested parties effective involvement based on different mechanisms of representation. The EU Fishery Advisory Councils are one of the main mechanisms, but at a national level, the fishers are also represented by fishers' associations and federations in the different forums and consultation mechanisms, whether they are general in nature or specific to each fishery. The Common Fisheries Policy Reform process allowed all the interested parties, including the civil society, to provide their comments to the Green Paper on Fishing in Europe that formed the basis for the new CFP.

On a national level, the Spanish government regularly meets with the sector to tackle shared interest issues and learn of their opinions on the issues that affect their activity. The Consejo Asesor de Medio Ambiente (CAMA, Environment Advisory Council) of MAPA is a forum where environmental NGOs and the fishing sector have the opportunity to discuss environmental issues, including those related to the health of the seas and the existing issues, and where action measures are proposed to try to improve the identified negative aspects. Fishing activity related aspects are discussed in CAMA.

The process of consultations at the level of the Principality of Asturias provides the opportunity for, and encourages all stakeholders to, participate in meetings for drafting the OFMP in an open and transparent process. The OFMC has became the main participatory forum within the fishery. There is participation by the DGPM and the eight guilds that are part of the OFMP (Cudillero, Oviñana, Luarca, Puerto de Vega, Ortiguera, Viavélez, Tapia de Casariego and Figueras) and management measures are generally adopted unanimously, since the DGPM does not impose a measure without consensus with the fishing sector (e.g. the DGPM and CEP hasve tried several times imposing a daily and/or weekly maximum quotas, but it has never been implemented due to the opposition of the fishing sector). The participation of other stakeholders like ARPESOS, WWF, OMA-Universidad de Oviedo and SIGMA s.l. is active and promoted by the DGPM through the main engagement forum, the OFMC.

Although there are other stakeholders, such as conservation recreational fishing associations (e.g., Volver al Pedreru) and fishers' guilds east of the San Esteban de Pravia estuary (outside the scope of the OFMP), we have not observed interest by any of them in participating in this process. We are not aware of any request to participate which has been denied by the DGPM. We are not aware that any stakeholder was seeking to participate but not admitted in the OFMC.

Based on the above, it is clear that the consultation process provides opportunity and encouragement for all to get involved, and facilitates their effective engagement; therefore, this SI reaches SG 80 and SG 100.

References

- Ley 2/1993, de 29 de octubre, de pesca marítima en aguas interiores y aprovechamiento de recursos marinos. Boletín oficial del Principado de Asturias, núm. 264, 15 de noviembre de 1993.

- Fernández, MP. 2015. Impacto de la pesca de arrastre en la captura de pulpo común *Octopus vulgaris* en Asturias. Centro de Experimentación Pesquera (CEP), Consejería de Agroganadería y Recursos Autóctonos. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**The information available is sufficient to score this PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	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**

Rationale

The new EU CFP set of rules for managing European fishing fleets and for conserving fish stocks, aiming to ensure that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for EU citizens. Its goal is to foster a dynamic fishing industry and ensure a fair standard of living for fishing communities. The current policy stipulates that between 2015 and 2020 catch limits should be set that are sustainable and maintain fish stocks in the long term and it also does away with the wasteful practice of discarding through the introduction of a landing obligation by no later than 2019. The CFP adopts a cautious approach which recognises the impact of human activity on all components of the ecosystem and seeks to make fishing fleets more selective in what they catch, and to phase out the practice of discarding unwanted fish. This way the CFP is committed not only to sustainability and to applying the pre-cautionary principle to fisheries management, but also to an 'ecosystem-based approach'.

Nationally, Spain ratified the Convention on Biological Diversity (CBD) in 1993. Its objectives are the conservation of biodiversity, the sustainable use of its components and the fair and equitable sharing of benefits arising from the utilisation of genetic resources. Act 3/2001, of 20 March, on State Marine Fisheries establishes as objectives the oversight of the balanced and responsible exploitation of fisheries resources, the promotion of sustainable development and the adoption of the necessary measures to protect, preserve and restore the said resources and their ecosystems, while at the same time it intends to improve the conditions in which fishing activities are carried out and the standard of living of the fishers.

The Statute of Autonomy of the Principality of Asturias (Estatuto de Autonomía del Principado de Asturias, 1982) sets out the jurisdiction of Asturias with regard to the regulation of shellfish harvesting and coastal fishing and the protection of the ecosystems in which these activities take place. Moreover, within the DGPM' fisheries policy, the long-term objectives for this fishery are explicitly defined, guide the decision-making and are consistent with the Principles 1 and 2 of the MSC. The precautionary approach is inherent in the management policy and the information available is applied on a regular basis to the design of the OFMP.

Certain general objectives are spelt out in Fisheries Act 2/1993 (Ley 2/1993), such as that the DGPM "shall promote the improvement of production structures in the fisheries sector and, in particular, foster the renewal and modernisation of fishing vessels in order to increase productivity, health and safety at work and the improvement of the quality of the products handled, taking into account the need to adapt the fishing effort to the state of resources and selectivity of the gear to use".

Based on the above, it is clear that the management policy has clear long-term objectives to guide decision-making that are consistent with MSC fisheries standard; therefore, this **SI reaches SG80 and SG 100**.

References

- Estatuto de Autonomía del Principado de Asturias. 1982. Ley Orgánica 7/1981, de 30 de diciembre. Boletín Oficial del Estado, núm. 9, 11 de enero de 1982.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report	
Draft scoring range	**≥80**
Information gap indicator	**The information available is sufficient to score this PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report	
Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**	**No**
Rationale				

The OFMP in Asturias explicitly determines objectives consistent with achieving the outcomes expressed in Principles 1 and 2 of the MSC. Certain general objectives are also spelt out in the Law 2/1993 of the Principality of Asturias (Ley 2/1993) (see PI 3.1.3).

The fishery objectives have been discussed within the OFMC in the past two years and are now explicit in the OFMP (Resolución de 21 de noviembre de 2019). P1 objectives are defined in terms of addressing further declines, rather than specifically maintaining optimum yields or biomass levels. P2 objectives are focus on the impact over other species and the ecosystem. The fishery objectives currently implemented are already explicit in the OFMP:

1. — The main objective of the management plan for the 2018/2020 campaign is to maintain the balance between the fishing effort and the abundance of the resource, which until now has guaranteed the sustainability of the fishery. For this, and given the risk that changes in socioeconomic conditions may alter the described equilibrium situation, it is considered appropriate to maintain the general rules of previous campaigns and also establish the following specific objective:

• Determine if there is a risk of overfishing based on early indicators of the state of the stock and limit the fishing effort in the event that such risk is detected.

2. — Although the monitoring data of the octopus fishery in previous campaigns demonstrates its low impact on the ecosystem, it is intended to ensure that this situation is maintained during this campaign, or even improved as far as possible, by establishing the following specific objectives:

• Conduct at least two sampling per month with observers on board to assess the impact of the fishery on the accessory species.

• Maintain the mortality of discarded specimens below 5%.

3. — It is also a basic objective of the management plan to ensure that biological and ecological sustainability are associated with social and economic improvements in the fisheries sector. To this end, the co-management system established in previous campaigns that involves the main actors related to this fishery through the Octopus Fishery Monitoring Committee is maintained.

Moreover, the CEP proposal to establish a TAC of 189 t for the current fishing season 2019-20 was unanimously approved by all stakeholders present in the OFMC meeting, conditioned not to make any changes in the management measures unless reported landing were approaching the 189 t, and after deliberations with the octopus' fleet (CS, 2020).

Based on the above, it can be concluded that the fishery-specific management system has explicit objectives which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, therefore SG 60 and SG 80 are meet. Nevertheless, those objectives (in a short and long-term) are not well defined and measurable, therefore SG100 is not met.

References

- CS [Comisión de Seguimiento del Plan de Gestión del Pulpo]. 2019. Acta de la Comisión de Seguimiento del Plan de Gestión del Pulpo. Dirección General de Pesca Marítima, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 29 de octubre de 2019. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- Resolución de 21 de noviembre de 2019, de la Consejería de Desarrollo Rural, Agroganadería y Pesca, por la que se regula la pesca del pulpo común (*Octopus vulgaris*) durante la campaña 2019/2020. BOPA, núm. 232, 2 de diciembre de 2019.

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**The information available is sufficient to score this PI**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**	
Rationale				

The decision making process in the fishery is a co-management system, both for the design of the OFMP as for everyday decision-making. The DGPM has just approved on February 2020 a *Protocol for the Decission-Making Process in the Octopus Fishery Management Plan of the Principado de Asturias* (DGPM, 2020a). This protocol has gone through several versions and was extensively discussed within the consultative OFMC where all stakeholders of the fishery are actively participating. The DGPM has approved the protocol that came from the OFMC. Nevertheless, as some stakeholders have criticized (e.g. WWF-Spain) the OFMC it is only a consultative body without capacity for taking decisions, and that the DGPM persons responsible for taking those decisions (Head of Service and Managing Director of the DGPM) do not participate in the OFMC. Although WWF raised this issue, the decision-making process protocol does not include the participation of the final decision takers in the OFMC, but only in the following steps of the decision making; 1) when drafting the OFMP after the discussion within the OFMC, and also posteriorly, 2) when receiving and answering the formal allegations, if any, to the draft OFMP before being formally approved by its publication in the BOPA, the Official Gazette of the Principality of Asturias.

The decision-making process incorporates both the scientific and technical knowledge of scientists and technicians from the DGPM (especially the CEP and the Surveillance and Control Unit), from the IEO and the OMA-Universidad de Oviedo, ARPESOS (Association of the vessel owners included in the UoC), WWF (conservation NGO), SIGMA s.l. (private consulting in charge of carrying out the on-board observers' program, the GPS tracking of vessels and in situ octopus tagging experiences in closed collaboration with CEP) as well as the local knowledge of fishers. The guilds, as institutions representing the productive sector, are actively involved in taking decisions through face-to-face meetings and formal communications.

From the standpoint of scientific research, the CEP contributes to the management objectives by improving and integrating scientific knowledge into the fishery. Although the CEP is a small centre with limited staff, there is a strong commitment to get all the information possible in order to reduce the uncertainties surrounding the biology/ecology of the octopus and to collect all the data, both dependent and independent of the fishery, that may help it to be better monitored.

Communication between the parties (cofradías and DGPM) is direct and easy, allowing high flexibility in the decision-making process. Part of the decision-making process is an administrative procedure (regulated by Act 30/1992 of 26 November on the Legal Regime of Public Administrations and the Common Administrative Procedure) (Ley 30/1992) that has been formally incorporated to the whole Protocol for the Decission-Making Process of the OFMP. The first part of the decision making process (steps 1, 2 and 3) takes places within the OFMC where all stakeholders are actively represented, and the second part (steps 4, 5 and 6) takes places outside the OFMC and is under the responsibility of the Head of Fisheries Management Service - Jefe de Servicio de Ordenación Pesquera (from the DGPM), who after considering the meeting notes from the OFMC will make a proposal for the next OFMP (DGPM, 2019a). The final Decision-making protocol specific for the OFMP has the following steps (DGPM, 2020a):

1- Proposals to consider (within the OFMC): any participant within the OFMC can raise and propose and issue to discuss, that has to be explained and motivated. The proposal has to be send to the CEP which will disseminate the proposal and get heir opinion. If a OFMC meeting will happen soon, the proposal will be included in the OFMC agenda, and if not an extraordinary meeting can be set up if the mayority of the OFMC participants considers so.

2- Collection and dissemination of information (within the OFMC): the CEP is the body in charge of compilling all relevant information and monitoring the fishery which will disseminate with the OFMC participants before the meetings takes place. The CEP is also in charge of convene the OFMC meetings.

3- Evaluation of the information (within the OFMC): within the OFMC the CEP will show and explain the information related the fishery monitoring. The information will be analysed in common and different management options will be debated. The CEP is in charge of writing down the meeting minutes and pass it afterwards to all participants with all the topics discussed and agreements, if any.

4- Analysis of the different options and proposed regulations for fisheries management (outside the OFMC): this phase occurs outside the OFMC and is under the responsibility of the Head of Fisheries Management Service - Jefe de Servicio de Ordenación Pesquera (from the DGPM), who after considering the meeting minutes from the OFMC will make a proposal for the next OFMP (DGPM, 2019a), or could also propose a change in the current fishing season. Its decision will be communicated to all fishers´ guilds and onther concerned entities. The DGPM can ask for advice to the CEP before taking any decision.

5- Allegations of the interested stakeholders (outside the OFMC): under this administrative process outside the OFMC the stakeholders have the opportunity to present formal written allegations to the draft OFMP of the changes in the current fishing season.

6- Decision making and management application (final OFMP) (outside the OFMC): the Head of Fisheries Management Service and the Managing Director – Director General (from the DGPM) will review and answer all the allegations and will approve a final measure, either for the current fishing season or the next OFMP. The DGPM can ask for advice to the CEP before taking any decision. The final OFMP will be sent by the Managing Director for publishing in the BOPA, the Official Gazette of the Principality of Asturias.

7- Evaluation of the effectiveness of decisions: the new management measures and changes in the regulation will be assessed in order to inform the next decisions to be taken in the OFMP. It is not clear yet who will be the responsible at this stage and how this assessment will be made.

After the OFMP has been published in the BOPA the fishers´ guilds still have a new opportunity to, if they so wish, bring an administrative appeal before the Board of Administrative Litigation of the Superior Court of Justice of Asturias. Nevertheless, the good environment and understanding between the parties has facilitated that things have never came to that point.

The first part of the decision making process (steps 1, 2 and 3) takes places within the OFMC where all stakeholders are actively represented. The roles of the OFMC are:

a) Exchange of information and knowledge between stakeholders. This is the main purpouse of the comitte and this role has been so far extremely well achieved, with all stakeholder regularly participating in the two fishing season meetings, sharing results and discussing the information showed as well as new proposal for managing the fishery.

b) Inform or propose changes in the management measures. Until the 2019-20 fishing season the OFMC was only discussing regarding possible changes in the management measures but no proposal for the DGPM was coming out from this comitte since no consensus was achieved. In February 2020, for the first time, the OFMC achieved unanimously three relevant agreements: 1) stablish a 2019-20 fishing season TAC of 189 tonnes (a sustainable level coming out from the stock assessment depletion model), 2) introduce a change in the decision-making protocol for all allegations to be answered in a written format explaining why decisions were taken, and 3) ask the DGPM for increasing the control and surveillance in the fishery (CS, 2020).

c) Promote and facilitate scientific studies and technical monitoring. Gaps of information and future projects to addressed it has been effectively discussed in the OFMC and results from those studies has been shared (e.g. octopus marking experience, estudies on possible HCR associated to CPUE, stock assessment model, identification of special recruit-juvenile habitats, …). The implication of the fishing sector along with the CEP, SIGMA and the OMA (Universidad de Oviedo) has been material for successfully developing this role.

d) To do a follow up of the degree of execution of the objectives of the plan. This last role was added in the OFMP 2018-19 and it was done for the first time in the OFMC meeting in October 2019 (CS 2019). The individual objectives of the management plan have been assessed and difficulties or weak points identified.

All this results in measures and strategies to achieve the objectives of the fishery, based on a clear and established decision-making process; therefore this SI **reaches SG 80.**

b	Responsiveness of decision-making processes			
	Guide post	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**
Rationale				

The active participation of all stakeholders allows the decision-making process to respond to serious and important issues relevant in terms of research, fishery surveillance and consultation (e.g., the establishment of an onboard monitoring plan, GPS satellite tracking of vessels, databases of catches, CPUE, etc.). This process works on a regular basis and is able to respond quickly to any event that affects the fishery due to the harmony between managers and fishers.

However, not all topics are addressed (e.g., the influence of climatic factors on the octopus population) and there is also a lack of clear target reference points linked to fishery status indicators that could guide solid, day-to-day decision-making.

Nevertheless, the implications of the decisions taken around the more serious and important issues on fisheries management (e.g comprehensive fishery monitoring, stock status, reproductive closure, minimum size, other fisheries impact on octopus, traps bycatch and its survivorship, bycatch of ETPs, impact on habitats and ecosystem, tracking system for the fleet and for the line of traps for reducing poaching, etc.) are considered, therefore this SI gets a SG of 80. However, the SG100 is not met.

c	Use of precautionary approach			
	Guide post		Decision-making processes use the precautionary approach and are based on best available information.	
	Met?		**Yes**	
Rationale				

Ley 2/1993 on Fisheries of the Principality Asturias has a precautionary approach because it establishes that the improvement of the fisheries sector shall be promoted taking into account "the need to adapt the fishing effort to the situation of the resources".

The precautionary approach is inherent in the decision-making process and is applied. The decision-making process is based on the best information available and, in addition, the DGPM in general – and the CEP in particular – make a great effort to get the best information available; if there is no relevant information, it responds quickly by designing a study to cover these gaps. A clear example of this is the project commissioned to the consultancy firm SIGMA s.l. to carry out during the 2014-15 campaign sampling on board the boats (features of the fishing gear, fishing zones, retained catch, discards, ETP species, etc.), install GPS/GPRS devices in ten boats and proceed to the marketing/release/recapture of octopus.

Currently the OFMC mets in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going (CPUE at the beginning of the fishing season during the months of December and January is analyzed) and decide wether any effort restriction should be taken (the measures to reduce effort would be an early daily closure of the fishery at 16h (instead of at 17h) and a maximum daily quota of 60, 120 or 180kg for 1, 2 or >2 crew members respectively). The Fisheries Act 2/1993 of the Principality of Asturias provides that octopus fishing boats also have licences for other coastal fishing gear, and thus, in practice, the fishers themselves con immediately move to other fisheries under a precautionary approach if anything wrong happens with the octopus.

The entire system uses a precautionary approach based on the best scientific and technical information available, **so the SI gets a SG of 80**.

	Accountability and transparency of management system and decision-making process			
d	Guide post	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**
Rationale				

During the consultations for the drafting of the OFMP each year, and during the decision-making process, information is offered on the current status and historical evolution of different fishery indicators (catches, sales, CPUE, price, octopus weight distribution, etc.) to all stakeholders.

In the *Protocol for the Decission Making Process in the Octopus Fishery Management Plan of the Principado de Asturias* (DGPM, 2020a) explained in SIa, a detailed procedure, step by step, on how decision are taken is described.

The first part of the decision making process (steps 1, 2 and 3) takes places within the OFMC where all stakeholders are actively represented. The OFMS meets at least twice in each fishing season; 1) the first meeting (October-November) is done before the OFMP is published (usually December), and it is intended to review the past fishing season and discuss management measures for the next management plan, and 2) the second meeting takes place in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going and decide wether any effort restriction should be taken. Moreover, before each meeting the CEP is in charge of delivering in advance to all stakeholders monitoring reports on the status of the fishery. After the meeting, the CEP also delivers meeting minutes to all participants, that are endorsed by all stakeholders in the next OFMC meeting.

The second part of the decision making process (steps 4, 5 and 6) takes places outside the OFMC and is under the responsibility of the Head of Fisheries Management Service - Jefe de Servicio de Ordenación Pesquera (from the DGPM), who after considering the meeting notes from the OFMC will make a proposal for the next OFMP (DGPM, 2019a). This proposal is a written document sent to all fishers´ guilds who can make formal allegations that will be answered back by the DGPM on a written document. After this, the final OFMP will be sent by the Managing Director for publishing in the BOPA, the Official Gazette of the Principality of Asturias. The fishers´ guilds still have a new opportunity to, if they so wish, bring an administrative appeal before the Board of Administrative Litigation of the Superior Court of Justice of Asturias.

This procedure provides accountability and transparency of the management system and decision-making process. Nevertheless, some relevant information, as data on the number of traps used based on the on-board observer program reports (Fernández, 2019b, 2020b) are not being distributed by the CEP within other stakeholders at the OFMC. Other relevant information as the monthly landings of octopus below the weight

limit (1 kg) from the CEP monitoring at port is not shown since the 2019-20 fishing season. The CEP confirmed the CAB during the 4SA site visit that, although they keep registering this information, it is deliberately omitted in the reports “for not interfering with the Surveillance and Control Unit and also for avoiding this way a potential loss of trust from the fleet in the CEP monitoring” (Mª del Pino Fernández, biologists and responsible of CEP monitoring, personal communication). This circumstance is preventing the circulation of key information on the fishery between stakeholders. So far the CAB is not aware if any stakeholder has requested this information.

Moreover, although the protocol establishes that the new management measures and changes in the regulation will be assessed in order to inform the next decisions to be taken in the OFMP, this has still not been implemented in place, and it is not clear yet who will be the responsible at this stage and how this assessment will be made.

Based on the above, it can be concluded that information on the fishery’s performance and management action is available to stakeholders, 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, therefore, this **SI reach SG 80**. SG 100 is not reached since the formal reporting does not provide key information on the fishery to all stakeholders, and, moreover, so far, the effectiveness of management measures and decisions has not been reviewed.

	Approach to disputes			
e	Guide post	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**
Rationale				

In Title IX of the 2/1993 Fisheries Act of the Principality of Asturias (Ley 2/1993) there is a section related to offences and sanctions that states in great detail all the kinds of offences (classified as minor, serious and very serious) and the concomitant sanctions, which range from administrative fines to the revocation of licences and disqualification from activity for up to three years.

We have not observed any legal disputes within the scope of this fishery. In any event, should there be any,the legislative framework makes it clear how they must be resolved.

The resolution of conflicts between fishers and the Administration is done through dialogue and direct negotiations. Otherwise, it is done with statements from the involved parties to the administration and appeals, both administratively and – if rejected – via the appropriate judicial processes to the authorities necessary for the resolution of disputes between the parties (Superior Court of Justice of Asturias).

Conflict resolution with other fisheries (trawl platform and recreational) has cooperation/dialogue frameworks established. The DGPM consults the fishers' guilds regarding the regulations concerning the recreational fishing of octopus in Asturias. The conflict with the trawlers (state-jurisdiction fishery) dates from many years ago (creel boats claim that the industrial trawling fleet occasionally operates in waters shallower than 100 m and that they do have to respect the octopus closed period) and there have not been, to our knowledge, meetings and/or contacts to resolve it. However, Act 3/2001 of 26 March, on State Marine Fisheries sets out in its first additional provision the creation of two bodies for coordination and consultation between the Spanish state, autonomous regions and the fisheries sector when the issues are topics of common interest. The *Consejo Nacional Pesquero* (National Fisheries Council) is the coordinating body between the MAPA and the autonomous regions, and on it are represented the SGP, the Directors General of the General Secretariat of Maritime Fisheries and a representative from each of the autonomous regions. The other body is the *Comité Consultivo del Sector Pesquero* (Consultative Committee of the Fisheries Sector), which has advisory and consultation functions, and which has representatives from the most important associations or

organisations in the fisheries sector, including the *Federación Nacional de Cofradías de Pescadores* (National Federation of Fishers' Guilds).

Based on the above, it can be concluded that the management system acts proactively to avoid legal disputes, so this SI gets a SG of 100.

References

- CS [Comisión de Seguimiento del Plan de Gestión del Pulpo]. 2019. Acta de la Comisión de Seguimiento del Plan de Gestión del Pulpo. Dirección General de Pesca Marítima, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 29 de octubre de 2019. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- CS [Comisión de Seguimiento del Plan de Gestión del Pulpo]. 2020. Acta de la Comisión de Seguimiento del Plan de Gestión del Pulpo. Dirección General de Pesca Marítima, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 20 de febrero de 2020. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- DGPM [Dirección General de Pesca Marítima]. 2019a. Propuesta de resolución de la Consejería de Desarrollo rural, Agroganadería y Pesca, por la que se regula la pesca de pulpo común (*Octopus vulgaris)* durante la campaña 2019-2020. Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 5 de noviembre de 2019. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- DGPM [Dirección General de Pesca Marítima]. 2020a. Protocolo para la toma de decisiones en el plan de gestión del pulpo común del Principado de Asturias. Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. Febrero de 2020. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- Fernández, MP. 2019b. Resultados de los muestreos de pulpo realizados en el plan de gestión como parte del seguimiento de la campaña 2018/2019. Centro de Experimentación Pesquera, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 16 de julio de 2019. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

- Fernández, MP. 2020b. Resultados de los muestreos de pulpo realizados en el plan de gestión como parte del seguimiento de la campaña 2019/2020. Centro de Experimentación Pesquera, Consejería de Desarrollo Rural y Recursos Naturales, Gobierno del Principado de Asturias. 30 de julio de 2020. (Document available under request to the CAB, in accordance with FCP v2.1, 4.4 & 7.16.2).

Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**≥80**
Information gap indicator	**More information sought**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide 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**	**No**
Rationale				

The DGPM' Surveillance and Control Unit has the primary responsibility for ensuring compliance with the rules governing the activity as it is written in the Fisheries Act 2/1993 of the Principality of Asturias, Title VIII and IX (Ley 2/1993). In addition, the DGPM cooperates with the SGP as part of the MAPA on monitoring issues, mostly related to industrial fleets that may catch octopus, as the trawling fleet. Another state organisation that contributes to monitoring in terms of food safety, poaching and coastal and marine environmental impacts is SEPRONA (Nature Protection Service), which is part of the Civil Guard (Ministry of the Interior). The Surveillance and Control Unit also coordinates the Coastguards-Guardapescas work, who are directly employed by the fishers´ guilds.

The Surveillance and Control Unit (from the Resource Protection Division a branch of the Fisheries Management Department) is the main body in charge of the MCS in the OFMP. The monitoring and inspection system (Title VIII) along with violations and sanctions (Title IX) are set out in Ley 2/1993 on Asturian Fisheries. This unit has by law the faculty to get access to the vessels, first auction markets, marine farming facilities, processing, marketing and consumption facilities of marine products (Ley 2/1993). This unit actually does inspections to the professional fishers at sea, at the harbor piers, at the landing facilities and first auction markets in the fishers´guilds, during transporting and finally at the sales points to the public. Moreover, also does inspections to the recreative fishers. The Surveillance and Control Unit has four teams: one on the eastern coast, two on the central coast and one on the western coast. In each one, there are three or four agents who monitor all fishing activities, from the catch to the sale.

The DGPM has released on September 2020 an update of the minimum number of inspections (on land and at sea) compromised in the fishery to be applied in the coming 2020-21 fishing season (DGPM, 2020c). According to the new program for the MCS system the minimum number of actions to be done by the Surveillance and Control Unit in the OFMP each fishing season are: 1) On land actions: minimum of 15% of the boats randomly selected will be checked while landing (but if any infringement is detected in a boat, its landings will be checked at least once a month during the current and next fishing season), 2) At sea actions: minimum of 5% of the lines of traps will be inspected for checking its correct marking according to the directions issued by the DGPM, minimum of 5% of the total number of traps will be seized for checking compliance with the maximum number of traps per boat allowed and with the line of traps marking system, a minimum of 5% of the boats will be inspected to check compliance with other management measures (license, dispatch of crewmembers, weight-limit, fish loading sanitary conditions, …).

In the past years the MCS system suffered a weakening of the surveillance capacity in the octopus' fishery due to a reduction in the number of enforcement officers in the Surveillance and Control Unit because of retirement and medical leaves of part of the staff. For the 2019-20 fishing season this weak point was partially solved by incorporating more officers and by giving priority to this fishery in terms of surveillance and control.

Of the 16 inspectors of the unit in Asturias (12 inspectors full time and 4 part time), currently 2 full time inspectors openings are still pending to be filled. Nevertheless, the octopus' fishery is a priority for the unit so the number of inspections compromised in the fishery, according to the minimum approved by the Surveillance and Control Unit (DGPM, 2017), has been fulfilled in the current fishing season 2019-20. Some of the staff retired could not be replaced in time due to the long administrative process, but would be done along next fishing season according to the head of the unit.

The fleet in the OFMP is monitored by tracking devices. The CEP started in 2016 to install a GPS in some of the vessels included in the OFMP, and since 2017 the GPS devices are mandatory in all vessels. This means that comprehensive information on the geographical effort of the assessed fleet is available (these data are being used by the CEP to determine the duration of the fishing trips, the maximum distance that the vessels sail, and the specific areas where the vessels set the traps). According to the During the 2018-19 fishing season all the vessels that assisted to the fishery were tracked by GPS, although in 8 boats the device did not work properly and could not be replaced along the fishing season, so only 40 vessels were finally tracked. In 20 of those vessels a 100% of the fishing days were monitoring, while in the rest of the boats only partial monitoring was achieved, since the GPS device was not installed since the beginning of the fishing season. During the 2018-19 season 1,380 fishing days were GPS tracked, representing 80% of the total fishing days in the OFMP.

In addition to the GPS system, the fishery implemented in the 2019-20 fishing season a procedure for marking the line of traps. The measure was implemented in 25 of the 43 vessels licensed (all vessels from the fishers´ guilds of Luarca, Figueras, Tapia and Viavélez, and one vessel from Ortiguera), representing 58% of the OFMP fleet. The marking system is as follows: the line of traps has two buoys, one in each end, where a seal is set with a unique ID (silk-screen printing in relief) that identifies the boat name, plate number of the boat and the number of lines of traps of that boat (for cross-checking during the inspections, the DGPM has a database with the number of lines of traps of each boat and the number of traps included in each line). If both seals from a line of traps are lost, that ID its removed from the database (becoming a non-valid ID) and a new ID is issued to that line of traps (so far this has only happened once in the fishery). Before the start of the fishing season 2019-20 the CEP sent to all cofradías part of the OFMP directions for the skippers regarding this marking system, under which all boats should identify the number of lines of traps and the amount of traps in each line. Based on that, the DGPM issued the seals. The CAB was told in the 4th surveillance site visit that all lines of traps will be marked for the 2020-21 fishing season.

The DGPM Surveillance and Control Unit also coordinates the Guardapescas work hired by the fishers´ guilds. Both bodies have a good relationship and work together. The *guardapescas* are guild staff and their functions are regulated by Decree 23/1995 of 2 March, which created the figure of the coastguards (Decreto 23/1995). Each of the guilds in Puerto de Vega, Ortiguera, Viavélez and Tapia de Casariego has a coastguard. Their functions are: 1) Ensure compliance with the rules governing the exploitation plans (mainly barnacle and octopus); 2) Collaborate with the DGPM Surveillance and Control Unit in the enforcement of fishing laws and 3) Report periodically on the state of fish stocks in their area. Despite this regulation in the initial assessment of the fishery it was found that the coastguards perform other tasks beyond those provided for in the decree and a condition was open (see PCR 2016). In order to tackle this issue the roles and responsabilities of the *guardapescas* in the OFMP were included in the resolution for the management plan in the fishing season 2017-18 for the first time, and are currently active in the Resolución de 21 de noviembre de 2019; "The duties of the *guardapesca* assigned to each fishing guild will be to check the weighing of landings, the quotas and admissible catch, when applicable, and the compliance with the minimum weight". In the same line a detailed *Operating Procedure of the Guardapescas in the OFMP* was just delivered in February 2020 (DGPM, 2020b). The protocol details all the roles the guardapescas should take regarding the monitoring of the landings and the control and surveillance of the professional octopus fishery as well as the recreational fishing occurring in their areas. Regarding the landings monitoring the protocol establishes that the *guardapescas* shall control and follow up the daily activity of all vessels in their fishers´guild, register and weight the landings, check for individuals below the 1kg weight limit and send all this information to the CEP, as well as collaborating with them in their monitoring of the fishery. Regarding the control and surveillance, the guardapescas shall check for compliance on weight limit, control que quotas (daily, weekly annually) if established in the OFMP, collaborate with the DGPM Surveillance and Control Unit on the control of the maximum number of fishing traps and with the implementation and development of the marking system for the line of traps, and check for compliance in any other measure of the fishery, including the closed periods. The protocol also establishes the possibility that the *guardapescas* can take action on control and surveillance at sea, although the reality is that they do not have the resources for doing it (i.e. a vessel). Moreover, the *guardapescas* shall also control the recreative fishing in their areas.

Regarding the number of inspections in the fishery and according to the report provided by Valentín García (Head of Surveillance and Control Unit) (DGPM, 2020d), the following actions were done during the 2019-20 fishing season: 7 boats (16% of the total boats in the OFMP) were inspected while unloading the fish (mostly to control the weight-limit regulation), 34 lines of traps (10% of the total) from 12 boats were checked at sea were for controlling the compliance in the new trap marking regulation recently implemented in the fishery, the weight-limit regulation and other fishery measures, moreover, 18 lines of traps in 7 of those boats inspected were being lifted on board while the enforcement officers were there, so the number of traps were counted (592 traps which correspond to 5% of the total) in order to check compliance with the maximum number of traps per boat allowed). Finally, 4 boats (9% of the fleet) were inspected at sea for checking compliance with all other management measures (license, dispatch of crewmembers, weight-limit, fish loading sanitary conditions, …). These number of inspections made are over the minimum number of actions that the Surveillance and Control Unit has to do in the OFMP each fishing season, according to the new program for the MCS system in this fishery (DGPM, 2020c).

The system has proven to be sufficient to meet most of the rules set out in the OFMP. However, it is known that there is a lack of robustness to exhaustively and consistenly enforce some of the rules (e.g. total number of traps set at sea). This circumstance seems to be caused by some shortage of operational means (human and material resources) on behalf of the DGPM Surveillance and Control Unit in the last years:

1- Human resources limitation – Enforcement officers: Due to an enforcement capacity reduction in the 2018-19 fishing season, the implementation of a protocol for marking the line of traps had to be postponed until the next season. The Surveillance and Control Unit has just started the implementation of the marking protocol for the line of traps in the current 2019-20 fishing season in just part of the OFMP fleet (58% of the boats) and so far this management measure is not in place for the whole UoA.

2- Material resources limitation – Enforcement vessel: so far the DGPM still has no ability to seize and remove lines of traps at sea because of the lack of a vessel large enough to do it. In June 2020 the Asturias Government release a press note announcing the tender of a vessel for the DGPM (21 m length, 1,500 horse power) with a multiannual budget (2020-22) of 1.7 million € (GPA, 2020). Moreover, in May 2020 the Maritime Service of the Civil Guard (Ministry of the Interior, Spanish Goverment) in Asturias received a new vessel (20.5 m length, 2,400 horse power) designed for surveillance and control activities of coastal fisheries, rescue and drug traffic in the maritime Asturias waters. The Surveillance and Control Unit from the DGPM collaborates with the Civil Guard in the surveillance of the coastal marine waters in Asturias..

The MCS system in place still has to be improved, as it has been recently expressed by the fishing sector in an unanimously agreement within the OFMC, asking the DGPM for increasing the control and surveillance in the fishery (CS, 2020). Based on this limitations, the CAB considers that the MCS system implemented in the fishery is not comprehensive and it has not demonstrated yet a consistent ability to enforce relevant management measures, strategies and/or rules.

A MCS system is implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules, therefore **SG80 is met**. Nevertheless, the shortage of operational means (human and material resources) on behalf of the DGPM Surveillance and Control Unit in the last years, and the recent and partial implementation in 2019-20 of the procedure for marking the line of traps, prevents reaching SG 100.

b	Sanctions			
	Guide post	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**	**No**	**No**
Rationale				

Until 2015, infractions of the fishing regulation in Spain only had administrative sanctions. But due to the pressure of the Spanish fishing sector in 2015 the penal code was modified under which shellfish poaching is now considered a criminal offense, with penalties of up to two years in prison as it is stated on article 180

of the Penal Code of the Organic Law 1/2015, of 30 March (Ley Orgánica 1/2015) and so is expected to have a higher deterrent effect as sentences are gradually made public.

DGPM' Surveillance and Control Unit was created in 1993 (Fisheries Act 2/1993 of the Principality of Asturias, Title IX). This body also coordinates the *Guardapescas* work hired by the fishers´ guilds under a program started in 1995. Both bodies have a good relationship and work together. In the Fisheries Act 2/1993, Título IX, is entirely dedicated to Infringements and Sanctions where a comprehensive list of type of infractions and sanctions to each one are given (from monetary penalties to removal of fishing licence and confiscating of fishing gears and boats). In this section all kind of infractions are presented and categorized in 3 types: minor, severe and very severe infractions. The administrative procedure, the competent organisms and the responsibles of the infractions are also established. For each type of infraction, a monetary sanction is set; between 12-66 €, 66-6,000 € and 6,000–18,000 € for the minor, severe and very severe infractions respectively. The law states that for the severe and very severe infractions the DGPM may impose a temporal cancellation of the license, as well as disqualification to obtain it in a future period. The confiscation of the catch at the moment of the infraction and the confiscation of properties (fising gears and even the vessels itself) can also be imposed.

There have been few sanctions in this fishery due to the low conflict atmosphere within this fishery. The vast majority of sanctions related to octopus are to recreational fishers for not reaching the minimum wage or for exceeding the quota. During the priod 2010-2014, the Surveillance and Control Unit imposed only nine sanctions on professional octopus´ fishers with traps (five in 2010 and only one in 2014). A decline of sanctions has been observed from 2010 to 2014, and no sanctions were imposed to professional fishers in 2016 and 2017 according to information provided by the DGPM, although the intensity of control and surveillance vessels targeting octopuses has been maintained (40 inspections at auction points, 62 vessels inspected while landing and 22 vessels inspected while fishing, during the fishing season 2016/17 according to data provided by the DGPM during the 1st SA). In the 2017-18 fishing season, 4 sanctions (fines between 400-1,250 eur) were issued due to excess of traps (all in the port of Luarca) and 2 sanctions were issued due to individuals smaller than the minimum weight (one of the sanctions was issued to a boat part of the MSC UoC) to boats from the OFMP. In the 2018-19 only one sanction was issued due to fishing during the closure period, and in the 2019-20 no sanctions were issued since no infractions were found. The *Guardapescas* have not powers to impose sanctions, although they have reported to DGPM conflicts with recreational fishers but not with the professional fishing sector. The Guardapescas surveillance activity is restricted inside the auction points buildings and outside right on the coastline mainly in rocky shores for recreative fishers, but no inspections are done by this unit at sea and on docks.

During the 4th surveillance remote audit a non-conflict atmosphere was observed regarding this issue and everybody agrees that sanctions have worked for increase fisher´s compliance and has provide an effective deterrence. The non-conflict atmosphere was also observed during all previous site visits to the fishery during this certification that started in 2015.

According to the above it is clear that sanctions to deal with non-compliance exist and there is some evidence that they are applied and provide some effective deterrence, therefore **SG 60 is met**.

However, there is currently shortage of operational means (human and material resources) on behalf of the DGPM Surveillance and Control Unit (*i.e.* lack of enforcement officers associated with a reduction in the number of enforcement actions in 2019, and lack of a vessel with the ability of lifting the lines of traps), which has been extensively explained on SI a. Moreover, so far it is not clear for this CAB if sanctions are consistenly applied since there is no accountability and transparency in the management system of the infractions found, sanctions applied and the final resoluction of those sanctions (e.g. fines, penalties, …). As an example, during the 4SA site visits we asked to Valentín García (Head of Surveillance and Control Unit) about the resolution of these sanctions, but the final result of them were unknown.

Another weak point is that the implementation of the marking protocol for the line of traps has only started in the fishing season 2019-20 in a limited number of the UoA vessels (58% of the vessels, although it is expected to reach 100% of the vessels for the coming 2020-21 fishing season). Moreover, the on-board observers reports on the 2018-19 and 2019-20 fishing seasons (Fernández, 2019b, 2020b) do not provide information on the number of traps used per day per boat. And finally, the yearly reports on the fishery monitoring are currently not publishing detailed data on the monthly landings of individuals below the weight limit of 1 kg (data not available for the 2019-20 fishing season), which in the 2016-17 fishing season reached a maximum of 10-15% in June-July (Fernández, 2017). The CEP confirmed the CAB during the 4SA site visit that, although they keep registering this information (number of traps and individuals below the weight limit) in their monitoring, it is deliberately omitted in the reports "for not interfering with the Surveillance and Control

Unit and also for avoiding this way a potential loss of trust from the fleet in the CEP monitoring" (Mª del Pino Fernández, biologists and responsible of CEP monitoring, personal communication).

Therefore, it is not totally clear for this CAB if the absence of violations, sanctions and penalties in the OFMP is indicating that compliance and enforcement is actually very effective, or if the MCS is in fact not that effective and what is happening is an absence of detection. Actually, this lack of accountability and transparency in the MCS system (no records of final penalties for violations and deliberate omission of information from the CEP on-board observers monitoring) prevented closing Condition 4A in the 4SA.

All these limitations do not allow us to confirm that sanctions are consistently applied and thought to provide effective deterrence, therefore, SG80 is not met.

c	Compliance			
	Guide post	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**
Rationale				

The fishers are maintaining high levels of commitment in complying with most of the management system requirements and the fishery regulations. The MCS system seems effective and hardly any cases of non-compliance have been reported. The whole OFMP fleet is since the 2017-18 fishing season constantly tracked by GPS, and the fleet is well recognized by the CEP and SIGMA for collaborating in the on-board observer program; both aspects are mandatory in the OFMP (Resolución de 1 de diciembre de 2017). Moreover, the fishery has just implemented in the 2019-20 fishing season a procedure for marking the line of traps.

A historic weak point in fishers´ compliance on this fishery has been the measure regarding the the maximum number of traps per vessel due to the inability of the MCS to enforce this measure. The fishery has done a strong progress from the fishing season 2014-15 when a high degree of non-compliance was found (see 1st SA report). In the 2017-18 fishing season just one single excess in the number of traps was observed during the on-board observers' program in a 2 crew members-boat using 295 traps instead of 250 which is the maximum allowed on those boats (Fernández, 2018b). Although in the following reports on the on-board observer program (Fernández, 2019b) the number of traps per boat per day is not reported, none of the stakeholders has raised this issue in the OFMC. Moreover, the traps marking system that has been started to be implemented in the fishery is expected to increase fishers compliance regarding this topic.

Another conflictive measure is the weight limit of 1 kg for octopus. Reports on the fishery monitoring has consistenly shown monthly pecentages of individuals below the weight limit in the landing point of <5%, with peaks in June-July of 10-15% (Fernández, 2017, 2018a), but in the 2018-19 fishing season the proportion of individuals below 1kg was the lowest of all the historic time series, being <1%, and moreover, no individuals were found below 900 g (Fernández, 2019a). Moreover, this regulation has recently changed in the 2018-19 fishing season, and currently one single octopus between 900-1,000 g is allowed every 25 kg of octopus catches (Resolución de 4 de diciembre de 2018), therefore fishers´ compliance with this regulation in the last fishing season with data available (2018-19) has been complete.

In the last two fishing seasons (2018-19 and 2019-20) no infringements against the number of traps and the weight limit measures have been found in the UoA by the Surveillance and Control Unit (DGPM, 2020d). Several stakeholders including the Surveillance and Control Unit agrees that in general fishers comply with the management measures. The climate of dialogue is good and collaborative and the outcome is an absence of conflicts between the parties involved. The *guardapescas* have also not reported to the DGPM conflicts with the professional fishing sector (only some with the recreational sector).

Based on the above, **SG80 is met**.

Nevertheless the current shortage of operational means (human and material resources) on behalf of the DGPM Surveillance and Control Unit explained on SI a, the the recent and partial implementation in 2019-20 of the procedure for marking the line of traps, and the limitations regarding the on-board observer program (see SI b for more information), does not allow us to confirm that fishers comply with the management system with a high degree of confidence, therefore SG100 is not met.

d	Systematic non-compliance			
	Guide post		There is no evidence of systematic non-compliance.	
	Met?		**Yes**	

Rationale

The fishery has done a strong progress from the fishing season 2014-15 when a high degree of non-compliance was found regarding the the maximum number of traps per vessel (125, 250 and 350 traps for vessels with 1, 2 and 3 or more crew members, respectively) (see 1st SA report). In the 2017-18 fishing season just one single excess in the number of traps was observed during the on-board observers' program in a 2 crew members-boat using 295 traps instead of 250 which is the maximum allowed on those boats (Fernández, 2018b). Nevertheless, since this report, although observers keep registering this data, the information is not any more shown on the report. Mª del Pino Fernández (CEP biologists in charge on the on-board observers program) confirmed us during the 4SA site visit that they decided not to report the number of traps data for not interfering with the Surveillance and Control Unit, avoiding this way a potential loss of trust from the fleet in the monitoring work done from CEP.

Nevertheless, none of the stakeholders has raised this issue in the OFMC. Moreover, the traps marking system that has started to be implemented in the fishery in the 2019-20 season, is expected to increase fishers´ compliance regarding this topic.

In the 2018-19 fishing season the proportion of individuals below 1kg was the lowest of all the historic time series, being <1%, and moreover, no individuals were found below 900 g (Fernández, 2019a). Moreover, this regulation has recently changed in the 2018-19 fishing season, and currently one single octopus between 900-1,000 g is allowed every 25 kg of octopus catches (Resolución de 4 de diciembre de 2018), therefore fishers´ compliance with this regulation in the last fishing season with data available (2018-19) has been complete.

During the priod 2010-2014, the Surveillance and Control Unit imposed only nine sanctions on professional octopus´ fishers with traps. A decline of sanctions has been observed from 2010 to 2014, and no sanctions were imposed to professional fishers in 2016 and 2017 according to information provided by the DGPM, although the intensity of control and surveillance vessels targeting octopuses were maintained. In 2018, from January to July, a total of 119 actions were done (59 on land and 60 at sea), resulting in a total of 6 sanctions applied (4 due to excess of traps and 2 due to individuals smaller than the minimum weight). In 2018-19, although the enforcement capacity was reduced, a total of 36 actions were done (14 on land and 22 at sea) and just one sanction was applied for fishing during the closure period. Despite increasing the number of actions in 2019-20 fishing season (7 on land and 50 at sea), no infringements were observed in the UoA (DGPM, 2020d).

Stakeholders consulted during the site visit on 2020 and while preparing this report considers that fishers' compliance is very high in the fishery, and only in the fishing port of Luarca (part of the UoA but outside the UoC) a problem due to an excess of traps still persists. Actually, based on information from the Surveillance and Control Unit, in 2018 the four sanctions (between 400-1250 €) issued in the UoA regarding an excessive number of traps were all imposed to vessels based in the fishers´ guild of Luarca.

Based on the above, we consider that there is no evidence of systematic non-compliance and therefore **SG80 is met.**

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**Updated information on the enforcement activity (actions and sanctions) and human**

	and material resources of the Surveillance and Control Unit is necessary

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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			
	Guide post	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**	**No**
Rationale				

There is a OFMP that is reviewed annually with the fishing sector, represented by the fishers´ guilds, and other stakeholders relevant for the fishery like ARPESOS (Association of the vessel owners included in the UoC), SIGMA s.l. (private consulting in charge of carrying out the on-board observers' program, the GPS tracking of vessels and in situ octopus tagging experiences in closed collaboration with CEP), OMA (Observatorio Marino de Asturias belonging to the Universidad de Oviedo) and WWF Spain (conservation NGO). Most of this assessment is done within the OFMC, where the information related to all the monitorings in place related to the fishery are exposed and discussed. The monitoring and performance evaluation systems in place in the OFMP are:

1- SIGMA-CEP on-board observer program: gets information on the whole UoA on the characteristics of the vessels, traps and operation (distance to coast, deep,…), catches per trap by species (in terms of individuals and weight), retained and discarded species, effort (time fishing, number of traps and crew members), CPUE, habitat where the traps are deployed, ETPs, species survival at release, and type of bait used in the traps.

2- CEP landings monitoring: gets information from all the fishers´ guilds of the OFMP on daily landings by boat (volume and value), effort, CPUE, and also biological information of the catch during the special surveys at the landing sites on weight frequency of the catch and sex. All this information in analysed and presented by month, fishers´guild, and historic comparison with all previous fishing seasons.

3- Stock assessment: no formal stock assessment was done in the fishery until 2019. Before the status of the fishery was assessed using indicators based on the CEP landings monitoring and the SIGMA-CEP on-board observer program. DGPM commissioned a stock assessment analysis to a private consultant (Rubén Roa) who assessed the Spawning Stock Biomass (SSB) using a generalized depletion model based on an eel fishery (Lin et al, 2017). In the stock assessment report (Roa-Ureta, 2019) a historic analysis of the fishery has been done using daily data from fishing season 2000-01. The model provides the following yearly parameters: natural mortality, fishing rate, abundance, biomass, SSB and recruitment. Since the stock is not at equilibrium (but fluctuating between two states of equilibrium), reference points based on MSY (biomass and fishing mortality) are not valid, but a latent productivity of 239 tonnes (189-289) has been estimated, which corresponds with a biologically sustainable surplus production. A stock recruitment relationship is also presented.

4- Vessel tracking monitoring: all the UoA is daily monitored by GPS and GIS maps of spatial effort intensity and fishing grounds are regularly available.

5- MCS system: the Surveillance and Control Unit monitors the fishers´compliance and reports on the actions and sanctions on each fishing season.

Other information related to the fishery like HCRs options and specific project (e.g. octopus tagging and identification of special recruit-juvenile habitats) are also presented and assessed in the OFMC. The data

monitoring and analysis system is reviewed, as is the scientific knowledge generated. Moreover, there is ample feedback from the fishers at the OFMC meetings.

Measures such as minimum catch weight, the closed season or catching the ETP species *Charonia lampas* have been recently assessed to better protect the octopus and ETP species in the area. In this sense, the SIGMA-CEP monitoring implemented a specific daily logbook on vessels to register catches of *C. lampas* and ensure they are returned to the sea.

Since the OFMP 2018-19 a new role was added to the OFMC, which is to do a follow up of the degree of execution of the objectives of the plan. This work was done for the first time in the OFMC meeting in October 2019 (CS, 2019). The individual objectives of the management plan have been assessed and difficulties or weak points identified. Moreover, in the new decission making protocol it has been stablished that “an evaluation of the effectiveness of decisions” should be done every year. It is expected that the new management measures and changes in the regulation will be assessed in order to inform the next decisions to be taken in the OFMP. Nevertheless, this task has not been done yet, and moreover, it is not clear yet for this CAB who will be the responsible at this stage, how this assessment will be made and if a full Management Strategy Evaluation will be made or not.

The operation of some measures of the fishery-specific management system as the number of traps per boat, the annual TAC of 10,000 kg/boat, or the number of ships that could join the fishery have not been assessed yet. Moreover, it is not clear if a Management Strategy Evaluation will be made in this fishery or in what degree the evaluation of the effectiveness of the management decisions will be made. We consider tha all parts of the fishery-specific management system are not evaluated (SG100 is not met) but the are mechanism to evaluate the key parts, **therefore SG 80 is met**.

b	Internal and/or external review			
	Guide post	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**	**No**	**No**
Rationale				

In this fishery there are regular opportunities and/or forums for decision-makers to receive internal feedback on the management system, and there are also exchange of information between the fishing community (fishers´ guilds and ARPESOS), the management institutions (DGPM and its other units as CEP, and the Surveillance and Control Unit), the scientific community (OMA-University of Oviedo) and other stakeholders as the conservation NGOs or the consultancy firm SIGMA s.l. in charge of implementing the on-board observer program. The Octopus Fishery Monitoting Comission (OFMC) meet at least twice in each fishing season. The first meeting (October-November) is done before the OFMP is published (usually December), and it is intended to review the past fishing season (the CEP provides in advance a report on the status of the fishery) and discuss management measures for the next management plan. The second meeting takes place in the middle of the fishing season (February-March), and it is intended to analyze how the fishing season is going and decide wether any effort restriction should be taken. Besides this, an administrative process with drafts of the OFMP and allegations that have to be formally answered in a written format is as well in place. There is therefore a comprehensive regular internal review, therefore SG 60 is met.

The fishery-specific management system is subject to very sporadic external review like the Comité de Coordinación del Cantábrico and other forums with regional fishing agencies.. In 2014 a forum with fishers, scientists and managers from Galicia, Asturias, Cataluña, Islas Canarias and Portugal around common octopus fisheries was held in Santiago de Compostela organized by WWF. At this point it is not clear for the CAB if this can be considered occasional external review, and therefore, SG 80, so far, is not met.

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Draft scoring range and information gap indicator added at Announcement Comment Draft Report

Draft scoring range	**60-79**
Information gap indicator	**More information on the external review of the management system and who and how will evaluate the effectiveness of management decisions is needed.**

Overall Performance Indicator scores added from Client and Peer Review Draft Report

Overall Performance Indicator score	**NA at this stage**
Condition number (if relevant)	**NA at this stage**

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9 Appendices

9.1 Assessment information

9.1.1 Previous assessments

The fishery was certified (against FCR 2.0) in February 10th, 2016. However, due to the MSC Covid-19 Derogation 27 March 2020, the certificate of the fishery has been extended 6 months. Consequently, the updated date of expiry is now 16th August 2021.

Four conditions were initially raised on Performance Indicators (PI) 1.2.2 (HCRs & tools), 3.2.1 (Fishery specific objectives), 3.2.2 (Decision-making processes), and 3.2.3 (Compliance & enforcement). However, during the 1SA, PI 3.2.3 was re-scored based on new findings and downgraded; condition 4 was therefore modified and a new condition was established (modified condition was called 4A).

The status of the four conditions is include in **Table 9.1.1**. Condition 1 (PI 1.2.2) was found 'behind target' at the 4th SA and a remedial action was set, condition 2 (PI 3.2.1) was already closed on 3SA, PI 3.2.2 was closed on 4SA, and condition 4A (PI 3.2.3) was found 'on target' on 4SV but condition remains open. Progress on these two open conditions will be checked along the re-assessment process. Both pending conditions should be closed before the certificate expires on 9th August, 2021.

All reports elaborated during the first certification cycle are available at the MSC website: https://fisheries.msc.org/en/fisheries/western-asturias-octopus-traps-fishery-of-artisanal-cofradias/@@assessments

Table 9.1.1 – Summary of previous assessment conditions

Condition	PI(s)	Year closed	Justification
Condition 1. Before the end of the certification cycle, evidence must be presented that shows there are well-defined HCRs in place which are responsive to the state of the octopus stock in the coast of Asturias.Management tools and measures should ensure that the exploitation rate is adequate to the octopus population status and are expected to keep the stock fluctuating around a sustainable long-term highly productive level and above an acceptable risk range.	1.2.2	Remains opened	The fishery has implemented several actions to support the development of comprehensive HCRs (i.e. continuation of the fishery on board monitoring, tracking devices in almost all vessels, CEP analysis of the CPUE indicator, OMA study and a recent stock assessment model). Currently a preliminary HCR based on a TAC derived from a stock assessment model has been approved in the OFMC. But the OFMC is just a consultative body, and so far the HCR has not been endorsed by the DGPM and set in place in the fishery. Moreover, how this HCR will work is unknown, since what and when decisions will be set if the fishery gets close to this TAC, has not been established yet. The CEP confirmed during the 4SA off-site visit that they will formally recommend to include this HCR in the OFMP for the next 2020-21 fishing season, which will be drafted along October-November 2020. Based on the information presented above, the assessment team considers this condition tobe 'BEHIND TARGET' and a remedial action was set.
By the third surveillance audit, short and long-term objectives for the fishery which are consistent with achieving the outcomes expressed by	3.2.1	Closed 3rd Year	The CAB considers that short and long term objectives are now already explicit in the OFMP consistent with achieving the

MSC's Principles 1 and 2, need to be explicitly included within the fishery management plan. There should also be a clear means of assessing performance relative to these objectives.			outcomes expressed by MSC's Principles 1 and 2. The client actions are considered appropriate with the requirements of the condition which is therefore considered to be Ahead-Target. CONDITION CLOSED.
By the third surveillance audit, evidence shall demonstrate that Information on the fishery's performance and management action is available on request, and explanations for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity occurs.	3.2.2	Closed 4th Year	Reports and information are shared and discussed within the OFMC. The CAB has also received the final Decision-making protocol (DGPM, 2020a) which has amended to answer all allegations done by the cofradías explaining why their allegations have been rejected or approved. Information on which these answers are based will be also send to stakeholders. The CAB considers that this new protocol is a clear evidence that the information on the fishery's performance and management action is available on request, and explanations for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity occurs. The client actions are considered appropriate with the requirements of the condition which is therefore considered to be 'ON TARGET' and CONDITION CLOSED.
By the fourth year, the fishery must provide evidence that: (i) the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to enforce relevant management measures, strategies and/or rules (including the regulation limiting the maximum number of traps per vessel), and (ii) that professional fishers are being inspected consistently and sanctions applied.	3.2.3	Remains open	Several relevant improvements in the fishery MCS system have occurred in the last fishing season 2019-20; the surveillance capacity of the Surveillance and Control Unit has increased by incorporating more officers to the unit, a procedure for marking the line of traps has been implemented 58% of the OFMP fleet, and finally a protocol detailing the roles and duties of the guardapescas was delivered. The Surveillance and Control Unit has presented evidences that professional fishers are being inspected and sanctions applied and that the MCS system its improving its ability to enforce relevant management measures, strategies and/or rule (including the regulation limiting the maximum number of traps per vessel). All this have resulted in a substantial improvement but since not all SGs 80 were meet the condition is still open.

9.1.2 Small-scale fisheries

This is small-scale fishery. All vessels included in the OFMP are, in turn, included in the census of small-scale vessels ('*censo de artes menores*') of Asturias. In Spain, the small-scale or artisanal fleet ('*flota*

artesanal) is comprised by vessels below 15m length that are normally entitled to use more than one fishing gear, so they are moving from one fishing gear to another along the year, based on the catchability of the different target species, market values and weather conditions. See Table 9.1.2.

Table 9.1.2 – Small-scale fisheries

Unit of Assessment (UoA)	Percentage of vessels with length <15m	Percentage of fishing activity completed within 12 nautical miles of shore
UoA1	100%	100%

9.2 Evaluation processes and techniques

9.2.1 Site visits

The report shall include:

- An itinerary of site visit activities with dates.
- A description of site visit activities, including any locations that were inspected.
- Names of individuals contacted.

Reference(s): FCP v2.1 Section 7.16

9.2.2 Stakeholder participation

The report shall include:

- Details of people interviewed: local residents, representatives of stakeholder organisations including contacts with any regional MSC representatives.
- A description of stakeholder engagement strategy and opportunities available.

Reference(s): FCP v2.1 Section 7.16

9.2.3 Evaluation techniques

The report shall include:

- Justification for how public announcements were developed.
- Methodology used, including sample-based means of acquiring a working knowledge of the management operation and sea base.
- Details of the scoring process e.g. group consensus process.
- The decision rule for reaching the final recommendation e.g. aggregate principle-level scores above 80.

If the RBF was used for this assessment, the report shall include:

- The justification for using the RBF, which can be copied from previous RBF announcements, and stakeholder comments on its use.

- The RBF stakeholder consultation strategy to ensure effective participation from a range of stakeholders including any participatory tools used.
- A summary of the information obtained from the stakeholder meetings including the range of opinions.
- The full list of activities and components that have been discussed or evaluated in the assessment, regardless of the final risk-based outcome.

The stakeholder input should be reported in the stakeholder input appendix and incorporated in the rationales directly in the scoring tables.

Reference(s): FCP v2.1 Section 7.16, FCP v2.1 Annex PF Section PF2.1

9.3 Peer Review reports

To be drafted at Public Comment Draft Report

The report shall include unattributed reports of the Peer Reviewers in full using the relevant templates. The report shall include explicit responses of the team that include:

- Identification of specifically what (if any) changes to scoring, rationales, or conditions have been made; and,
- A substantiated justification for not making changes where peer reviewers suggest changes, but the team disagrees.

Reference(s): FCP v2.1 Section 7.14

9.4 Stakeholder input

To be drafted at Client and Peer Review Draft Report

To be completed at Public Certification Report

The CAB shall use the stakeholder input template to include all written stakeholder input during the stakeholder input opportunities and provide a summary of verbal stakeholder input received during the site visit. Using the stakeholder input template, the team shall respond to all written stakeholder input identifying what changes to scoring, rationales and conditions have been made in response, where the changes have been made, and assigning a 'CAB response code'. The team may respond to the verbal summary.

Reference(s): FCP v2.1 Section 7.15

9.5 Conditions

9.5.1 Summary of conditions closed under previous certificate

Table 9.1.1 presents a summary of previous assessment conditions closed during the current certificate.

9.5.2 Open conditions at reassessment announcement

The CAB shall complete this section if:

1. The assessment is a reassessment, and
2. There are open conditions when the reassessment is announced.

The CAB shall identify conditions that are open at the time of the reassessment announcement, conditions that will be closed during the reassessment including an outline of how and when the condition will be closed, and conditions that are being carried over into the next certificate.

The CAB shall confirm the status of progress for each open condition. For the ACDR the CAB shall base this on the most recent surveillance audit. For the PCDR the CAB shall base this on the site visit.

The CAB shall include details regarding the closing of conditions during the reassessment following Section 5.3.2 from the MSC Surveillance Reporting Template.

The CAB shall only include information on conditions that are being carried over in the ACDR. In the Client and Peer Review Draft Report and subsequent reports the CAB shall incorporate all conditions that are being carried over into Section 8.5.2.

Reference(s): FCP v2.2 Section 7.30.5.

Two conditions remain open at the time of writing the ACDR. Table 9.5.1 and Table 9.5.2 includes the details of the open conditions, progress at the last surveillance audit (4SA) and when the conditions should be closed.

Table 9.5.1 – Open Condition 1 (*use existing numbering)*

Performance Indicator	1.2.2
Score	*75*
Justification	*SI(a) SG80- 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*
Condition	*Before the end of the certification cycle, evidence must be presented that shows there are well-defined HCRs in place which are responsive to the state of the octopus stock in the coast of Asturias. Management tools and measures should ensure that the exploitation rate is adequate to the octopus population status and are expected to keep the stock fluctuating around a sustainable long-term highly productive level and above an acceptable risk range.*
Condition start	10th February 2016 (Public Certification Report)

Condition deadline	9th August 2021 (Expiry date of the certificate)
Milestones	Before the certification expires (9 August, 2021) the fishery shall demonstrate that 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.
Progress on Condition	During the first 4 years of the certification period the fishery has implemented several actions to support the development of comprehensive HCRs (i.e. continuation of the fishery on board monitoring, tracking devices in almost all vessels, CEP analysis of the CPUE indicator, OMA study and a recent stock assessment depletion model). Several possible HCRs to reduce the exploitation rate have been proposed and discussed with stakeholders within the OFMC, and options appears in several policy documents. Nevertheless, issues have arisen with candidate HCRs, and a stock assessment model has been applied to the fishery this last year. A new HCR derived from this new stock assessment was approved in the OFMC meeting in February 2020. The CAB considers this HCR to be responsive to the state of the stock. But the OFMC is just a consultative body, and so far the HCR has not been endorsed by the DGPM and set in place in the fishery, therefore this condition has found in the 4SA 'behind target' and a remedial action was set. For more details See PI 1.2.2 of the current report. As a remedial action a new milestone was set at the 4SA to be meet before the certificate expires on 9th August, 2021, in order to close the condition on time. Both the CAB and client have considered that there is no need to review the original Client Action Plan to meet the new milestone (see above).
Progress status	The progress explained below is extracted from the 4SV report: *The fishery has implemented several actions to support the development of comprehensive HCRs (i.e. continuation of the fishery on board monitoring, tracking devices in almost all vessels, CEP analysis of the CPUE indicator, OMA study and a recent stock assessment model). Currently a preliminary HCR based on a TAC derived from a stock assessment model has been approved in the OFMC. But the OFMC is just a consultative body, and so far the HCR has not been endorsed by the DGPM and set in place in the fishery. Moreover, how this HCR will work is unknown, since what and when decisions will be set if the fishery gets close to this TAC, has not been established yet. The CEP confirmed during the 4SA off-site visit that they will formally recommend to include this HCR in the OFMP for the next 2020-21 fishing season, which will be drafted along October-November 2020.* *Based on the information presented above, the assessment team considers this condition to be 'BEHIND TARGET' and a remedial action was set.* *As a remedial action a new milestone has been set to be meet before the certificate expires on 9th August, 2021, in order to close the condition on time. In spite of the above, the progress of the condition for this (2019) and the previous years, were on target and the work flow of this fishery had always been positive. The client and main stakeholders involved (particularly the CEP and DGPM) are confident to meet the condition before the end of the current certificate cycle. Both the CAB and client have considered that there is no need to review the original Client Action Plan to meet this new milestone.*
Carrying over condition ☐	*Check the box if the condition is being carried into the next certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).*

Closing the condition during the reassessment	As a remedial action a new milestone (*Before the certification expires on 9 August, 2021 the fishery shall demonstrate that 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*) was set at the 4SA. Both the CAB and client have considered that there is no need to review the original Client Action Plan to meet the new milestone because the work in progress is well advanced to have a HCR in place for the coming 2020-21 fishing season. The OFMP for this fishing season will be approved in November-December 2020. The CAB will check the status of this condition during the reassessment site visit planned for January 2021. Clear evidence (policy documents) of the implementation of the HCRs in the fishery should be provided by the client.

Table 9.5.2 – Open Condition 4A (*use existing numbering)*

Performance Indicator	3.2.3
Score	*SI(a) SG80 - 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.* *SI(b) SG80 - Sanctions to deal with non-compliance exists, are consistently applied and thought to provide effective deterrence* *SI(d) SG80 - There is no evidence of systematic non-compliance.*
Justification	*The system has proven to be sufficient to meet most of the rules set out in the MP. However, it is known that there is a lack of robustness to enforce the rules exhaustively in relation to the total number of traps set at sea or to monitor the unloading of the catches. This seems to be cause by:* *i. Shortage of operational means on behalf of the DGPMs Office of Fisheries Inspection and Surveillance Unit to enforce at sea the regulation limiting the maximum number of traps per vessel* *ii. The guardapescas perform other tasks beyond those provided for in the Decree 23/1995, limiting the effectiveness of their control and surveillance activities.* *iii. The volume and number of undersized individuals is not recorded (even for statistical purposes) and those illegal individuals are either released back to sea (if the octopus is alive) or given back to the vessel owner (if it is dead).* *Evidence provided also showed that there is a systematic non-compliance with the regulation limiting the maximum number of traps per vessel. Despite the non-compliance is documented, no sanctions were issued relation to lack of compliance with this regulation.* *In conclusion, it was found that the fishery fails to meet SG80 for SI(a), SI(b) and SI(d).*
Condition	*By the fourth year, the fishery must provide evidence that: (i) the monitoring, control and surveillance system implemented in the fishery has demonstrated an ability to enforce relevant management measures, strategies and/or rules (including the regulation limiting the maximum number of traps per vessel), and (ii) that professional fishers are being inspected consistently and sanctions applied.*

Condition start	10th February 2016 (Public Certification Report)
Condition deadline	9th August 2021 (Expiry date of the certificate)
Milestones	*Year 5 (2021): Before the expiration date of the certificate, the fishery shall demonstrate that a monitoring, control and surveillance system has been implemented and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exists, are consistently applied and thought to provide effective deterrence. There is no evidence of systematic non-compliance. SG80 would be met.*
Progress on Condition	The progress explained below is extracted from the 4SV report and has been included in PI 3.2.3 of the current report: *The main relevant issue concerning the MCS in the past years was the weakening of the surveillance capacity in the octopus' fishery due to a reduction in the number of enforcement officers in the Surveillance and Control Unit because of retirement and medical leaves of part of the staff. For the 2019-20 fishing season this weak point was partially solved by incorporating more officers and by giving priority to this fishery in terms of surveillance and control. Of the 16 inspectors of the unit in Asturias (12 inspectors full time and 4 part time), currently 2 full time inspectors openings are still pending to be filled. Nevertheless, the octopus' fishery is a priority for the unit so the number of inspections compromised in the fishery, according to the minimum approved by the Surveillance and Control Unit (DGPM, 2017), has been fulfilled in the current fishing season 2019-20. Some of the staff retired could not be replaced in time due to the long administrative process, but would be done along next fishing season according to the head of the unit.* *The main novelty in the fishery was the implementation this fishing season 2019-20 of the procedure for marking the line of traps, which was pending to be set in place since it was approved in the 2017-18 OFMP. This measure was implemented this season in 25 of the 43 vessels licensed (all vessels from the fishers´ guilds of Luarca, Figueras, Tapia and Viavélez, and one vessel from Ortiguera), representing 58% of the OFMP fleet which have now the lines of traps marked. The marking system (Fig. 2-1) is as follows: the line of traps has two buoys, one in each end, where a seal is set with a unique ID (silk-screen printing in relief) that identifies the boat name, plate number of the boat and the number of lines of traps of that boat (for cross-checking during the inspections, the DGPM has a database with the number of lines of traps of each boat and the number of traps included in each line). If both seals from a line of traps are lost, that ID its removed from the database (becoming a non-valid ID) and a new ID is issued to that line of traps (so far this has only happened once in the fishery). Before the start of the fishing season 2019-20 the CEP sent to all cofradías part of the OFMP directions for the skippers regarding this marking system, under which all boats should identify the number of lines of traps and the amount of traps in each line. Based on that, the DGPM issued the seals.* *Regarding the number of inspections in the fishery and according to the report provided by Valentín García (Head of Surveillance and Control Unit) (DGPM, 2020d), the following actions were done during the 2019-20 fishing season: 7 boats (16% of the total boats in the OFMP) were inspected while unloading the fish (mostly to control the weight-limit regulation), 34 lines of traps (10% of the total) from 12 boats were checked at sea for controlling the compliance in the new trap marking regulation recently implemented in the fishery, the weight-limit regulation and other fishery measures, moreover, 18 lines of traps in 7 of those boats inspected were being lifted on board while the enforcement officers were there, so the number of traps were counted (592 traps which correspond to 5% of the total) in order to check compliance with the maximum number of traps per boat*

allowed). Finally, 4 boats (9% of the fleet) were inspected at sea for checking compliance with all other management measures (license, dispatch of crewmembers, weight-limit, fish loading sanitary conditions, …).

Regarding the number of infractions, during the 2019-20 fishing season a 100% compliance with all management measures has been found in the boats belonging to the OFMP according to the information provided by Valentín García (Head of Surveillance and Control Unit) during the site visit and it subsequent report (DGPM, 2020d). The only infractions set for setting illegal octopus´ traps has been issued to recreational fishers (35 illegal traps found in Asturias during the 2019-20 fishing season, 18 of them found in the area of the OFMP); 13 infractions were issued due to having octopuses under the weight limit and 1 infraction for using an illegal fishing gear.

The fishery has done in recent years a strong progress regarding compliance with the maximum number of traps per vessel allowed, since the fishing season 2014-15 when a high degree of non-compliance was found. A work done during the fishing season 2014-2015 in the four fishers´ guilds of the UoC revealed a "high degree of non-compliance in the number of traps used" (CEP-SIGMA, 2016). This study was done by on-board biologists from the CEP and SIGMA SL for characterizing the octopus' fishery and it just had a descriptive intention, without any surveillance purposes. In the 2017-18 fishing season just a single excess in the number of traps was observed based on the on-board observers' program report (Fernández, 2018c). Nevertheless, since this report, although observers keep registering this data, the information is not any more shown on the report. Mª del Pino Fernández (CEP biologists in charge on the on-board observers program) confirmed us during the 4SA site visit that they decided not to report the number of traps data for not interfering with the Surveillance and Control Unit, avoiding this way a potential loss of trust from the fleet in the monitoring work done from CEP. Nevertheless, stakeholders consulted during the site visit, as in previous years, considers that fishers' compliance regarding this measure is very high, and only in the fishing port of Luarca (part of the UoA but outside the UoC) the problem still persists.

The above circumstance was confirmed by the Surveillance and Control Unit. Based on their report (DGPM, 2020d), in the 2017-18 fishing season, 4 sanctions (fines between 400-1,250 eur) were issued due to excess of traps (all in the port of Luarca) and 2 sanctions were issued due to individuals smaller than the minimum weight (one of the sanctions was issued to a boat part of the MSC UoC) to boats from the OFMP. In the 2018-19 only one sanction was issued due to fishing during the closure period, and in the 2019-20 no sanctions were issued since no infractions were found. During the 4SA site visits we asked to Valentín García (Head of Surveillance and Control Unit) about the resolution of these sanctions, but the final result of them were unknown.

Another source of information regarding the fishers comply with the minimum weight comes from the CEP monitoring at port. In the 2018-19 fishing season, the percentage of individuals below the weight limit (1 kg) was kept all the season below 5% of the landings (Fernández, 2018a), showing a slight decrease from last season (4-8%) (see 2SA report). Nevertheless, during June and July, percentages goes up to 15% (Fernández, 2018a). In the last fishery monitoring report available (fishing season 2018-19) (Fernández, 2019c) monthly information on octopus below the weight limit (1 kg) is not shown anymore, although it is still being registered. Mª del Pino Fernández (CEP biologists in charge of the monitoring) confirmed us during the 4SA site visit that they decided not to report this information anymore, for not interfering with the Surveillance and Control Unit, avoiding this way a potential loss of trust from the fleet in the monitoring work done from CEP. The only information shown about this is a general statement; in the 2018-19 and 2019-20 fishing seasons the proportion of individuals below 1kg was

the lowest of all the historic time series, being <1%, and moreover, no individuals were found below 900 g (Fernández, 2019b, 2019c, 2020b).

So far the DGPM still has no ability to seize and remove lines of traps at sea because of the lack of a vessel large enough to do it. In June 2020 the Asturias Government release a press note announcing the tender of a vessel for the DGPM (21 m length, 1,500 horse power) with a multiannual budget (2020-22) of 1.7 million € (GPA, 2020). Moreover, in May 2020 the Maritime Service of the Civil Guard (Ministry of the Interior, Spanish Goverment) in Asturias received a new vessel (20.5 m length, 2,400 horse power) designed for surveillance and control activities of coastal fisheries, rescue and drug traffic in the maritime Asturias waters. The Surveillance and Control Unit from the DGPM collaborates with the Civil Guard in the surveillance of the coastal marine waters in Asturias.

Regarding the roles and duties of the guardapescas in Asturias, a Protocol of Guardapescas Action in the OFMP (DGPM, 2020b) was delivered in February 2020. The protocol details the roles the guardapescas should take regarding the monitoring of the landings and the control and surveillance of the professional octopus' fishery as well as the recreational fishing occurring in their areas. Regarding the landings monitoring the protocol establishes that the guardapescas shall control and follow up the daily activity of all vessels in their fishers´ guild, register and weight the landings, check for individuals below the 1kg weight limit and send all this information to the CEP, as well as collaborating with them in their monitoring of the fishery. Regarding the control and surveillance, the guardapescas shall check for compliance on weight limit, control que quotas (daily, weekly and annually) if established in the OFMP, collaborate with the DGPM Surveillance and Control Unit on the control of the maximum number of fishing traps and with the implementation and development of the marking system for the line of traps, and check for compliance in any other measure of the fishery, including the closed periods. The protocol also establishes the possibility that the guardapescas can take action on control and surveillance at sea, although the reality is that they do not have the resources for doing it (i.e. a vessel). Moreover, the guardapescas shall also control the recreational fishing in their areas. The guardapescas does not carry out inspections or monitoring of catches at sea and have never imposed any sanctions for any violation on any vessels/fishers included in the OFMP. They have, however, imposed sanctions on recreational fishers, for which they often request assistance from the Civil Guard (SEPRONA) because of their proximity and rapid response.

Regarding the compliance with other measures like the fishing time (vessels must be at port before 17:00 h), and after analysing 1,380 fishing days from 40 different vessels based on the GPS tracking system (see Section 2.2.6), it has been observed that compliance with this measure is practically absolute, with just very rare cases of non-compliance (Fernández, 2019a).

Lastly, the DGPM has released on September 2020 an update of the minimum number of inspections (on land and at sea) compromised in the fishery to be applied in the coming 2020-21 fishing season (DGPM, 2020c). According to the new program for the MCS system the minimum number of actions to be done by the Surveillance and Control Unit in the OFMP each fishing season are: 1) On land actions: minimum of 15% of the boats randomly selected will be checked while landing (but if any infringement is detected in a boat, its landings will be checked at least once a month during the current and next fishing season), 2) At sea actions: minimum of 5% of the lines of traps will be inspected for checking its correct marking according to the directions issued by the DGPM, minimum of 5% of the total number of traps will be seized for checking compliance with the maximum number of traps per boat allowed and with the line of traps marking system, a minimum of 5% of the boats will be inspected to check compliance with other management measures (license, dispatch of crewmembers, weight-limit, fish loading sanitary conditions, …).

Progress status	The progress status explained below is extracted from the 4SV report: *Several relevant improvements in the fishery MCS system have occurred in the last fishing season 2019-20; the surveillance capacity of the Surveillance and Control Unit has increased by incorporating more officers to the unit, a procedure for marking the line of traps has been implemented 58% of the OFMP fleet, and finally a protocol detailing the roles and duties of the guardapescas was delivered. The Surveillance and Control Unit has presented evidences that professional fishers are being inspected and sanctions applied and that the MCS system its improving its ability to enforce relevant management measures, strategies and/or rule (including the regulation limiting the maximum number of traps per vessel). All this have resulted in a substantial improvement but since not all SGs 80 were meet the condition is still open.* *Based on the information presented above, the assessment team considers this condition to be 'ON TARGET'.* *Nevertheless, it is not clear for this CAB that sanctions to deal with non-compliance are consistently applied and thought to provide effective deterrence due to a lack of accountability and transparency in the MCS system (no record of final penalties for violations and deliberate omission of information from the CEP on-board observers monitoring) prevents closing Condition 4A.*
Carrying over condition ☐	*Check the box if the condition is being carried into the next certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).*
Closing the condition during the reassessment	A new milestone (*Before the expiration date of the certificate [9 August, 2021], the fishery shall demonstrate that a monitoring, control and surveillance system has been implemented and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. Sanctions to deal with non-compliance exists, are consistently applied and thought to provide effective deterrence. There is no evidence of systematic non-compliance. SG80 would be met*) was set at the 3SA. The CAB will check the status of this condition during the reassessment site visit planned for January 2021. Meeting will be held with responsibles of the DGPM in charge of the administrative process of the violations found by the Surveillance and Control Unit in order to find out if penalties were actually impossed. Clear evidence that penalties are consistently applied (e.g. record of final penalties) and thought to provide effective deterrence (e.g. CEP onboard monitoring) will be asked for.

9.5.3 Conditions – delete if not applicable

To be drafted at Client and Peer Review Draft Report stage

The CAB shall document in the report all conditions in separate tables.

Reference(s): FCP v2.2 Section 7.18, 7.30.5 and 7.30.6

Table X – Condition 1

Performance Indicator	

Score	*State score for Performance Indicator.*
Justification	*Cross reference to page number containing scoring template table or copy justification text here.*
Condition	*State condition.*
Condition deadline	*State deadline for the condition.*
Exceptional circumstances ☐	*Check the box if exceptional circumstances apply and condition deadline is longer than the period of certification (FCP v2.2 7.18.1.6). Provide a justification.*
Milestones	*State milestones and resulting scores where applicable.*
Verification with other entities	*Include details of any verification required to meet requirements in FCP v2.2 7.19.8.*
Complete the following rows for reassessments.	
Carried over condition ☐	*Check the box if the condition is being carried over from a previous certificate and include a justification for carrying over the condition (FCP v2.2 7.30.5.1.a).* *Include a justification that progress against the condition and milestones is adequate (FCP v2.2 7.30.5.2). The CAB shall base its justification on information from the reassessment site visit.*
Related condition ☐	*Check the box if the condition relates to a previous condition that was closed during a previous certification period but where a new condition on the same Performance Indicator or Scoring Issue is set.* *Include a justification – why is a related condition being raised? (FCP v2.2 7.30.6 & G7.30.6).*
Condition rewritten ☐	*Check the box if the condition has been rewritten. Include a justification (FCP v2.2 7.30.5.3).*

9.6 Client Action Plan

To be added from Public Comment Draft Report

The report shall include the Client Action Plan from the fishery client to address conditions.

Reference(s): FCP v2.1 Section 7.19

9.7 Surveillance

To be drafted from Client and Peer Review Draft Report

The report shall include the program for surveillance, timing of surveillance audits and a supporting rationale.

Reference(s): FCP v2.1 Section 7.28

Table X– Fishery surveillance program

Surveillance level	Year 1	Year 2	Year 3	Year 4
e.g. Level 5	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit	e.g. On-site surveillance audit & re-certification site visit

Table X – Timing of surveillance audit

Year	Anniversary date of certificate	Proposed date of surveillance audit	Rationale
e.g. 1	e.g. May 2018	e.g. July 2018	e.g. Scientific advice to be released in June 2018, proposal to postpone audit to include findings of scientific advice

Table X – Surveillance level rationale

Year	Surveillance activity	Number of auditors	Rationale

e.g.3	e.g. On-site audit	e.g. 1 auditor on-site with remote support from 1 auditor	e.g. From client action plan it can be deduced that information needed to verify progress towards conditions 1.2.1, 2.2.3 and 3.2.3 can be provided remotely in year 3. Considering that milestones indicate that most conditions will be closed out in year 3, the CAB proposes to have an on-site audit with 1 auditor on-site with remote support – this is to ensure that all information is collected and because the information can be provided remotely.

9.8 Harmonised fishery assessments – delete if not applicable

To be drafted at Announcement Comment Draft Report stage

To be completed at Public Certification Report stage

Harmonisation is required in cases where assessments overlap, or new assessments overlap with pre-existing fisheries.

If relevant, in accordance with FCP v2.1 Annex PB requirements, the report shall describe processes, activities and specific outcomes of efforts to harmonise fishery assessments. The report shall identify the fisheries and Performance Indicators subject to harmonisation.

Reference(s): FCP v2.1 Annex PB

There are no other overlapping fisheries. There are only two MSC certified or in-assessment fisheries targeting octopus worldwide, and the other one is an Australian fishery. There are no other MSC certified or in-assessment fisheries managed by the Asturian Government. Harmonisation is not required.

9.9 Objection Procedure – delete if not applicable

To be added at Public Certification Report stage

The report shall include all written decisions arising from a 'Notice of Objection', if received and accepted by the Independent Adjudicator.

Reference(s): FCP v2.1 Annex PD