SMALL PELAGICS SUSTAINABILITY

FISHERY IMPROVEMENT PROJECT

PROGRESS REPORT
- FIRST YEAR -

Cámara Nacional de Pesquería

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Acronyms

CNP	National Chamber of Fisheries
FAP	Fishery Action Plan
INP	National Fisheries Institute
GMC	Global Marine Commodities Project
MAE	Ministry of Environment of Ecuador
MCPEIP	Ministry of Production, Foreign Trade, Investment and Fisheries of Ecuador
SFP	Sustainable Fisheries Partnership
SMCP	Sustainable Marine Commodities Platform
SPFDP	Small Pelagic Fishery Dialogue Platform
SPS-FIP	Small Pelagic Sustainability Fishery Improvement Project
SRP	Undersecretariat of Fisheries Resources
UNDP	United Nations Development Programme
VAP	Vice Ministry of Aquaculture and Fisheries

1. Introduction

1.1 Background

The Ecuadorian small pelagic fishery is economically and socially important for the country. Industrial fishing began in the 1950s, but only started to grow into a substantial activity in the 1970s. Total reported landings reached a peak of nearly 1 million tonnes in the mid-1980s, but in recent years have generally fluctuated between 200,000-300,000t. The catches are influenced by oceanographic and environmental variables, both in terms of total volume but also catch composition. There is extensive evidence to indicate that there is high natural variability in the relative sizes of the stocks targeted by the fishery, and therefore their relative prevalence in landings. Natural variability also affects whether certain species occur in the catch at all.

De la Cuadra (2010) point out that in front of the Ecuador, the small pelagic fish species landed by the industrial fleet are strongly influenced by the short-term thermal changes that occur in the ocean, such as the warm and cold phase of the ENSO cycle (El Niño / Southern Oscillation). While, Ormaza Gonzalez et al. (2016), analyzing the landings of small pelagic species between 1981 and 2012 and comparing them with different oceanographic indices such as ONI, MEI and PDO, point out that in the long-term fluctuations the small pelagic landings decrease under a warm PDO and increase of a cold PDO.

According to Ormaza, Anastacio&Velasco (2019), exports of small pelagic fishery products averaged around US$235 million per year between 2015-2017, and generates employment for around 25 thousand people. In small pelagic fishery, the most relevant supply chain is the production of marine ingredients. Fishmeal is the second most important fishing product in Ecuador, but frozen production is having a growing dynamic.

In this context, shipowners and producers know that the only way to guarantee their companies, employees and families a future is through sustainable fishing. The same happens in the market, the global awareness of sustainability is growing, which generates even greater responsibility among supply chain stakeholders, including governments.

But the insufficient economic resources allocated to fishery research by the Ecuadorian government represent an important challenge, in terms of greater knowledge of the state of exploitation of these resources. This is also a challenge to the industry's efforts to move towards sustainability certification.

In a historical moment when producers and customers demand sustainability, it was a call to action to promote from the industry itself the changes that the fishery needs.

Since 2016, various actions of stakeholders in the supply chain have converged towards the search for sustainability of the small pelagic fishery.

- In 2016, at the National Chamber of Fisheries, created the Small Pelagic Commission to promote the required changes to the government.
- In the same way, the feed producers approached the fishing sector to show their interest to promote sustainability certifications.

- Also, in 2017 the Ecuadorian government prioritized the small pelagic fishery in the Global Sustainable Supply Chains for Marine Commodities Project coordinated by the United Nations Development Program and implemented by Sustainable Fisheries Partnership.

The convergence of these actions created synergies among the different stakeholders in the supply chain that were consolidated in a Fisheries Improvement Project.

At the beginning of 2018 with the technical assistance of Sustainable Fisheries Partnership we developed the pre FIP phase. During this phase, the pre-assessment and the working plan were prepared and presented to IFFO RS. The working plan stablished improvements in science, and governance. Once IFFO RS accepted the working plan into its fishery improvement program, our FIP started its implementation at the end of 2018.

The project currently coordinates public and private actions in the priority areas identified, together with the fisheries administration, the National Fisheries Institute, and key stakeholders such as National Chamber of Fisheries in Ecuador, the United Nation Development Program and Sustainable Fisheries Partnership (GMC Project).

Figure 1. Memorandum of Understanding for Small Pelagic FIP creation, signing event at CNP, August 20, 2018

1.2 Date SPS-FIP launched

The MOU for FIP implementation was signed on August 22, 2018, and the project was accepted in the IFFO Improver Programme on October 12th of the same year.

1.3 Name of Species – common and Latin name of the species

The scope of the FIP covers the 95% of the catches of the coastal purse seine fleet, which includes the following species:

Table 1. Species covered by SPS-FIP

Common name	Scientific name
Pacific chub mackerel (macarela)	*Scomber japonicus*
Frigate tuna (botellita)	*Auxis spp.*
Shortfin scad (picudillo)	*Decapterus macrosoma*
Largedhead hairtail (corbata)	*Trichiurus lepturus*
Thread herrings (pinchagua)	*Opisthonema spp.*
Pacific anchoveta (chuhueco)	*Cetengraulis mysticetus*
Pacific cornetfish (trompeta)	*Fistularia corneta*
Round herring (sardina redonda)	*Etrumeus acuminatus*
Yellowstripe grunt (roncador)	*Haemulopsis axillaris*
Longnose anchovy	*Anchoa nasus*
Pacific harvestfish (pámpano)	*Peprilus medius*
Drums (barriga juma)	*Larimus spp.*
Jack Mackerel (jurel)	*Trachurus murphyi*

It is important to note not all species are used for fishmeal production according to Ecuadorian law and not all are classified as small pelagic fish.

1.4 Management of the project

The Project has successfully designed and implemented its governance and funding model during first months of operation. These are fundamental aspects for the FAP implementation. The project structure includes:

- An assembly of participating companies
- An executive committee
- A project coordinator
- A technical staff

The main functions of the Executive Committee are a) to enable project implementation and b) to work as the management and representative body of the FIP. The Executive Committee is integrated by the following members:

- Two representatives of fishmeal producers with whole fish raw material
- One representative of fishmeal producers with by-products raw material
- One representative of the traders
- One representative of the aquaculture feed industry
- The President (or delegated person) of the National Chamber of Fisheries
- The Chairman of the Small Pelagics Commission

Additionally, the Executive Committee receives the technical assistance from:

- The FIP Coordinator (The Committee's Technical Secretary).
- Advisors of the National Chamber of Fisheries (CNP, as per its acronym in Spanish)
- Advisors of the Sustainable Fisheries Partnership.

Since May 2019, the FIP operates under the name Small Pelagics Sustainability (hereinafter referred to as SPS-FIP).

The main results and progress of the project in these first months of implementation are detailed below, describing the activities and results for each FAP Objective.

1.5 Government authorities supporting the SPS-FIP

CNP signed an agreement with the Vice Ministry of Aquaculture and Fisheries (VAP) and Undersecretariat of Fisheries Resources (SRP) on September 22, 2019, for inter-institutional cooperation for the development of the SPS-FIP (**Annex 2.1**), its specific objectives are:

i. Develop, implement and disseminate policies, plans and strategies for fishery improvement that are implemented within the framework of the Agreement between the VAP, the SRP and the CNP;
ii. Collaborate and exchange information on issues of mutual interest;
iii. Promote the adoption of adequate management measures to achieve the objectives of the SPS-FIP;
iv. Identify and implement improvements in the governance of the small pelagic fish fishery.
v. Identify and implement improvements in the system of document control and traceability of catches, processing and marketing of small pelagic fish.
vi. Identify and implement improvements in the observer program of the small pelagic fishery of the SRP and information flow to the INP.

Also, CNP and the National Institute of Fisheries (herein to referred as INP for its acronym in Spanish) signed, on November 5, 2018, an agreement for Inter-institutional Cooperation for SPS-FIP implementation (**Annex 2.2.1 and Annex 2.3.1**), its specific objectives are:

i. Development and dissemination of the scientific outcomes that are carried out within the framework of this Agreement between the INP and the CNP;
ii. Promotion of scientific and technical research on topics of mutual interest;
iii. Execution of scientific research campaigns jointly by both institutions;
iv. Creation of an inter-institutional research team between the CNP and the INP in virtue of the objectives of this Agreement.

The agreement builds also the framework for the implementation of the research surveys. Specifically, the "SPECIFIC COOPERATION AGREEMENT BETWEEN THE NATIONAL FISHERIES INSTITUTE AND THE NATIONAL CHAMBER OF FISHERIES FOR THE EXECUTION OF RESEARCH SURVEYS WITHIN THE FRAMEWORK OF THE PROGRAM OF RESEARCH RELATED TO THE "FIP" FOR THE SMALL PELAGIC FISHERY" (**Annex 2.3.1.**) aims to enable the following surveys which contributes to the FIP objectives:

i. Evaluation of fishery resources, hydroacoustic, fishing technology, population dynamics, monitoring of fisheries, fishery statistics, physical and biological oceanography.

ii. Studies: Joint research of the state of the resources, fishing areas, fishing gear, etc.

Both agreements with INP were renewed in December 2019 for a new period of 3 years. (**Annex 2.2.2 and 2.3.2**)

Also, the Small pelagic FIP process was established as a "Presidential Commitment #1043" by the Ecuadorian government for support the industry and CNP to obtain the IFFO RS ecocertification for sustainable exploitation of fishing resources in the small pelagic fishery. (**Annex 2.4**)

All these actions have helped to create a strong framework for private-public cooperation.

1.6 SPS-FIP Participants and stakeholders

The FIP is supported by the following firms of the marine ingredients supply chain:

The project is also supported by the following Authorities and NGOs:

Figure 2. SPS-FIP supporting members (first year)

1.7 Summary of Fishery Action Plan objectives

According to the FAP approved by IFFO RS, the objectives of the fishery improvement project are:

Table 2. Summary of FAP objectives

6 months	1. Decision making process on fishery management is transparent, Inclusive and participatory 2. Fishery data, species, habitats and environmental information is collected, published and publicly available.
1 year	3. Stock assessments of relevant species to the fishery are conducted on regular bases, following scientific methodology and their results are published and publicly available. 4 Conservation and Management Measures (CMMs) are adopted by fishery managers accordingly to the Stock Assessments outcomes and recommendations
2 years	3. Stock assessments of relevant species to the fishery are conducted on regular bases, following scientific methodology and their results are published and publicly available. 4 Conservation and Management Measures (CMMs) are adopted by fishery managers accordingly to the Stock Assessments outcomes and recommendations 5. Fishery interactions with ETP are registered by concerned fleets and mangers adopt CMMs accordingly
3 years	3. Stock assessments of relevant species to the fishery are conducted on regular bases, following scientific methodology and their results are published and publicly available.

The Fishery Action Plan of the project has incorporated the suggested changes resulting from the application process (peer review comments and IPAC meeting), updated FAP is detailed in Annex 1. The updates mentioned are the followings:

> *18. Provide evidence from The National Fisheries Institute (INP, as per acronym in Spanish) showing that jack mackerel catches are negligible.*
>
> *19. Provide evidence that habitat interactions are minimal.*

1.8 Last IFFO Improver Programme assessment

The last IFFO IP assessment was in June 2019, in which the FIP completed the first 6-month validation check. The conclusion was that the Ecuadorian small pelagic industrial fishery FIP demonstrated the required improvements at this milestone of the process. The results of the assessment are detailed in the following link: https://www.iffors.com/sites/iffors/files/approved-raw-materials/Ecuador%20Overview%20for%20Website%20-%202019_0.pdf

1.9 Reporting period

This progress report covers the activities realized by the SPS-FIP since its acceptance into the IFFO RS Improver Programme in October 12th, 2018 until December 31st, 2019. It also details the milestones or progress previous reported to IFFO RS in the six-month audit realized in June 2019.

2. Fishery action plan (FAP) - Progress report

2.1 FAP Objective 1: Decision making process on fishery management is transparent, inclusive and participatory

2.1.1 Improvement recommendation

Ensure stakeholder engagement mechanisms are functional.

2.1.2 Activities and results

The Fishing Authority opened a multi-sector dialogue and enhanced the governance process in the small pelagic fishery. This was reinforced by a national policy, through which the government committed to open dialogue with stakeholders to identify solutions for the problems that the country is facing. Also, the Global Marine Commodities Project (GMC) is implementing actions to improve governance of the small pelagic fisheries. This project is implemented by the Under-Secretariat of Fisheries Resources (SRP) in collaboration with the technical support of the United Nations Development Program (UNDP) and the facilitation support of the Sustainable Fisheries Partnership (SFP).

In the case of Ecuador, the small pelagic fishery is one of the fisheries prioritized by the Government in the GMC project. The project seeks to generate multi-sector dialogue platforms and to implement fishing improvement projects, among others. In the case of the Small Pelagics Sustainability-Fishery Improvement Project (herein after referred to as SPS-FIP) implemented by the CNP, the FAP aims at the creation of a “Sustainable Marine Commodities Platform” as a tool to enhance the governance of the fishery. The execution of these activities is the responsibility of the GMC Project as detailed in the FAP, specifically the Under-Secretariat of Fisheries with technical and financial support of the United Nations Development Programme. As SPS-FIP, we have provided technical and advocacy support to accelerate the implementation of the Platform.

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For the establishment of the Small Pelagic Fishery Dialogue Platform (SPFDP), the GMC project completed the following activities to achieve the objectives of the FAP:

i. Developed a Cause-Root Analysis (CRA) of the small pelagic fishery. The CRA conducted a diagnosis of the fishery's problems and analyzed the conditions necessary for the creation of the dialogue platform. (October 2018 - March 2019).

ii. Organized the platform launch event whit the participation of FIP representatives (November 2018)

iii. Established a platform piloting committee to review the first operational statutes of the dialogue platform (March 2019).

iv. Developed technical meetings with fishing authorities to define both objectives and criteria to choose platform participants (from public and private sectors), (July 2019 and November 2019).

v. Conducted several meetings with stakeholders to socialize the concept of the platform and its governance structure (August – November 2019)

vi. Hired a consultant team to develop the National Plan of Action and the Management Plan for the small pelagic fishery. In 2019 the consultant team had:

a) presented the roadmap to develop these two documents with the participation of the fishery stakeholders through the platform, and

b) facilitated the first plenary meeting of the dialogue platform, where the authorities informed to stakeholders the platform functioning (December- 2019)

vii. The development of the dialogue platform roadmap for 2020 (November 2019)

During this period, there were changes of national fisheries authorities, causing delays in the coordination and implementation of part of these activities. In particular, the approval of the statutes and strategic plan of the SMCP was accorded with the new National Fisheries Authority at the end of December 2019 and scheduled to socialize it with private stakeholders in January 2020 as detailed in sections 2.1.5 and 2.1.6.2.

2.1.3 FAP Activity 1.1. Identify all members that will participate on the "Sustainable Marine Commodities Platform" (Intersectional working group), with membership composed of the public and private sector stakeholders directly concerned by the small pelagic fishery

In the framework of the GMC project, the technical consultancy "Root Cause Analysis for the small pelagic fishery in Ecuador" was conducted by the firm CORAMIR S.A. The study was aimed at identifying the main issues to be tackled by the Platform. The fourth report of this consultancy was an "ANALYSIS ON THE ESTABLISHMENT OF THE PLATFORM" of the small pelagic fishery which —in its chapter 6.3, contains the identification list of key stakeholders who should be summoned to actively participate in the platform (**Annex 4.1.1**).

On July 24, a working meeting was held between GMC staff, the SRP and INP to analyse and validate the proposed structure for the Small Pelagic Fishery Dialogue Platform, based on the fourth report of the "Root Cause Analysis for the small pelagic fishery in Ecuador". The main results of this working meeting were: a) the definition of the objectives and structure and b) the identification of the platform participants from the private and public sector.

The objectives of the Sustainable Marine Commodities Platform are:

- Create a multisectoral commitment to the sustainability of the small pelagic fishery.
- Formulate and monitor actions that address the root causes of the problems.
- Establish alliances, coordinate investments and actions that help the sustainability of the fishery.
- Establish a participatory governance system for the fishery.

The structure of the Sustainable Marine Commodities Platform (SMCP) will consider a steering committee and dialogue tables. Moreover, the platform could form working groups to discuss themes of interest.

Table 3. Small Pelagic Fishery Dialogue Platform (SPFDP) structure

Dialogue tables	Steering committee
Role: a) Provide expert advice and scientific evidence to recommend solutions or actions for the National Plan of Action and Management Plan according to different topics. b) Discuss management proposals	Role: a) Lead and drive the work of the platform, b) Make practical decisions about the dialogue process. c) Carry out the officialization process of the proposals generated at the dialogue tables.
Participants:	Participants:
Between 15 and 23 permanent members: **Private sector representatives:** 1. 5 representatives of the Class I and II of the small pelagic purse seiner vessels 2. 2 representatives of the Class II, III and IV of the small pelagic purse seiner vessels 3. 1 representative of the fish meal and fish oil processor sector 4. 1 representative of the canned/frozen processor sector 5. 1 of the fish feed processor sector 6. 3 representatives of the artisanal fleet **Public sector representatives:** Vice-Ministry of Aquaculture and Fishing Under Secretariat of Fisheries Resources National Fisheries Institute Ministry of Environment. Facilitator-Coordinator	**Public sector Representatives:** 1. Vice-Ministry of Aquaculture and Fisheries 2. Under Secretariat of Fisheries Resources 3. National Fisheries Institute **Private sector representatives:** 7. 1 Representative of the Class I and II of the small pelagic purse seiner vessels 8. 1 representative of the Class II, III and IV of the small pelagic purse seiner vessels 9. 1 representative of the artisanal fleet

The minutes of the meeting are attached in **Annex No. 4.1.2.**

The platform structure will be an important input of the bylaws, which will be reviewed and validated with private stakeholders in the first meeting of the Platform dialogue table scheduled at the first quarter of 2020.

2.1.4 FAP Activity 1.2. Develop a by-law defining the way through which the "Sustainable Marine Commodities Platform" will operate.

A first draft of the Platform by-laws was developed by the Platform Coordinator. The GMC staff prepared the requirements of the delegates by sector that will make up the SMCP, in order to make

the process transparent. These requirements were reviewed and validated in a GMC, SRP and INP meeting on November 11, 2019 (**Annex 4.2**).

The established requirements for private delegates are:

Table 4. Requirements for private delegates to the Small Pelagic Fishery Dialogue Platform

Actor	**Private - Artisan**
Fishing gear	Coastal purse seine
Type of representation	Provincial
Number of participants	3
Representative requirements	• Be registered in the annex of the Ministerial Agreement which authorize their fishing activity and fishing gear in their province. Have updated artisan fisherman's license • Be part of a legally constituted organization • Have the support of more than 50% of the partners in the organization to which they belong.
Actor	**Private – Industrial**
Fishing gear	Purse seine (Class I-II)
Type of representation	Provincial
Number of participants	5
Representative requirements	• Demonstrate to be a vessel owner • Be part of a legally constituted organization • Demonstrate that your vessel or vessels are legally registered to capture small pelagics Have the support of more than 50% of the partners in the organization to which they belong.
Actor	**Private – Industrial**
Fishing gear	Purse seine (Class III-IV)
Type of representation	National
Number of participants	2
Representative requirements	• Be an active partner of the National Chamber of Fisheries (CNP) • Demonstrate that your vessel or vessels are legally registered to capture small pelagics)
Actor	**Private – Industrial**
Fishing gear	Fish meal and fish oil processors
Type of representation	National
Number of participants	1
Representative requirements	• Be an active partner of the National Chamber of Fisheries (CNP) • Have the authorization to carry out the fishing activity issued by the ministry of the sector.
Actor	**Privado – Industrial**
Fishing gear	Conserves/frozen processors
Type of representation	National
Number of participants	1
Representative requirements	• Be an active partner of the National Chamber of Fisheries (CNP) • Have the authorization to carry out the fishing activity issued by the ministry of the sector.

Actor	Private – Industrial
Fishing gear	Fish feed processors
Type of representation	National
Number of participants	1
Representative requirements	• Participate in the fishery improvement project

2.1.5 FAP Activity 1.3 Define a calendar for yearly regular meetings, the standard agenda of items to be discussed and specify, at least, the next two meetings dates.

Due to the changes detailed in the process for conform the SMCP, the meeting schedule has been restructured. The updated proposal approved and reported to the SPS-FIP by the GMC project (**annex 4.3**) is detailed bellow:

Table 5. Small Pelagic Fishery platform workplan designed by GMC project

Objective	Date
Start the dialogue process with the different actors of the Platform, ratifying the commitment of the authority. Presentation of the 2020 work plan.	3-4 Dec/2019
Presentation of the project to the platform, design and validation of the governance mechanism	28-31 Jan/2020
Presentation of the fishery diagnosis and prioritization of the working activities	25-28 Feb/2020
Design of the National Action Plan	28-30 Apr/2020
Design of the National Action Plan	23-26 Jun/202
Management plan design: Development of goals and objectives and indicators by component	23-26 Jun/2020
Design of the Management Plan: Identification of Reference Points and control rules	25-28 Aug/2020
Design of the Management Plan: Identification of Reference Points and control rules	25-28 Aug/2020
presentation and validation of action plan and management plan	27-30 Oct/2020

2.1.6 FAP Activity 1.4 Attend Sustainable Marine Commodities Platform meetings in order to discuss about harvest control rules, CMMs related to ETP interactions and ecosystem impacts and other management issues

2.1.6.1 Participated in the launch of the Sustainable Marine Commodities Platform (SMCP).

On November 26, 2018, the event “Launching of the Sustainable Small Pelagic Fishery Platform” was carried out by the GMC Project. The FIP participated as exhibitors under the theme “Current State of the Small Pelagic Fishery FIP”, presentation that was in charge of Mr. Jimmy Anastacio, from the National Chamber of Fisheries and Coordinator of SPS-FIP (**Annexes 4.4.1 – 4.4.2 - 4.4.3 and 4.4.4**).

In addition, the GMC Project developed a plenary meeting of the Small Pelagic Fish Dialogue Platform in December 2019. The authorities gave an update of the platform functioning to the fishery stakeholders, and the dialogue process began. Seventy-six participants attended the plenary, 55% of whom were representatives of the private sector.

This plenary maintained the following agenda:

1. Intervention by authorities.
2. Presentation of root cause analysis results and governance proposal.
3. Dialogue forum between authorities and industry representatives.

The main meeting commitments were:

- The SMCP participants committed to participate in the dialogue process.
- The representatives of the private sector expressed the need for institutional stability and the prioritization of the sector.
- The authority ratified its commitment to maintain these structured spaces for dialogue that allow establishing the necessary management measures for the sustainability of the resource.
- Use scientific technical data to develop scientifically based decision-making process.
- Through the website of the platform, the dissemination of all the minutes and relevant information is publicly available.

The plenary meeting minutes are attached in **Annex No. 4.5.3.**

2.1.6.2 Participate in the first SMCP meeting in order to approve its statutes and strategic plan.

The first meeting of the steering committee was held on March 15, 2019 (initially scheduled for March 13) through videoconference, the participants were:

- Ana María Núñez, Program Officer, Environment and Energy Area - UNDP
- María Verónica Cordova - Director of Regulations and Projects, Ministry of Environment of Ecuador (MAE, Spanish acronym)
- Amnuska Veliz - Director of policies and management, Vice-Ministry of Aquaculture and Fisheries (VAP, Spanish acronym)
- Rafael Trujillo - Executive Director of the National Chamber of Fisheries and Jimmy Anastacio as technical advisor to the CNP and FIP Coordinator
- Viviana Jurado - Responsible of the Small Pelagic Fishery research program - INP
- Pablo Cueva - National Platform Coordinator - GMC Ecuador

The agenda of the meeting was the following:

1. Structure and objective of the steering committee
2. Scope, vision and objectives of the Small Pelagic Fishery Platform
3. Process and work plan of the platform
4. Review of the working group structure
5. Others

The steering committee approves the work plan of the platform for the year 2019 and invites to enforce its development. (Supporting documents from this meeting can be found in set of **Annexes 4.5.1**). However, The SRP and the steering committee has rescheduled the process of review and approval of these documents, as well as the implementation of the work plan of the platform, because

of the resignation of the Platform Coordinator and the changes incorporated to the SMCP as detailed previously in FAP activity 1.1 – 1.2 and 1.3.

The individual in charge of coordinating the work of the platform, Mr. Pablo Cueva, left his position. The GMC project was in selection and hiring process for a new National Coordinator since April 2019, which was designated by SRP in July 2019. The actual coordinator of the Ecuadorian GMC Project is Mr. Tito Navia.

Due to the changes in the structure of the SMCP, the GMC staff realized socialization meetings with the different actors.

These socialization meetings were held during the months of August-November 2019, with the following actors:

Table 6. GMC Socialization meetings

Meeting date	Stakeholders
22/08/2019	Association of shipowners and boat owners "Posorja"
29/08/2019	Company “Pesquera Polar”- National Chamber of Fisheries
10/09/2019	National Fisheries Institute
24/09/2019	ASOPROCER Las Gilces
26/09/2019	Valdivia Culture Artisan Fishermen's Association San Pedro Artisan Fishermen's Association Santa Elena Federation of Artisan Fishermen
26/09/2019	Association of Artisan owners of Fishing Boats -August 26
22/10/2019	National Coordination of Fisheries and Related Organizations of Ecuador
29/10/2019	Costa Brava Artisan Fishermen's Association - Villamil Playas
06/11/2019	National Coordination of Fisheries and Related Organizations of Ecuador

During these meetings, the different organizations expressed their interest in to participating in the dialogue platform. More information about the meetings held is detailed in **annex 4.5.2.**

According to the new schedule, the validation of the proposed structure of the SMCP by the GMC project with the private stakeholders will be realized on January 28-31, 2020.

2.1.7 Complementary activities to improved governance

In parallel to the development of the Platform for Dialogue, the fishing authorities carried out a meetings with relevant stakeholders in order to present the results and discuss management measures based on scientific research carried out within the framework of the SPS-FIP (see report of actions detailed below). The outcomes of the research conducted have been socialized with the stakeholders of the fishery industry: The National Fisheries Institute (INP), the Under-Secretariat of Fisheries Resources (SRP), the National Chamber of Fisheries (CNP), and other related associations.

As a result of the research executed within the framework of the SPS-FIP —specifically resulting from the outcomes of the hydroacoustic surveys of small pelagics (set of **annexes 13**), INP has gained more and enhanced knowledge that has enabled the development of recommendations to the SRP to generate management measures. These measures have been discussed with the stakeholders.

In particular, four management decisions related to seasonal closures in the fishery have been discussed along with relevant stakeholders (processors, ship-owners of all segments of the fleet, INP, SRP). In November 22, 2018, January 11, September 05, and December 27, 2019, meetings were held to discuss these management measures:

- November 22, 2018: meeting where the addition of 15 days to the seasonal closure was discussed for the month of December 2018. There were 46 participants, 33 of which were men and 13 women. Likewise, 15 people belonged to the public sector and 31 to the private sector. The decision was made based on the results of the small pelagic research survey carried out in November 2018 within the framework of the SPS-FIP.
- January 11, 2019: meeting where the seasonal closure for 2019 was discussed, in which 43 people participated; 29 men and 14 women. Likewise, 22 people were from the public sector and 21 from the private sector. Moreover, the scientific recommendations for the setting of seasonal closure were based on the information from the monitoring of the small pelagic fishery carried out by the corresponding Program of INP and also based on the data obtained in the research surveys carried out within the framework of the SPS-FIP and the CNP-INP cooperation.
- September 05, 2019: meeting where the seasonal closure for the second half of the year 2019 was reviewed and discussed, in which 43 people participated; 36 men and 7 women. Likewise, 8 people were from the public sector and 35 from the private sector. Moreover, the scientific recommendations for the setting of seasonal closure were based on the information from the monitoring of the small pelagic fishery carried out by the corresponding Program of INP and also based on the data obtained in the research surveys carried out within the framework of the SPS-FIP and the CNP-INP cooperation.
- December 27, 2019: meeting to analyse the CNP requirement to extend the closure of the second half of 2019 for 15 days in January 2020 (**Annex 3.5.1**). The scientific recommendations for the setting of seasonal closure were based on the information from the monitoring of the small pelagic fishery carried out by the corresponding Program of INP and also based on the data obtained in the IV research cruise carried out within the framework of the SPS-FIP and the CNP-INP cooperation (as detailed in sections **Hydroacoustic research surveys programme**).

During the meetings, participants were able to provide their perspective on the data provided by the fisheries administration. This reflects that the decision-making was based on a transparent, participatory and inclusive process that was not present before the development and starting of the FIP.

The dialogue process described led to the establishment of the following ministerial agreements with fisheries management measures:

- AGREEMENT Nro. MAP-SRP-2018-0240-A (November 22, 2018). (**Annex 3.1.2**)
    - Extension of the seasonal closure for the catching of small pelagic fish to 15 additional days, from November 24 to December 8 of 2018.

- AGREEMENT Nro. MPCEIP-SRP-2019-0007-A (January 11, 2019). (**Annex 3.2.2**)
    - Establishment of the seasonal closure from February 17 to March 25 of 2019.
    - Suspension of Pacific Anchoveta (*Cetengraulis mysticetus*) seasonal closure.
- AGREEMENT Nro. MPCEIP-SRP-2019-0151-A (September 24, 2019). (**Annex 3.3.2**)
    - Establishment of the seasonal closure from November 15 to December 31 of 2019.
- AGREEMENT Nro. MPCEIP-SRP-2019-0211-A (December 27, 2019) (**Annex 3.5.2**)
    - Extension of the seasonal closure for the catching of small pelagic fish until January 13, 2020 and establish the next seasonal closure from March 5 to April 10, 2020.

A summary of the meetings is appended as **Annex 3.1.1, 3.2.1, and 3.3.1**, along with signatures and photographic record of the fishery stakeholders' meeting.

As reported in the previous progress report, the ex Ministry of Production, Foreign Trade, Investment and Fisheries, Mr. Pablo Campana, established on March 18, 2019 a Consultative Council for the Fishing Industry; including both, the artisanal and industrial sectors, but this council wasn't conformed because new authorities were designed (**Annex 3.4**). Perhaps the public-private dialogue continues. Actually, Mr. Iván Ontaneda is the Ministry of Production, Foreign Trade, Investment and Fisheries, and Mr. Roberto Viteri is the Vice Ministry of Fisheries and Aquaculture.

Also as part of the agreement for inter-institutional cooperation between CNP, VAP and SRP signed on September 22, 2019 (**Annex 2.1**), the institutions accorded to identify and implement improvements in the governance of the small pelagic fishery, work that actually is coordinated together with the GMC Project staff of the SRP through the Small Pelagic Fishery Dialogue Platform (SPFDP).

2.2 FAP Objective 2: Fishery data, species, habitats and environmental information is collected, published and publicly available

2.2.1 Improvement recommendations

- *"Ensure reports relating to management activities, stock assessments, data collection, control and enforcement, and other key areas of the fishery management process are made publicly available."*
- *"Collect landings data to indicate total landings from the stock. This also requires an understanding of the biological stock, such that removals by other fisheries can be included if necessary."*
- *"Collect other stock data sufficient to determine the current stock status – most commonly, an estimate of biomass."*

2.2.2 Activities and results

2.2.2.1 FAP Activity 2.1: Establish an office with equipment and a research team which will develop a research program in order to assess both the small pelagic fish stocks and the fishery impacts on ETP species and the ecosystem.

Within the framework of the cooperation between SPS-FIP with SFP and the GMC Project, Dr. Cristian Canales was hired as an expert in stock assessment since January 28, 2019 (**Annex 5.1**). Dr. Canales is a professor at the PUCV in Chile and has extensive experience in the evaluation of fishery resources and particularly small pelagic fish. The objective of Mr. Canales' technical assistance was to strengthen the knowledge and skills of scientists and technical staff of the National Fisheries Institute (INP) in the process and methodologies of stock assessment, ultimately enabling them to carry out adequate stock assessments for key small pelagic fishes in the Ecuadorian continental coast. Final product of technical assistance of Dr. Canales will be:

a) Stock assessment results for those small pelagic fishes with enough data availability,

b) Diagnosis for those other key small pelagic species with poor data;

c) A proposal of biological reference points and harvest control rules,

d) A summary of the peer review process and outcomes.

The final deliverable of Dr. Canales work is to develop assessments of the SPS-FIP focal species that have passed an independent peer review process.

It is important to highlight that the technical assistance of Dr. Canales not only consists in carrying out stock assessments of Small Pelagic Fish, but also strengthening the INP researchers' capacities in stock assessment during the implementation of its technical assistance. A total of 7 researchers of the INP have been trained, both during field visits and through videoconferences and e-mail, being another added value of the project and its lines of cooperation.

The research team that has worked along with Dr. Canales was integrated by:

- Viviana Jurado Maldonado, National Fisheries Institute
- Manuel Peralta Bravo, National Fisheries Institute
- David Chicaiza Veloz, National Fisheries Institute
- Álvaro Romero Guerrero, National Fisheries Institute
- Mercy Preciado, National Fisheries Institute
- Esteban Elías Méndez, National Fisheries Institute
- Evelyn Landivar, National Chamber of Fisheries

Under the framework of technical cooperation, Dr. Cristian Canales recommended a set of professional profiles that should be hired by the SPS-FIP to join INP's in-house research team. Based on his recommendations, the INP prepared the drafts of the ToRs to be hired within the framework of the cooperation agreement with the FIP (set of **annexes 5.2**). After a public call and a joint selection process between the CNP and INP, 3 additional professionals were selected to be part of the FIP technical team and are currently working on the project since June 3, 2019. Curriculum vitae of the professionals are attached in Annex 5.3:

- Engineer Gabriela Ponce, researcher in fisheries and acoustic oceanography.
- Lcda. Karina Solis, process engineering and database manager.
- Biologist Guillermo Gilbert, MRes, fishery researcher and database manager.

Under the framework agreement of interinstitutional cooperation between the INP and the CNP for the development of the FIP for the small pelagic fishery with purse seine nets in Ecuador (**Annex 2.2.1 and 2.2.2**), the research team has facilities at the headquarters of the INP (Letamendi and La Ría, Guayaquil, Ecuador), as well as at the office of the CNP (October 9 and Chile, Guayaquil, Ecuador). Regular meetings and the coordination are held at both locations, so it was determined unnecessary to rent and equip a new office for the project staff.

As part of the cooperation agreement, SPS-FIP has acquired 4 laptops available to the technical staff of the project and the INP, as well as 2 portable hard disk and other equipment required in the project (**Annex 5.4**).

Additionally, the oceanographer Eng. Evelyn Landívar (Annex 5.3.4) was part of the project. She participated in the research campaigns of March/November 2018 and March 2019 for the estimation of biomass and abundance of small pelagics in hydroacoustic surveys (**Annexes 13.1.2, 13.2.2, 13.3.2**), as contributions of the FIP within the framework of the INP-CNP cooperation agreement. Nowadays this role is realized by Eng. Gabriela Ponce, as part of our technical staff.

2.2.2.2 FAP Activity 2.2: Review and evaluate all the historical information / data related to the Ecuadorian small-scale fishery existing at the INP.

The FIP Coordinator, along with the INP, compiled all the information related to the small pelagic fishery, including bulletins and technical reports, journal articles and scientific articles. As a result, a list of publications and scientific reports related to the small pelagic fishery was prepared with its respective link, which is uploaded to the FIP project website (http://www.smallpelagics.org/fishery-data/), and in the INP website (http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/), in such a way that the information is public and available.

2.2.2.3 FAP Activity 2.3: Recollect all the relevant legislation and normative related to the Ecuadorian small pelagic fishery

The FIP Coordinator, along with the INP and the SRP, compiled all the regulations related to the small pelagic fishery. Once compiled, it was systematized in such a way that this legislation with its respective link is public and available in the digital platform of the FIP (http://www.smallpelagics.org/fishery-data/), and in the INP website (http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/), in such a way that the information is public and available.

2.2.2.4 FAP Activity 2.4: Design a research project in order to define and conduct stocks assessment models, which may take into consideration oceanographic particularities.

2.2.2.4.1 Develop a scientific strategic plan in order to conduct stock assessments and evaluate the impacts of the fishery on ETP species and the ecosystem.

Based on the annual operational program of the Small Pelagic Fish Program of the INP and recommendations made by Dr. Canales to the INP, the institute carried out along with the FIP staff adjustments to the fishery research plan detailed in **Annex 6**. The report defines lines of action for research aligned to the requirements of stock assessment and others FIP objectives. The FIP team will add skills to the implementation of this plan.

During the first year of the process of improving the Small Pelagic Fishery, the INP and the SPS-FIP implemented numerous activities to strengthen data collection and analysis, in order to increase knowledge about the dynamics of small pelagic fish populations. The activities are detailed below:

a. Determine the spatial and temporal variability of landings of the coastal purse seine fleet (small pelagics).

Indicator	• Monthly field visits to landing ports, fishmeal factories and port captaincies. • Data collected analyzed and stored in the INP biological-fishing database. • Workshops developed to present the results achieved during the data collection phase
Results	• During 2019, 8 field trips were carried out, 500 data were collected, including georeferenced catches, total capture in tones, landing composition by species. • The daily landings of 7 industries dedicated to catching small pelagic species for different purposes were collected (9 686 registers of data). • During 2019, several workshops were held to address issues on the management of the fishery or the exhibition of research data (see activity d)

b. Determine the growth parameters of the main species.

Indicator	• Monthly frequency histograms with biological have been made by species and landing port data of small pelagic • The growth parameters determined have been determined from the recorded lengths. • Four internal workshops developed have been held to discuss results.
Results	This activity was part of the report of Stock Assessment of Small Pelagic Fish on the Ecuadorian coast, for which the following was prepared: • 9 histograms for the period 2013 - 2017, with the modal compositions by age group, for the species Pacific thread herring, Frigate tuna, Red-eye round herring, Shortfin scad, Pacific anchoveta, Pacific cornetfish, Large head hairtail, Yellowstripe grunt and Chub mackerel . • 9 histograms for the period 2013 - 2017, with the relative ages and catches by age group, for the species Pacific thread herring, Frigate tuna, Red-eye round

herring, Shortfin scad, Pacific anchoveta, Pacific cornetfish, Large head hairtail, Yellowstripe grunt and Chub mackerel.

- 9 histograms for the period 2013 - 2017, with the length compositions of the exploitable population by age group, for the species Pacific thread herring, Frigate tuna, Red-eye round herring, Shortfin scad, Pacific anchoveta, Pacific cornetfish, Large head hairtail, Yellowstripe grunt and Chub mackerel
- 17 histograms for the period 2013 - 2017, with the length compositions for Frigate tuna species
- 35 histograms for the period 1982– 2017, with the length compositions for Chub mackerel species
- 35 histograms for the period 1982– 2017, with the length compositions for Pacific anchoveta species
- 36 histograms for the period 1981–2017, with the length compositions for Pacific thread herring species.

Internal workshops between Dr. Cristian Canales and INP staff have been held to discuss results as detailed in section 2.2.2.4.2.

c. Establish the reproductive conditions of the main small pelagic species.

Indicator

- Data collection of the field trips, organized, processed, and validated.
- The mean length of sexual maturity of the main species recalculated.
- Two internal workshops to discuss results.

Results

R software was used to recalculate the mean length (Lm) of sexual maturity for the main small pelagic species, which were the input for the stock assessment, carried out in 2019. INP internal workshops was done to discuss results. **Recalculation of the Mean Length of Sexual Maturity for the main small pelagic species.**

SPF species	Previous Lm50%	Recalculated Lm 50%
Frigate tuna	26.2 cm LF (2015)	25.33 cm LF
Pacific anchoveta	16.00 cm LT (2000)	14.7 cm LT
Chub mackerel	28.6 cm LF (2000)	23.02 cm LF
Shortfin scad	-	17.6 cm LT
Pacific thread herring	21.6 cm LT (2000)	21.0 cm LT
Red-eye round herring	-	17.40 cm LT

d. Disseminate research activities and technical results on the population status of the main species.

Indicators	• At least 20 representatives of companies, cooperatives and ship owners participate in workshops to disseminate results. • Two workshops to disseminate results and activities
Results	During 2019, several workshops were held to address issues on the management of the fishery, or the exhibition of research cruise results and other data obtained by researchers, which are detailed below: • **11/01/2019**. Present the results from the reproductive activity analysis of the individuals captured during the acoustic research cruise and propose the closure dates for the first period of 2019, with the participation of 45 delegates, belonging to 13 fishing organizations, representatives of fishmeal companies, canning companies, authorities and technicians of the research institute. (Annex 3.2.1) • **23/05/2019.** Socialize results on evaluation of small pelagic stocks in Ecuador, it was attended by members of the FIP committee (10 participants). (Annex 7.1) • **27/05/2019.** Socialize the catches on spatial analysis study of the small pelagics from 6 miles offshores and the recommendations for the management of the fishery, with delegates from the National Chamber of Fisheries. • **05/09/2019.** Socialize the study on gonadosomatic index monthly variation and abundance of fish eggs and larvae and define the dates for the second closure period of 2019 for the small pelagic fish fishery, with 38 participants belonging to 13 fishing associations and authorities. (Annex 3.3.1) • **9/12/2019.** Socialize results on evaluation of small pelagic stocks in Ecuador, with the participation of 20 members of the main fishmeal and canning companies, as well as Undersecretary of Fishery Resources. (Annex 7.2)

e. Collect additional data for stock assessment of main small pelagic species via hydroacoustic cruises with public-private cooperation.

Indicators	• At least 6 meetings with members of the National Chamber of Fisheries and independent shipowners to plan each research cruise • At least 6 workshops to publicize the methodology proposed to participating ships. • Two hydroacoustic cruises during this year • At least 22 eco-integration transects are carried out. • At least 15 evidence fishing sets are made • Data obtained in the two research cruises is analyzed and stored in the biological-fishing database. • SPF biomass and abundance are estimated every year
Results	Based on public - private cooperation, with the signing of the memorandum of understanding between the INP, the acoustic research cruises on board the vessels that are part of the FIP member companies were reactivated. Several meeting to plan the 2 research cruises of 2019 were held.

- 2 Cruise Plans were prepared: "INP 2019- 03 -0 1 PV ACOUSTIC SURVEY AND PROOF FISHING", "INP 2019-12-02 PV ACOUSTIC PROSPECTION AND PROOF FISHING".
- 2 hydroacoustic prospecting cruises have been carried out in March and December (depending on seasonal closures).
- 2 reports of estimation of acoustic biomass were prepared.
    - HYDROACOUSTIC ESTIMATION OF THE MAIN SMALL PELAGIC FISHES IN ECUADOR AND ITS GEOSPACE DISTRIBUTION, DURING MARCH 2019 (INP 2019- 03 - 01 PV) (http://smallpelagics.org/content/uploads/cruises/crucero_2019_mar/informe_crucero_marzo_2019_versi%C3%B3n_final.pdf).
    - HYDROACOUSTIC ESTIMATION OF THE MAIN SMALL PELAGIC FISHES IN ECUADOR AND ITS GEOSPACE DISTRIBUTION, DURING DECEMBER 2019 (INP 2019-12-02PV) (http://smallpelagics.org/content/uploads/cruises/crucero_2019_dic/informe-crucero-diciembre-2019.pdf).
- 12 graphs of vertical and horizontal spatial distribution of 6 species recorded during the Acoustic Cruise of March 2019
- 12 graphs of vertical and horizontal spatial distribution of 6 species recorded during the December 2019 Acoustic Cruise.
- Calculation of confidence limits for the estimation of total biomass of the Acoustic Cruise of March 2019.
- Calculation of biomass per mile in four areas: from the coastal profile at 4 miles, 4 to 6 miles, 6 to 8 miles and outside 8 miles.
- 33 eco-integration transects between the cruises of March and December.

- 34 fishing sets, of which 26 were effective sets and 8 were unsuccessful sets, catching a total of 125 tones, composed of 78% of pelagic species and 22% of non-pelagic species (March 2019).
- 23 fishing sets, of which 9 corresponded to fishing classified as "oceanic" and 14 sets were made "near the coast" , made up of pelagic (90%) and non-pelagic (10%) species (December 2019).
- The biological-fisheries database was updated adding 50523 (March 2019) and 32625 (Dec 2019) records corresponding to the samples obtained from the evidence fishing.
- 291 acoustic marks registered during the March 2019 cruise and 91 in December 2019.
- During the March 2019 cruise, the estimated biomass of small pelagics was 1 128 776 t and an abundance of 14.1 billion individuals.
- During the period covered by this report, final report of December 2019 cruise was still on development by INP staff.

More information available in: http://www.smallpelagics.org/cruises/ and also in section 2.2.2.9.1.

f. Review of the biological sampling system to expand coverage from on-board observers.

Indicators	• Length frequencies per set and trip for each target species and other species associated with the fishery, are obtained. • Sample units of small pelagics are collected • New indices (Hepatosomatic and Condition Factor) are calculated from the taking of eviscerated weight and liver variables. • Temperature validated from in situ and satellite sea surface • Worksheets with information on ETP species
Results	In order to accomplish this activity, the **Data Collection Protocol of the Observer Program for the Industrial Fleet of Small Pelagic Fish** was implemented, which consists of the following items: • Identification of statistical confidence levels, the ideal sample size was calculated, associated with the confidence level. The protocol determined that the sample required is 82 vessels. It also established a guide for SRP in order to adjust the size of the sample according the available number of observers in order to ensure the sampling methodology established in the protocol (Annex 11.1.2) • The observer's boarding time, in the entire fleet (class I, II, III and IV) will be a minimum of seven consecutive days in the same boat, alternating with another, until completing the 22 days in each month, being able to modify the number of boarding days according to the needs of the Observer Program on board. • Regarding the weight of the sample, it was established as follows: In the case of large species such as Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta, among others, a minimum of 30 kg is required. - In the case of species of small sizes such as anchovy, plump, Regan's anchovy, a minimum of 8 to 10 kg is required (approximately 300 individuals). - In the event that species such as Chub mackerel, Frigate tuna, are large, it will proceed to take twice the weight designated for these species, in order that the data collection is representative for the capture. (Minimum 60 Kg). • For the biological sampling, the following procedures were implemented to establish the hepatosomatic index, condition index and to give continuity to the gonadosomatic index: - weight of the whole fish with guts in grams - gutted weight in grams - gonad weight in grams - liver weight in grams • It was demonstrated through the correlation analysis, selecting a random sample of the records of the Observers program, there is a 65% correlation between the in-situ SST data with the satellite Sea surface temperature (SST). • Sheets were prepared to record the sighting or interaction of marine birds, mammals, and reptiles during the fishing trip. The fisheries observer will record any event during the fishing operations, listing additional species that have interacted at the time of the sets, such as sharks, rays, etc., and the state (live,

	dead, injured, hovering) in which they are found the species at the time of its release (if applicable). • Available in: http://www.institutopesca.gob.ec/wp-content/uploads/2018/01/Protocolo-sistema-de-muestreo-observadores.pdf

g. Improve reports and its focus about the fishing and biological data of the fishery.

Indicators	• Stratified information on fishing areas / sizes / reproductive conditions of the target species of the fishery has been included
Results	• Based on the data collected by observers, the report **Biological and Fishing Aspects of Small Pelagic Fish during 2019** was prepared, where topics such as: - Estimated catches by ship class and month - Fishing areas by ship class - Maps of fishing areas by class of boat - Interaction of fishing operations with ETP species - Maps with record of interactions with ETP species - Structure of monthly sizes for the species Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta • Available in: http://www.institutopesca.gob.ec/wp-content/uploads/2018/01/Análisis-biológicos-y-pesqueros-durante-2019-Observadores.pdf

h. Correlate biological aspects of fisheries with environmental variables.

Indicators	• Temporal and biological variables are defined • Information downloaded from satellites are stored in a database.
Results	• This activity led to a thesis proposal which main objective is to evaluate the adaptations in the biological characteristics that Pacific thread herring (*Opisthonema* spp.) would have developed in response to variations in oceanographic conditions (Sea Surface Temperature, Chlorophyll, Mean Sea Level), in the Ecuadorian coast during 1990 - 2019 using GLM and satellite imagery, which is under development. • Currently, there are databases of environmental variables downloaded monthly for the period 1995 - 2019, for the variables Sea Surface Temperature, Chlorophyll, Mean Sea Level, as well as the coordinates of each data, with a spatial resolution of 9 km. • From this first job, it is expected to carry out similar work with Chub mackerel and Frigate tuna.

i. Increase the efficiency of on-board observer sampling capabilities.

Indicators	• On-board trained observers. • The knowledge of the Observers on board has been evaluated.
Results	• In the framework of the objectives of the SPS-FIP, INP developed a workshop entitled "Training in biological-fishery-environmental data collection established in the protocol of small pelagic fish" aimed at observers of the SRP. The trainers were: Fernando Félix of the Permanent Commission for the South Pacific (CPPS, Spanish acronym), Julián Pérez of the Espíritu Santo University (UEES, Spanish acronym), Marcos Herrera, Mario Hurtado and Viviana Jurado of the INP. A report on the trainings is found in Annex 8.1. As a result of the trainings, the templates that the observers will use for the mammals, birds and turtle's observation was discussed and elaborated (Annex 8.2), this template came into force in April, 2019. This activity is also aligned with the improvement recommendation "13. [F1.1] Require vessels to record and report all interactions with ETP species" and activities described in the FAP. • On November 19, 2019, a work meeting was held in order to socialize the Management Model for the delivery of data and the periodic evaluation that will be carried out to the observers who will be in charge of taking data in the small pelagic fishery. The management model consists of components such as the model to be implemented, the operation, how the coordination for shipments will be, as well as the following processes: - Process 1. Administrative Management - Process 2. Boarding of Observers - Process 3. On-board monitoring and SPF sampling - Process 4. Data validation by the INP - Process 5. Improvement process (performance evaluation) • As part of process 5, a socialization workshop was held for the 22 observers designated for the small pelagic fishery, where the Data Collection Protocol was again explained, reinforcing the knowledge previously acquired. As part of this workshop, it was obtained a diagnostic test. (Annex 11.4.1 and 11.4.2)

j. Implement improvements to the Small Pelagic Fishery Database System.

Indicators	• A diagnosis of the fisheries information system. • Data modeling has been designed according to INP's needs.
Results	• The Excel sheets and data from the INP small pelagic program registered from 1981 to 2019 was reviewed, analyzing the data fields that are relevant to obtain information required by the INP small pelagic fish program. It was concluded with the consolidation of a historical data base that compiles 40 years of information. Within the diagnosis of the information system at the INP, it was identified that they have a web application called "SIRPA" (FISHERIES AND AQUACULTURE RESOURCES INFORMATION SYSTEM), connected to a database of the same name, developed in SQL, which will be used to create the database of the program. • The data is being debugged and migrated to a permanent repository within the databases (SQL) that are at INP. Actions were developed to integrate the data from the small pelagic program with the SIRPA Database, such as the

	standardization of necessary fields, records of biological sampling data from the years 1981 to 2018, validate information on dates, ships and zones by years to incorporate them into the new standardized database structure.

k. Implement electronic Logbook

Indicators	• An interface for data entry on board, with validation on land designed. • Tests have been run on the interface and its results. • A developed protocol for using the interface.
Results	• For the second semester of 2019, the revision of the data collection mechanism provided for the On-Board Observers program began, both for the fishing trip, field sampling and port or factory landings, with the aim of determine the parameters required to implement an electronic logbook for the fishing captain. • To achieve the proposed objective, several actions were taken, among which the collection of information in SRP, on the electronic logbook system available in the SRP for the pomada shrimp fishery, in addition to identifying possible processes that would be modified / adjusted on the platform so that it is multipurpose (to various fisheries) and can be used for the small pelagic fishery, agreeing on a list of observations and adaptations within the BEP web application which included its adaptation to the needs of the fishery and a Test Pilot that was executed at the end of 2019. The execution of the First Test Pilot was agreed within the IV Hydro-acoustic Research Campaign carried out by the INP and the private sector. See section 2.2.2.5 FAP Activity 3.1 for more details about this activity

l. Assess the population status of the species that are part of the fishery.

Indicators	• Biological and fishery data for each species under evaluation is reviewed and validated. • A defined index that expresses in a best mood the abundance of resources. • An assessment model established • It has been applied assessment models stock • Estimates of virgin, exploited biomass, biomass projections and limit and biological reference points are obtained
Milestone achieved	As part of the improvement process, the stock assessment of 9 species was developed Pacific thread herring, Frigate tuna, Red-eye round herring, Shortfin scad, Pacific anchoveta, Pacific cornetfish, Large head hairtail, Yellowstrip grunt and Chub mackerel, for these species the following results were obtained: • Abundance indices for 8 species from 1983 - 2017 (Chub mackerel , Pacific thread herring); 1986 - 2017 (Pacific anchoveta); 1999 - 2017 (Frigate tuna); 1991 - 2017 (Red-eye round herring); 2004 - 2017 (Large head hairtail, Shortfin scad , Pacific cornetfish). • Life history parameter calculations: Maximum length, L_{50}, K, M. • Length compositions of the average catches of the last 5 years of the nine species analyzed.

- Compositions of age of the population and catches of the nine analyzed species.
- Length compositions of the exploitable population of the nine species.
- Relative yield curves and spawning biomass reduction per recruit with respect to fishing mortality for the nine species analyzed.
- Biomass Charts, fishing mortality, recruitment anomaly, % spawning potential for Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta.
- Main population indicators of Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta resources for the period 1997 - 2017.
- Kobe Plot diagram for Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta.
- Calculation of the Biological Reference Points for Frigate tuna, Chub mackerel, Pacific thread herring, Pacific anchoveta.

Available in: http://smallpelagics.org/evaluacion-de-stocks-de-pelagicos-pequenos-y-revision-de-pares/

2.2.2.4.2 Define stock status models for all species on the basis of historical data and management regulations.

In coordination with SFP, and in the framework of the GMC project, the fishery assessor Dr. Cristian Canales was hired as a stock assessment consultant, whose terms of reference can be found in **Annex 5.1.** The scope of this contract includes, among others:

- Based on the agreed assessment methodology between the consultant and INP's scientific staff, identify and recommend complete data collection and analytical requirements needed to support the development of stock assessments in key fisheries. At a minimum, recommendations should address issues related to quantities, temporal and spatial aggregation, profiles of the staff required to implement the stock assessment, along with timeframes for: research surveys, commercial catch and effort data, and biological data collection and analyses.
- Estimating biological and fishing parameters required for stock assessment.
- Exploring and advising on options for abundance indices
- Standardizing abundance indices, which are focused on different types of distributions
- Along with INP scientists, conceptualizing adequate stock assessment models and carrying out stock assessments for the following small pelagics species in Ecuador: *Scomber japonicus, Auxis brachydorax, Decapterus macrosoma, Trichuuris lepturus, Opisthonema* spp*, Cetengraulis mysticetus, Fistularia* spp*, Etrumeus acuminatus y Haemulopsis spp.* Specific models/approaches will be established/identified for the different species depending on the availability and quality of data, ranging from models specific for data poor as well as for data-rich species.
- Applying evaluation models and analysing adequacy of the different approaches as well as assessment results, identifying among others:
  - Recruitment trends
  - Fishing mortality trends
  - Spawning biomass trends
  - Capture strategies

- Long-term biomass projection (taking into consideration F variable)
- Decision tables
- Probabilities distribution of measures which will be applied
- Risk analysis

Dr. Canales, along with the INP, analysed the historical information available in the INP databases: landings, catches, species composition, reproductive and biological features of the 9 species assessed, as well as information on estimates of biomass and abundance from hydroacoustic surveys. All these parameters are information sources for the development of stock assessment models.

The stock assessment models defined for the species covered in this project are defined in **Annex 7.2 and 7.3.** An integrated data model (MESTOCK) was used for the species *macarela, pinchagua, chuhueco, and botella*. And for species: roncador, trompeta, sardina redonda, corbata, a data-poor model (MODACT) was used in which only the size compositions of the catches are considered informative of the condition of the resource.

2.2.2.4.3 Develop training workshops for observers, fishing inspectors and captains on data collection.

Additionally, trainings have been carried out in data collection processes:

- In the framework of the objectives of the SPS-FIP, INP developed a workshop entitled "Training in biological-fishery-environmental data collection established in the protocol of small pelagic fish" aimed at observers of the SRP. The trainers were: Fernando Félix of the Permanent Commission for the South Pacific (CPPS, Spanish acronym), Julián Pérez of the Espíritu Santo University (UEES, Spanish acronym), Marcos Herrera, Mario Hurtado and Viviana Jurado of the INP. A report on the trainings is found in **Annex 8.1**. As a result of the trainings, the templates that the observers will use for the mammals, birds and turtle's observation was discussed and elaborated (**Annex 8.2**), this template came into force in April, 2019. This activity is also aligned with the improvement recommendation "13. [F1.1] Require vessels to record and report all interactions with ETP species" and activities described in the FAP.
- Likewise, the 4 research campaigns that have been carried out in the framework of cooperation CNP - INP had an induction on the research activities to be carried out on board the "scientific" vessels for the captains, crew and fishery inspectors that participated in the research campaigns. Finally, the survey plans of all the research campaigns are socialized with the participating companies: managers, fleet managers and captains, explaining how the data collection process would be carried out, explaining the methodology of the research activities and collection of field data, as well as the deadlines established to present the results. (**Annex 8.3).**
- Also, on December 05, 2019, INP made a workshop for the private sector in order to explain about ETP species and the importance to generate data for the research and management process. (**Annex 8.4**)

2.2.2.5 FAP Activity 3.1: Implement electronic logbooks for all the industrial boats targeting small pelagic, including interaction with ETPs.

As part of the cooperation agreement with the VAP and SRP, the design of an electronic logbook (hereinafter BEP) for the small pelagic fishery was agreed, adapting an existing platform for the "pomada" shrimp fishery developed by IBM and WWF Ecuador for the SRP (**Annex 2.1 and 9.1**).

Several meetings were held between SPS-FIP staff and SRP in order to agree a schedule for the design of the BEP, as detailed in the **Annex 9.2 - 9.3 - 9.4 and 9.5**.

The BEP is located at http://bitacora.produccion.gob.ec/bitacora/ and is also available as an APP for Android smartphones. The BEP has two components:

1) The mobile application that is used by the captains to record the catches of target and incidental species obtained in each set.

2) The website (database) that is used by the shipowners and fishing authority to know the information reported from each of the vessels.

The **annex 9.8** details the operation of the BEP.

In the figure on the left side below, the user and password validation of the captains within the application is shown, while the figure on the right side shows the main screen with the options of Close Logbook, sets, Log History and Logout.

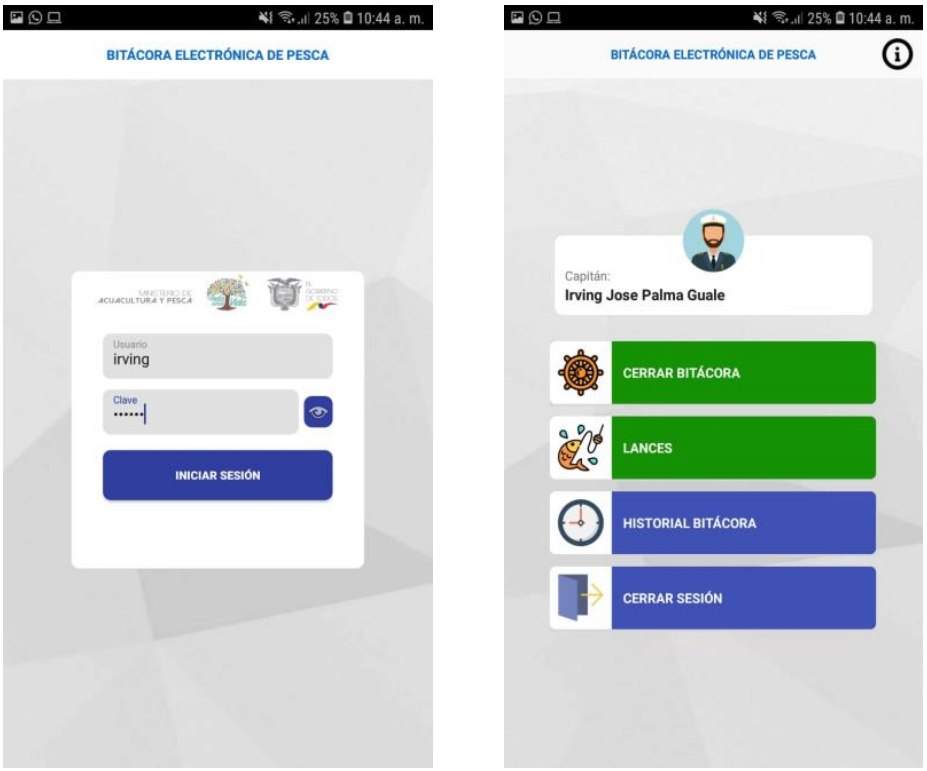


Figure 3. Electronic logbook interface (1/2)

With the start of a set, the logbook is opened and the catch record can be started, which is composed of the main objective species of the fishery, as shown in the figures below.

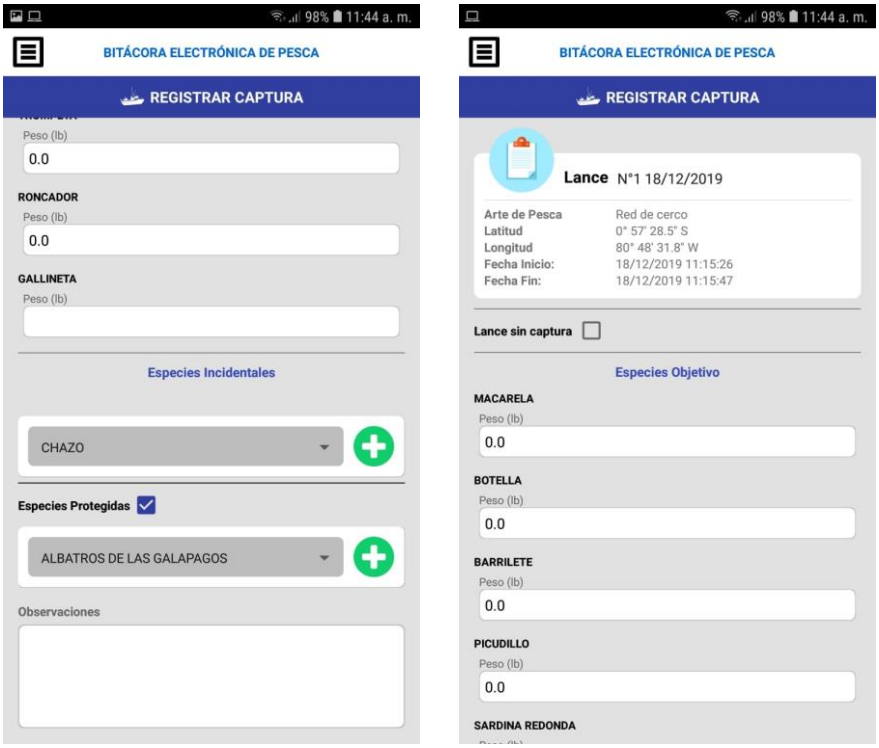


Figure 4. Electronic logbook interface (2/2)

Finally, when the set is over (there could be several in a day), the log is closed and sent to the Fishing Authority, and to the shipowner.

The activities for BEP design were fully implemented according to the planification. Considering the seasonal closure on December 2019, the prototype of the BEP was tested during the IV research cruise executed between SPS-FIP and INP, for which, a training workshop was first carried out for the captains of the B/P Palma (owned by Empresa Pesquera Polar, a SPS-FIP member) and B/P Marcillo III. The training was conducted on December 5th (**Annex 9.6 and 9.7**), and the SPS-FIP staff also received the feedback of the captains for some improvements that will be included in a report that will be complemented with the results of the test period in order to notify the observations to the SRP.

The electronic logbooks made during the research cruise can be found in the **annex 9.9**. The test was performed successfully. However, work should be done on parameterization adjustments of the logbook, such as the list of ETPs species and their inclusion in a separate section of the final PDF report of the BEP. These activities will be done at the beginning of 2020.The work will continue with extended tests involving more ships and captains of the SPS-FIP members.

The main conclusions of the first testing period are:

- There are no problems using the platform, since it maintains a user-friendly environment.
- In the management of credentials, there were technical problems when sending confirmations or notifications to the participants' emails, which were overcome instantly.
- A cell phone with an android system is required, the app does not require too much memory storage. The installation on the participants' devices was satisfactory.

- The electronic logbook is a support to the captain's management and that it must be replicated for all captains of the small pelagic fishery, thus avoiding making double efforts to send the information to the control authorities.
- The only way to have no information, after the application has been installed, is that the battery is discharged, so it was suggested that it be kept with sufficient charge previous the fishing trip.

During the pilot test in the IV Research Campaign were reported:

- As an advantage:
  - "going out and recording the time and place of departure in the same way in the catch and sets given",
  - "obtain the information in real time to make the most accurate and thoughtful decisions";
  - "Everything must go according to the available technological development";
- As suggestions were given:
  - An user manual or brochure about the tool will be useful.
- None mentioned disadvantages in this trial period;

Additionally, it is important to mention that the government of Ecuador is considering to finish the design of the Integrated Aquaculture and Fisheries System (SIAP acronym in Spanish) https://youtu.be/T2GuFiUxeNo, which is a traceability management system for the fishing sector that includes the integration of traceability from the electronic fishing logbook until the commercialization of the product. It is a milestone of the national action plan to attend the recommendations of the European Commission due to the yellow card notified on October, 2019. The private sector, CNP, CEIPA and Atunec, are working with the government in order to implement this action, in which the SPS-FIP is also participating through CNP.

Currently, as CNP we are in preliminary conversations with the company ALTURA S.A., responsible for the design of the SIAP, to discuss the parameterization of the electronic logbook for small pelagic fishery and the creation of a platform for the on-board observer program, integrated into the SIAP system. In all these initiatives, our requirement is that the INP must to have access to a report interface.

2.2.2.6 FAP Activity 3.2: Develop a system, endorsed by the research team, to calculate withdrawals (catches per specie) from the artisan fleets.

2.2.2.6.1 Develop a strategy to pass the data collected from fishing inspectors to the research team. Strategy approved by the Ministry of Aquaculture and Fisheries

As a necessity to collect data from the artisanal fleet to incorporate to the stock's evaluations, the SPS-FIP staff and the INP made a sampling protocol for the fishing gear know as "Chinchorro de playa" in Ecuador (**Annex 10.1**). This protocol indicates that the National Institute of Fishery (INP) and the SRP will conduct the data collection monthly throughout all year. The INP will collect the biological data for all species as well as fishery data, throughout field and laboratory samplings. The SRP will

collect fishery data such as the catch volume and number of operative nets, from the mobilisation guide and the sampling certificate issued by the fishery authority. All this information will be incorporated into the next species' stock assessment.

As part of the FAP, the protocol was proposed to the SRP for the respective coordination and approvals. On December 17, 2019, the SRP approved (MPCEIP-SRP-2019-2363-O) the management model and protocol for the artisanal fishery data collection as an instrument to help improve coordination, monitoring and information exchange processes between INP and SRP. In compliance with the execution of the instruments mentioned, the Fisheries Control Department of the SRP was delegated, through the technical focal points designated for this purpose. (**Annex 10.2**)

2.2.2.6.2 Analyse this data and incorporate it in the stock assessments and biomass estimations. Data analysis report

The SPS-FIP staff estimated the total value of the artisanal fleet´s fishing in Ecuador during May, July, August, September and October 2018 and February, April and May 2019 (**Annex 10.3**). This calculation was done using samplings of 43 nets (chinchorros de playa) collected by the National Institute of Fishery. As a result of this estimations, *Opisthonema spp*. was the specie with the highest catch percentage by this fleet during 2018 (37%). *Cetengraulis mysticetus* was the specie with the highest catch percentage during the 3 months analysed of 2019. With the implementation of the sampling protocol, already approved, (**Annex 10.1 and 10.2**) on 2020, the INP will be able to improve the estimation of the total amount of fishing for this artisanal fishery to incorporate it to the next stock evaluation.

2.2.2.7 FAP Activity 4. Establish a biological data gathering system through the observers' program.

As part of the FAP, a management model for the Observers Programme was made by SPS-FIP staff together with the INP and SRP.

The changes in abundance of different small pelagic fishes in Ecuador have been widely reported. It is necessary to understand these fluctuations, and this can be done with a continuing sampling. The Food and Agriculture Organisation (FAO) recognise the onboard observers as an essential component for the fisheries management. The onboard observers' data can provide and accurate understanding of the effects of fishing over species. In Ecuador there is an onboard observers' program of the Undersecretary of Fishy Resources which collect data from Small Pelagic Fish fishery (actually ratified by Ministerial Agreement MPCEIP-SRP-2019-0160-A).

The SRP currently have 13 observers on board of the fleet that are randomly allocated. Additionally, it has 6 people who do biological sampling of the samples obtained by the observers during the fishing operations.

The data collection from this program allows to collect representative data of the target species, accompanying wildlife, bycatch species, and ETP species. With this data, the research team were able to make various reports:

1. Habitat interactions of the small pelagic purse seine fishery. (**Annex 14.1.1**)
2. Interactions between Seabirds, turtles and marine mammals in the purse-seine fisheries in continental coast of Ecuador during June 2019 (first draft). (**Annex 14.2**)
3. Data report from the Fisheries Observer Programme of the Under-Secretary of Fisheries Resources, Jan-Aug 2019. (**Annex 11.3**)
4. Estimation of artisanal fishing values of Small Pelagic Fish during the year 2018 and 2019 in Ecuador. (**Annex 10.3**)

In this context, the SPS-FIP staff together with the INP worked in an improvement proposal for the SRP, which was presented during some workshops. On December 17, 2019, the SRP approved (MPCEIP-SRP-2019-2363-O) the management model and research protocol for the observer programme (biological and fishing data, and ETP interactions), in charge of the SRP in order to articulate the data transfer to the INP staff, as an instrument to help improve coordination, monitoring and information exchange processes between INP and SRP. In compliance with the execution of the instruments mentioned, the Fisheries Control Department of the SRP was delegated, through the technical focal points designated for this purpose. (**Annex 11.2**)

The protocol and its approval are detailed on **Annex 11**. Below is a summary of the processes established for the program:

Process No. 1: Administrative Management / SRP

The SRP, through the person in charge of the Observer Program, must maintain a list of qualified and suitable Observers for the Program and a Vessel Register formalized by the SRP and DIRNEA, which determines and identifies the number of vessels to be sampled and their respective contact details.

Likewise, the person responsible for the Observer Program must respect the boarding schedule designed by the INP, provided that the contractual / financial conditions of the institution allow it, in order to comply with the data collection protocols within the Program, both in number of shipments per observer, number of days of observation per vessel and sample amount of total vessels in the fishery.

Process No. 2: Boarding of Observers

The person in charge of the Observer Program must manage a Boarding Agreement and enough documentation to have proof of the Shipowner's acceptance of having an Observer on board, with the guarantees that it must have.

The Observer, prior to shipment, must be induced in the filling of the forms that are part of the protocol designed for the data collection of the Observer Program, and must be filled out in full and according to the guidelines given by the INP.

The SRP will provide the Observer, the official forms for data capture on board, the data entry protocol and will have a Link or access to shared files to be used by all observers.

The fishing observer must have an academic degree related to the areas of biology and / or fishing technology. Its main function will be to register fishing activities, registration of ETP species and environmental aspects during fishing, as well as obtaining biological data, for which it will fill out the

forms described in Annexes 1, 2 and 3 identified in the Sampling protocol designed by the INP. (Annex 11.1.2)

The rotation of the observer on board must be at least two (2) months to coincide again in previously assigned vessels. And the assignment will be managed in a maximum time of 48 hours by the person in charge of the Observer Program, for which a boarding schedule (between SRP and INP) must be designed considering the number of vessels to be sampled and the lunar phase or calendar fishing.

Process No. 3: On-board monitoring and sampling

It will be executed as established in the Data Collection Protocol of the Observer Program of the small pelagic fish industrial fleet, designed by the INP. (Annex 11.1.2)

Process No. 4: Data validation

The data will be obtained through the observation of the fishing trips, by the observers on board, which are considered as the primary source of information. The observation records will be validated by INP technicians, through a statistical validation procedure and additional information taken will be contrasted with historical information, prior to being entered in the general registry.

Obtaining these parameters is mandatory and the forms will be those determined by the INP as official in the annexes of the Data Collection protocol of the Observer Program.

The data entry process will have three stages: the previous validation stage, the data processing stage and the third stage is the contingency stage.

In the pre-data entry stage, a validation process of the forms filled out by the on-board observers will be carried out, which consists of an ocular inspection by the assigned technician or the person responsible for the Program, the status of the forms and the coherence of the data obtained by the observer. The INP technician will make a list of inconsistencies or observations of the data provided by the Observer Program during the data validation process, which will be treated during the feedback workshops for the improvement of the data collection process or, to support a performance evaluation process, if applicable.

The person in charge of the Observer Program will comply with sharing (the scanned forms) and transfer the fishing data registered in the Excel format to the INP, by traditional means, virtual access or using an email, every 15 days.

Process No. 5: Improvement Process

a) The List of Inconsistencies or observations on the management of the Observer will be reviewed, twice per year, in order to improve.

b) The List of Observers should be updated, according to their merits.

c) All observers within this program will be evaluated one time per semester by the fishing authority and the INP, in accordance with the Ecuadorian law, which must be part of their employment contract.

The figure below resumes the processes detailed and the articulation established between SRP and INP for the collection of fishing and biological data through the observers' program:

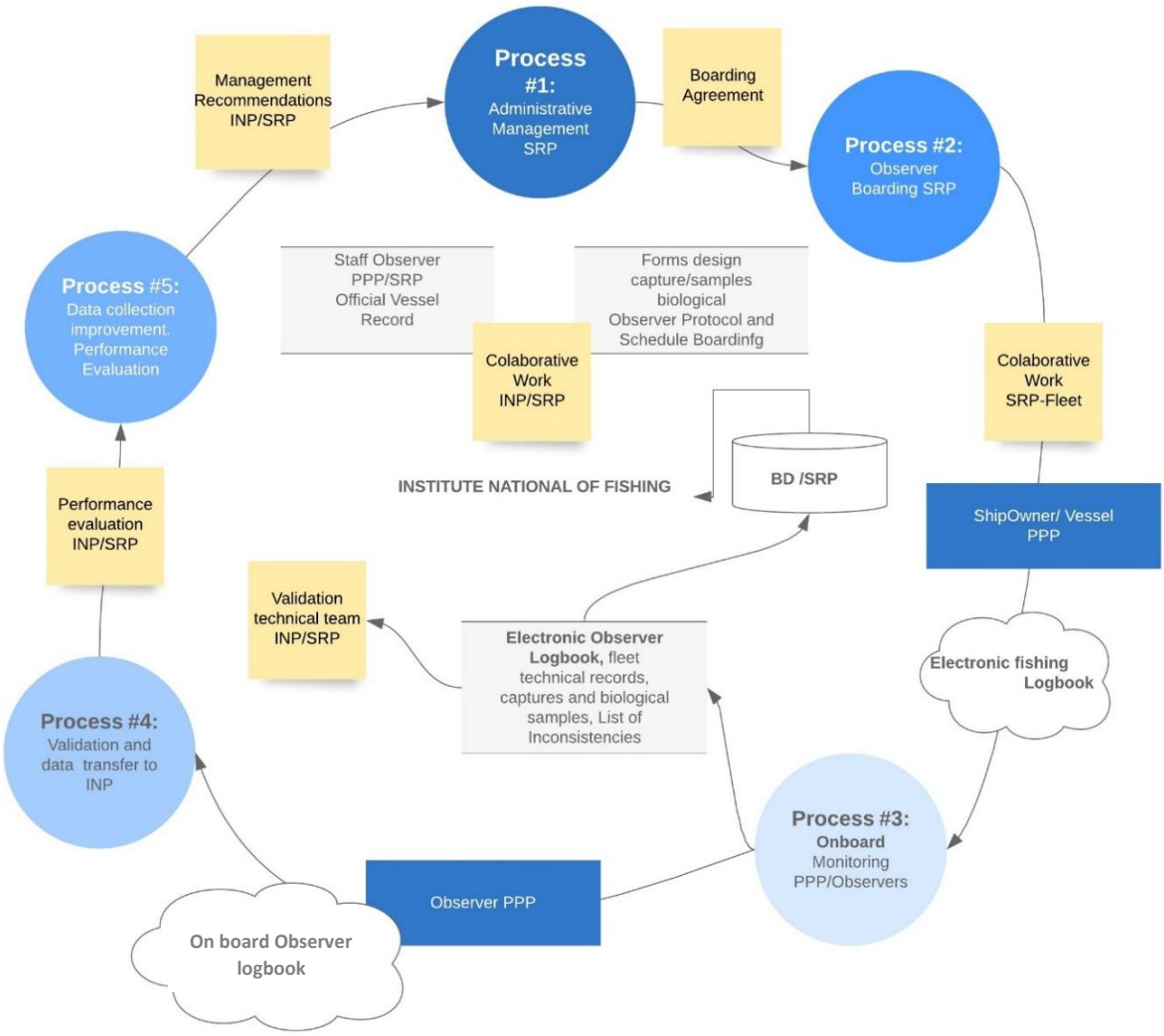


Figure 5. Data collection model established for small pelagic fishery

2.2.2.8 Peer review comments on FAP: evidence is required to demonstrate that the amount of landings of jack mackerel are negligible.

INP's Small Pelagic Fish Program prepared a report on the Jack mackerel species, which describes the historical landings data, thus demonstrating that the landings of Jack mackerel are not significant/marginal in comparison with the total annual catches in the small pelagic fishery.

Jurado (2019) indicated that the presence of jack mackerel in Ecuador since 2000 became sporadic and associated with the presence of extreme cold conditions (La Niña phenomenon), but even so the catches represented 1% of the total caught until completely disappearing from the landings in the last years.

As additional information, Ecuador is part of the South Pacific Regional Fisheries Management Organization that regionally manages Jack mackerel.

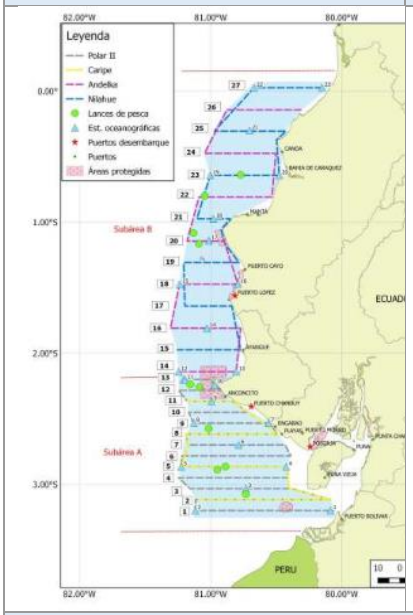
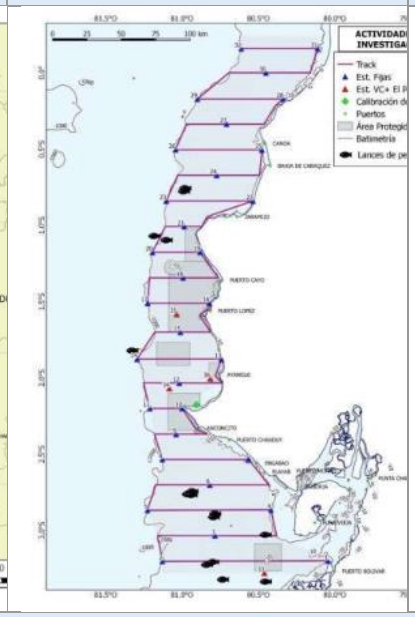
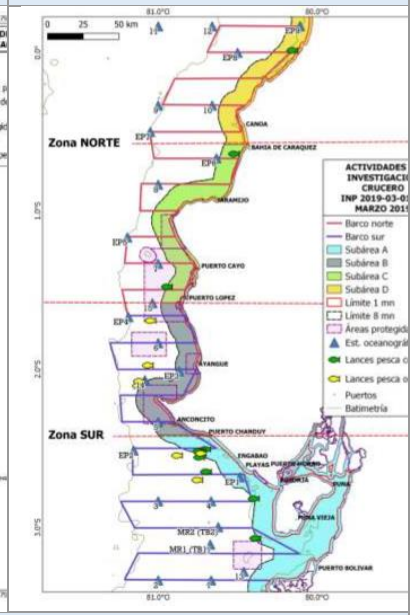
The resource is evaluated under Category C Species according to IFFO RS fishery assessment methodology

The full INP report about landings of jack mackerel in Ecuador is available in **Annex 12**.

2.2.2.9 Other activities aligned to the objective and developed by SPS-FIP

2.2.2.9.1 Hydroacoustic research surveys programme

An important milestone for the cooperation between CNP and INP in the SPS-FIP framework has been the reactivation of the hydroacoustic research surveys programme. Issues related with the allocation of the government budget for repowering the only fishing research platform in country, I/V TOHALLI, have led to discontinuation of the programme since 2013. Faced with this adversity and with need to strengthen fisheries research in country, from 2018, through collaboration between the INP, SRP, CNP and its partner companies in the framework of SPS-FIP, the research surveys with hydroacoustic equipment installed on commercial fishing vessels were reactivated (**Annex 13.4**). Consequently, INP researchers during 2018-2019, conducted 4 research campaigns for small pelagic fish in Ecuador to estimate biomass, abundance and distribution of these species. All research cruisers conducted have a scope in the territorial sea, which is limited to the coverage of it´s the transects, detailed below:

March 2018	November 2018	March 2019
		
November 2019		

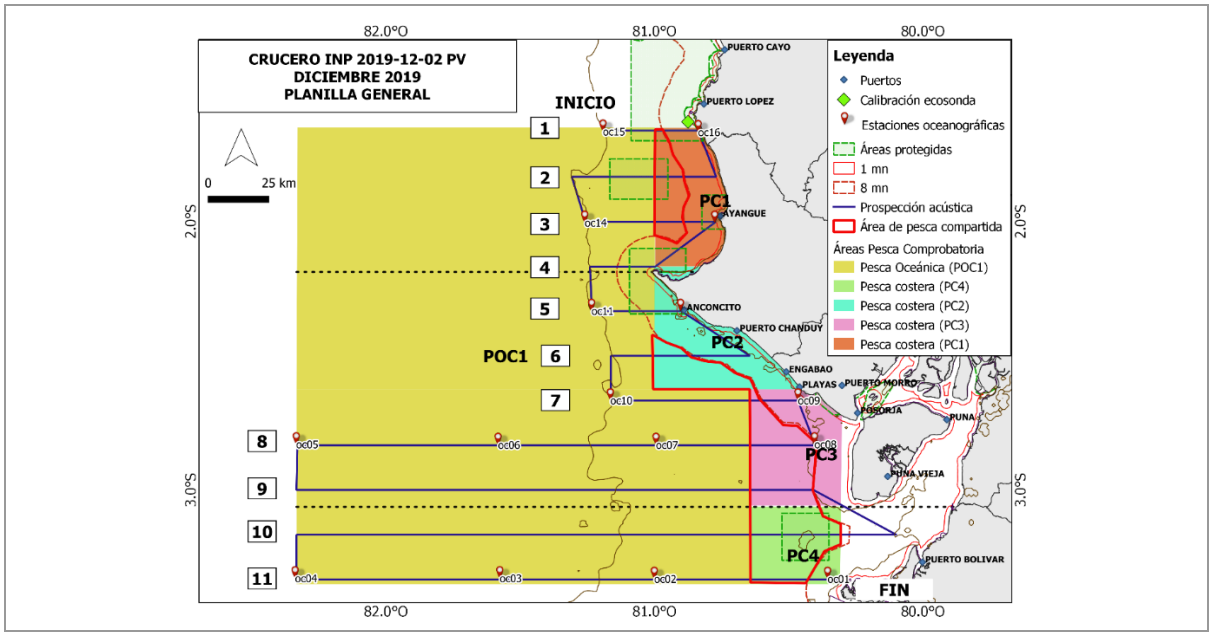


Figure 6. Research cruises planification (2018-2019)

Source: Romero, A., et al. (2018a); Romero, A., et al. (2018b); Romero, Á., et al. (2019)

The research cruisers on March and November, 2018 and March, 2019 were limited to 81°18'W. The last cruiser done on December 2019 extended the scope to the meridian 82°20', exclusively the southern part of Ecuador, in which the previous cruises determined that 80% of the abundance of small pelagic is concentrated, and also explore zones further from the Ecuadorian coast, as detailed in the figure above.

The final report of the IV research cruise (INP 2019-12-02 PV) implemented by de SPS-FIP will be available at the first quarter of 2020.

The logistics costs of the surveys were completely covered by the participating companies in the SPS-FIP, as well as the technical contribution of technical staff.

Results from the research campaigns are published in the INP and SPS-FIP official website and can be accessed by the following links:

- http://www.smallpelagics.org/cruises/
- http://www.institutopesca.gob.ec/cruceros-de-hidroacustica/

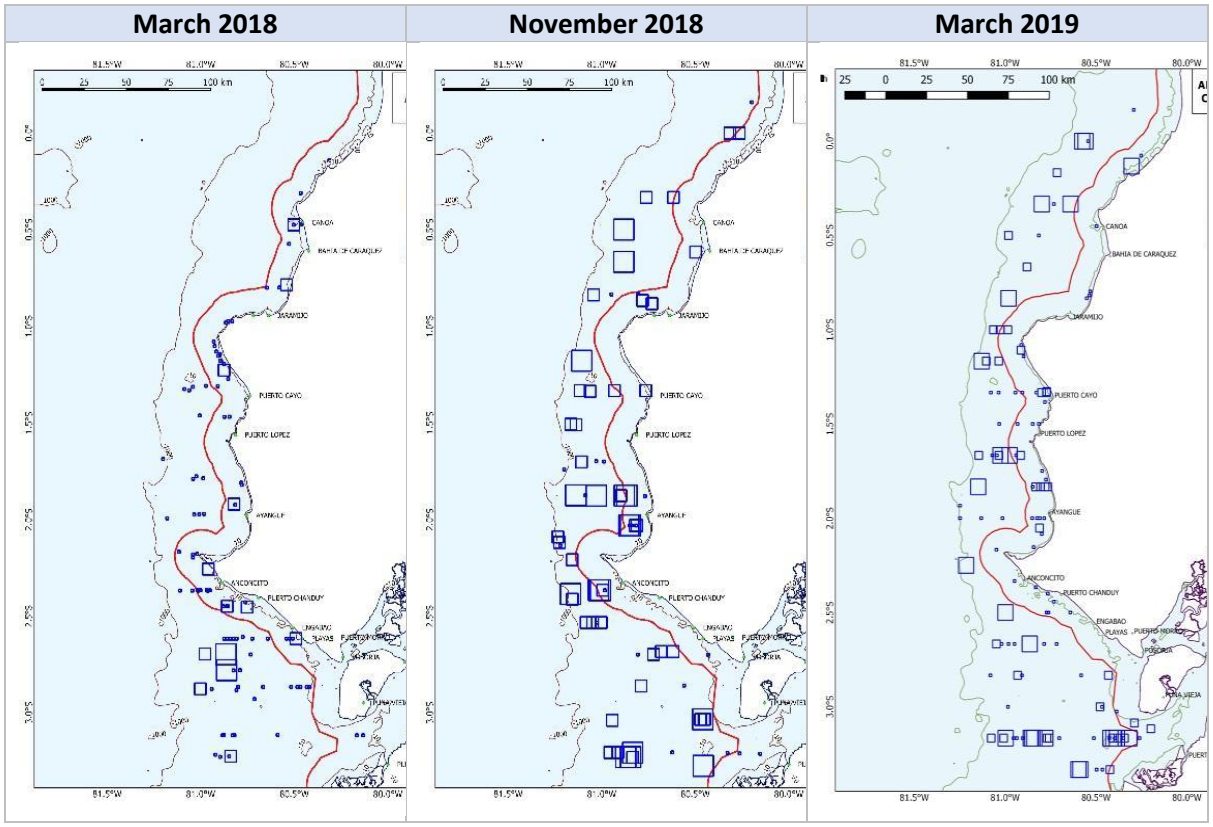


Figure 7. Small pelagic acoustic abundance distribution (2018-2019)

Source: Romero, A., *et al.* (2018a); Romero, A., *et al.* (2018b); Romero, A., *et al*. (2019)

Among the results obtained, it was known that the abundance of small pelagic fish in the Ecuadorian coasts was:

Table 7. Small pelagic biomass estimations (research cruises 2018-2019)

Research campaign	Estimated tonnes		
	March 2018	November 2018	March 2019
Botella	631,771	322,860	363,472
Macarela	265,714	999,506	210,798
Sardina Redonda	92,718	64,576	100,002
Pinchagua	114,815	61,964	125,648
Picudillo	101,212	12,844	113,857
Chuhueco	189,994	22,391	137,381
Anchoa	0	6,573	77,618
Total Biomass	1,396,223	1,490,713	1,128,776

Source: Romero, A., *et al.* (2018a); Romero, A., *et al.* (2018b); Romero, A., *et al*. (2019)

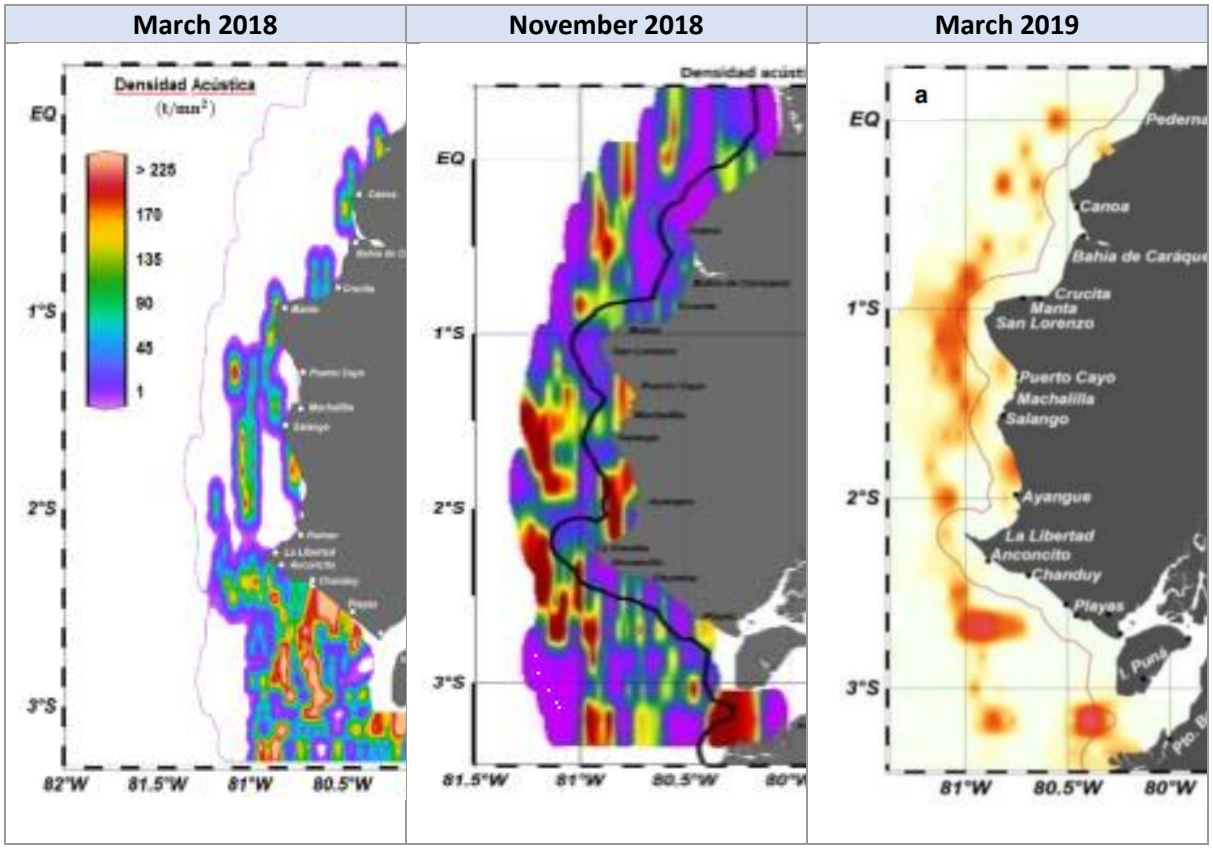


Figure 8. Small pelagic acoustic Density (2018-2019)

Source: Romero, A., *et al.* (2018a); Romero, A., *et al.* (2018b); Romero, A., *et al*. (2019)

The research cruise also realizes biological sampling of small pelagic, in order to analyse reproductive activity, size, maturity, gonads status, stomachs contents and otoliths research.

Research cruises have also generated opportunities for training professionals from some universities in Ecuador (UPSE and ESPOL) who participated in the research process by providing support to the INP, while receiving training.

The final reports of these studies are available in the set of **Annex 13.1.2 – 13.2.2 and 13.3.2**. There is an evidence of the SPS-FIP effort for the collection of primary data that have been used as input for the development of updated stock assessments and seasonal closure measures which are detailed in this report.

Also, as result of the IV research campaign, the CNP requested to the SRP to extend the seasonal closure of December until January 15, 2020 (**Annex 13.5.2**). This request was attended and approved by the SRP and INP on a meeting held on December 27, 2019 in which also participated private stakeholders of the fishery.

2.3 FAP Objective 3: Stock assessments of relevant species to the fishery are conducted on regular bases, following scientific methodology and their results are published and publicly

2.3.1 Improvement recommendations

- *"Conduct a stock assessment at least every 3 years, which considers all fishery removals and the biological characteristics of the species."*
- *"Ensure the stock assessments are made publically available."*

2.3.2 Activities and results

2.3.2.1 FAP Activity 5.1.1 - 5.1.9: Establish a periodic stock assessments system (every three years): To carry out the 1st Stock Assessment.

Through joint work with the INP, important progress has been made in the development of the first stock assessment of the 9 species that made up 95% of the catches according to the first pre-assessment under the IFFO RS standard.

On May 23, 2019, Dr. Canales, along with the INP, presented the preliminary results of the stocks assessments to the Executive Committee of the SPS-FIP, the presentation can be found in **Annex 7.1**.

The technical assistance of Dr. Canales and the results of his work were submitted later to a peer review panel, which provided the first stock assessment of the resources in this fishery, implying significant advances in activities of the project planned for the first 2 years.

Finally, on December 9, 2019, Mr. Cristian Canales and INP presented the results of the stock assessment realized for target species to the SPS-FIP Assembly and SRP. (**Annex 7.2**)

The full stock assessment report and its peer review are appended in **annex 7.3**.

Mr. Canales' work represents a great advance on stock evaluation of small pelagic in Ecuador and helped by training the scientific personal of the National Institute of Fishery in stock evaluation methodologies. The research integrates models which are modern methods to evaluate fish stocks.

The work was based on the exploration and analysis of historical data (biological and fisheries) obtained from the database of the small pelagic fish program of the INP, and the review of the results of research cruises conducted by the INP. Biological and fishery parameters necessary for stock assessment were estimated, abundance indices were standardized, focused on different types of probability distributions and analysis models were established for the evaluation of small pelagic stocks in Ecuador. In those species with greater data sufficiency, an integrated data model (MESTOCK) was used, from which all available historical data were considered. With this last analysis, estimates of recruitment, biomass and mortality from annual fishing were generated, which was used in the species *macarela, pinchagua, chuhueco, and botella*. The model assumes a closed stock in which recruitment is the result of "spawning" that occurred within the same distribution area of the analysed species but larval survival is determined mainly by environmental issues.

For species: roncador, trompeta, sardina redonda, corbata, a data-poor model (MODACT) was used in which only the size compositions of the catches are considered informative of the condition of the resource. The model depends strongly on the parameters of life history (growth, maturity and

mortality) and assumes equilibrium conditions, that is, recruitment and fishing mortality represented by a long-term average. This model is particularly useful when landings statistics are not available, but intensive sampling of catch sizes is available.

The short-term challenges are to establish fisheries management objectives and develop and evaluate exploitation strategies (MSE) in order to achieve the recovery of these populations. The final paper suggests a permanent updating of the models by the INP, as well as the improvement in data collection, generation of abundance indices, estimation of biological parameters and exploration of various hypotheses. These recommendations are working areas of the cooperation between INP and SPS-FIP.

Important recommendations were made by the peer reviewer in order to improve the work of stock assessment by INP in the short and long-term. The full assessment and peer review report is appended in **Annex 7.3.**

2.3.2.2 Ensure the stock assessments are made publically available.

The first stock assessment realized by Dr. Cristian Canales and INP (Canales, *et al.*, 2019) and its peer review are available on: http://smallpelagics.org/evaluacion-de-stocks-de-pelagicos-pequenos-y-revision-de-pares/

2.4 FAP Objective 4. Management Measures (CMMs) are adopted by fishery managers accordingly to the Stock Assessments outcomes and recommendations

2.4.1 Improvement recommendations

[A3.1] Implement a mechanism by which total fishery removals can be limited to the level recommended by stock assessments. This does not necessarily need to take the form of a quota; any effective mechanism can be implemented. The effectiveness will be demonstrated by meeting requirement A3.2.

2.4.2 Activities and results

2.4.2.1 FAP Activity 7. Identify and establish biological reference points (target and limit) as well as related Harvest Control Rules, based on data already available and results of the 1st Stock Assessment for this specie.

The analysis and definition of biological reference points are detailed in the stock assessment in **annex 7.3.**

In the case of control rules. Canales, *et al.*, (2019) recommends implementing capture control rules. However, the peer reviewer concludes that it was demonstrated in the assessment that small pelagic species have very variable recruitment. In that case, extraction control rules based on input control, such as fishing effort control through allowed fishing days (and closures) could be more effective. When recruitments are large, generating a lot of biomass, the effort control rules allow to take advantage of that increased productivity. Both documents can be founded in **annex 7.3**.

This activity will be completed during the participatory elaboration of the fisheries management plan that will be carried out in 2020 under the SMCP, and in which the CNP and the SPS-FIP will participate. The GMC project hired the Chilean consultant ECOS for the Facilitation of meetings for the dialogue platform and development of the National Action Plan and Management Plan for the Small Pelagic Fish fishery in Ecuador (https://procurement-notices.undp.org/view_notice.cfm?notice_id=60341).

2.5 Further impacts

2.5.1 Improvement recommendations

- *Require vessels to record and report all interactions with ETP species.*
- *Reviewer remarks that F2.1 should be a GAP, as habitats do not appear to be factored into the small pelagic management process.*

2.5.2 Activities and results

2.5.2.1 FAP Activity. Fishery interactions with ETP are registered by concerned fleets and mangers adopt CMMs accordingly

2.5.2.1.1 Implement electronic logbooks for all the industrial boats targeting small pelagic, including interaction with ETPs.

The interaction and mortality of the Endangered, Threatened and Protected species (ETP) caused by the small pelagic purse seine fleet was not well known in Ecuador. The SPS-FIP staff did the first report on the interactions with turtles, marine mammals and birds (still a draft document, **Annex 14.2**). For this report, data from the observer program collected on June 2019 was used. The observer program started to collect ETP data as a result of improvement recommendations implemented by SPS-FIP, as detailed in “Data Collection Protocol of the Observer Program of the small pelagic fish industrial fleet" (**Annex 11.1.2**):

PROGRAMA DE OBSERVADORES CIENTÍFICOS
REGISTRO DE TORTUGAS, AVES Y MAMÍFEROS MARINOS
EMBARCACIONES CON RED DE CERCO (PPP)

Anexo 4

Fecha salida y puerto:	Fecha entrada y puerto:	Compañía:	Nombre del observador:
Nombre de la embarcación:		Nombre del armador:	Nombre del Capitán de pesca:

Tipo de embarcación:	Matrícula:	Arte de pesca:	Pesca objetivo:	Faena de pesca:
				Lance:

OPERACIÓN DE PESCA

Calado				Dimensión de la Red (m)		Tamaño de la malla (pulg)		Profundidad del suelo marino (m)
				Altura	Longitud	Cabecero	Cuerpo	
Fecha:	Hora:	Latitud:	Longitud:					

CAPTURA

Especies:	#	Peso (lb)

DESCARTE

Especies:	#	Peso (lb)

AVISTAMIENTO DE AVES, TORTUGAS Y MAMÍFEROS MARINOS

Especie Tortugas, Aves y Mamíferos Marinos	#	Actividad					
		Alimentándose (Tor, Av y MM)	Volando (Av)	Reposo (Av, Tor)	Deambulando (Tor, MM)	# Juveniles	# Adultos

INTERACCIÓN: AVES, TORTUGAS Y MAMÍFEROS MARINOS

Especies:	Vivas No heridas	Heridas		Muerta	Interacción: Red de cerco con Jareta			Interacción								
		Graves	Leves		Cuerpo	Cabecero	Macaco	Pico	Patas	Alas	Cuello	Cuerpo	Hocico	Aletas		
														Pectoral	Caudal	

Material colectado: Fotos Videos Muestras

Abreviaturas: Tor: Tortuga, **Av:** Aves y **MM:** Mamíferos Marinos

Observaciones:

Figure 9. Data Collection forms of the Observer Program of the small pelagic industrial fleet

This preliminary study shows the first estimation of interactions between the purse-seine fishery and ETP species. The study area covered the Ecuadorian southern border with Perú (3°24'37" S) to the border of Manabí and Esmeraldas province (0°22'25" N). Overall, there were 11 different species

observed, but only 6 of this species interacted with the fishing activities. In Ecuador, there has being reports of 5 species of turtles, *Lepidochelys olivacea, Chelonia mydas, Dermochelys coriacea, Eretmochelys imbricate and Caretta caretta,* but only 2 has shown interactions with the small pelagic fishery in the coast of Ecuador in this study. These two species were the only species in the study to be categorised on the Red List (IUCN) as Endangered and Vulnerable, Green turtle (*Chelonia mydas*) (EN) and Olive Ridley (*Lepidochelys olivacea*) (VU). They both had a very low level of interactions for the analysed month.

While this report is the first assessment of ETP species interactions, due to the number of encounters and no reports of mortality of individuals, potential impacts during June 2019 are considered to have low impacts to individuals and believed to have essentially no impacts to populations. A yearly report will be able on the first quarter of 2020, for taking into account in the decision-making process.

Also, in the design of electronic logbooks (BEP), SPS-FIP required to the SRP includes the option to report ETP interactions, as detailed in the BEP´s screenshots below: (also see FAP Activity 3.1: Implement electronic logbooks for all the industrial boats targeting small pelagic, including interaction with ETPs.)

2.5.2.2 FAP Activity. Provide evidence that habitat interactions are minimal

Generally, habitats impacts are not a significant concern for purse seine fisheries. A report of the interaction between the small pelagic fishery and the habitat during 2018 was done by the SPS-FIP staff (**Annex 14.1.1**). Jurado, Gilbert, Ponce & Solis (2019) report used data from the onboard observer´s program. It introduces the importance of the marine habitats in Ecuador, the technics used by the fleet emphasizing the net's height. It also shows the bathymetry and the seabed composition.

This report describes the physical characteristics of the habitat, as well as the possible interactions between the purse seine fishery and the marine habitat of mainland Ecuador during 2018. The importance of marine habitats in Ecuador is introduced and linked to the small pelagic fish dynamics, the technical characteristics of the fleet are subsequently described by ship class (I, II, III and IV) with emphasis on the net height, mesh eye and net length. The data used were from the Observer's Program of the Undersecretary of Fisheries Resources (SRP) of 2018. A geographic information system (Quantum GIS) was used to import the effective catches from the registry, overlapping layers of bathymetry and subtidal systems which indicates the composition of the seabed; in order to obtain maps by zone. The description of the results is based on the location of the activities carried out by ship class (I, II, III and IV) in the designated study areas (Esmeraldas, Manabí, Santa Elena and the Gulf of Guayaquil), specifying the depth in which the fleet operates and in the same way the areas that could imply greater interaction between the purse seine net and the seabed.

Overall, the paper concluded that fishing activities of ships class II, III and IV do not have a direct affectation over the habitat. These fleets fish on zones deeper than the net´s height. Boats class I (<36 NRT), which are smaller and fish closer to the coast, might be interacting with the seabed. Nevertheless, they are not associated with ecosystems considered fragile. Additionally, possible affectations are taken into account on decision making of the management process, through regulations such as:

- Ministerial Regulations that prohibit fishing from the foreshore up to 1 nm (Ministerial Agreement N° 134, 2007). **Annex 14.1.2**
- Ministerial regulations that prohibit industrial fishing from the foreshore up to 8 nm (Ministerial Agreement N° 080, 1990). **Annex 14.1.3**
- Ministerial regulation that prohibit the use of the 'double lower sling or anti sludge' (net arranged along the lead border of the lower sling, in purse seine net. (MPCEIP-SRP-2019-0160-A, 2019). **Annex 14.1.4**

2.6 FAP milestones resume

Table 8. Milestone status

Activities	Milestone status	Evidence detailed in progress report:
1.1 Identify all members that will participate on the " Sustainable Marine Commodities Platform" (Intersectional working group), with membership composed of the public and private sector stakeholders directly concerned by the small pelagics fishery, and established by the Article number 7 of the Ministerial Agreement N 047 of April 9th, 2010.	**Milestone completed**	Progress report section 2.1.3 Annex 4.1.1: "Root Cause Analysis for the small pelagic fishery in Ecuador" "Analysis on the establishment of the platform" Annex 4.1.2.: Summary of the technical meeting-SMCP Structure
1.2 Develop a statute or norm defining the way on which the referred "Sustainable Marine Commodities Platform" will operate.	**Milestone completed**	Progress report section 2.1.4 Annex 4.2: Summary of the technical meeting-participation requirements of stakeholders
1.3 Define a calendar for yearly regular meetings, the standard agenda of items to be discussed and specify, at least, the next two meetings dates.	**Milestone completed**	Progress report section 2.1.5 Annex 4.3 SMCP calendar
1.4.1 Participate in the launch of the Sustainable Marine Commodities Platform (SMCP)	**Milestone completed**	Progress report section 2.1.6.1 Annexes 4.4.1 -4.4.2 - 4.4.3 and 4.4.4
1.4.2 Participate in the first SMCP meeting in order to approve its status and its strategic plan	**Milestone completed**	Progress report section 2.1.6.2 1st Steering Committee meeting- 1st review- Annexes 4.5.1 and 4.5.2 Approved by Government, socialization with private stakeholder re-Scheduled for January 2020 -Final review and validation
1.4.3 Participate in the second SMCP meeting in order to discuss Small Pelagic Harvest Control Rules (HCR)	**Scheduled, second year milestone**	
2.1 Establish an office with equipment and a research team which will develop a research program in order to assess both the small pelagic fish stocks and the fishery impacts on ETP species and the ecosystem. *	**Milestone completed**	Progress report section 2.2.2.1 Annex 2.2.1 and 2.2.2 (Agreements for public-private cooperation) Set of annexes Nro. 5: SPS-FIP technical staff

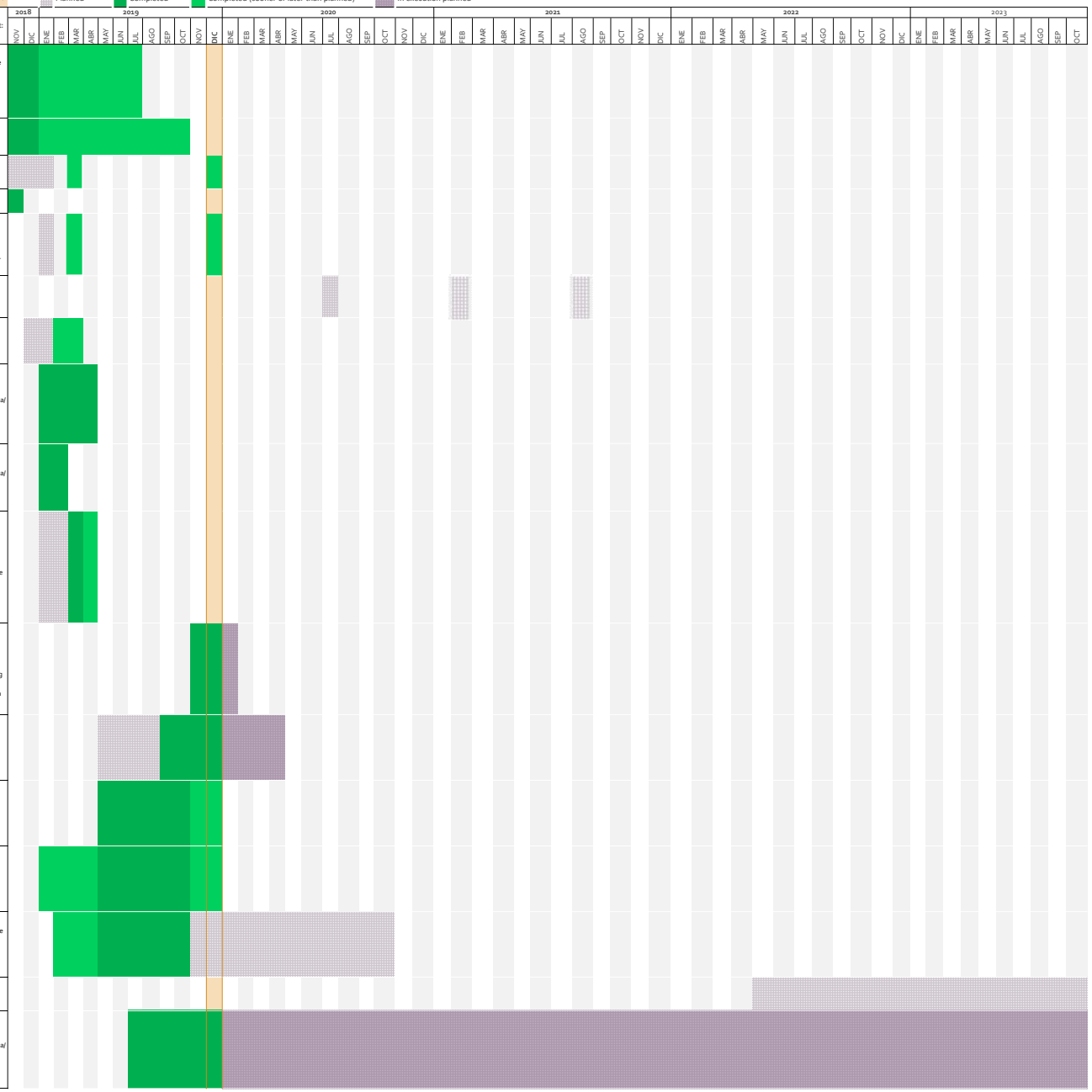
2.2 Review and evaluate of all the historical information / data related to the Ecuadorian small-scale fishery existing at the INP, for scanning it into an electronic format, allowing its further publication on the webpage of the INP and / or CNP. To assure that all the new documentation originated, relevant to the fishery, will be uploaded to the same place, including assessments.	**Milestone completed**	Progress report section 2.2.2.2 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/
2.3 Recollect (scanning into electronic format if needed) all the relevant legislation and normative related to the Ecuadorian small pelagics fishery and to place it all together in the web page of the CNP. To ensure all the relevant new issued legislation is uploaded as well.	**Milestone completed**	Progress report section 2.2.2.3 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/
2.4 Design a research project in order to define and conduct stocks assessment models , which may take into consideration oceanographic particularities. This project has to determine the stock structure and its distribution and will be the basis of the management strategy.	**Milestone completed**	Progress report section 2.2.2.4 Annex 6: Small Pelagic Fishery Scientific Program - Improvement Plan Annex 5.1 Terms of Reference of Dr. Cristian Canales (scientific for stock assessment) Annex 7. Stock assessment models for the main small pelagic species Annex 8. Captains and observers' workshops Annex 8.1. Report of the training works
2.5. Support legislation in order to improve the legal framework of the participatory decision making process.	**In progress, second year milestone**	CNP contributed in the development of the new Law for the Development of Aquaculture and Fisheries in Ecuador, in order to incorporate participatory mechanism as part of the decision making process. The new law is expected to be approved in the first half of 2020. This is a second year milestone.
3.1 Implement electronic logbooks for all the industrial boats targeting small pelagics, including interaction with ETPs. Research team and the authorized department of the Secretary of Fisheries will receive data automatically from the boat. System will be connected to GPS, so position is part of the provided data.	**In progress, second year milestone**	Progress report section 2.2.2.5 Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery. Annex 9. Electronic logbook (BEP)
3.2 Develop a system, endorsed by the research team, to calculate withdrawals (catches per specie) from the artisan fleets operating on the same stocks than the industrial vessels, and to incorporate this data to the stocks assessments or biomass estimations.	**Milestone completed**	Progress report section 2.2.2.6 Annex 10. Artisanal fishery research protocol
4. Establish a biological data gathering system through the observers program. Samples will include, but not limited to, size, maturity,	**Milestone completed**	Progress report section 2.2.2.7 Annex 10. Artisanal fishery research protocol

gonads status, stomachs contents, etc. Sampling frequency and size (number of individuals analyzed) will be determined by INP. Samplers will be hired by INP.		Annex 11. On board observer program improvement
5.1.1 - 5.1.9 Establish a periodic stock assessments system (every three years): To carry out the 1st Stock Assessment	**Second year milestone completed**	Progress report section 2.3.2.1 Annex 7. Stock assessment models for the main small pelagic species http://smallpelagics.org/evaluacion-de-stocks-de-pelagicos-pequenos-y-revision-de-pares/
5.2.1 - 5.2.9 Establish a periodic stock assessments system (every three years): To commit, via agreement with assessors, for the 2nd Stock Assessment.	Scheduled, end project milestone	
2.2 Review and evaluate of all the historical information / data related to the Ecuadorian small-scale fishery existing at the INP, for scanning it into an electronic format, allowing its further publication on the webpage of the INP and / or CNP. To assure that all the new documentation originated, relevant to the fishery, will be uploaded to the same place, including assessments.	**Recurrent activity**	Progress report section 2.2.2.2 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/
7.1 -7.9 Identify and establish biological reference points (target and limit) as well as related Harvest Control Rules, based on data already available and results of the 1st Stock Assessment for this specie. If Stock Assessment recommends it, to Establish a TAC (Total Admissible Catches).	**In progress, second year milestone**	Progress report section 2.4.2.1 Annex 7.3 First stock assessment for small pelagic fishes in Ecuador (final report and peer review).
18.Provide evidence from INP showing that catches are negligible (jack mackerel)	**Milestone completed**	Progress report section 2.2.2.8 Annex 12. Biological fishing aspects of Jack Mackerel (Trachurus murphyi) in Ecuadorian waters
3.1 Implement electronic logbooks for all the industrial boats targeting small pelagics, including interaction with ETPs. Research and the authorized department of the Secretary of Fisheries will receive data automatically from the boat. System will be connected to GPS, so position is part of the provided data.	**In progress, second year milestone**	Progress report section 2.2.2.5 Progress report section 2.5.2.1. Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery. Annex 9. Electronic logbook (BEP) Annex 14.2 Interactions between Seabirds, turtles and marine mammals in the purse-seine fisheries in continental coast of Ecuador during June 2019 (first draft) Annex 11.1.2 Research protocol for on board observers and biological sampling
14.1 ETP Assessment developed on yearly bases and available publicly	**In progress, third year milestone**	Progress report section 2.5.2.1. Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery.

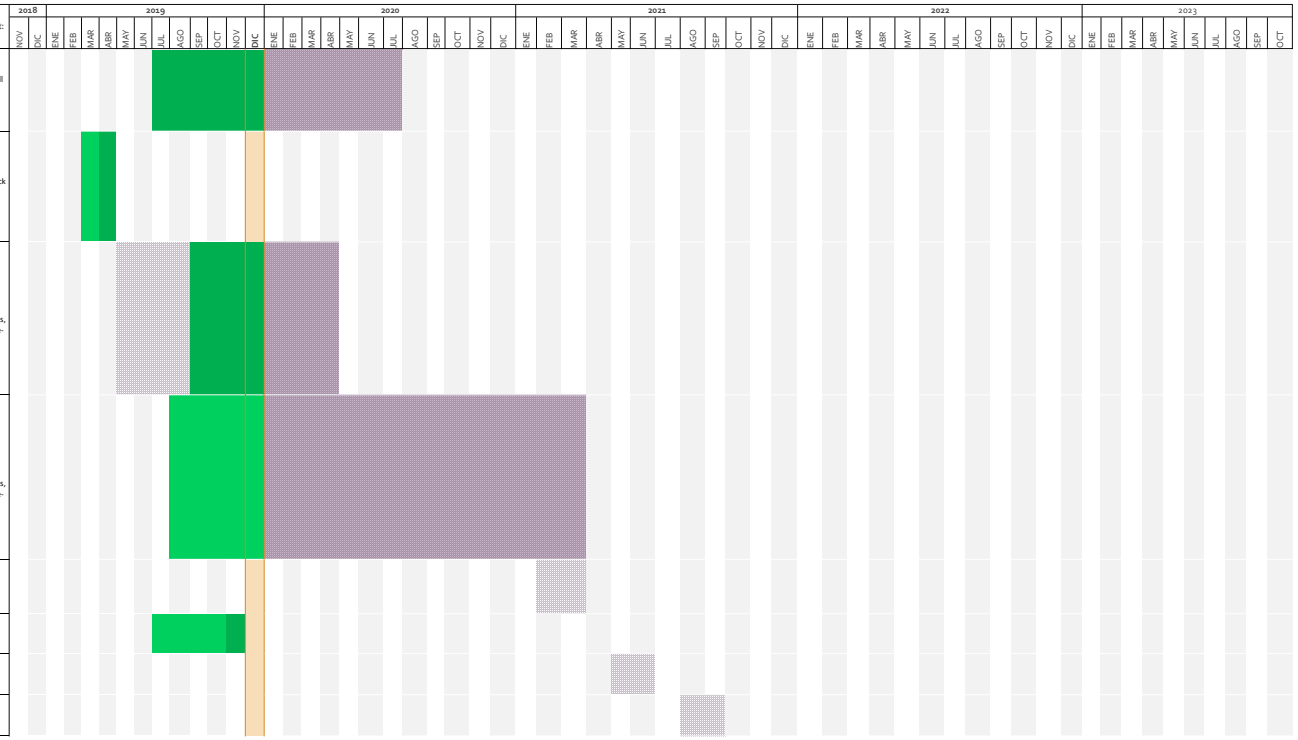
		Annex 9. Electronic logbook (BEP) Annex 14.2 Interactions between Seabirds, turtles and marine mammals in the purse-seine fisheries in continental coast of Ecuador during June 2019 (first draft) Annex 11.1.2 Research protocol for on board observers and biological sampling
14.2 CMMs related to ETP based on existing assessment adopted by managers	Scheduled, third year milestone	
19. Provide evidence that habitat interactions are minimal	**Milestone completed**	Progress report section 2.5.2.2. Annex 14. Further impacts
15.1 - 16.1 Ecosystems Impact Assessment developed and available publicly	Scheduled, third year milestone	
15.2 - 16.2 CMMs related to Ecosystem Impact based on existing assessment adopted by managers	Scheduled, third year milestone	

SPS-FIP: FISHERY ACTION PLAN (TRACKING)

Assessment Area	Activities	Milestone status	Evidence detailed in progress report:
		Reporting period	dic-19
Management	1.1 Identify all members that will participate on the " Sustainable Marine Commodities Platform" (Intersectional working group), with membership composed of the public and private sector stakeholders directly concerned by the small pelagics fishery, and established by the Article number 7 of the Ministerial Agreement N 047 of April 9th, 2010.	Milestone completed	Progress report section 2.1.3 Annex 4.1.1: "Root Cause Analysis for the small pelagic fishery in Ecuador" "Analysis on the establishment of the platform" Annex 4.1.2.: Summary of the technical meeting-SMCP Structure
	1.2 Develop a statute or norm defining the way on which the referred "Sustainable Marine Commodities Platform" will operate.	Milestone completed	Progress report section 2.1.4 Annex 4.2: Summary of the technical meeting-participation requirements of stakeholders
	1.3 Define a calendar for yearly regular meetings, the standard agenda of items to be discussed and specify, at least, the next two meetings dates.	Milestone completed	Progress report section 2.1.5 Annex 4.3 SMCP calendar
	1.4.1 Participate in the launch of the Sustainable Marine Commodities Platform (SMCP)	Milestone completed	Progress report section 2.1.6.1 Annexes 4.4.1 -4.4.2 - 4.4.3 and 4.4.4
	1.4.2 Participate in the first SMCP meeting in order to approve its status and its strategic plan	Milestone completed	Progress report section 2.1.6.2 1st Steering Committee meeting- 1st review- Annexes 4.5.1 and 4.5.2 Approved by Government, socialization with private stakeholder re-Scheduled for January 2020 -Final review and validation
	1.4.3 Participate in the second SMCP meeting in order to discuss Small Pelagic Harvest Control Rules (HCR)	Scheduled, second year milestone	
	2.1 Establish an office with equipment and a research team which will develop a research program in order to assess both the small pelagic fish stocks and the fishery impacts on ETP species and the ecosystem. *	Milestone completed	Progress report section 2.2.2.1 Annex 2.2.1 and 2.2.2 (Agreements for public-private cooperation) Set of annexes Nro. 5: SPS-FIP technical staff
	2.2 Review and evaluate of all the historical information / data related to the Ecuadorian small-scale fishery existing at the INP, for scanning it into an electronic format, allowing its further publication on the webpage of the INP and / or CNP. To assure that all the new documentation originated, relevant to the fishery, will be uploaded to the same place, including assessments.	Milestone completed	Progress report section 2.2.2.2 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/
	2.3 Recollect (scanning into electronic format if needed) all the relevant legislation and normative related to the Ecuadorian small pelagics fishery and to place it all together in the web page of the CNP. To ensure all the relevant new issued legislation is uploaded as well.	Milestone completed	Progress report section 2.2.2.3 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/
	2.4 Design a research project in order to define and conduct stocks assessment models , which may take into consideration oceanographic particularities. This project has to determine the stock structure and its distribution and will be the basis of the management strategy.	Milestone completed	Progress report section 2.2.2.4 Annex 6: Small Pelagic Fishery Scientific Program - Improvement Plan Annex 5.1 Terms of Reference of Dr. Cristian Canales (scientific for stock assessment) Annex 7. Stock assessment models for the main small pelagic species Annex 8. Captains and observers' workshops Annex 8.1. Report of the training workshops
	2.5. Support legislation in order to improve the legal framework of the participatory decision making process.	In progress, second year milestone	CNP contributed in the developement of the new Law for the Development of Aquaculture and Fisheries in Ecuador, in order to incorporate participatory mechanism as part of the decision making process. The new law is expected to be approved in the first half of 2020. This is a second year milestone
Category A-B Species. Greater than 5% of landings & Specific management regime in place	3.1 Implement electronic logbooks for all the industrial boats targeting small pelagics, including interaction with ETPs. Research team and the authorized department of the Secretary of Fisheries will receive data automatically from the boat. System will be connected to GPS, so position is part of the provided data.	In progress, second year milestone	Progress report section 2.2.2.5 Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery. Annex 9. Electronic logbook (BEP)
	3.2 Develop a system, endorsed by the research team, to calculate withdrawals (catches per specie) from the artisan fleets operating on the same stocks than the industrial vessels, and to incorporate this data to the stocks assessments or biomass estimations.	Milestone completed	Progress report section 2.2.2.6 Annex 10. Artisanal fishery research protocol
	4. Establish a biological data gathering system through the observers program. Samples will include, but not limited to, size, maturity, gonads status, stomachs contents, etc. Sampling frequency and size (number of individuals analyzed) will be determined by INP. Samplers will be hired by INP.	Milestone completed	Progress report section 2.2.2.7 Annex 10. Artisanal fishery research protocol Annex 11. On board observer program improvement
	5.1.1 - 5.1.9 Establish a periodic stock assessments system (every three years): To carry out the 1st Stock Assessment	Second year milestone completed	Progress report section 2.3.2.1 Annex 7. Stock assessment models for the main small pelagic species http://smallpelagics.org/evaluacion-de-stocks-de-pelagicos-pequenos-y-revision-de-pares/
	5.2.1 - 5.2.9 Establish a periodic stock assessments system (every three years): To commit, via agreement with assessors, for the 2nd Stock Assessment.	Scheduled, end project milestone	
	2.2 Review and evaluate of all the historical information / data related to the Ecuadorian small-scale fishery existing at the INP, for scanning it into an electronic format, allowing its further publication on the webpage of the INP and / or CNP. To assure that all the new documentation originated, relevant to the fishery, will be uploaded to the same place, including assessments.	Recurrent activity	Progress report section 2.2.2.2 http://www.smallpelagics.org/fishery-data/ http://www.institutopesca.gob.ec/peces-pelagicos-pequenos/



Assessment Area	Activities	Milestone status	Evidence detailed in progress report:
	7.1 -7.9 Identify and establish biological reference points (target and limit) as well as related Harvest Control Rules, based on data already available and results of the 1st Stock Assessment for this specie. If Stock Assessment recommends it, to Establish a TAC (Total Admissible Catches).	In progress, second year milestone	Progress report section 2.4.2.1 Annex 7.3 First stock assessment for small pelagic fishes in Ecuador (final report and peer review).
Category C Species. Less than 5% of landings & subject to a species-specific management regime	18.Provide evidence from INP showing that catches are negligible (jack mackerel)	Milestone completed	Progress report section 2.2.2.8 Annex 12. Biological fishing aspects of Jack Mackerel (Trachurus murphyi) in Ecuadorian waters
Further Impacts	3.1 Implement electronic logbooks for all the industrial boats targeting small pelagics, including interaction with ETPs. Research and the authorized department of the Secretary of Fisheries will receive data automatically from the boat. System will be connected to GPS, so position is part of the provided data.	In progress, second year milestone	Progress report section 2.5.2.1. Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery. Annex 9. Electronic logbook (BEP) Annex 14.2 Interactions between Seabirds, turtles and marine mammals in the purse-seine fisheries in continental coast of Ecuador during June 2019 (first draft) Annex 11.1.2 Research protocol for on board observers and biological sampling
	14.1 ETP Assessment developed on yearly bases and available publicly	In progress, third year milestone	Progress report section 2.2.2.5 Progress report section 2.5.2.1. Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery. Annex 9. Electronic logbook (BEP) Annex 14.2 Interactions between Seabirds, turtles and marine mammals in the purse-seine fisheries in continental coast of Ecuador during June 2019 (first draft) Annex 11.1.2 Research protocol for on board observers and biological sampling
	14.2 CMMs related to ETP based on existing assessment adopted by managers	Scheduled, third year milestone	
	19. Provide evidence that habitat interactions are minimal	Milestone completed	Progress report section 2.5.2.2. Annex 14. Further impacts
	15.1 - 16.1 Ecosystems Impact Assessment developed and available publicly	Scheduled, third year milestone	
	15.2 - 16.2 CMMs related to Ecosystem Impact based on existing assessment adopted by managers	Scheduled, third year milestone	



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4. Annexes

Annex 1. Fishery Action Plan SPS-FIP

Annex 2. Agreements for public-private cooperation

Annex 2.1 VAP-SRP-CNP cooperation agreement for the Improvement of the Small Pelagic Fishery.

Annex 2.2.1 Agreement for Inter-institutional Cooperation between INP and CNP for the Improvement of the Small Pelagic Fishery.

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